Coal Seam Gas – How it works and Regional Groundwater Impact Management

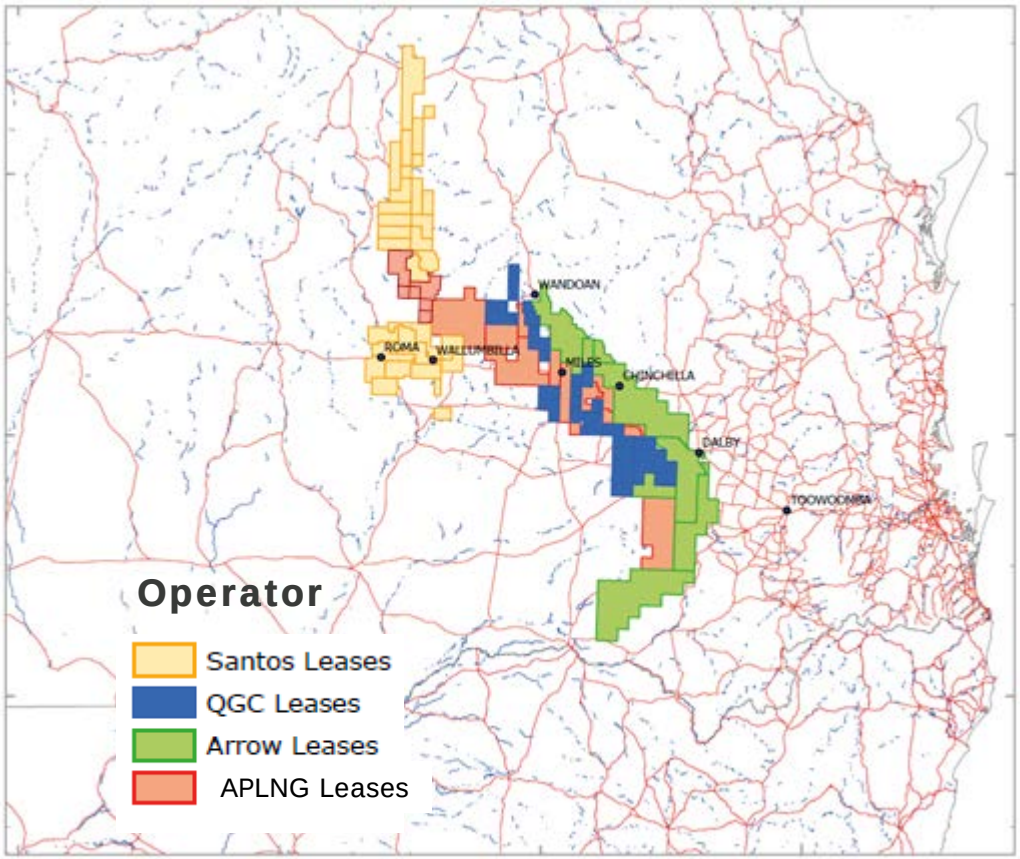
Andrew Moser, Groundwater Manager, Origin

