

KEEPING THE ENGINE ROOM RUNNING: KEY THEMES AND DEVELOPMENTS IN WATER RESOURCES MANAGEMENT IN THE PILBARA REGION OF WESTERN AUSTRALIA

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ABSTRACT: Water management is a key issue confronting government, the mining industry and the wider community in the Pilbara region of Western Australia. This article will provide an update on three current developments in Pilbara water resource management: preparation of the Pilbara groundwater allocation plan, consideration of facilitating the on-use of mine dewatering surplus (or excess), and preparation of a guidance note on environmental and water assessments relating to mining operations in the Fortescue Marsh area.¹ From these developments, we can draw three themes that appear to be guiding water resource management in the Pilbara: limited water allocation plans, diversification of water supply sources (and the associated removal of any potential legislative constraints with respect to the use of mine dewater), and management of cumulative impacts for specific areas of ecological significance. This article seeks to explore these guiding themes and identify issues that require further investigation.

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¹ The Fortescue Marsh is a wetland located north of Newman in the central Pilbara. The Fortescue Marsh has been identified in a number of Western Australian Government documents as a proposed Ramsar wetland. See Department of Environment and Conservation (WA), *Resource Condition Report for Significant Western Australian Wetland: Wetlands of the Fortescue River System* (2009) 2; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030* (June 2010) 8 <<http://www.water.wa.gov.au/PublicationStore/first/93029.pdf>>.

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I INTRODUCTION

With the Pilbara region of Western Australia often being described as the ‘engine room of the nation’,² water management is a key issue confronting government, the mining industry and the wider Pilbara community. Water management is a complex balancing act in the Pilbara due to the vastly different experiences of stakeholders in the region. For example, ensuring security of water supply is a major issue for the coastal towns and ports in the Pilbara region, whereas inland the mining industry has, in some instances, ‘too much’ water due to the amount of water abstracted by mine dewatering. However, even though dewatering may produce ‘too much’ abstracted water, there are concerns about the cumulative impacts of dewatering by multiple operations over extended

² Pilbara Development Commission (WA), *Pilbara Regional Economy* (2012) <<http://www.pdc.wa.gov.au/industry/>>. The Pilbara region is located in north-west Western Australia. A map of the regions of Western Australia is accessible at: Department of Regional Development and Lands (WA), *Regions and Local Government Areas Western Australia 2011* (24 October 2011) <<http://www.rdl.wa.gov.au/publications/Documents/RegionalMapWA.pdf>>.

periods of time, particularly given the expansion of mining in the area.³ This article will provide a description of water use in the Pilbara; an overview of the Western Australian statutory provisions and policies relevant to the Pilbara region; and then supply an update on three current developments, whilst exploring themes that appear to be guiding water resource management in the Pilbara.

II WATER IN THE PILBARA

Mining operations and mine dewatering discharge are the dominant uses of water in the Pilbara region, with water used in mining operations accounting for 26 per cent of total water use and mine dewater released to the environment accounting for 52 per cent of total water use — together they account for 78 per cent of total water use in the Pilbara.⁴ Mine dewatering is the ‘act of pumping groundwater to produce “dry” and safe conditions within the area to be mined’.⁵ The primary impacts of mine dewatering are lowering of the water table in the vicinity of the dewatered zone and the disposal of mine dewater.⁶ The Western Australian Department of Water identifies the options for use and release of dewatering discharge as: impact mitigation, fit-for-purpose activities (such as dust suppression), transfer to a third party (including other mining operations and public water supply), re-injection into the aquifer, and controlled release into the environment.⁷ The order of these options is relevant as they have previously been

³ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail* (May 2010) 56 <<http://www.water.wa.gov.au/PublicationStore/first/93030.pdf>>. See also Office of the Environmental Protection Authority (WA), ‘Environmental Protection Authority and Office of the Environmental Protection Authority 2011–2012 Annual Report’ (24 September 2012) 42. Report accessible at <<http://www.epa.wa.gov.au/EPADocLib/EPA-OEPA%20AR%202012-web.pdf>>.

⁴ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 1, 7.

