

# MEETING MINUTES



MINUTES OF: Arrow Surat Community Reference Group  
 HELD AT: Fitzy's Toowoomba, 153 Margaret Street  
 DATE: 9 November 2017  
 COMMENCEMENT TIME: 9.40 am

<b>Present:</b>	<p><b>Peta Tucker</b> – Manager Community Relations  <b>Simon Gossmann</b> – Groundwater Manager  <b>Ian Hayllor</b> – Gas Fields Commissioner  <b>Cr Nancy Sommerfield</b> – Toowoomba Regional Council  <b>Lee McNicholl</b> – Basin Sustainability Association  <b>Matthew Paull</b> – APPEA  <b>Ian Hayllor</b> – AgForce</p> <p>Proxies:  <b>Timothy Green</b> (DNRM), <b>Jane Walker</b> (Gas Fields Commission)</p> <p>Presenters:  <b>Adrian McKay</b> – Principal Project Officer (Groundwater), DNRM  <b>Michael Jamieson</b> – Principal Policy Officer, Strategic Water Programs, DNRM  <b>Ivan Tan</b> – Chief Operating Officer, Arrow Energy  <b>Chris Wicks</b> – Development Planner IFL, Arrow Energy  <b>Simon Gossmann</b> – Groundwater Manager, Arrow Energy  <b>Liz Edwards</b> – Media &amp; Communications Manager, Arrow Energy</p>
<b>Apologies:</b>	<p><b>John Hughes</b> – CSG Compliance Unit, DNRM  <b>Liam Jeory</b> – Gas Fields Commission  <b>Scott Braund</b> – Lot Feeders Association  <b>Pat Weir MP</b> – Member for Condamine  <b>Graham Clapham</b> – Central Downs Irrigators Ltd  <b>Mayor Paul McVeigh</b> – Western Downs Regional Council  <b>Jody Monaghan</b> – Dalby Chamber of Commerce &amp; Industry</p>
<b>Chair:</b>	<b>Leisa Elder</b> – Vice President External Relations and Tenure Management
<b>Secretariat:</b>	<b>Rita Hassan</b> – Senior Community Officer, Dalby
<b>Disclosures:</b>	None recorded

	<b>Joint Meeting – ASCRG &amp; AIFL Committee</b>	<b>ACTION/ SUGGESTIONS</b>
<b>ITEM 1</b>	<p><b>Welcome – Leisa Elder</b></p> <ul style="list-style-type: none"> <li>Leisa Elder welcomed attendees including proxies and introduced guest presenters.</li> </ul>	
<b>ITEM 2</b>	<p><b>Safety moment – Liam Stower</b></p> <ul style="list-style-type: none"> <li>Men's Health Movember campaign</li> </ul>	
<b>ITEM 3</b>	<p><b>Hopeland Seismic Survey update – Ivan Tan</b></p> <ul style="list-style-type: none"> <li>Seismic survey was recently carried out in the Hopeland area, 7 September – 16 October 2016.</li> <li>Seismic surveys are used to gather detailed images of the rock formations below the earth's surface.</li> <li>The geophysical technique uses vibration to create seismic waves which are picked by geophones.</li> <li>The seismic profile can be used to interpret the architecture and structural attributes of coal seams.</li> <li>The survey in the Hopeland area was undertaken on 150km of public and private roads with no incidents.</li> <li>Results of the survey will be available next year.</li> <li>Ian Hayllor asked if the data collected can help to identify risks associated with gassy bores and perhaps assist with managing these risks.</li> <li>Ivan Tan advised that the survey will help us to understand the faults in the area which is one aspect of gassy bores identification.</li> <li>Simon Gossmann noted that there is risk of gassy bores in the area due to the formations and that the area has a history of gassy bores. Arrow has already carried out bore assessments in the area. Some bores have been plugged and abandoned as a result of assessments.</li> <li>Lee McNicholl referenced a presentation from Jim Underschultz at CSG Net</li> </ul>	

