Arrow Energy - Presenters

- Robbert de Weijer – Chief Operating Officer
- Tony Knight – General Manager, Exploration
- Darren Stevenson – General Manager, Asset South
- Carolyn Collins – Environment and Water Manager
Presentation Outline

- What today is about
- An update on Arrow Energy
- How Arrow operates: Arrow’s plans and timeframes
- Your concerns and Arrow’s responses
- Potential benefits for the community
- Questions and Answers
We are here today to:

- Respond to your concerns about the CSG industry and Arrow’s projects
- Provide new information on the Surat Gas Project and EIS
- Work towards an Arrow, community and landholder win-win
- Answer your questions
- Listen to, and understand any additional community concerns
About Arrow Energy
Coal Seam Gas

- The Surat Basin has been known as a source of gas from as early as 1916

- Since 2000 companies have developed a way to extract this gas

- Low demand for gas in Queensland but a growing international demand

- By liquefying, gas can be shipped to international markets
Arrow Energy - Update

- Queensland based company providing >20% of the state’s domestic gas needs

- 500 staff in Dalby, Moranbah and Brisbane

- Arrow is the subject of a takeover bid by Royal Dutch Shell and PetroChina

- **Arrow Energy** would have two large, stable owners committed to safety, environment and to the long term with stakeholders

- Activities would expand to include LNG
Update on the Surat Gas Project

The Surat Gas Project was planned to supply gas to the growing domestic and LNG export markets:

- Fisherman’s Landing LNG Project at Gladstone
- Shell Australia LNG Project on Curtis Island
- Other market opportunities as they arose

What happens under a Shell/PetroChina takeover?

- The Project would supply the domestic market and an Arrow Energy LNG Project on Curtis Island
- The agreement to supply gas to Fisherman’s Landing LNG Project is currently on hold

*Approx. 3 years from now until large scale drilling for LNG and associated infrastructure*
Proposed Surat Gas Project - Look Ahead

**Exploration**
- 8 pilots (5 wells each)
- 5 extended pilots (10 wells each)
- 50 core holes

**Production**
- Approx. 50 wells (existing domestic production area)

**Project Starts**
- First 4 years:
  - 1200 wells
  - Average 2 - 4% farm land impacted

**LNG Production**
- Pipeline construction commences

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<tbody>
<tr>
<td>FID*</td>
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* FID = Final Investment Decision
## Surat Gas Project - EIS Update

<table>
<thead>
<tr>
<th>EIS Process</th>
<th>Expected Timeframes</th>
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<tbody>
<tr>
<td>Lodge Voluntary EIS Application</td>
<td>Completed</td>
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<td>Lodge Initial Advice Statement</td>
<td>Completed</td>
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<td>Project determined a ‘controlled action’ under the Federal Act</td>
<td>Completed March 2010</td>
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<tr>
<td>Exhibit Draft Terms of Reference for <strong>public comment</strong></td>
<td>Comments Closed May 2010</td>
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<tr>
<td><strong>Arrow to provide response to submissions to government</strong></td>
<td><strong>August 2010</strong></td>
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<td>Final Terms of Reference from QLD environment department</td>
<td>Q3 2010</td>
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<tr>
<td>Undertake technical studies</td>
<td>Commenced Q3 2009</td>
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<tr>
<td>Prepare EIS</td>
<td>Expect to complete Q4 2010</td>
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<tr>
<td>Exhibit EIS for <strong>public comment</strong></td>
<td>Q2 2011</td>
</tr>
<tr>
<td>Qld / Commonwealth Government decision on project</td>
<td>Q3/Q4 2011</td>
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Exploration activities to confirm a viable gas supply for LNG production
Surat Gas Project Development

Target area for development between 2013 and 2023
(approximately 2,000 wells)

Detailed maps available for viewing
Proposed Arrow LNG Project

Typical infrastructure layout

Well Site Footprint
- 70m x 60m for drilling
- Rehabilitated to 10m x 10m

Well Spacing
- Between 700 and 1200 metres (approx 1 per square km)

Gathering system - pipelines
- Buried to 750mm in grazing land
- Burial depth agreed with the landholder in intensively farmed areas (nominal 1200mm)
Your Concerns and Our Responses
Your Concerns and Our Responses

- We recognise there are key concerns that we must address, and consult with the community on:

  1. Working with landholders & others to minimise impacts
  2. Fair terms and process for access and development
  3. Property valuations
  4. Intensively farmed agricultural land
  5. Impact on groundwater
  6. Produced water management
  7. Salt management
  8. Social and economic impacts

- Arrow recognises as we work through these concerns, we need to improve our interaction with the community and our work practices
Concerns 1 - 3
Working with Landholders

Fact: Arrow has not always worked well with landholders in the past

Commitments:
- Arrow will:
  - Treat landholders and their property with respect
  - Engage with and learn from landholders
  - Negotiate fair terms and processes for accessing land
  - Recognise impact of our operations on property valuation
  - Support an industry standard compensation agreement and land access code
Concerns 1 - 3
Working with Landholders and the Community

Fact: Arrow has not always engaged well with landholders and the community in the past

Commitments:

