Australian Government

Department of Agriculture, Fisheries and Forestry

Supplementary Submission to

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Rural Affairs and Transport

Inquiry into the Management of the Murray–Darling Basin

Impact of Mining Coal Seam Gas

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DAFF Supplementary Submission to Senate Inquiry – Inquiry into management of the Murray Darling Basin – impact of mining coal seam gas

Introduction

The demand for liquefied natural gas for export and energy production in Australia has seen significant exploration and development of coal seam gas in Queensland and New South Wales. Coal seam gas projects have the potential to generate positive economic benefits for the Australian and state economies via large export markets and foreign investment in the industry. Export earnings from Australia's mineral resources sector are projected to increase significantly over the short to medium term (ABARES, 2011).

The mineral resources boom in Australia has important implications for the agricultural sector. Community concern regarding the potential alienation and loss of agricultural land for mining purposes is an issue that has recently risen in prominence. Concerns that mining activities, such as coal seam gas extraction, will negatively affect groundwater levels, groundwater pressures and water quality are also gaining momentum.

Other issues that could arise or re-emerge on a regional basis include possible competition for transport and infrastructure, and increased social issues in rural communities as a result of gas and mineral extraction.

This submission provides an overview of agriculture in the Murray–Darling Basin and the potential impacts from coal seam gas exploration and production.

State of agriculture in the Murray–Darling Basin

The Australian Government's long term objective for Australia's landscapes is to support and maintain ecosystem services such as clean water, biodiversity and healthy soils while continuing to improve food and fibre productivity and long term food security.

The government understands that land management practices (both for agricultural production and resource extraction), natural resource condition and the sustainability of agriculture in the Murray–Darling Basin are intrinsically linked. It recognises the ongoing work by farmers to continually adapt their farming systems and land management practices to the changing environment in an effort to improve environmental outcomes while maintaining a profitable business.

The Murray–Darling Basin provides important economic, social and ecological values for Australia. The majority of land in the Murray–Darling Basin is used for agriculture (84 per cent) and the Basin is Australia's most important agricultural area, supporting 65 per cent of Australia's irrigated agricultural land. It produces over one-third of Australia's food and generates 39 per cent of the national income derived from agricultural production (The Senate, 2009).

Coal seam gas reserves

Australia is a significant exporter of liquefied natural gas (LNG), with around 50 per cent of gas production exported. In 2009–10, the value of Australian LNG exports

was $7.8 billion (ABARES, 2011). In December 2009, the proven and probable (reported as 2P') reserves of coal seam gas in Australia were 26 132 Petajoules (PJ) a 61.5% increase over the 2008 2P reserves of 16 179 PJ.

The life of the resource is more than 130 years at the current annual rate of extraction of 195 PJ. Queensland has 23 038 PJ (or 88.1%) of the 2P reserves with the remaining 3094 PJ in New South Wales. Queensland's Surat Basin has 64.9% and the Bowen Basin has 23.2% of Australia's 2P coal seam gas reserves respectively (GA, 2011).

The Moran and Vink (2010) report states that as of November 2010, there were 105 tenements in the Murray–Darling Basin covering a total area of 18 903km^2, with 1 646km^2 of the Condamine Alluvium under coal seam gas tenement. Thirteen companies were identified in the Murray–Darling Basin to be undertaking coal seam gas related activities including exploration, extraction and processing. The report identified 1 272 current coal seam gas wells in the Murray–Darling Basin.

Australian Government legislation

The Australian Government greatly values the contribution farmers make to productivity and food security, often under difficult circumstances, and the vital role they play in managing private land for agricultural and environmental benefits. It recognises that some farmers are concerned about government regulation which they consider may impact their ability to effectively manage their land. A number of states have, or are in the process of developing policies for the protection of agricultural land.

