

Chapter 1

1.1 On 12 August 2009, the Senate referred the following matter to the committee for inquiry and report by 26 October 2009 (subsequently extended to 4 December 2009):

- a) the potential impacts of current and projected mining operations on all environmental values in the Murray-Darling Basin and, in particular, the potential impacts upon surficial and groundwater flows and quality in the alluvial flood plains at its headwaters in the Namoi Valley and the Darling Downs catchments; and
- b) evaluation of the potential impacts in the context of the Murray-Darling Plan and agricultural productivity.

1.2 In these terms of reference, 'mining operations' includes all minerals exploration and all minerals extraction including exploration for and extraction of gas.

1.3 In accordance with its usual practice, the committee advertised details of the inquiry in *The Australian*, *Gunnedah Namoi Valley Independent*, the *Tamworth Northern Daily Leader* and the *Toowoomba Chronicle*. The committee also contacted a range of organisations and individuals, inviting submissions. The committee received submissions from 85 individuals and organisations, listed at Appendix 1. A list of tabled documents is at Appendix 3.

1.4 The committee held four public hearings, in Gunnedah on 28 September 2009, Oakey on 29 September 2009, and Canberra on 14 October 2009 and 19 November 2009. Details of these public hearings are shown at Appendix 2.

Background

1.5 This report will focus on the potential impacts of mining upon surficial and groundwater flows and quality in the alluvial flood plains at its headwaters in the Namoi valley and the Darling Downs catchments. The committee acknowledges other mining activity conducted in the Murray-Darling Basin (MDB), particularly mineral sand operations in the south of the MDB. However, based on the submissions it received, the committee judged that the primary matters of public concern are the impacts of coal mining and coal seam methane extraction in the Namoi Valley and Darling Downs catchments. The committee also heard evidence pertaining to the impact of mining on Australia's current and future food security. In accordance with standing order 25(13) the committee deferred to the Senate Select Committee on Agricultural and Related Industries on the issue of food security, which reported on its inquiry into food production in Australia on 26 November 2009.

Murray Darling Basin

1.6 The MDB is the catchment for the Murray and Darling rivers and their many tributaries. Extending from north of Roma in Queensland to Goolwa in South Australia, the MDB includes three-quarters of New South Wales (NSW) and half of Victoria. In total there are 23 river valleys in the MDB, covering over 1 million square kilometres, or 14% of Australia.¹ The MDB also contains important groundwater systems.

Agriculture

1.7 The MDB is Australia's most important agricultural area, producing over one-third of Australia's food supply, and is home to more than 2 million residents.² The MDB generates 39% of the national income derived from agricultural production and includes 65% of Australia's irrigated agricultural land.³ It produces 53% of Australian cereals grown for grain (including 100% of rice), 95% of oranges, and 54% of apples.⁴ The MDB supports 28% of the nation's cattle herd, 45% of sheep, and 62% of pigs.⁵

Coal Mining

1.8 There is a long history of mining in the MDB, with regionally significant gold, copper and coal mining operations. Ms Sue-Ern Tan of the New South Wales Minerals Council observed:

In the New South Wales portion of the great Murray-Darling Basin, there are seven major coal operations and nine major mineral operations, with coal mainly mined in the western coalfields, which are out near Mudgee, and...the growing development of the coalfields around here in the Gunnedah Basin. There are also major metallic deposits in the basin from Orange through to Broken Hill, Cobar and West Wyalong.⁶

1.9 There is natural gas production in the Narrabri area, used in local power generation.⁷ Mining operations currently account for around 0.26% of land use in the MDB.⁸

1 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

2 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

3 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

4 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

5 Murray-Darling Basin Authority, www.mdba.gov.au (accessed 31 August 2009).

6 *Committee Hansard*, 28 September 2009, p. 2.