■ Arrow will engage:
  ➢ On key issues with:
    • Regional communities;
    • Individual landholders; and
    • Potentially affected neighbours

➢ At least 6 to 12 months before commencing production drilling or construction activities
Concern 4
Intensively Farmed Agricultural Land

Fact: Arrow’s project sits over some intensively farmed areas

Commitments:

- Arrow will:
  - NOT commence development until stakeholder concerns are properly addressed
  - NOT construct dams for the storage of untreated coal seam water or brine
  - Use surface tanks instead of pits to contain drilling fluids
  - Commence a development case study on an intensively farmed property with landholder assistance
  - Subject to approval, conduct a trial of developing both CSG infrastructure and intensive agriculture on a farm owned by Arrow
Concern 5
Impact on Groundwater Quantity

Fact: A new regulatory framework is being introduced in August to protect existing water bore users. The regime will:

• Set trigger levels for springs and aquifers
• Introduce a regional groundwater monitoring program
• Provide a groundwater model to support decision making and predict potential drawdown
• Protect existing water entitlements - “make good” obligations

Commitments:

- Arrow will:
  - Maintain a regional groundwater model
  - Expand our groundwater monitoring program to monitor changes in groundwater quality and quantity and update the model
  - Promptly address claims from water bore owners of reduced water supply
  - Participate in government/industry cooperative efforts to model and understand cumulative groundwater impacts

“Make Good”

Examples:
- Deepening a bore
- Reconditioning a bore
- Changing a pump
- Adding a rising main to lower pump depth
- Drilling a new bore
- Alternative supply
- Other forms of compensation
**Concern 5**
**Impact on Groundwater Quality**

**Fact:** Prevention of groundwater contamination is regulated for CSG activities:
- **New** dam standards
- **Prescriptive** drilling standards

**Commitments:**
- Arrow will:
  - Line all dams, install additional **leak detection**
  - Use licensed drillers
  - Ensure wells are **isolated** from formations other than the coal seam
  - Rehabilitate wells

- Arrow will **not use** oil or synthetic based drilling fluids
Concern 5
Fraccing and Groundwater

Fact: Arrow does not currently use the fraccing technique in the Surat Basin

Commitments:

✓ 99.5% water and sand

✓ 0.5% additives (also used in households)

– No Napthalene
– No Benzene
– No Phenantherenes

Detailed information sheet available
Concern 6
Produced Water Management – Treatment and Storage

Fact: Management of produced coal seam water is regulated by the Department of Environment and Resource Management, including:

- **New** dam standards (*Licensed Regulated Waste Disposal Facility*)
- **Treatment** of water

Commitments:
- Arrow will:
  - Conduct **3rd party** audits
  - Ensure dams meet **current** standards
  - **Integrate existing** dams into a network of treatment facilities
- Arrow will not construct evaporation dams

Daandine dam liner installation

Detailed information sheet available
Concern 6
Produced Water Management – Supply and Beneficial Use

Fact: Management of the supply of coal seam water is regulated by DERM. Arrow has made changes to the way we manage our water.

Detailed information sheet available
Concern 7
Salt Management

Fact: The amount of salt is dependent on the location and age of the coal seam. Arrow’s experience in the Surat and Bowen Basins shows an average of:

<table>
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<tr>
<th>COAL SEAM WATER</th>
<th>SALT</th>
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<tr>
<td>1 megalitre</td>
<td>5-8 tonnes (5000-8000 kg)</td>
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<td>OR</td>
<td>=</td>
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<td>1 million litres</td>
<td>OR</td>
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<td>3-4 cubic metres</td>
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Commitments:

- Arrow will:
  - **Remove** produced salt from the landscape
  - Investigate potential **beneficial uses** for the salt including:
    - Crystallisation for use in industrial processes
    - Use of brine in the chemicals industry
  - Research the viability of **reinjecting brine** into aquifers with high salinity

At a minimum, Arrow will remove the salt and dispose to an approved and regulated landfill.

Detailed information sheet available
Concern 8
Social and Economic Impacts & Benefits

Fact: Arrow’s project will deliver significant social and economic benefits to the region

Commitments:

- Arrow will:
  - Create more than 1,000 construction jobs; and
  - Create up to 400 operational jobs for the project
  - Recruit locally as a priority
  - Accommodate all operational staff in the region
  - Provide large scale skills training opportunities in regional Queensland, including Indigenous programs
  - Jointly fund a 24/7 emergency helicopter service, including doctors, to service both industry and the community in the Surat Basin
  - Facilitate pre-qualification of local suppliers to participate in tenders
  - Supply treated water to local communities, where approved
Arrow’s Key Commitments

- **Improved** community and landholder engagement
- An **open and honest dialogue** about issues and opportunities with our stakeholders
- Adoption of a **standard approach** to compensation and land access
- **No development** in intensely farmed areas until **concerns are properly addressed**
- **No** construction of **dams** for coal seam water on **intensively farmed** areas
- Use of surface **tanks not pits** on black soil
- Development of a robust **groundwater monitoring** regime
- **Prompt response** to bore owners who report a reduced water supply
- Construction of ‘**fit for purpose’** dams to **government standards**
- **Remove** produced **salt** from the landscape
- **Benefits** delivered to the community
Questions and Answers