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	<p>meetings in the Surat Basin. The presentation acknowledges that there are knowns and unknowns regarding connectivity in the area. PhD students from University of Queensland (UQ) are looking at fault systems and hydrocarbon migration. The research also found that the precipice flows north-east into the Dawson River, not south-west. Lee suggested the presentation may also be valuable for this committee.</p> <ul style="list-style-type: none"> <li>• Simon Gossmann noted that Arrow works closely with UQ through the Centre for Coal Seam Gas (CCSG). Some interesting work has been done regarding fingerprinting of water sources using isotope identification.</li> <li>• Leisa Elder recalled that Andrew Garnett from CCSG and a speaker from CSIRO attended our last meeting to present on research findings.</li> </ul>	
<b>ITEM 4</b>	<p><b>Arrow Operations update – Ivan Tan</b></p> <ul style="list-style-type: none"> <li>• A trial Brine Concentrator has been installed at the Daandine Reverse Osmosis (RO) plant to increase the system's capacity and improve water recovery rates.</li> <li>• The annual shutdown for Daandine Central Gas Processing Facility (CGPF) was undertaken 12-18 October. Produce the Limit (PtL) upgrades were commenced during the shutdown and are due to be completed later this month.</li> <li>• The Tipton CGPF annual shutdown was also undertaken 9-10 October.</li> <li>• Hopeland Pilot PPLa             <ul style="list-style-type: none"> <li>○ Arrow has applied for a Petroleum Pipeline Licence (PPLa) to transport CSG from Arrow's existing Hopeland Pilot to a neighbouring operation.</li> <li>○ If the application is successful, it will allow Arrow to reduce flaring associated with the Pilot and put the gas into production.</li> </ul> </li> <li>• Lee McNicholl asked if we could identify the third party involved in the Hopeland Pilot PPLa – Ivan Tan confirmed that the neighbouring operation is QGC.</li> <li>• Ian Hayllor commented that any move to reduce flaring is positive. He wonders if there is any way to further reduce the need for flaring as it gives the impression we are wasting gas.</li> <li>• Ivan Tan acknowledged the concern and assured the committee that Arrow is always looking to optimise the way our shutdowns are conducted in order to reduce the amount of gas flared. Don Ney provided information about a recent failure at the LNG plant in Gladstone which impacted the transport of gas out of the Surat Basin. This incident added to the amount of gas being flared across the region. Ivan also advised that transmission lines heading south were in repair/maintenance, compounding the situation.</li> <li>• Jane Walker asked how we communicated the need to flare. Peta Tucker advised that a mailout was conducted prior to the activity. All landholders within a 15km radius received notification of the shutdown and associated flaring that would take place.</li> <li>• Lee McNicholl believes that the public should be made aware that royalties are not paid on flared gas and that the statistics around this should be made available.</li> <li>• Ivan noted that Arrow monitor and report on all emissions including flaring. To date Arrow has operated well within emissions allowances. A more detailed presentation on this topic could be provided at a subsequent meeting.</li> </ul> <p><b>Tipton Expansion</b></p> <ul style="list-style-type: none"> <li>• Tipton Expansion is an expansion of the Tipton field on two Petroleum Leases (PL198 and PL238) over the next 4 years. The expansion is larger than the expansion carried out at Daandine and represents an investment of \$750 million dollars over the life of the project.</li> <li>• Front End Engineering and Design (FEED) should be complete by December.</li> <li>• Maps shown identify the Tipton expansion area and schedule of execution.</li> <li>• Most of the construction will take place in 2019-2020 with sustaining of wells thereafter.</li> <li>• Chris Wicks clarified the schematic diagram showing the location of proposed wells in the existing field and new locations. Diagram colours refer to timing; red items are first and refer to infilling/twinning of wells in existing field; orange/yellow/green wells are in new locations and will occur later in the program.             <ul style="list-style-type: none"> <li>○ 3 CCAs in total including 1 with Arrow</li> <li>○ 2 landholders in phase 1 (existing relationship with Arrow).</li> <li>○ 90 wells to be drilled in the next 5 years (targeting the Taroom Coal Measures)</li> </ul> </li> <li>• Lee mentioned that Max Winder's water modelling indicates connectivity between the Taroom subset and the Hutton. He also noted that CSIRO have been tardy to look at this.</li> <li>• Simon is aware of Max Winder's modelling and advised that OGIA already looks at the impacts in this area.</li> </ul>	<p><b>Emissions monitoring information to be shared at the next meeting</b></p>

