

Chapter 1

Introduction

1.1 On 18 October 2017, the Senate referred the following matters to the Environment and Communications References Committee for inquiry and report by 27 March 2018:

The adequacy of the regulatory framework governing water use by the extractive industry, with particular reference to:

- a. the social, economic and environmental impacts of extractive projects' take and use of water;
- b. existing safeguards in place to prevent the damage, contamination or draining of Australia's aquifers and water systems;
- c. any gaps in the regulatory framework which may lead to adverse social, economic or environmental outcomes, as a result of the take and use of water by extractive projects;
- d. any difference in the regulatory regime surrounding the extractive industry's water use, and that of other industries;
- e. the effectiveness of the 'water trigger' under the *Environment Protection and Biodiversity Conservation Act 1999*, and the value in expanding the 'trigger' to include other projects, such as shale and tight gas; and
- f. any other related matters.¹

1.2 On 13 February 2018, the Senate granted the Committee an extension of time to report until 27 June 2018.² On 25 June 2018, the Senate granted the Committee a further extension until 21 August 2018.³ On 20 August 2018, the Senate granted the Committee a further extension of time until 19 September 2018.⁴ On 17 September 2018, the Committee was granted another extension of time to report until 17 October 2018.⁵

1.3 In accordance with its usual practice, the Committee advertised the inquiry on its website and wrote to relevant individuals and organisations inviting submissions by 15 December 2017. The Committee received 32 submissions, which are listed at Appendix 1, and held three public hearings, in Brisbane on 1 May 2018, Sydney on

1 *Journals of the Senate*, No. 66, 18 October 2017, p. 2111.

2 *Journals of the Senate*, No. 85, 13 February 2018, p. 2690.

3 *Journals of the Senate*, No. 102, 25 June 2018, p. 3271.

4 *Journals of the Senate*, No. 110, 20 August 2018, p. 3534.

5 *Journals of the Senate*, No. 118, 17 September 2018, p. 3766.

2 May 2018 and Canberra on 10 September 2018. Submissions and the transcripts of evidence are available on the committee's website at www.aph.gov.au/senate_ec.

Acknowledgements

1.4 The Committee expresses its thanks to the organisations and witnesses who provided evidence to the inquiry.

Structure of this report

1.5 This report concentrates on the water sources commonly used by extractive industries in the process of extracting resources lying beneath the surface—that is, underground water sources. The report examines the environmental, social and economic impacts of water extracted in this process, and the current regulatory frameworks governing water use.

1.6 The report is divided into five chapters:

- Chapter 1: Introduction (this chapter), which gives an overview of the inquiry and previous related inquiries;
- Chapter 2: Background, which provides a synopsis of Australia's underground water systems, water users and the different methods of water extraction;
- Chapter 3: Regulatory systems governing water use, which examines federal legislation and bodies responsible for oversight of water use; the National Water Initiative; differences between state and territory regulatory frameworks and requirements; and current issues and gaps in regulatory frameworks;
- Chapter 4: Impacts of extraction on Australia's water resources, which outlines the major environmental, economic and social impacts of water extraction, including beneficial impacts; and
- Chapter 5: Committee view, which also includes the Committee's recommendations.

Key terms used in this report

1.7 The following key terms are used in this report:

- *Extractive industry*: the mining, mineral processing, and oil and gas industries;⁶
- *Aquifer*: a geological formation (or group of geological formations) that is able to receive, store and transmit significant amounts of water;⁷

6 Australian Petroleum Production and Exploration Association Ltd (APPEA), *Submission 22*, p. 10; Department of Agriculture and Water Resources, *Submission 30*, p. 1.

7 Bureau of Meteorology, *Australian water information dictionary: Aquifer*, <http://www.bom.gov.au/water/awid/initial-a.shtml> (accessed 23 May 2018).