⁵ Sinclair Knight Merz, ‘Framework for Risk-Based Assessment of Cumulative Effects to Groundwater from Mining’ (Technical Report No 3, National Water Commission, 11 May 2010) 6. Report accessible at <http://www.nwc.gov.au/__data/assets/pdf_file/0016/11554/Report_3.pdf>. This technical report is part of a larger project: Paul Howe, ‘Framework for Assessing Potential Local and Cumulative Effects of Mining on Groundwater Resources’ (Waterlines Report Series No 59, National Water Commission, October 2011). Report accessible at <<http://archive.nwc.gov.au/library/waterlines/59>>.

⁶ Paul Younger and Christian Wolkersdorfer, ‘Mining Impacts on the Fresh Water Environment: Technical and Managerial Guidelines for Catchment Scale Management’ (2004) 23 *Mine Water and the Environment* 2, 3; Natascha Sommer, ‘Mine Dewatering in the Pilbara: A Legal Framework for Managing the Cumulative Impacts on Environmental Values and Indigenous Interests’ (2012) 31 *Australian Resources and Energy Law Journal* 65, 68.

⁷ Department of Water (WA), *Pilbara Water in Mining Guideline* (Water Resource Allocation Planning Series, Report No 34, September 2009) 43–4 <<http://www.water.wa.gov.au/PublicationStore/first/88526.pdf>>; Department of Water (WA), *Western Australian Water in Mining Guideline: Draft for Public Comment* (Water Licensing Delivery Series, Report No

referred to as a 'hierarchy' and in the most recent Department of Water document are stated as 'in order of preference'.⁸

It is anticipated that by 2030, water use in the Pilbara 'will more than double, with the greatest increase occurring in mine dewatering discharge'.⁹ The Department of Water acknowledges that, as a generalisation, many of the above water table deposits have already been mined and this will now lead to an increase in mining of below water table deposits requiring dewatering.¹⁰ Over the next 20 years, it is predicted that dewatering volumes are likely to increase threefold.¹¹ For an example related to just one producer, in 2010, Rio Tinto managed approximately 100 gigalitres (GL) of freshwater across its operations, with the below water table deposits (of the Mesa J, Hope Downs I and Yandicoogina mines) being responsible for 'a significant part of this flow'.¹² It is estimated that in the ten years to 2020, the annual volume of water that Rio Tinto will be managing will increase to '160 GL +' (an increase of 60 per cent in this instance).¹³ It is noted in this calculation that, 'the planned production profile implies that approximately 50% of company mining operations will be below the water table'.¹⁴

Availability of surface water in the Pilbara is highly variable. Aside from the Harding Dam, surface water resources are not generally used as a permanent water supply.¹⁵ Rainfall in the Pilbara region is highly dependent on cyclonic rainfall during the months of January to March. Groundwater is, therefore, critical in the Pilbara. Groundwater in the Pilbara originates from rainfall

12, June 2012) 40–1; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment* (Water Resource Allocation and Planning Report Series, Draft Report, October 2012) 32 <<http://www.water.wa.gov.au/PublicationStore/first/103784.pdf>>. Note that the *Draft Pilbara Groundwater Allocation Plan* states that the *Draft Western Australian Water in Mining Guideline* provides more guidance on this subject.

⁸ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 32.

⁹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 37.

¹⁰ *Ibid.* xii.

¹¹ *Ibid.* 41.

¹² Marcus Barber and Sue Jackson, 'Water and Indigenous People in the Pilbara, Western Australia: A Preliminary Study' (Water for a Healthy Country Report Series, CSIRO, September 2011) 56. Report accessible at <<http://www.csiro.au/Organisation-Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Water-and-Indigenous-People-in-the-Pilbara.aspx>>. It is stated that this information was provided to the authors of that report by Rio Tinto water management staff. It should be noted that this report was 'instigated and funded' by Rio Tinto Iron Ore: at 5.

¹³ *Ibid.* 56.

¹⁴ *Ibid.* It is noted that additional mines included for this calculation were: Marandoo Phase 2, Greater Nammuldi, Western Turner Syncline and possibly Mesa J (which may not require pumping due to closure).