The increased demand for LNG for export and energy production in Australia has seen significant exploration and development for coal seam gas extraction in Queensland and New South Wales. State governments currently regulate the coal seam gas industry. State government regulation involves assessment, approval and monitoring against a number of planning, environmental and other criteria. The Australian Government only has a direct regulatory role if the activity is likely to have a significant impact on matters of national environmental significance, as defined by the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

To date three coal seam gas developments (Australia Pacific LNG, Santos and Queensland Gas Company) have been approved by the Minister for Sustainability, Environment, Water, Population and Communities, the Hon. Tony Burke MP, under the EPBC Act. Each of these developments were in Queensland and have had strict environmental conditions placed upon them to protect matters of national environmental significance (including the endangered ecological community '*native species dependent on the natural discharge of groundwater from the Great Artesian Basin'*). The conditions of these approvals require that the respective mining companies carry out planning and monitoring to protect groundwater resources and submit for approval management plans for aquifers, groundwater and surface water.

The coal seam gas projects approved under the EPBC Act and located within the Murray–Darling Basin were also subject to section 255A[A] of the Commonwealth *Water Act 2007*, on the mitigation of unintended diversions. An independent expert study (as required under the *Water Act 2007*) was carried out to determine potential impacts of proposed mining operations on the connectivity of groundwater systems, surface water and groundwater flows and water quality. The scope of the study

included the rivers, streams and associated alluvial aquifers of the Murray-Darling Basin. The study found that dewatering of coal measures (series of coal bearing rocks) has the potential to impact alluvial aquifers of the Murray-Darling Basin, in particular the Condamine Alluvium (Moran and Vink, 2010).

Community concerns

The significant increase in coal seam gas exploration and production is raising community concerns and receiving significant media coverage, particularly in areas where coal seam gas extraction occurs on agricultural land. Competing uses for agricultural land, predominantly from the mining sector and urban development, have raised concerns about environmental impacts and food security.

Coal seam gas developments can consist of thousands of wells with the potential to affect much larger areas than the immediate foot-print of production infrastructure. Multiple developments in a region have the potential to have a broader cumulative effect. Localised aquifer drawdown effects are likely to be significantly different to the predicted regional average drawdown owing to the spatial variability in hydraulic connectivity between the coal measures and aquifers, rates of water movement, depth of the coal seam and the thickness of confining layers (Moran and Vink, 2010).

Environmental impacts

Moran and Vink (2010) in their assessment of impacts of the proposed coal seam gas operation on surface and groundwater systems in the Murray–Darling Basin found that the location and nature of current and proposed coal seam gas activities in Queensland may trigger Section 255AA (Mitigation of unintended diversions) of the *Water Act 2007*. The scope of the study included the rivers, streams and associated alluvial aquifers of the Murray–Darling Basin.

Queensland coal seam gas reserves are located within the Walloon Coal Measures of the Surat Basin and Permian coal measures of the Bowen Basin, both part of the Great Artesian Basin (GAB). Coal seam gas exploration and development of the Surat Basin extends into the northern parts of the Murray–Darling Basin. The GAB is not part of the Murray–Darling Basin surface water management area, however research highlights that the dewatering of the Walloon Coal Measures could impact alluvial aquifers of the Murray–Darling Basin, in particular the Condamine Alluvium (Hillier, 2010).

Potential risks and local impacts to the Murray–Darling Basin include discharge of coal seam gas water to rivers, reinjection of coal seam gas water via bores into aquifers and the redistribution of groundwater within the Alluvium and aquifers of the GAB as a result of dewatering of the Walloon Coal Measures (Moran and Vink, 2010).

During water table drawdown, water in the alluvium may be redistributed so that in some cases low quality water may flow to areas where water quality was previously high. This local (individual water bores) change to water quality may be significant, but the number of bores likely to be affected and the locations cannot currently be predicted or the magnitude of change estimated (Moran and Vink, 2010).

Coal seam gas Environmental Impact Statements from companies approved to undertake coal seam gas extraction activities under the EPBC Act have estimated the following coal seam gas associated water production rates:

- Queensland Gas Company – total project peak water production to be 190ML/day (2012-2013); average production to be approximately 165ML/day (2015-2025); 1 200GL over the life of the project
- Santos – peak project production around 20ML/day; maximum total production of 91 336ML over the life of the project
- Australia Pacific LNG – peak project production around 170ML/day; approximately 1 241GL for the first 20 years.

