Australian Government
National Water Commission

Position Statement
Coal Seam Gas and Water

The Coal Seam Gas and water challenge

The Coal Seam Gas (CSG) industry offers substantial economic and other benefits to Australia. At the same time, if not adequately managed and regulated, it risks having significant, long-term and adverse impacts on adjacent surface and groundwater systems.

In light of the scale of potential benefits and associated risks, the National Water Commission is highlighting the need for appropriate management of CSG developments, consistent with the objectives of the National Water Initiative (NWI). To meet NWI objectives, the Commission recommends that industry, water and land-use planners, and governments adopt a precautionary approach to CSG developments, ensuring that risks to the water resource are carefully and effectively managed.

Current projections indicate the Australian CSG industry could extract in the order of 7,500 gigalitres of co-produced water from groundwater systems over the next 25 years, equivalent to ~300 gigalitres per year. In comparison, the current total extraction from the Great Artesian Basin is approximately 540 gigalitres per year.

Potential impacts of CSG developments, particularly the cumulative effects of multiple projects, are not well understood.

Potential risks to sustainable water management

- Extracting large volumes of low-quality water will impact on connected surface and groundwater systems, some of which may already be fully or overallocated, including the Great Artesian Basin and Murray-Darling Basin.
- Impacts on other water users and the environment may occur due to the dramatic depressurisation of the coal seam, including:
  - changes in pressures of adjacent aquifers with consequential changes in water availability
  - reductions in surface water flows in connected systems
  - land subsidence over large areas, affecting surface water systems, ecosystems, irrigation and grazing lands.
- The production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and have significant impacts on water quality, and river and wetland health. There is an associated risk that, if the water is overly treated, 'clean water' pollution of naturally turbid systems may occur.
- The practice of hydraulic fracturing, or fraccing, to increase gas output, has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality.
- The reinjection of treated waste water into other aquifers has the potential to change the beneficial use characteristics of those aquifers.

In addition to these water management risks, CSG development could also cause significant social impacts by disrupting current land-use practices and the local environment through infrastructure construction and access.

The Commission is concerned that CSG development represents a substantial risk to sustainable water management given the combination of material uncertainty about water impacts, the significance of potential impacts, and the long time period over which they may emerge and continue to have effect. Therefore, an adaptive and precautionary management approach will be essential to allow for progressive improvement in the understanding of impacts, including cumulative effects, and to support timely implementation of 'make good' arrangements.

CSG and the National Water Initiative

Under clause 34 of the NWI, the signatory governments agreed that there may be special circumstances facing the petroleum and minerals sectors that need to be addressed by policies and measures beyond the scope of the NWI Agreement. In this context, all governments noted that specific project proposals would be assessed according to environmental, economic and social considerations, and that factors specific to resource development projects (such as isolation, relatively short project duration, water quality issues, and obligations to remediate and offset impacts) may require specific management arrangements outside the scope of the NWI.

Progress on CSG related reforms

In its 2009 Biennial Assessment of national water reform progress, the Commission found that the circumstances in which special clause 34 would apply are not defined and identified in a consistent and transparent manner. Little progress had been made in the five years since the signing of the NWI in fleshing out the special provisions for the minerals, petroleum and related industries. As a consequence, there has been little integration of those industries with broader water markets and water planning processes, despite the potential for considerable benefits in many cases.

The potential impacts of CSG extraction are currently managed through state and territory laws and policies, including environmental approval processes with subsequent conditions or special arrangements often implemented to mitigate risks to the environment and communities. These conditions are set by the approving authority which can be a state government minister or appointed official. In certain circumstances, the Commonwealth Minister for the Environment will have a role in approving and setting conditions for projects under the Commonwealth *Environment Protection and Biodiversity Conservation Act*.

While these processes have the capacity to address many of the issues relating to water and CSG development, they are often not well integrated with state and territory water planning and management arrangements.

The Commission's work on CSG

The Commission is completing a discussion paper on CSG water issues and potential impacts to provide useful background information for regulators, water managers and other water users. A$1.8 million *Potential local and cumulative effects of mining on groundwater resources* project funded by the Commission is also developing tools and guidelines to account for potential local and cumulative effects of mining on groundwater resources. These guidelines and tools are intended to assist in the management of CSG.

Principles for managing CSG and water

The Commission believes that wherever there is potential for significant water resource impacts, CSG activities should be incorporated into NWI consistent water planning and management regimes from their inception. Given the high level of uncertainty around water impacts, and the temporal nature of CSG developments, this will likely require a precautionary approach that demands innovation from water managers and planners, and significantly greater coordination with existing project approval processes.

Specifically, the Commission proposes the following principles be applied by state and territory jurisdictions to managing the cumulative impacts of CSG water:

- The interception of water by CSG extraction should be licensed to ensure it is integrated into water sharing processes from their inception.
- Project approvals should be transparent, including clear and public articulation of predicted environmental, social and economic risks along with conditions implemented to manage the risks.
- Adequate monitoring, including baseline assessment of surface and groundwater systems, should be undertaken to provide a benchmark for assessing cumulative impacts on other water users and water-dependent ecosystems.

- Jurisdictions should work to achieve consistent approaches to managing the cumulative impacts of CSG extraction. Such arrangements should consider and account for the water impacts of CSG activities in water budgets and manage those impacts under regulatory arrangements that are part of, or consistent with, statutory water plans and the National Water Initiative.
- Potential options to minimise the cumulative impacts of extraction on the water balance should be pursued as a first priority. These options include aquifer reinjection, where water quality impacts are acceptable, and groundwater trading or direct substitution for other water use.
- If discharges to surface waters are unavoidable, discharges should be conditioned so that environmental values and water quality objectives, including water quality to meet public health objectives, are protected. In such circumstances discharges to ephemeral streams should be pulsed to avoid flows in naturally dry periods.
- Jurisdictions should undertake water and land-use change planning and management processes in an integrated way to ensure that water planning implications of projects are addressed prior to final development approval.
- Clear accountabilities should be identified for any short- or long-term cumulative impacts from CSG processes, clarifying which organisations are responsible for managing and rectifying or compensating for any impacts.
- The full costs, including externalities, of any environmental, social and economic water impacts and their management should be borne by the CSG companies. This includes, if not already in place, mechanisms such as bonds and sureties that deal with uncertainty and the timeframes associated with potential impacts. Given that these timeframes may extend for 100 or more years, current systems need to be re-evaluated.
- A precautionary and adaptive approach to managing and planning for CSG activities is essential to enable improved management in response to evolving understanding of current uncertainties. This includes impacts such as long-term reductions in adjacent aquifer pressures and levels, and impacts on environmental assets that are not adequately protected by current 'make good' mechanisms.
- Water produced as a by-product of CSG extraction, that is made fit for purpose for use by other industries or the environment, should be included in NWI-compliant water planning and management processes. This will enable CSG producers to manage this resource in accordance with the principles of the National Water Initiative.

The consequences of not managing the water risks and uncertainties associated with the economic benefits of CSG are substantial. Therefore, the Commission strongly argues for the careful, transparent and integrated consideration of water-related impacts in all approval processes.

The Commission's position is that NWI-consistent water access entitlements should be made available to coal seam gas activities wherever possible, as the use of Clause 34 of the NWI is only intended to operate in exceptional circumstances. Where Clause 34 is used, a clear and transparent explanation of why it was used, rather than complying with the normal water planning and management regime, should be provided.

National Water Commission
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