¹⁵ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 6.

infiltration or surface water flows.¹⁶ The Pilbara has alluvial, sedimentary rock and fractured rock aquifers.¹⁷ Most of the aquifers in the central and eastern Pilbara, where mining is predominantly located, are fractured rock aquifers.¹⁸ As the water in these aquifers is stored in the fractures of rock, these aquifers are harder to locate and it is difficult to determine how much water is in them. Impacts from abstraction are also more localised with respect to fractured rock aquifers due to the way the water is stored.¹⁹ Recent work by the CSIRO suggests that due to the long term drying climate trend, both surface and groundwater in the Pilbara are likely to become more variable in the future.²⁰

Other water uses in the Pilbara include residential, agricultural, ports and industrial uses.²¹ Recent population growth in the Pilbara has been strong. In 2010–11, the Pilbara was the second fastest growing region in Western Australia (and Western Australia was the fastest growing state or territory in Australia).²² There are also large numbers of ‘fly-in/fly-out’ workers in the Pilbara that impact on infrastructure, including water usage.²³ In 2010, it was estimated that the number of fly-in/fly-out workers in the Pilbara was 15 464 and this is expected to increase to approximately 33 685 by 2020.²⁴ The permanent population of the Pilbara is also predicted to continue increasing and growth is being encouraged by the Western Australian Government.²⁵ Through the Pilbara Cities initiative,

¹⁶ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 31.

¹⁷ Ibid.

¹⁸ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 6. A map showing the location of mines in the Pilbara can be seen in: Department of Regional Development and Lands (WA), *Pilbara: A Region in Profile 2011* (February 2011) 4 accessible at <<http://www.pdc.wa.gov.au/publications/>>.

¹⁹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 33–4; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 16.

²⁰ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, ix.

²¹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 7.

²² Australian Bureau of Statistics, *3218.0 - Regional Population Growth, Australia, 2010-11: Western Australia* (30 March 2012) accessible at <<http://www.abs.gov.au/ausstats/abs@.nsf/mf/3218.0/>>; Australian Bureau of Statistics, *3101.0 - Australian Demographic Statistics, Sep 2011: September Key Figures* (29 March 2012) <<http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0/>>.

²³ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 44; Heuris Partners, *Planning for Resources Growth in the Pilbara: Employment & Population Projections to 2020* (Pilbara Industry’s Community Council, August 2008) 3 <<http://www.cmewa.com/UserDir/Documents/PICC%20Publications/091006-MPR-PICC%20Pop%20Projections%20Exec%20Summary-v1.0.pdf>>.

²⁴ Department of Regional Development and Lands (WA), *Pilbara: A Region in Profile 2011*, above n 18, 2.

²⁵ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 44; Heuris Partners, above n 23, 3.

the Western Australian Government has committed funding to ‘transform the Pilbara through building modern, vibrant cities and regional centres’ and aims to further build the populations of Karratha, Port Hedland and Newman.²⁶ Two of the focus areas of the Pilbara Cities initiative are security of water supply and use of mine dewater for ‘[h]orticulture, agriculture, aquaculture, [and] floriculture’.²⁷ The Pilbara Cities initiative also provided \$2.5 million of funding for Pilbara Water Opportunity projects which involve nine pilot water projects to ‘test the feasibility of projects to make the best use of water resources in the region’ and includes projects such as ‘irrigation of biofuel crops from mine dewatering and a water bottling facility using excess mine dewatering and locally manufactured biodegradable bottles’.²⁸

Agriculture is a relatively small water user in the Pilbara, but pastoral stations use surface and groundwater.²⁹ Pursuant to the *Rights in Water and Irrigation Act 1914* (WA) (*‘RIWI Act’*), licences are not required for stock and domestic use.³⁰ Concerns have been raised by some pastoralists about the lowering of groundwater levels that may be associated with abstraction due to mine dewatering.³¹ On the other hand, agriculture occupies an interesting space in the Pilbara water management sphere as there is the potential to use surplus mine dewater to diversify agricultural activities undertaken in the region.³² The ability to make use of dewater (in terms of both extent and duration) will depend on characteristics of dewater, including location, unpredictability of supply, quality of the dewater, and the timeframe associated with the life of the mine.³³

²⁶ Department of Regional Development and Lands (WA), *Pilbara Cities Vision* (15 May 2012) <<http://www.rdl.wa.gov.au/royalties/r4rpilbara/Pages/default.aspx>>. The Pilbara Cities Office of the Department of Regional Development and Lands was transferred to the Pilbara Development Commission on 26 October 2012: Department of Regional Development and Lands (WA) *Pilbara Cities Office to Transfer to the Pilbara Development Commission* (20 September 2012) <<http://www.rdl.wa.gov.au/royalties/r4rpilbara/Pages/default.aspx>>.