- *Artesian basin*: a geological structural feature (or combination of features) in which water is contained under pressure, including confined aquifers;⁸
- *Groundwater*: water lying below the earth's surface contained in aquifers;⁹
- *Groundwater-dependent ecosystems (GDEs)*: ecosystems that rely on groundwater, such as rivers, springs, wetlands, forests, caves and aquifers;¹⁰
- *Stygofauna*: fauna that live in groundwater;¹¹ and
- *Unconventional gas*: natural gas located in complex geological systems, such as coal seam gas (natural gas located within coal seams), shale gas (located in shale rock formations) and tight gas (located within low permeability sandstone rock).¹²

Recent related inquiries

1.8 A number of inquiries have examined, or are examining, matters related to water use by the extractive industry. These include, among others:

- Federal Parliamentary inquiries;
- inquiries commissioned by the Commonwealth Government into the regulatory frameworks governing water use; and
- inquiries commissioned by state governments into particular forms of mining and their impacts, including on water resources.

Federal Parliamentary inquiries

1.9 During the 44th Parliament the Senate Select Committee on Unconventional Gas Mining examined the adequacy of Australia's legislative, regulatory and policy framework for unconventional gas mining. The select committee's interim report, tabled in May 2016, examined water use and impacts caused by unconventional gas mining.¹³ On 8 May 2016, the Governor-General issued a proclamation dissolving the House of Representatives and the Senate from 9.00am on 9 May 2016 for a general election. As a result of the dissolution of the Senate, the Select Committee ceased to exist. The Select Committee was not reinstated in the 45th Parliament.

8 Bureau of Meteorology, *Australian water information dictionary: Artesian basin*, <http://www.bom.gov.au/water/awid/initial-a.shtml> (accessed 23 May 2018).

9 Murray-Darling Basin Authority, *Discover groundwater*, <https://www.mdba.gov.au/discover-basin/water/discover-groundwater> (accessed 23 May 2018).

10 Bureau of Meteorology, *Groundwater dependent ecosystems atlas*, <http://www.bom.gov.au/water/groundwater/gde/> (accessed 23 May 2018).

11 Geoscience Australia, *Submission 2*, p. 3.

12 CSIRO, *What is unconventional gas?*, <https://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/What-is-unconventional-gas> (accessed 7 June 2018).

13 Select Committee on Unconventional Gas Mining, *Interim report*, May 2016, pp. 64–68.

1.10 The Senate Environment and Communications References Committee (this Committee) is currently conducting an inquiry into the rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities, including the environmental impacts on water from abandoned mines. The Committee is due to report by 28 November 2018.

1.11 The Senate Select Committee on Red Tape held an inquiry into environmental assessment and approvals, with its interim report tabled in October 2017. The inquiry examined the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including its inclusion of 'a water resource, in relation to coal seam gas development and large coal mining development' (also known as the water trigger—see Chapter 3) as a matter of national environmental significance that requires applications for relevant projects to be approved by the Minister for the Environment.¹⁴ The Red Tape Committee recommended that the water trigger be removed from the EPBC Act because of regulatory duplication between state environmental approvals processes and the Commonwealth.¹⁵ A dissenting report by Labor senators disagreed with a number of the report's recommendations. Labor senators emphasised that the water trigger was 'carefully considered', and suggested that a statutory review of the EPBC Act scheduled to be undertaken in 2019 could consider ways to reduce regulatory burden.¹⁶

Commonwealth Government inquiries

1.12 On 19 December 2017, the Productivity Commission released a report into national water reform, focusing on the progress of the National Water Initiative (NWI) intergovernmental agreement between the Commonwealth, state and territory governments, including state and territory initiatives to meet the NWI's objectives. The review also examined possible future reform priorities and ways in which the NWI could be improved.¹⁷ The Productivity Commission recommended that state and territory governments 'ensure that water entitlement and planning arrangements explicitly incorporate extractive industries' and that entitlements for extractive industries be 'issued under the same framework that applies to other consumptive users'. It also recommended governments commit to a renewed National Water Initiative through the Council of Australian Governments by 2020.¹⁸

14 Senate Select Committee on Red Tape, *Effect of red tape on environmental assessment and approvals: Interim report*, October 2017, p. 9.