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	<ul style="list-style-type: none"> <li>• Timothy Green questioned whether the project scheduling has been communicated with landholders; this was confirmed.</li> </ul>	
ITEM 5	<p><b>Arrow Project update – Chris Wicks</b></p> <p>3PL well drilling program</p> <ul style="list-style-type: none"> <li>• The 3PL program is being carried out on three Petroleum Leases to meet production targets for compliance.</li> <li>• Longswamp and Plainview wells are currently being commissioned.</li> <li>• Meenawarra Pilot at Cecil Plains will have an additional 2 wells drilled to be online in 2018; targeted engagement and advertising will occur to notify local stakeholders since the wells will be visible from the road.</li> </ul> <p>PtL project</p> <ul style="list-style-type: none"> <li>• 9 new Tipton and Daandine wells are being commissioned.</li> <li>• New equipment has been installed at Daandine and Tipton CGPFs including a new fuel gas compressor and a new flare tip at Daandine (to increase capacity).</li> </ul> <p>Plainview pilot</p> <ul style="list-style-type: none"> <li>• A core well has been drilled through the Horrane Fault and results are being analysed. This well will be converted into a Ground Water Monitoring site.</li> <li>• The Horrane fault location was identified to assist with planning since the Pilot is close to the fault. The data will help to determine potential impacts to production or gas migration.</li> <li>• The project includes a soil gas monitoring plan which will: <ul style="list-style-type: none"> <li>○ Investigate gas migration.</li> <li>○ Include 23 soil gas monitoring locations; 5 to be installed this month, the remainder in early 2018.</li> <li>○ The sites will gather data on baseline soil gas content.</li> </ul> </li> <li>• The water team are also updating monitoring bore data in this area which will capture information from deeper zones.</li> </ul> <p><b>Moved to:- ITEM 9</b></p> <p>Actions regarding questions on the Horrane fault</p> <ul style="list-style-type: none"> <li>• From the core samples taken, gas migration was not apparent but monitoring will continue above and below the fault.</li> <li>• Images show photographs of samples for analysis.</li> <li>• Ian Hayllor commented that it is good to see this work taking place.</li> <li>• Lee McNicholl asked about the extent of the fault laterally. Simon noted that it is difficult to quantify however, the main section of the fault is estimated to be up to 1 metre wide with smaller faults radiating out at a higher frequency.</li> <li>• Core sampling also helps us to understand the history of an area i.e. water movement.</li> <li>• Further analysis is carried out by Geologists who can further explain the core sampling results (action taken).</li> </ul> <p>Arrow Property</p> <ul style="list-style-type: none"> <li>• Meenawarra property at Cecil Plains and Wyalla property at Brigalow are being offered for lease by Expressions of Interest through Ray White Dalby.</li> <li>• Opportunity came about to advertise the leases after one of the current vendors retired. Re-leasing will put these properties to better use while still allowing Arrow to undertake activities as required.</li> <li>• Meenawarra homestead will be sold at a later date.</li> </ul>	<p><b>Geologist to attend subsequent meeting to further explain Horrane fault analysis</b></p>
ITEM 6	<p><b>Groundwater Dependent Ecosystem (GDE) Investigations 2017-2018 – Simon Gossman</b></p> <ul style="list-style-type: none"> <li>• Assessments will commence later this year and into the New Year.</li> <li>• The investigation into GAB springs and GDEs is required as part of our Surat Gas Plan Greenfield project approvals. There are no GAB springs on our current tenure but non-spring GDE sites have been identified.</li> <li>• GDE surveys will be carried out to understand the impacts of dewatering and how this may impact local ecosystems.</li> <li>• The surveys will be undertaken in areas where potential GDEs have been identified where a 1m drawdown is predicted.</li> <li>• 4 locations have been identified where there are plant species that may be impacted by a drawdown in the water table. Steps of the survey include: <ol style="list-style-type: none"> <li>1. Identify vegetation access to groundwater (how deep the roots travel)</li> <li>2. Confirm if areas are Springbok sandstone</li> <li>3. Identify degree of connectivity between the aquifer hosting trees and the Walloon Coal measures.</li> </ol> </li> <li>• Tree species to be investigated include the mature River Red Gum and Poplar Box. The survey will look at root depth and how groundwater responds in the root zones.</li> <li>• The study will also use isotope identification to determine water interaction by</li> </ul>	