²⁷ Department of Regional Development and Lands (WA), *Key Focus Areas - Pilbara Cities* (3 September 2012) <<http://www.rdl.wa.gov.au/royalties/r4rpilbara/Pages/Key-Focus-Areas.aspx>>.

²⁸ Brendon Grylls (Minister for Regional Development and Lands (WA), Minister Assisting the Minister for State Development (WA)), ‘Pilbara Water Projects Approved’ (Media Statement, 4 May 2010) <<http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133416>>. See also Department of Regional Development and Lands (WA), ‘Pilbara Cities Continues to Investigate Water Opportunities’ (Royalties for Regions: Pilbara Cities Update, February 2012) 2.

²⁹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 43.

³⁰ *Rights in Water and Irrigation Act 1914* (WA) (*‘RIWI Act’*) s 10(1).

³¹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 13.

³² Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 43. For example, growing biofuel crops, cattle feed and farm crops: Department of Regional Development and Lands (WA) ‘Pilbara Cities Continues to Investigate Water Opportunities’, above n 28.

³³ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 11.

The Pilbara is also an area of ecological and cultural significance. The Pilbara is a World Wildlife Fund Global 200 Eco-region due to its rich biodiversity.³⁴ The region includes two Ramsar wetlands and two areas which have been identified in a number of Western Australian Government documents as being 'proposed' Ramsar wetlands (or being considered for nomination as such).³⁵ A Ramsar wetland is defined in s 17 of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) as a wetland which is 'designated by the Commonwealth under Article 2 of the *Ramsar Convention*³⁶ for inclusion in the List of Wetlands of International Importance kept under that Article'. It has also been recognised that there are important links in the relationship between water and the environment (the 'hydro-ecology'), which make protection of 'high-value environmental processes' in the Pilbara important.³⁷ This leads to concerns about the volumes abstracted and methods of dewatering potentially having adverse impacts on important regional ecological values, as well as concerns regarding the impact of the use and discharge of the abstracted water.³⁸

Indigenous people in the Pilbara have a strong cultural connection to water and there is a sense of ownership and responsibility towards it.³⁹ A CSIRO study has revealed concerns of Indigenous peoples in the Pilbara about the impact of increasing development on groundwater.⁴⁰ In particular, concerns were raised, with respect to abstraction of water, about '[s]inkhole formation, reduced flow rates and/or drying up of naturally permanent springs', and with respect to mine dewatering discharge, about 'inadequate approvals and estimates' and a 'lack of

³⁴ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 34.

³⁵ The Ramsar wetlands are Eighty Mile Beach coastal wetlands and Mandora Salt Marsh; proposed Ramsar wetlands are Millstream Pools and Fortescue Marsh: Department of Water, *Pilbara Regional Water Plan 2010–2030*, above n 1, 9. Mandora Salt Marsh is included with the Eighty Mile Beach Ramsar listing: Department of Sustainability, Environment, Water Population and Communities (Cth), *Eighty-mile Beach* (24 January 2011) <<http://www.environment.gov.au/cgi-bin/wetlands/ramsardetails.pl?refcode=34>>.

³⁶ *Convention on Wetlands of International Importance Especially as Waterfowl Habitat*, opened for signature 2 February 1971, 996 UNTS 246 (entered into force 21 December 1975) ('*Ramsar Convention*').

³⁷ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 35.

³⁸ *Ibid* 36. The *Pilbara Regional Water Plan 2010–2030* cites the source for this information as 'Rangelands NRM 2004'. This citation is not referenced in the bibliography. The author suggests that they are referring to Rangelands NRM Co-Ordinating Group, *A Strategy for Managing the Natural Resources of Western Australia's Rangelands* (2005) 107, 117, 134.

³⁹ Barber and Jackson, above n 12, 27, 33; Hilary Rumley and Kim Barber, "We Used to Get our Water Free": *Identification and Protection of Aboriginal Cultural Values of the Pilbara Region* (Water and Rivers Commission of Western Australia, April 2004) 32 <<http://www.water.wa.gov.au/PublicationStore/first/80735.pdf>>; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 37.

