Interim Report of the NSW Chief Scientist of the independent review of CSG activities
July 2013

Quotes from the official website

It commits to establishing a regime for extraction of coal seam gas that is world class, including an insistence on industry best practice at all stages of CSG extraction – as well as in the training of all employees and contractors; rigorous, high-level monitoring and stringent compliance inspections; hefty penalties for licences breaches, including possible licence revocation; having a central, comprehensive, spatially-enabled, open, whole-of-environment data repository as part of the commitment to transparency; and developing a system within government to assess cumulative impacts of multiple industries operating in sensitive environments.

It commissions the design and establishment of a whole-of-environment data repository for all State environment data – including all data collected according to legislative and regulatory requirements associated with water management, gas extraction, mining, manufacturing, and chemical processing activities.

A pre-major-CSG whole-of-State subsidence baseline be calculated using appropriate remote sensing data going back, say, 15 years. And that, from 2013 onwards, an annual whole-of-State subsidence map be produced so that the State's patterns can be traced for the purpose of understanding and addressing any significant cumulative subsidence.

All coal seam gas industry personnel including subcontractors working in operational roles be subject to mandatory training and certification requirements and that these mandatory training and certification requirements be included in the codes of practice relevant to CSG; and

It continues and extends its role as a champion of research relevant to the hard problems related to under-earth especially the development of sophisticated predictive underground models and a formalisation of engineering processes for cumulative impact assessment. The Government should not only lead by example in encouraging and funding such research to be undertaken and discussed in NSW, but should exhort other governments and organisations to take a related approach through mechanisms such as COAG and international partnerships.

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5.7 COMMENTS FROM THE REVIEW
The general geological structure and tectonic history of the basins in NSW is relatively well understood at the large basin-wide scale. Fine-scale features such as the locations of faults and dykes, as well as mechanical, physical and chemical characteristics of the rocks, are less well understood. The groundwater characteristics are also not well understood. It is the development of this fine-scale knowledge that is the focus of prospecting and exploration stages of CSG projects through drilling programs, core sampling, in situ hydraulic conductivity measurements, geophysical mapping etc.
Efforts to improve our overall understanding of the geology (and groundwater) system through improved monitoring, measurement, modelling and data analytics, and broader access for companies, regulators and researchers to this data through repositories, will make a considerable difference to our understanding of the geological system and potential impacts (including cumulative impacts) from CSG

The impacts and severity of subsidence in CSG production depends mostly on proximity to the well, but also on the vulnerability of the infrastructure under study.

Even slight subsidence can be important in some places, notably where flood irrigation is used on laser-levelled fields. A discussion paper for the cotton industry prepared by Woodlots and Wetlands Pty Ltd on risks from coal mining noted that grades were typically 1:1000 to 1:1500 across fields. Obviously even small subsidence movements would disrupt these, and sags of as little as 5mm lead to ponding that greatly reduces crop yield.

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Broad area monitoring of subsidence in NSW could be accomplished through analysis of data from a variety of sources including InSAR, LiDAR and historical photographic images of the State.

The question is time frame for these. To do the 15 year baseline on subsidence is a big job and I question whether the remote sensing data is accurate enough. Longwall mining subsidence is mapped by LIDAR in specific places but coalfield-wide coverage at suitable scale is not available, nor is historical baseline data. And I wonder how reliable InSAR data would be in discerning the ground level in the wooded catchment areas as opposed to in more open agricultural areas.

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Cumulative impacts can arise when multiple activities are sharing the same space either at the same or different times. Cumulative impacts include environmental and social impacts. This section of the report will focus on the environmental side.

One cumulative impact not considered is that from surface infrastructure. In agricultural areas, this can be - but by no means always is - limited, especially once wells and pipelines are established. In the catchment area, it would be devastating. Even narrow lines cut for seismic monitoring are easily discerned a decade or more after they have been abandoned and 'rehabilitated'. The network of much larger and hard-surfaced tracks that would be necessary to allow well drilling and pipeline construction and management would be completely unacceptable. And the threat to water supply of spillage also would be completely unacceptable.