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### ABSTRACT

#### UCG: supposed environmental issues – myths and realities

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The Mesozoic Surat Basin of Southern Central Queensland contains significant gas and coal resources. It is currently a world-rated producer of coal seam gas/coal bed methane (CSG/CBM). Prior to the extensive production of CSG from the basin, investigations were also carried out relating to the suitability of the coal seams for underground coal gasification (UCG). These investigations were undertaken by three Government licenced pilot operations. Assessment of these pilots was undertaken by a 3-member Independent Scientific Panel (ISP) established by the Queensland Government. The ISP reviewed operations of the pilots for the period 1999 to 2013.

The ISP had unrestricted access to data from all three operating companies and was, therefore, in a unique position to make overall findings on many aspects of the technology. To achieve this assessment the ISP used a Layers of Protection (LOPA) approach. LOPA was viewed as more applicable to adaptive management procedures than attempting to apply existing, fixed, separate regulatory regimes designed for the oil and gas industry, and/or the coal industry.

As a process, UCG fitted into, and contradicted, both regulatory regimes. Consequently there were areas of non-compliance with respect to both codes. Many of these non-compliance incidents arose from regulatory systems that had not been designed specifically for the new technology. Also, the pace of the development of the technology was such that the regulators were continually playing “catch-up” and not fully understanding the technology they were trying to regulate.

In contrast, the LOPA approach was far more adaptive to technological change, differentiating between “real” and “implied” non-compliances by evaluating and monitoring process performance on a continual basis.

It was concluded by the ISP that the UCG industry was able to safely and successfully select appropriate sites, design suitable plants, successfully operate over extended periods, and decommission operations. At the conclusion of the investigation the ISP was unable to comment on site decontamination and rehabilitation.

Significant problems relating to decontamination arose from interpretation of the actual definition of the “site”. Was it the reactor itself? Or was it the thermal material active zone (MAZ) adjacent to the reactor? Or was it the hydrologically active zone (HAZ) induced around the reactor? It is the concepts of the MAZ and HAZ around the reactor that pose difficulties for regulators.

Examples will be “given” in relation to “actual” and “inferred” non-compliances around the pilot chambers, and a way forward for the industry in an ever-changing regulatory environment will be offered.