⁴⁰ Barber and Jackson, above n 12, 34, 41.

suitably clear understanding of the volumes of water'.⁴¹ Broader concerns have also been raised with respect to water quality, responsibility for later generations, access to water sites, changes in vegetation, amount of water being used by mines and inadequacies relating to consultation and decision making.⁴²

There is now a strong focus on water regulation in the Pilbara so that water availability does not become a limiting factor in the growth of mining or the general development of the 'revitalised Pilbara region' and does not impact on areas of ecological significance and cultural importance.⁴³

III OVERVIEW OF RELEVANT WESTERN AUSTRALIAN STATUTORY PROVISIONS

To assist with understanding the context of the Pilbara policy developments, this article will provide a brief overview of the relevant Western Australian statutory provisions relating to water and mining, with a focus on abstraction of groundwater due to mine dewatering.⁴⁴

The *Mining Act 1978* (WA) ('*Mining Act*') authorises the holders of prospecting licences, exploration licences and mining leases to exercise certain rights relating to water.⁴⁵ These include rights to take and divert water from natural springs, lakes, pools or streams (which are situated in, or flowing through, the land) or from any excavation made or used for mining purposes; and to sink a well or bore and to take that water and use it for domestic purposes or for 'any purpose in connection with' prospecting, exploring or mining.⁴⁶ However, these rights are subject to the *RIWI Act*.⁴⁷ An application can also be made pursuant to the *Mining Act* for a miscellaneous licence for a purpose which is 'directly connected with mining operations'.⁴⁸ The use of water under a miscellaneous licence is also subject to the *RIWI Act*.⁴⁹

In Western Australia, the taking of groundwater in a proclaimed area must be authorised under the *RIWI Act* (or other legislation) or a licence must be issued

⁴¹ Ibid 41–5.

⁴² Ibid 41–56.

⁴³ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, iii.

⁴⁴ The author acknowledges that the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) and the *Native Title Act 1993* (Cth) may be relevant to issues relating to water and mining. However, the focus of this article is on state legislation, regulation and policy. Further, this section seeks to provide a brief overview of the relevant Western Australian provisions to assist with understanding the context of the Pilbara policy developments and is not intended to be a complete review of all relevant legislation.

⁴⁵ *Mining Act 1978* (WA) ('*Mining Act*') ss 48(d), 66(d), 85(1)(c).

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Ibid ss 91(1), 91(1)(6). See s 8 (definition of 'mining operations').

⁴⁹ Ibid s 91(1).

under the *RIWI Act*.⁵⁰ Most of Western Australia is a proclaimed groundwater area and this includes the whole of the Pilbara region.⁵¹ This means that, in the Pilbara, a licence pursuant to s 5C of the *RIWI Act* is required in order to take groundwater.⁵² The grant or refusal of a s 5C licence and its terms, conditions and restrictions are at the discretion of the Minister.⁵³ Clause 7(2) of sch 1 of the *RIWI Act* provides that, in exercising that discretion, the Minister is to have regard to ‘all matters that the Minister considers relevant’ and provides a list of mandatory considerations, including whether the proposed taking and use of water is in the public interest, whether it is ecologically sustainable, whether it is environmentally acceptable and whether it may prejudice current and future water needs.⁵⁴ A licence is also required to construct, enlarge, deepen or alter a well, pursuant to s 26D *RIWI Act*. With respect to a s 26D licence, the Minister may issue a licence subject to ‘such terms and conditions as the Minister thinks fit’.⁵⁵

Therefore, although the *Mining Act* provides ‘authorisation’ for these water uses, where water licensing is required under the *RIWI Act* (for example, where there are proclaimed groundwater management areas), then the *RIWI Act* licensing requirements override the *Mining Act* ‘rights’. At the same time, the mining tenement provides the landholder qualifications needed to be eligible to apply for a licence and the land tenure rights to apply the water to the area of land.⁵⁶ This point takes on further significance when we consider the use of dewater after it has been abstracted.

From the discussion above, it can be seen that the act of dewatering itself is regulated by *RIWI Act* licences, although what is done with the dewater is not. This is so even though the *RIWI Act* has the ability to impose licence terms, conditions or restrictions that relate to the ‘taking, use or disposal of water’.⁵⁷ It may be suggested that even though the *RIWI Act* licence can regulate that use, it cannot overcome the limitations on use authorised by the mining tenement. However, the ‘breakdown’ in the relationship between the *RIWI Act* and what is done with the surplus dewater is ameliorated by policy. As part of the application process for licences outlined in the *Pilbara Water in Mining Guideline* (to which

⁵⁰ *RIWI Act* s 5C; Alex Gardner, Richard Bartlett and Janice Gray, *Water Resources Law* (LexisNexis Butterworths, 2009) 205.