9th & 10th October 2013

The CSG Industry in Queensland

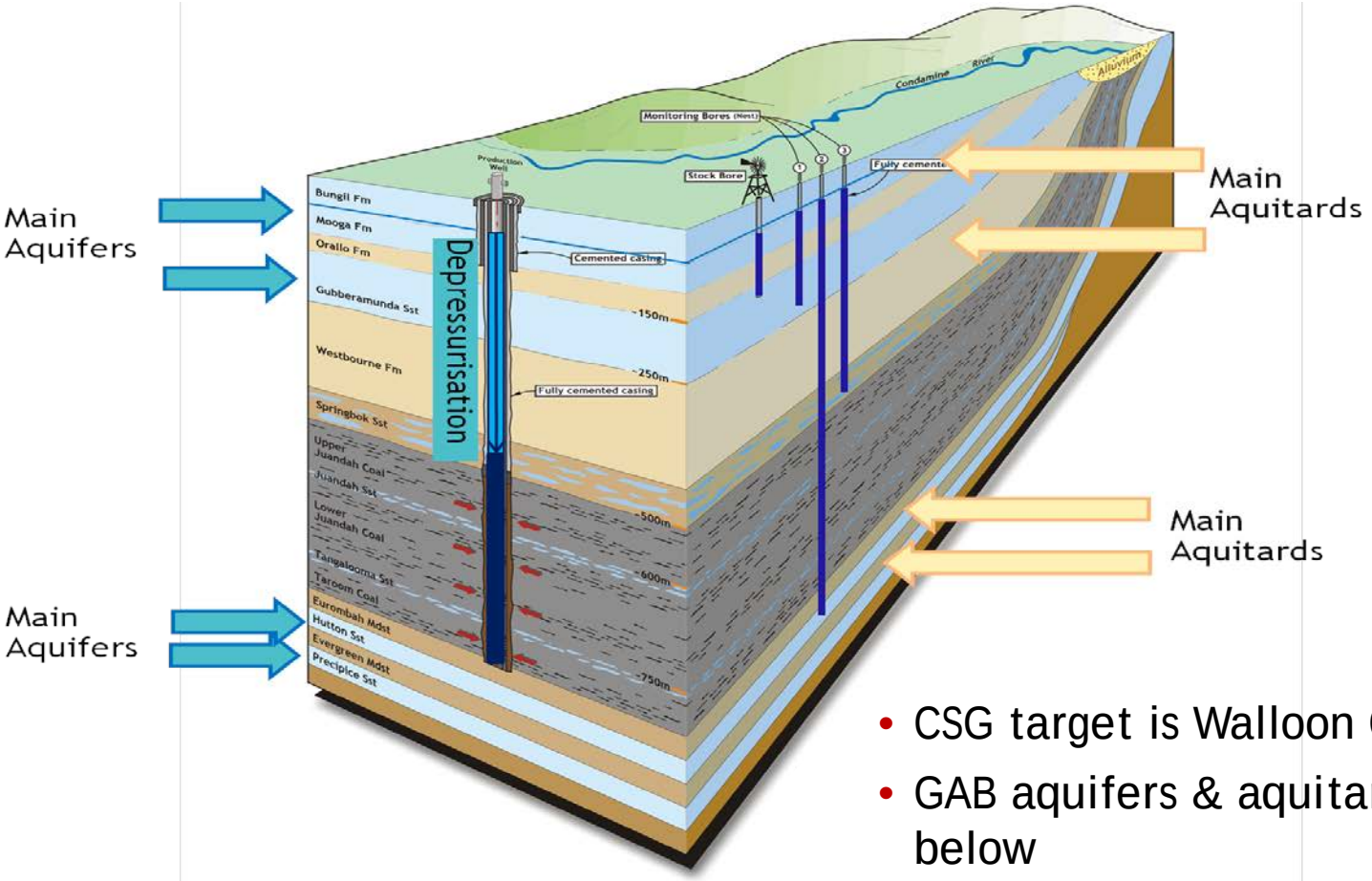
Queensland's CSG industry

- Queensland has been producing CSG for more than 15 years, supplying both domestic retail and power generation markets
- Expansion of the industry is a result of continued demand for sustainable energy sources both locally and globally
- Acceleration of development is a result of EXPORT MARKET
- CSG is a key transitional fuel
- There are four major proponents in the QLD CSG industry
  - Australia Pacific LNG
  - QCLNG (Qld Gas Corp)
  - GLNG (Santos)
  - Arrow
- Three Environment Impact Statements have been approved, Arrow has gained State Approval and is awaiting Federal Approval