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	<p>sampling tree water.</p> <ul style="list-style-type: none"> <li>• 2 drilling programs will be carried out:               <ul style="list-style-type: none"> <li>○ Small sonic rig (will drill right next to the tree)</li> <li>○ Standard water bore rig (into the Walloon Coal Measures and Springbok)</li> </ul> </li> <li>• 4 Sites across our tenure               <ul style="list-style-type: none"> <li>○ Longswamp</li> <li>○ Lake Broadwater</li> <li>○ Glenburnie (Millmerran)</li> <li>○ Burunga Lane (Gulugaba)</li> </ul> </li> <li>• The Lake Broadwater study is required by the Federal Government. The survey at this site will also investigate the presence of a clay layer under the lake.</li> <li>• Lee McNicholl pointed out that the Springbok formation is expected to outcrop in this area. The Springbok comes to the surface in many places. Farmers would be interested in the results of these investigations. Locals are very aware of the ability for tree roots to chase water to significant depths (in excess of 20m in some cases).</li> <li>• Stephen Williams agrees that the results of the investigation will be valuable, especially in the farming areas.</li> </ul>	
<b>ITEM 8 brought forward</b>	<p><b>GABORA Water Plan 2017 – Adrian McKay and Michael Jamieson</b></p> <ul style="list-style-type: none"> <li>• The GABORA replaces the original Great Artesian Basin water plan from 2006.</li> <li>• Assessments and significant changes have taken place since 2006. The ORA (Other Regional Aquifers) component is new to the plan.</li> <li>• The review of the plan commenced in 2015 when proposals were first brought to the community. Feedback to the draft was considered and adjustments made. The final plan was released on 2 September 2017.</li> <li>• Consultation included 26 community meetings across the state. All submissions were catalogued and reported.</li> <li>• One of the findings noted that different stakeholders had different interests.</li> <li>• The Great Artesian Basin is made up of 4 main sub-basins               <ul style="list-style-type: none"> <li>○ Carpentaria Basin</li> <li>○ Eromanga Basin (largest)</li> <li>○ Surat Basin</li> <li>○ Clarence-Moreton Basin</li> <li>○ and the smaller Mulgildie Basin</li> </ul> </li> <li>• Precipice sandstone is the Basal Aquifer of the GAB. The GAB is made up of a series of formations that are basal in shape. The basins outcrop in higher range areas. The Springbok sandstone outcrops next to the Condamine Alluvium. Topographic flows occur in these outcrop areas.</li> <li>• The plan analyses the volume of water extraction. Specific data from the Surat/Clarence Moreton &amp; Mulgildie Basin 2015, estimated the following:               <ul style="list-style-type: none"> <li>○ 60,000 ML – petroleum and gas industry</li> <li>○ 48,000 ML – volumetric licences (not all metered)</li> <li>○ 20,000 ML - stock and domestic</li> <li>○ 9,000 ML - Stock and domestic (distribution losses)</li> </ul> </li> <li>• Part of the plan is to work towards metering for all volumetric licences especially for larger bores.</li> <li>• Stephen Williams made note that the volume of water taken by the gas industry is approximately 40% which is a concern to landholders.</li> <li>• Simon Gossmann noted that this take is for 2015, yet the impacts to the Hutton have been on-going for decades prior to the industry's existence. The statistics help us to look to future management.</li> <li>• Industry water take graph maps changes with the introduction of CSG from 1995-2015.</li> <li>• Looking at trends in water use from Surat Basin water bores to 1900 we see that the usage is starting to maintain/stabilise in the last 10 years.</li> <li>• Stephen Williams has concerns with the volume of water take by the industry and questions whether it is sustainable. Agriculture relies on the availability of water into the future. He considers the matter is a larger political problem.</li> <li>• Ian Hayllor acknowledged that we have come a long way to better understanding water management. Ideally the CSG industry would not have any water impacts; however, it is important to note that the water taken by the industry is often water that farmers wouldn't be targeting.</li> <li>• Arrow currently provides treated CSG water to Grassdale feedlot which offsets their water take from the precipice (under licence).</li> <li>• The GABORA Water Plan sets a 10 year framework to sustainably manage the basin. This framework includes a deadline for the completion of remaining capping and piping and the following key measures:               <ol style="list-style-type: none"> <li>1. Facilitating make good arrangements – licences can be moved to another aquifer.</li> </ol> </li> </ul>	