⁵¹ Department of Water (WA), *Groundwater Proclamation Areas 2009* (June 2009) <<http://www.water.wa.gov.au/PublicationStore/first/86307.pdf>>.

⁵² *RIWI Act* s 5C. Licences are granted in accordance with sch 1.

⁵³ *Ibid* sch 1 cl 7(1).

⁵⁴ *Ibid* sch 1 cl 7(2)(a)–(d). Gardner, Bartlett and Gray, above n 50, 457.

⁵⁵ *RIWI Act* s 26D(2).

⁵⁶ Katie Winterbourne, ‘Obtaining Access to Water for Mining Purposes in Western Australia’ (1997) 16 *Australian Mining and Petroleum Law Journal* 166, 172; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 27–8.

⁵⁷ *RIWI Act*, Appendix to sch 1 cl(1).

this article shall return), a proponent must define the end use of dewater.⁵⁸ An interesting question is what range of surplus water disposal options could be authorised by a water licence operating strategy.

Two further pieces of legislation may be of particular relevance to the use of dewater. A Part V licence pursuant to the *Environmental Protection Act 1986* (WA) ('*EP Act*') may be required to discharge dewater to the environment or reinject dewater into the aquifer.⁵⁹ If the dewater is to be used to provide a water supply service, the *Water Services Licensing Act 1995* (WA) may apply as it states that a person cannot provide a water service in a controlled area unless they have a licence or are exempted by the Governor.⁶⁰

State Agreements can also be relevant as they may contain clauses relating to water use and groundwater abstraction.⁶¹ State Agreements are comprehensive 'contracts' between the Government of Western Australia and proponents of major resources projects which are negotiated between the two parties and then ratified by an Act of the Western Australian Parliament.⁶² Eighteen State Agreements relating to iron ore have been enacted in Western Australia.⁶³ Most of these relate to the Pilbara.⁶⁴ All State Agreements are subject to the *EP Act* and any relevant Commonwealth legislation, but they override all other Western Australian legislation, unless otherwise specified in the State Agreement.⁶⁵ Most, but not all, State Agreements contain clauses that relate to water.⁶⁶ State Agreements that do refer to water generally either provide that the proponent is 'entitled to a proportion of available water from a water resource' or provide for the proponent to contribute to the cost of infrastructure for water supplies 'in return' for an entitlement to water.⁶⁷

⁵⁸ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 43–4. This is also provided for in the Department of Water (WA), *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 40.

⁵⁹ *Environmental Protection Act 1986* (WA) s 57. See also Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 32.

⁶⁰ *Water Services Licensing Act 1995* (WA) ss 18–19.

⁶¹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 19. See also Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 25–6.

⁶² Department of State Development (WA), *State Agreements* (7 November 2012) <<http://www.dsd.wa.gov.au/6641.aspx>>; Richard Hillman, 'The Future Role for State Agreements in Western Australia' (2006) 25 *Australian Resources and Energy Law Journal* 293, 293.

⁶³ See index of state legislation: State Law Publisher, *Western Australian Legislation: Acts in Force*, <http://www.slp.wa.gov.au/legislation/statutes.nsf/main_actsif_i.html>.

⁶⁴ Some relate to the Mid-West region, for example, the *Iron and Steel (Mid West) Agreement Act 1997* (WA).

⁶⁵ Hillman, above n 62, 296; *Environmental Protection Amendment Act 2003* (WA) s 123.

⁶⁶ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 19, 24.

⁶⁷ *Ibid* 24.

Due to the comprehensive nature of State Agreements, they have the potential to contain a wide variety of tailored provisions in relation to water and the use of dewater. It should be noted that State Agreements can be varied by tabling the amendment in both Houses of the Western Australian Parliament.⁶⁸

Arguably, State Agreements represent an ‘inhibition’ to effective management of cumulative impacts of mine dewatering due to the lack of overarching water planning.⁶⁹ In fact, the *Pilbara Regional Water Plan* identified ‘aligning cumulative impact management with State Agreements’ as one of the challenges to implementing a ‘robust policy on cumulative impacts’.⁷⁰ On the other hand, State Agreements also represent an opportunity with respect to individualised beneficial uses of mine dewatering discharge where there otherwise may be limitations. This notion of the ‘separation’ of water allocation planning and beneficial uses of mine dewater discharge will be considered further below.