Vertical permeability and connectivity between aquifers is not well understood or quantified. Little is known about the impact of such large scale dewatering and changes to capillary pull of the coal seams. Existing faults and fractures must be accounted in the models, or at least signalled as areas of concern (Moran and Vink, 2010).

The Queensland Department of Environment and Resource Management (DERM) is carrying out a Commonwealth funded Healthy Headwaters Coal Seam Gas Water Feasibility study to investigate the opportunities, risks and practicality of using coal seam gas water to address water sustainability in the Queensland section of the Murray–Darling Basin.

Food security

Australia is sheltered from direct concerns about food shortages because of its world class agricultural sector and Australia's farmers produce far more food than is consumed domestically. The overwhelming majority of food sold in Australia is grown and supplied by Australian farmers. Australia is able to export more than half of its agricultural produce, while around 98 per cent of fresh fruit and vegetables, meat, milk and eggs sold in supermarkets is domestically produced (Department of Agriculture, Fisheries and Forestry 2011).

While Australia faces no foreseeable risk to its food security, the tensions between agriculture, mining and urban land issues can be expected to continue and the Australian Government encourages jurisdictions to pursue policies which provides a framework for dealing with competing uses and externalities, such as the potential for mining to affect aquifers which agriculture and others users rely on.

Food security will be supported by improving agricultural productivity, particularly through research and development and its adoption, by protecting the productive base by maintaining plant and animal health status, and by sustaining the natural environment and maintaining efforts to liberalise trade.

This provides significant capacity to meet Australia's future food needs, and that of many import dependent countries. The government recognises that we cannot be complacent, particularly given challenges such as climate change and resource constraints. The government has introduced important initiatives such as Australia's Farming Future, Caring for our Country, and continues to invest in research and development to help support agricultural and food production.

Socio economic impacts

Landholders may be directly impacted from mining through the acquisition or leasing of land and the alienation of land from current agricultural production activities. Coal seam gas well-heads may cause limitations in cropping land use by impeding controlled traffic practices, sowing, harvesting and irrigation. Some land management practices such as burning may be impeded. The potential lowering of groundwater pressures and drawdown in the underlying aquifers, from intense pumping, may affect livestock watering points (i.e. groundwater bores) by reducing water supply and ease of extraction, resulting in additional pumping costs.

Large mining projects can impact the demographics of small rural towns, attracting predominantly young families leading to pressures on particular types of services. For example, small and/or isolated mining towns can find it difficult to attract professional support personnel such as doctors and teachers, making it difficult to increase the supply of workers quickly in many cases. The proportion of the male population also rises in the resident and non-resident workforce. Mining projects can go through boom and bust cycles leading to a loss of economic momentum in smaller towns as the prospect of future downturns or shutdowns discourages investment in the smaller less diversified economies in favour of investment in larger service centres (Economic Associates 2010).

Although the areas involved are relatively small, it is envisaged that competition for land use in some regions could intensify due to growth in mineral exploration and development. There has been strong opposition in some rural communities to the granting of exploration licenses such as in the Surat and Bowen basins, Queensland and the Liverpool Plains region of NSW. Other issues that could arise or re-emerge on a regional basis include possible competition for transport and infrastructure, competition for water consumption between mining and other regional activities and social issues in the rural community as a result of the resources boom.

Economic impacts

Increased activities and profitability from coal seam gas production has the potential to generate major economic benefits for states and the Australian economy through foreign investment and exports. This has the potential to add to the local economy with benefits that are likely to last for the duration of coal seam gas projects.

Regional economies in which the projects are located are likely to gain greater benefit (per capita) than the wider Australian economy (Economic Associates, 2010) providing increased business activities in regional economies and employment opportunities for rural communities that provide an economic base for increased infrastructure development.

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