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An Overview of the Coal Seam Gas Developments in Queensland

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Abstract

The demand for natural gas in Queensland, Australia has historically been supplied from conventional reservoirs. However, depletion in conventional sources has led producers to turn to extensive supplies in Queensland's coal resources. These coal seam gas (CSG) developments not only represent new supplies for the domestic market in eastern Australia, they are also the first time that CSG (aka coal bed methane or CBM) has been liquefied to serve the expanding world LNG market. In order to make this development occur, considerable infrastructure had to be installed, with field developments still on-going. This AUD\$60 billion investment precipitated a major overhaul of state regulations to provide not only a safe and clean operating environment, but also to allay the concerns of certain stakeholders.

The gas is primarily produced from thin high permeability coals in the Jurassic-age Walloon Coal Measures in the Surat Basin and from several relatively thick Permian-age coal seams in the Bowen Basin, of which the Baralaba Coal Measures and the Bandanna formation are the most important. There are numerous technical challenges with this production, such as fines production from the inter-burden clays, which can form a thick paste that is difficult to pump. Salt extraction by reverse osmosis, from associated water produced to depressurise the coal seams and enable the flow of gas, allows for the beneficial use of the water. Technical challenges also include mathematical modelling of the counter-current two-phase flow (gas and water) in the well annuli because conventional models in simulators only handle co-current two-phase flow in the well-bores. Also, the subject of on-going investigations is decommissioning of the large number of shallow wells over the next few decades in a safe and cost effective manner, with compressed bentonite being a promising option for well plugging.

As with any major commercial development, in addition to the technical challenges there have been social challenges as well. These include interaction and coexistence of extensive surface operations with an established agricultural sector, interactions between gas

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