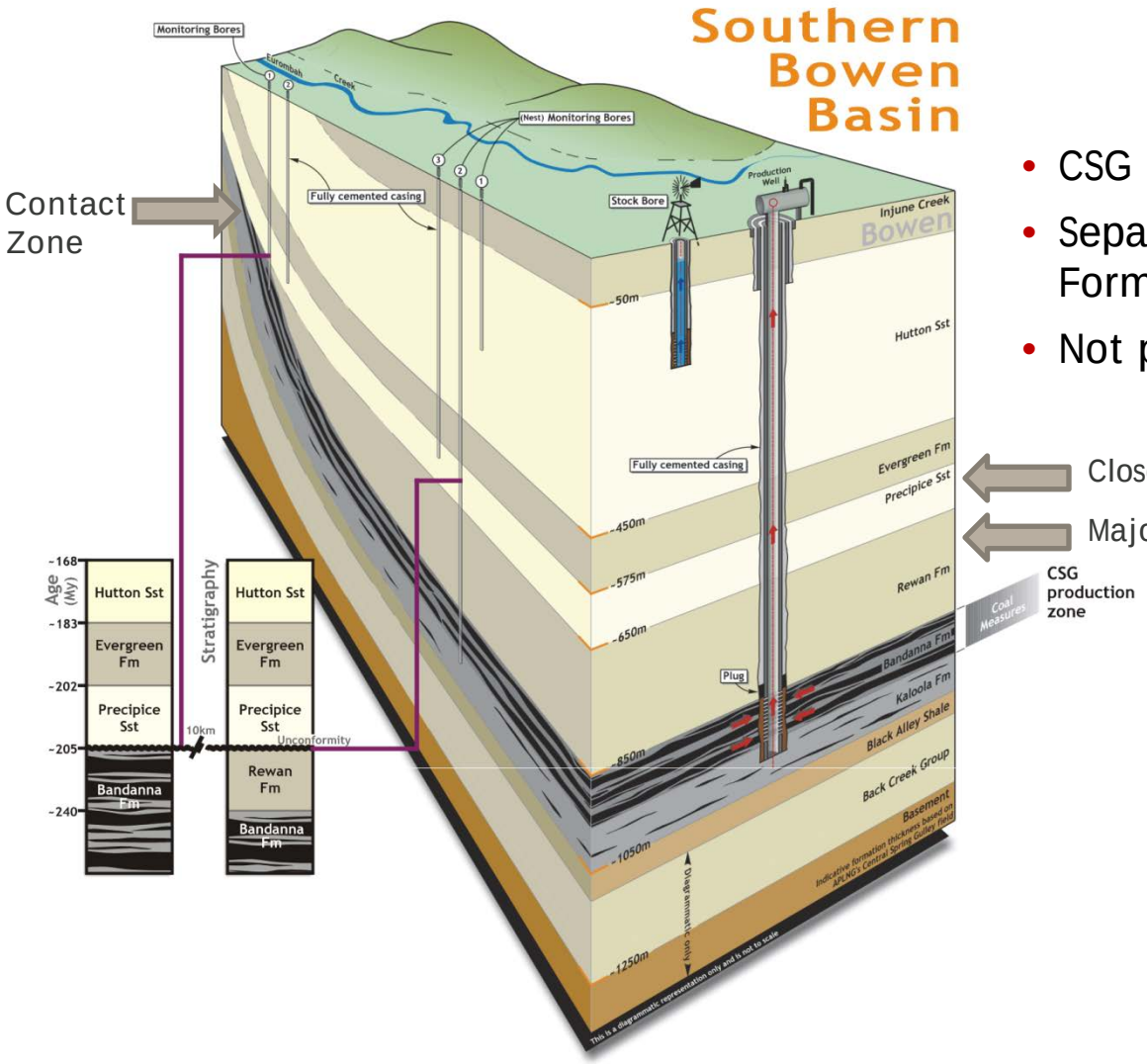
How CSG is Produced

Groundwater and CSG – Surat Basin



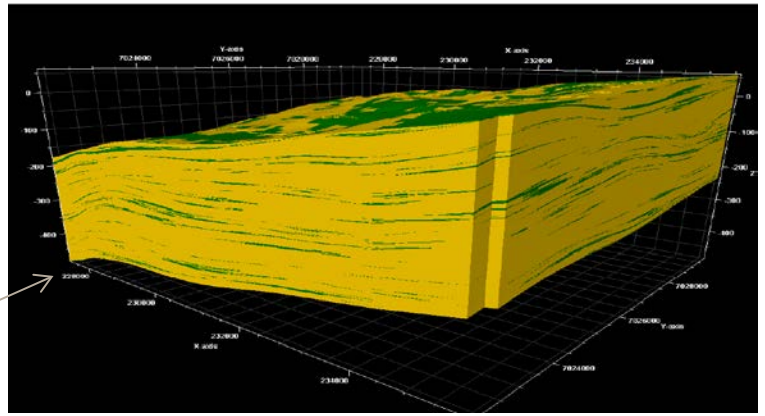
- CSG target is Walloon Coal Measures
- GAB aquifers & aquitards above & below
- Existing use and impact

Groundwater and CSG – Bowen Basin



- CSG target is Bandanna Formation
- Separated from GAB aquifers by Rewan Formation except at thin contact zone
- Not producing gas close to contact zone

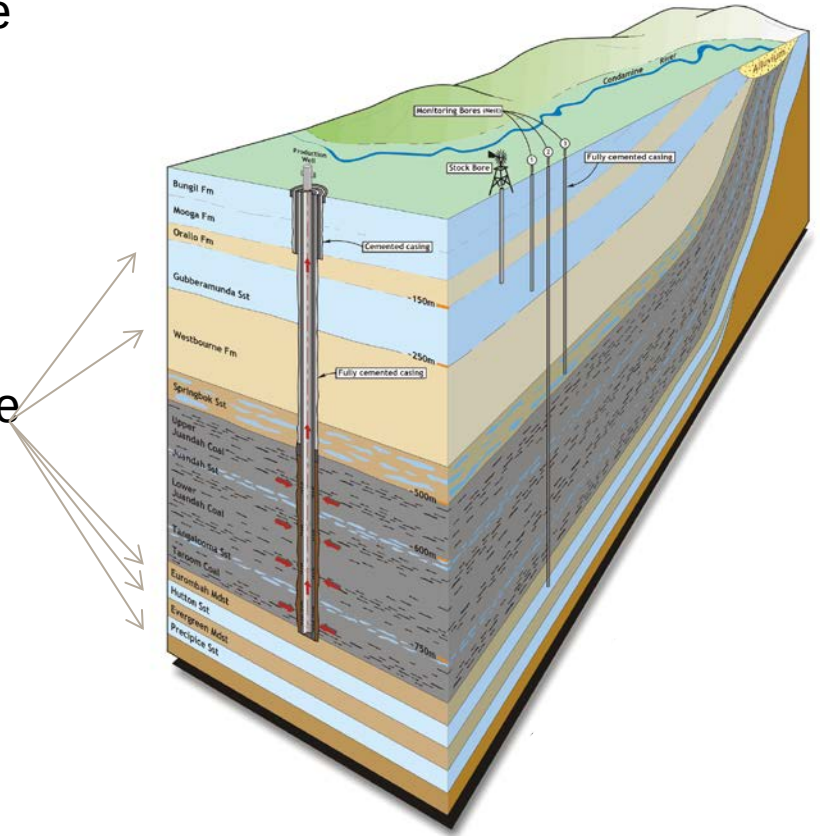
Natural environmental safeguards protecting the GAB