7 NSW State Government, *Submission 34*, p. 2.

8 Minerals Council of Australia, *Submission 74*, p. 2.

1.10 Coal is a fossil fuel accounting for around 27 per cent of total world energy production.⁹ Black coal is Australia's largest single export commodity, accounting for around 16 per cent of Australian commodity trade.¹⁰ Australia is the world's fourth largest coal producer (behind China, the USA and India) and the largest exporter, supplying around 27 per cent of world coal trade, including over half of world metallurgical coal trade (used in steelmaking).¹¹

1.11 More than 70 per cent of Australia's metallurgical coal exports and more than 94 per cent of thermal coal exports (used in power generation) were exported to the Asian region in 2008.¹² Australia's reserves are sufficient to sustain current black coal production rates for nearly 100 years, with brown coal economic reserves are estimated to sustain current production for over 400 years.¹³ The most common methods of coal mining in Australia are open cut – typified by the removal of rock covering the coal seam – and longwall – characterised by extraction via a series of underground tunnels.¹⁴ Coal and coal seam gas deposits can both be found in the area around the north eastern rim of the MDB.

1.12 The value of NSW mineral production has been calculated at \$14 billion for 2007-08, of which coal accounted for over 70% of total production value.¹⁵ The minerals industry returns \$1.4 billion in royalties and taxes annually to the State Government's consolidated revenue.¹⁶ Land directly used by mining operations accounts for less than 0.1% of total land use in NSW.¹⁷ In the NSW MDB there are seven major coal operations and nine major mineral operations.¹⁸ Coal is mainly mined in the Western Coalfields near Mudgee and the growing development in the coal fields of the Gunnedah Basin.¹⁹

9 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

10 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

11 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

12 The Department of Resources, Energy and Tourism, www.ret.gov.au (accessed 14 October 2009).

13 NSW Minerals Council, *Submission 63*, p. 2.

14 Geoscience Australia, http://www.australianminesatlas.gov.au/education/fact_sheets/coal.jsp#black_mining (accessed 14 October 2009).

15 NSW Minerals Council, *Submission 63*, p. 2.

16 NSW Minerals Council, *Submission 63*, p. 2.

17 NSW Minerals Council, *Submission 63*, p. 2.

18 NSW Minerals Council, *Submission 63*, p. 2.

19 NSW Minerals Council, *Submission 63*, p. 2.

1.13 In 2007-08, the Queensland resources sector is estimated to have directly and indirectly contributed to 20 percent of Queensland's total Gross State Product.²⁰ Queensland is the world's largest seaborne exporter of coal with shipments to 33 countries throughout the world in 2006-07.²¹ According to Department of Mines and Energy, Queensland exported 153.36 million tonnes of coal in 2006–07 with a total sales value of \$16.3 billion free-on-board.²² There is an estimated 6.4 billion tonnes of high-quality thermal coal identified in the Surat Basin, the area encompassing the Darling Downs, of southern Queensland.²³

Coal seam methane extraction

1.14 Coal seam methane is a form of natural gas. It occurs when coal is formed deep underground over millions of years of heating and compressing decomposing plant matter.²⁴ Over time, the gas becomes trapped in coal seams by water, typically 300-600 metres underground.²⁵ Coal seam methane usually has only small amounts of carbon dioxide and nitrogen. As such, it is considered a 'cleaner' gas that requires relatively little treatment before being used by industry and households.²⁶ Consequently, the Queensland Government is encouraging a transition from coal to gas as an effective mechanism to reduce greenhouse gas emissions.²⁷ The number of coal seam gas exploration wells drilled annually in Queensland increased from 10 in the early 1990s to a high of approximately 600 in 2007–08.^{28,29} Santos was planning around 23 exploratory drill holes for its project on the Liverpool Plains.³⁰