State Agreements form a large ‘gap’ in knowledge with respect to water planning in the Pilbara. There has been little recent academic exploration of State Agreements in Western Australia generally and there has been no specific consideration of the impacts of State Agreements relating to iron ore in the Pilbara on water allocation planning. This particular area requires urgent research attention.

IV OVERVIEW OF CURRENT WATER POLICES, GUIDELINES AND PLANS

The *State Water Plan* identified the Pilbara as a priority area for the development of regional water planning.⁷¹ Even though the Plan, produced by the Western Australian State Labor Government in 2007, is rarely referred to by the Department of Water (now operating under a State Liberal-National Coalition Government), the Pilbara is still a priority region with respect to water. This is particularly apparent from the discussion of the Pilbara Cities initiative above.

There are two broad documents that are relevant to water in the Pilbara: the *Pilbara Regional Water Plan* (‘*Pilbara Water Plan*’) and the *Pilbara Water in Mining Guideline* (‘*Pilbara Mining Guideline*’).⁷² Both of these documents have been produced by the Western Australian Department of Water. On 25 June 2012, the Department of Water also released the *Western Australian Water in*

⁶⁸ Hillman, above n 62, 326. See, eg, *Iron Ore (Channar Joint Venture) Agreement Act 1987* (WA) sch cl 36; *Iron Ore (FMG Chichester Pty Ltd) Agreement Act 2006* (WA) sch 1 (Iron Ore (FMG Chichester Pty Ltd) Agreement) cl 27.

⁶⁹ Sommer, above n 6, 73.

⁷⁰ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 14.

⁷¹ Department of Water (WA), *State Water Plan* (2007) 67.

⁷² Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1; Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7. The former was produced in 2010, the latter in 2009.

Mining Guideline: Draft for Public Comment ('*Draft Water in Mining Guideline*').⁷³ This draft guideline proposes a new state-wide guideline which, according to the draft, will apply to all regions of Western Australia. Therefore, it will supersede the Pilbara-specific guideline. The *Draft Water in Mining Guideline* was adapted from the *Pilbara Mining Guideline* and 'has only minor changes to allow it to be applicable state-wide'.⁷⁴ With respect to cumulative impact management, the *Draft Water in Mining Guideline* has a similar approach to the *Pilbara Mining Guideline* and this will be referenced where necessary; however, it is beyond the scope of this article to undertake an in-depth analysis of the significance of any differences between the two documents.

The *Pilbara Water Plan* provides a strategic approach to planning and management of water resources in the Pilbara. The *Pilbara Mining Guideline* was developed 'in parallel' with the *Pilbara Water Plan* to provide information on the Department of Water's regulatory processes with respect to mining projects.⁷⁵ The aim of the *Pilbara Mining Guideline* is to improve how 'water is managed across the Pilbara mining industry'.⁷⁶ The 'key objective' of the *Draft Water in Mining Guideline* is to 'ensure mining companies in Western Australia adopt leading-practice water management principles'.⁷⁷

A Overarching Strategic Planning and Long Term Vision: *Pilbara Water Plan*

The *Pilbara Water Plan* was published in June 2010 and sets out a strategic vision to manage the region's water to 2030, with an action plan over five years.⁷⁸ The purpose of the *Pilbara Water Plan* is to set 'strategic directions' for 'management and development of the Pilbara region's water resources in a sustainable manner to maintain and enhance its natural environment, cultural and spiritual values, quality of life and economic development'.⁷⁹

The *Pilbara Water Plan* notes that in 2006, Western Australia signed the *Intergovernmental Agreement on a National Water Initiative* (NWI) and confirms Western Australia's commitment to a 'reform agenda' consistent with

⁷³ The new draft guideline is accessible at: Department of Water (WA), *State-wide Water Management Guideline Gives Clarity to Miners* (25 June 2012) <<http://www.water.wa.gov.au/News+and+events/Current+news/1967.aspx>>.

⁷⁴ Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, viii.

⁷⁵ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, ii.

⁷⁶ *Ibid* v.

⁷⁷ Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, v. The concept of 'leading-practice water management' is also there further explored.

⁷⁸ Department of Water, *Pilbara Regional Water Plan 2010–2030*, above n 1, iii.

