

Advice to decision maker on coal mining project

Proposed action: Gloucester Gas Project (2008/4432)

Requesting agency	Department of Sustainability, Environment, Water, Population and Communities
Date of request	30 July 2012
Date request accepted	6 August 2012
Project title	Gloucester Gas Project (EPBC 2008/4432)
Summary of request	<p>The Department of Sustainability, Environment, Water, Population and Communities (the department) is currently assessing the Gloucester Gas Project in accordance with the provisions of the <i>Environment Protection and Biodiversity Conservation Act 1999</i>.</p> <p>The department sought independent scientific advice from the Interim Independent Expert Scientific Committee on Coal Seam Gas and Coal Mining (the interim committee) as to:</p> <ol style="list-style-type: none"> 1. Whether the draft approval conditions adequately: <ol style="list-style-type: none"> 1.1. Protect the matters of national environmental significance, specifically the endangered Giant Barred Frog and the vulnerable Green and Golden Bell Frog; 1.2. Address Minister Burke's eight hydrological concerns/requirements as explained in a letter sent to the proponent dated 21 September 2011; and 2. Whether the Water Balance provided by the proponent provides an acceptable conceptual model of approximate water movement and rate of flow throughout the hydrological units and surface streams.

Advice

- A. Having evaluated the information present by AGL, the committee has residual concerns regarding:
- 1) surface water and shallow aquifer connectivity, particularly in the recharge areas; 2) the connectivity between the deep aquifers and shallow aquifers; 3) the general hydraulic connectivity to 1000 m; and 4) the presence of numerous vertical faults that could result in vertical flow even though lateral flow is expected to be the dominant mechanism. The committee recommends that AGL undertake the following prior to any related works commencing:
 - A thorough investigation of the tectonic fault zones to provide a better understanding of the stratigraphy and structures within the project area. The role of faulting and their influence on vertical hydraulic conductivities and connectivity requires more elucidation to understand the sites involved;
 - A risk based assessment of the vertical hydraulic conductivity and its impact on surface water, shallow and deep aquifer connectivity is required;

- A baseline investigation of gas occurrence in surface and groundwater;
- A risk based assessment of the potential impacts from dewatering (and depressurisation) of the coal seams, including the risk that tectonic faults could be conduits for vertical gas movement and thus facilitate fugitive gas emissions; and
- The water balance model should be reassessed in the light of the above concerns and additional information. In addition, the model should be extended to cover 1000 m below ground surface.
 - Further, the water balance provided does not provide sufficiently detailed, scientifically robust data or analysis to adequately model water movement and rate of flow through the hydrological units. The water fluxes do not seem to constitute a 'zero sum game', e.g. total rainfall 193 GL/a, aquifer recharge 7.7 GL/a, evaporative transpiration 99.2 GL/a, and surface runoff 94.2 GL/a. The model does not take into account the tectonic faults or fracturing and thus it is not able to predict the potential effects of dewatering activities during coal seam depressurisation. Indications of confidence, accuracy and precision are likewise absent.

B. The department's draft conditions could be improved to obtain sufficient assurance that a significant adverse impact on matters of national environmental significance, or their supporting habitat, will not occur if the proposed coal seam gas extraction activities proceed as outlined in the proposal.

Specifically, the committee suggest that the departmental draft conditions could be strengthened by the following measures:

- Condition 2 – To avoid confusion, the condition could specify 'not more than' 110 wells. As currently expressed it could be interpreted as 'as a minimum and maximum' 110 wells must be constructed.
- Condition 16a & 17a – The conditions could specify the standard (of methods) to which the surveys of the vulnerable and the endangered frog species should be carried out.
- Conditions 18 to 25 – While surface water is in the heading, the conditions focus on groundwater issues. A similar set of conditions specifically for surface water assets could be developed. Further, a greater focus on water chemistry (quality) is required throughout these conditions. The conditions lack specific details which would ensure adequate information is provided by AGL. A condition regarding brine (salts and heavy metals) disposal would be beneficial.
- Condition 19 – To provide better assurance the condition could require that the Produced Water Management Strategy plan is to the satisfaction of the department and that it is implemented prior to commencement.
- Condition 23 – The condition could also include the requirement for annual review of the estimate and reporting of actual use. Spatial distribution needs clarification to include both location (latitude and longitude in degrees and decimal minutes) as well as depth below ground surface.
- Condition 24 – The definition of details of components could include: typical load, concentration and the Chemical Abstracts Service number. Further, a requirement for an annual recording of actual use could be included.
- Condition 25 – The condition lacks the requirement for adequate measures to be taken to inhibit pond use by migratory birds. Further, as AGL is proposing to utilise currently existing ponds there is potential weakness in this condition through confusion of the wording "developed as part of the project".

C. In relation to the request whether the department's draft conditions adequately address the requirements that the Minister specified in his letter dated 21 September 2011, we note the following (using the numbering as contained in the Minister's letter):

1. 'data for the Planning Assessment Commissions requirements 3.5 to 3.13 and 4.1 to 4.2';

- To avoid ambiguity the department's draft conditions could include a condition which specifies that the data and reports from the New South Wales Planning Assessment Commission conditions 3.5 to 3.13 and 4.1 to 4.2 be to the satisfaction of the Minister.

2. 'data from pilot testing at Waukivory and Stratford';

- The department's draft conditions do not require AGL to provide the data from the pilot testing

at Stratford. Condition 22 could be expanded to include both the pilot testing at Waukivory and Stratford.

3. 'baseline data associated with Phase 1 and Phase 2 studies';

- The department's draft conditions do not require AGL to provide this data; the conditions do not mention the phase 1 or phase 2 studies.

4. 'the numerical groundwater model';

- The department's draft conditions addresses the requirements specified in the Minister letter; condition 18 requires AGL to 'develop a numerical hydrogeological model in accordance with state requirements'.

5. 'data on the location, depth and age of groundwater samples including proximity to known faults and fractures';

- The department's draft conditions addresses the requirements specified in the Minister letter; conditions 21 require AGL to provide the department 'with data on the location, depth and age of groundwater including proximity to known faults and fractures and the potential for fault zones to provide connectivity between coal seam water bearing zones and surface aquifers.'

6. 'the Produced Water Management Strategy';

- The department's draft conditions addresses the requirements specified in the Minister letter; condition 19 requires AGL to provide the department with 'a Produced Water Management Strategy in accordance with the NSW Planning Assessment Commission conditional approval'.

7. 'details on when the Extracted Water Management Strategy will be available'; and

- The department's draft condition addresses the requirements specified in the Minister letter; condition 20 requires AGL to provide the department with 'an Extracted Water Management Strategy in accordance with the NSW Planning Assessment Commission conditional approval'.

8. 'information and data about the assessment of a representative site for fault testing'.

- The department's draft conditions do not require AGL to provide this data; the draft conditions do not mention faults other than the information pertaining to the location of groundwater samples and their proximity to known faults and fractures (see point 5 above). See also advice at Item A.

**Date of
advice**

12 September 2012