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- 20 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 21 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 22 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 23 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).
- 24 Queensland Curtis LNG, *Coal Seam Gas Fact Sheet*, http://qclng.com.au/uploads/docs/qclng_csg_fs_WEB.pdf (accessed 31 August 2009).
- 25 Queensland Curtis LNG, *Coal Seam Gas Fact Sheet*, http://qclng.com.au/uploads/docs/qclng_csg_fs_WEB.pdf (accessed 31 August 2009).
- 26 Queensland Curtis LNG, *Coal Seam Gas Fact Sheet*, http://qclng.com.au/uploads/docs/qclng_csg_fs_WEB.pdf (accessed 31 August 2009).
- 27 Queensland Department of Mines and Energy, *Queensland's Coal Seam Gas Overview*, http://www.energy.qld.gov.au/zone_files/coal_files_pdf/new_csg_cc.pdf (accessed 31 August 2009).
- 28 CSIRO, *Submission 65*, p. 4.

Namoi Valley

1.15 The Namoi region is in north-eastern NSW and represents 3.8 percent of the area of the MDB.³¹ The region is based around the Namoi, Manilla and Peel Rivers and has a population of around 88,000 predominantly concentrated in the towns of Tamworth, Gunnedah, Boggabilla, Narrabri and Wee Waa.³² The majority of land in the Namoi region is used for cattle and sheep grazing while wheat, cotton and other broadacre crops are grown on the floodplains.

1.16 The region has the highest level of groundwater development in NSW and one of the highest levels of groundwater extraction in the MDB at around 50 percent of current water use in the Namoi region and around 15 percent of the MDB total.³³

Liverpool Plains

1.17 The Liverpool Plains is an area of around 12,000 square kilometres in the upper Namoi Valley.³⁴ The region is renowned for the agricultural productivity of its alluvial floodplains. The Liverpool Plains has been at the centre of escalating tensions between local farmers and members of the coal mining industry – specifically BHP Billiton and Shenhua Watermark Coal Pty Ltd.³⁵ In 2006 BHP secured a coal exploration licence in the Liverpool Plains, for approximately \$100 million, while Shenhua also received a licence in 2008 for approximately \$300 million, with subsequent exploration revealing substantial coal deposits.³⁶ Local farmers are concerned that coal mining will pollute the underground aquifers and surface water flows that are vital to their livelihood.³⁷ They claim pollution could have potentially

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- 29 Queensland Department of Employment, Economic Development and Innovation, Queensland Mines and Energy, 'Petroleum & gas: production', www.dme.qld.gov.au/mines/production_1.cfm, (accessed 23 November 2009).
- 30 Liverpool Plains Shire Council, Mining Consultative Committee, minutes of meeting, 13 October 2009, p. 2.
- 31 CSIRO, *CSIRO Murray-Darling Basin Sustainable Yields Project – a report to the Australian Government*, www.clw.csiro.au/publications/waterforahealthycountry/mdbsy/pdf/Namoi-FactSheet.pdf (accessed 31 August 2009).
- 32 CSIRO, *CSIRO Murray-Darling Basin Sustainable Yields Project – a report to the Australian Government*, www.clw.csiro.au/publications/waterforahealthycountry/mdbsy/pdf/Namoi-FactSheet.pdf (accessed 31 August 2009).
- 33 CSIRO, *Water Availability in the Namoi*, www.csiro.au/files/files/phzr.pdf (accessed 31 August 2009).
- 34 Mr Timothy Duddy, Spokesperson, Caroon Coal Action Group, *Proof Committee Hansard*, 28 September 2009, p 16.
- 35 Australian Bureau of Statistics, *National Regional Profile: Liverpool Plains*, www.abs.gov.au (accessed 31 August 2009).
- 36 Four Corners, *The Good Earth*, www.abc.gov.au/4corners (accessed 25 August 2009).
- 37 Four Corners, *The Good Earth*, www.abc.gov.au/4corners (accessed 25 August 2009).

adverse impacts on one of Australia's most productive agricultural communities and, due to the proximity of the Namoi region to the MDB, the nation's key water system.³⁸