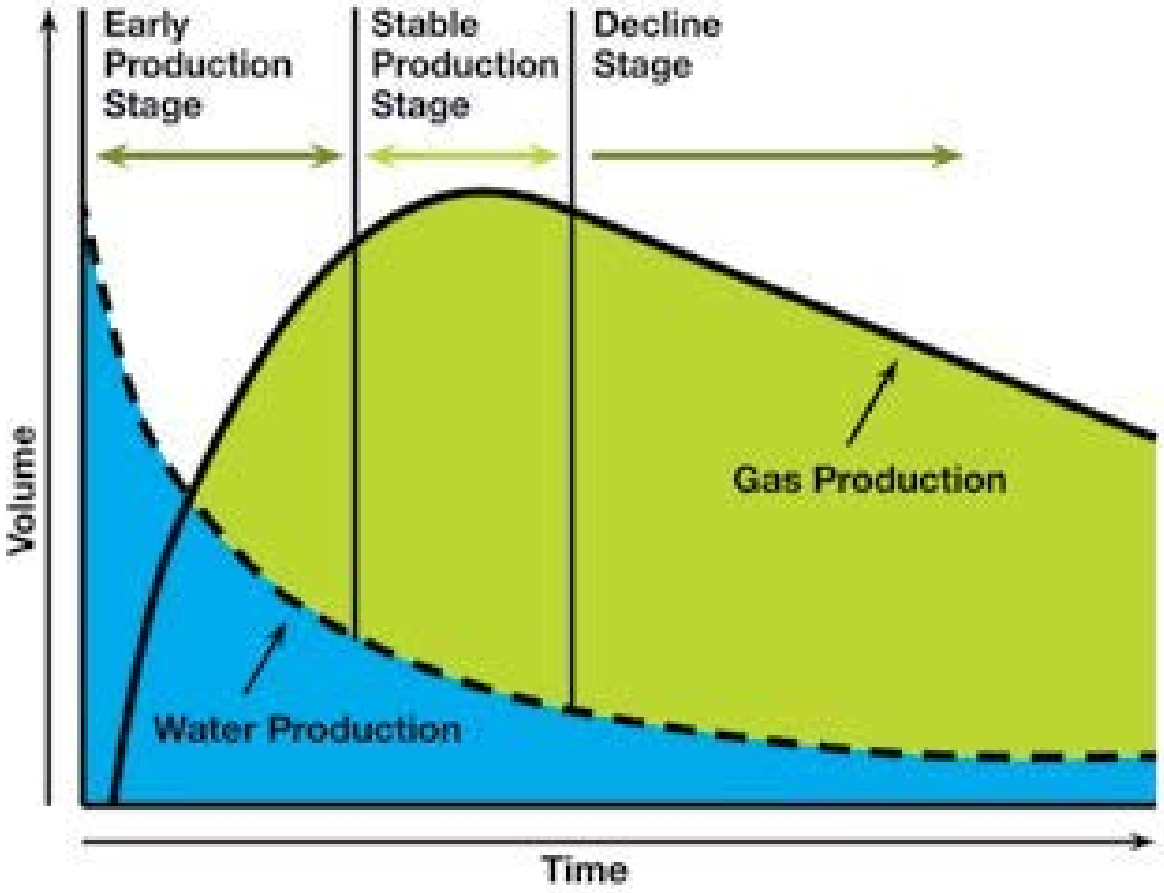
Natural Geological Barriers

- The coals themselves are encapsulated in a formation which is mainly (90%) siltstone forming a very low permeability aquitard

- There are thick sequences of siltstone aquitard between the coals and exploited GAB aquifers which will also limit the potential transfer of depressurisation effects



Gas and Water Production



How much water are we talking about?

- CSG water estimates are constantly revised on the basis of production data
- A small amount of water from a large number of wells