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	<ol style="list-style-type: none"> <li>2. 3 Zones (where impacts due to CSG are predicted) declared to protect existing water users from additional drawdown:               <ul style="list-style-type: none"> <li>- Springbok Walloon zone</li> <li>- Hutton zone</li> <li>- Precipice zone</li> </ul> </li> <li>3. Very little unallocated water – this is a significant change since the 2006 plan.</li> <li>4. New users – trading will be the only way to get water               <ul style="list-style-type: none"> <li>- Active and sleeper licences may be tradable</li> <li>- A current market exists for water trade</li> <li>- Rules around trade are to facilitate trade, not forced</li> <li>- Users can trade with specific identified areas</li> <li>- Water can only be traded if user is on a meter and buyer must also be metred</li> </ul> </li> <li>5. Minimum bore separation distances to protect existing water users and springs.               <ul style="list-style-type: none"> <li>- Trade will only be allowed if predicted drawdown is within limits</li> </ul> </li> </ol> <ul style="list-style-type: none"> <li>• Key messages:               <ul style="list-style-type: none"> <li>- Licences can be moved to facilitate make good if existing water users and springs are protected.</li> <li>- Surat Basin aquifers are highly developed</li> <li>- Smaller volumes of unallocated water than in the past</li> <li>- Water trading is an option for new water users</li> <li>- Rules protect existing water users and springs (Northern Surat Basin has little capacity for new water licences including trade due to springs).</li> </ul> </li> </ul>	<p><b>DNRM agreed to make the presentation available to Members</b></p>
<p><b>ITEM 7 (presented after ITEM 8)</b></p>	<p><b>Surat Basin Attitudinal Market Research 2017 – Liz Edwards</b></p> <ul style="list-style-type: none"> <li>• Arrow conducts community-wide research every 18-24 months by phone interview of a sample section of Surat Basin residents</li> <li>• APPEA also carries out research on Queensland perceptions of the industry – their most recent has mainly targeted east coast residents.</li> <li>• Arrow research shows that those outside the directly-impacted areas remain the most influential on media and government policy. However, both impacted and non-impacted residents have become vocal regarding energy supply and pricing.</li> <li>• On-the-ground engagement and word-of-mouth continue to inform community sentiment across the region (much more than online and digital sources).</li> <li>• The Arrow survey shows support for the industry is at its highest level in five years and that there is increased recognition of the benefits of CSG development to local economies.</li> <li>• Research shows Arrow has been able to maintain community awareness through a period of low development.</li> <li>• Environment continues to be a significant issue for residents, however, new issues have emerged i.e. energy prices and the need for energy sector regulation. There is a growing interest in regional employment and economic growth.</li> <li>• This research guides external relations work at Arrow.</li> <li>• The influence of staff as local company advocates is significant.</li> <li>• Arrow needs to remain focused on responding to emerging local issues.</li> </ul> <p>Lee McNicholl believes that people often don't understand the impacts or long-term consequences of decisions made by politicians.</p> <p>Leisa Elder pointed out that the aim is to promote co-existence, it's not about making people choose.</p> <p>Stephen Williams made note that Arrow has come a long way in its dealings with farmers. He agreed with Lee that frustrations exist with the political decisions made.</p>	

ASCRG Committee only		
ITEM 9	<p><b>Minutes of previous meetings</b></p> <ul style="list-style-type: none"> <li>Minutes of the June meeting were reviewed and accepted without change.</li> </ul> <p><b>Actions from previous meeting</b></p> <ul style="list-style-type: none"> <li>TipEx water production and Transmissivity                             <ul style="list-style-type: none"> <li>TipEx water production forecast ~55GL over ~40 years</li> <li>Transmissivity is variable but ranges from &lt;math&gt;&lt;1\text{m}^2/\text{day}&lt;/math&gt; to ~5m<sup>2</sup>/day; this estimates correlates with recent bore assessments undertaken for Walloon Coal Measures water bores.</li> </ul> </li> <li>Horrane Fault (discussed earlier in the meeting – see minutes ITEM 5)</li> </ul>	
ITEM 10	<p><b>Social investment update</b></p> <ul style="list-style-type: none"> <li>Informal discussion regarding Social Investment was carried out over lunch due to time constraints.</li> </ul>	
ITEM 11	<p><b>Any other business</b></p> <ul style="list-style-type: none"> <li>Nil</li> </ul>	
ITEM 12	<p><b>Agreed outcomes, actions and deliverables</b></p> <ul style="list-style-type: none"> <li>Emissions reporting responsibilities and statistics to be shared at a subsequent meeting</li> </ul>	
ITEM 13	<p><b>Next meeting</b></p> <ul style="list-style-type: none"> <li>8 March 2018 (tentative, subject to change)</li> </ul>	

There being no further business, the meeting was closed at 12.15pm.