1.18 Shenhua estimate that there is approximately 500 million tonnes of inferred coal within the Watermark Exploration Licence, with a potential mine life of around 50 years in a possible open cut mine located in the ridge country of the Liverpool Plains.³⁹ Should a viable mine be identified and subject to all necessary environmental planning and mining approvals, Shenhua anticipates construction to begin in 2012 with mine production commencing in 2013.⁴⁰

1.19 Publicly, farmers have put pollution fears at the centre of their protest. However, as fifth and sixth generation land owners, there is also significant emotional attachment to the land and distress at the prospect of impacts on family properties.⁴¹

1.20 The committee undertook a tour of the Carroona region with members of the Carroona Coal Action Group and visited a coal seam methane exploration rig operated by Santos.

Darling Downs

1.21 The Darling Downs is situated in Southern Queensland, at the head of the MDB, along the NSW Queensland border. The Darling Downs is a farming region characterised by fertile soil similar to the Liverpool Plains. The committee heard evidence from representatives of several farming communities on the Darling Downs including from the Felton Valley, the Haystack Plains and the Jimbour Plains. The Darling Downs region has been historically dominated economically by agricultural production, with crop and livestock generating approximately 25% of Queensland's total production.⁴²

1.22 The Surat Basin⁴³, running beneath the Darling Downs, is a rich source of coal and coal seam methane gas. However, local farming communities, fearing the potentially adverse environmental impact of coal mining and associated industries on their prime agricultural land, have generated significant public profile for their protest against a proposed mine.⁴⁴

38 Carroona Coal Action Group, <http://www.ccag.org.au/> (accessed 31 August 2009).

39 Shenhua Watermark Coal Pty Ltd, *Submission 72*, p. 2.

40 Shenhua Watermark Coal Pty Ltd, *Submission 72*, p. 2.

41 Four Corners, *The Good Earth*, www.abc.gov.au/4corners (accessed 25 August 2009).

42 State Development Centre Toowoomba, *Darling Downs and Southwest Queensland - Energy infrastructure and resources*, <http://www.dalbychamber.com.au/docs/Qld%20Centre%20Of%20Enterprise%20-%20Darling%20Downs%204.pdf> (accessed 31 August 2009).

43 The southern end of the Surat Basin is also referred to as the Clarence-Moreton Basin.

44 Friends of Felton Inc, <http://www.friendsoffelton.blogspot.com/> (accessed 31 August 2009).

1.23 The potential for coal seam gas to reduce carbon emissions, combined with Darling Downs' proximity to pipeline infrastructure and ease of access to markets in Southern Queensland, has encouraged exploration and development of the coal seam gas resources in the Surat Basin.⁴⁵ The current level of coal seam gas production from the Bowen Basin and Surat Basin now supplies more than 80 per cent of Queensland's gas market.⁴⁶ The local agricultural industry is concerned about the potential for coal seam gas production to damage waterways and crop land.⁴⁷ They are also anxious about the treatment and disposal of salt produced during the coal seam gas extraction process.

1.24 The committee was given a tour with local residents of the proposed Ambre Energy mine and petrochemical site in the Felton region by the Friends of Felton, as well as visiting the town of Acland, which is in the process of being acquired and demolished or relocated in preparation for the expansion of an adjacent open-cut coal mine. The committee thanks the various individuals, groups, companies, and governments who assisted it in its work.

45 Councillor Ray Brown, Dalby Regional Council Mayor, Quoted in *Coal Mining*, <http://www.miningcoal.com.au/article/Surat-Basin-coal-booming-despite-Queensland-job-cuts/435005.aspx>, (accessed 4 September 2009).

46 Queensland Department of Mines and Energy, *Queensland's World-class Coals*, http://www.dme.qld.gov.au/zone_files/coal_files_pdf/wcc_nov_07_1.pdf (accessed 31 August 2009).

47 Friends of Felton Inc, <http://www.friendsoffelton.blogspot.com/> (accessed 31 August 2009).