15 Senate Select Committee on Red Tape, *Effect of red tape on environmental assessment and approvals: Interim report*, October 2017, p. 12, Recommendation 2.

16 Senate Select Committee on Red Tape, *Effect of red tape on environmental assessment and approvals: Interim report*, October 2017, Dissenting Report by Labor Senators, p. 35.

17 Productivity Commission, *National Water Reform*, Report no. 87, December 2017, Canberra, p. 3.

18 Productivity Commission, *National Water Reform*, Report no. 87, December 2017, Canberra, p. 28, Recommendation 3.1 and p. 43, Recommendation 10.1.

1.13 The Department of the Environment and Energy commissioned an independent review of the water trigger, as required under the EPBC Act, to examine the extent to which the water trigger legislation has achieved its objectives. The inquiry's report was published in April 2017. The review found that 'the water trigger is an appropriate measure to address the regulatory gap' that it was established to fill.¹⁹ It also found that the conditions of approval applied to proposals related to the water trigger had increased transparency and public confidence in the regulatory system, but the effectiveness of the water trigger legislation was not yet clear because of its relatively recent establishment.²⁰

State government inquiries into particular forms of mining

1.14 The Northern Territory Government commissioned an independent Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Reservoirs in the Northern Territory, with a final report presented in March 2018. The inquiry looked at the environmental, social and economic risks and impacts of hydraulic fracturing, and devoted an entire chapter to water in its final report.²¹ The Northern Territory Government in its response to the report supported, among others, the inquiry's recommendations that the Australian Government amend the EPBC Act for the water trigger to include onshore shale gas development; that the use of all surface water for onshore gas activity in the Northern Territory be prohibited prior to the grant of any further exploration approvals; and that reinjection of wastewater into aquifers be prohibited in the absence of full scientific investigations determining that associated risks can be mitigated.²²

1.15 In September 2017, the Western Australian Government announced the establishment of an independent scientific panel inquiry into the environmental impacts of hydraulic fracturing. The inquiry is due to present its final report later in 2018.²³

1.16 The New South Wales Government commissioned an independent review of coal seam gas activities in New South Wales, with the Chief Scientist and Engineer's

19 Commonwealth of Australia, *Independent Review of the Water Trigger Legislation*, April 2017, p. 6.

20 Commonwealth of Australia, *Independent Review of the Water Trigger Legislation*, April 2017, p. 7.

21 Scientific Inquiry into Hydraulic Fracturing in the Northern Territory, *Final Report*, April 2018, p. 10, Chapter 7.

22 Northern Territory Government, *Government Responses to Recommendations from the Final Report on Hydraulic Fracturing in the Northern Territory*, pp. 5, 7, https://hydraulicfracturing.nt.gov.au/_data/assets/pdf_file/0005/497426/Government-responses-to-Recommendations.pdf (accessed 24 May 2018).

23 Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia 2017, *Progress of the Scientific Inquiry*, <https://frackinginquiry.wa.gov.au/progress-scientific-inquiry> (accessed 24 May 2018).

report handed down in September 2014. The most frequently raised issue to the inquiry was that of potential risks to groundwater.²⁴ The inquiry recommended the creation of a risk management and prediction tool for extractive industries, and a plan to manage legacy matters associated with coal seam gas mining.²⁵

1.17 Other related inquiries include:

- Senate Select Committee on the Murray-Darling Basin Plan, which tabled its report in March 2016; and
- Senate Rural and Regional Affairs and Transport References Committee inquiry into the integrity of the water market in the Murray-Darling Basin, due to report in November 2018.

24 NSW Chief Scientist and Engineer, *Independent review of coal seam gas activities in NSW: Managing environmental and human health risks from CSG activities*, September 2014, p. 1.

25 NSW Chief Scientist and Engineer, *Independent review of coal seam gas activities in NSW: Managing environmental and human health risks from CSG activities*, September 2014, p. vi.