

National Water Commission's responses to the Questions on Notice for the inquiry into coal seam gas

Written Question on Notice:

Do you believe the data from the exploration phase can confirm whether depressurisation in a coal seam gas seam will impact on adjoining aquifers?

Answer:

The exploration phase of a coal seam gas project typically involves a drilling program to collect vertical core samples of coal and rock over a defined area. These samples are then tested and if the data indicates that the gas resource may be suitable for commercial production, pilot testing is conducted. It is only at this stage that water is pumped off the coal seams, resulting in depressurisation.

Therefore, from the hydrogeological data collected during the exploration phase alone, it is unlikely to be possible to determine the impacts of depressurisation on adjoining aquifers. This is consistent with the view that, in many instances, the only way to test the response of an aquifer is to stress it, and this does not occur during the exploration phase.

Questions on Notice from the transcript:

The Chair asked:

CHAIR: So perhaps the expression "extracting large volumes of low quality water will impact" should read "may impact". Have you any evidence that you could bring to the table to demonstrate where that has occurred, for example in Queensland?

Mr CAMERON: It is certainly the case in Queensland. For example, the extraction of water from coal seam gas is lowering the levels of groundwater systems and some of the proponents there are making arrangements to compensate for the impacts of those activities. I do not have the particular examples in front of me today but it is certainly true that the extraction of that water will impact on groundwater systems.

CHAIR: Would you be able to provide the Committee with some documentation to support that?

Mr CAMERON: I will take that on notice.

Answer:

In August 2011, the University of Southern Queensland published a report that documented the potential cumulative groundwater impacts of CSG production in Queensland's Surat Basin. It is available at <http://eprints.usq.edu.au/19462/>. The report highlights that, despite the uncertainties regarding the magnitude of the impacts, the process of CSG extraction by the four major CSG companies operating in the Surat Basin will have at least some impact on the groundwater systems of the region in all cases.

The Hon. Jeremy Buckingham asked:

The Hon. JEREMY BUCKINGHAM: Mr Cameron, have there been any examples outside of the coal seam gas industry of which you are aware where there has been extraction from a deep aquifer that has led to a depressurisation and the lowering of volume and pressure in adjacent aquifers? Is that a process that has occurred in other areas?

Mr CAMERON: I cannot point to specific examples but it is the case that where aquifers are connected with other aquifers or significantly also surface water systems, that the extraction of water from one aquifer, a lower aquifer in particular, has the effect of changing the pressure within both aquifers, meaning that water can transfer between those aquifer systems. I do not have examples in front of me but I would certainly be able to point the Committee to an analysis which has shown that to be the case.

The Hon. JEREMY BUCKINGHAM: Could you take that on notice to provide the Committee with any relevant research documentation of such processes?

Mr CAMERON: Certainly in terms of the cross-linkages between aquifer systems, we take that on notice.

Answer:

Determining the nature and degree of connectivity between aquifers can be a complex process. However, it is generally accepted that deep groundwater pumping can induce downward leakage from upper aquifers in most cases. The resultant drawdown in shallow aquifers depends on the degree of connection between them and the deeper aquifers and the period of time over which pumping occurs. Often, the distribution of leakage across the landscape can be difficult to determine as the spatial connection between the shallow and deep aquifers is highly variable. There have been several studies in irrigation areas that have shown that vertical leakage does occur as a result of deep groundwater pumping, including a study conducted by CSIRO in the Coleambally Irrigation Area <http://www.clw.csiro.au/publications/technical2001/tr01-01.pdf>.