⁷⁹ *Ibid* 4.

the NWI.⁸⁰ In respect of water planning, the focus of the NWI is to define the limits of ecologically sustainable development of water resources and provide secure and tradable water access entitlements.⁸¹ The NWI requires statutory water allocation plans to be prepared for both surface and groundwater.⁸² Broadly, these water plans should provide secure water for environmental and other public benefit outcomes and then determine shares for other consumptive users.⁸³ With respect to mining, the NWI contains a clause (cl 34) which recognises that special circumstances may exist ‘that will need to be addressed by policies and measures beyond the scope of’ the NWI.⁸⁴ However, this clause should not be read as automatically ‘excluding’ the mining industry from the NWI, as it appears that there are benefits to inclusion of mining operations within the NWI framework.⁸⁵ Further, the position of the National Water Commission is that ‘the use of clause 34 of the NWI is only intended to operate in exceptional circumstances’.⁸⁶

Western Australia’s reform agenda in the Pilbara includes ‘water allocation plans for high priority areas and new legislation for water resource management and water service provision’.⁸⁷ Until very recently, there were no water allocation

⁸⁰ Ibid; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 20; National Water Commission (Cth), *Intergovernmental Agreement on a National Water Initiative* (25 June 2004) <http://nwc.gov.au/_data/assets/pdf_file/0008/24749/Intergovernmental-Agreement-on-a-national-water-initiative.pdf>. The NWI is a water reform agreement signed by the Council of Australian Governments (which includes the Prime Minister, the Premiers of the states and the Chief Ministers of the territories). The agreement is not based on legislation, rather it is an agreement that signatories will implement it through their own statutory mechanisms. A copy of the NWI and general information about the NWI is accessible at the National Water Commission website <<http://nwc.gov.au/nwi>>.

⁸¹ Gardner, Bartlett and Gray, above n 50, 348.

⁸² National Water Commission (Cth), *Intergovernmental Agreement on a National Water Initiative*, above n 80, cl 36.

⁸³ Ibid cl 37.

⁸⁴ Ibid cl 34.

⁸⁵ See, eg, National Water Commission (Cth), *Mining Position Statement* (May 2010) <http://archive.nwc.gov.au/_data/assets/pdf_file/0006/9726/Mining_PS3.pdf>; Mark Hamstead and Steve Fermio, ‘Integrating the Mining Sector into Water Planning and Entitlements Regimes’ (Waterlines Report No 77, National Water Commission, March 2012) <http://archive.nwc.gov.au/_data/assets/pdf_file/0005/21857/Integrating-the-mining-sector.pdf>. The latter report also states that: ‘Noting that the NWI is due for review by 2014, the report could also be the basis for development of a replacement text for clause 34 that sets out clearly and specifically the particular adaptations of the general NWI water management framework needed to allow fuller integration with mining’: at xi. For a more historical perspective on the development of clause 34, see National Water Commission (Cth), *Australian Water Reform 2009: Second Biennial Assessment of Progress in Implementation of the National Water Initiative* (September 2009), particularly at 15 (Finding 1.5).

⁸⁶ National Water Commission (Cth), *Mining Position Statement*, above n 85.

⁸⁷ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 5. The Department of Water is responsible for drafting the water plans, which ‘will be implemented

plans in the Pilbara. However, the *Draft Pilbara Groundwater Allocation Plan* was released for public comment on 31 October 2012.⁸⁸ This is a non-statutory plan. There are other water allocation plans already in place in other parts of Western Australia, and they too are not statutory.⁸⁹ The *RIWI Act* does provide for statutory plans;⁹⁰ however, it may be that one of the major reasons why no statutory plans have been prepared is that, pursuant to cl 7(2) of sch 1 of the *RIWI Act*, a statutory plan only has effect as a relevant consideration in the exercise of the Minister's discretion to grant a *RIWI Act* licence.⁹¹

The Western Australian Department of Water does not intend to regulate mine dewatering in the Pilbara in accordance with NWI principles of water allocation planning.⁹² This article does not suggest that simply being non-NWI compliant is unsatisfactory but rather that this particular approach lacks an effective overarching management mechanism to deal with cumulative impacts.

The *Pilbara Water Plan* provides that water allocation plans will be developed in areas where there are multiple users of the same resource.⁹³ This has been confirmed in the *Draft Pilbara Groundwater Allocation Plan*. The *Draft Pilbara Groundwater Allocation Plan* has identified nine target aquifers where allocation limits have been set and then proposes a licensing policy that will apply across the region.⁹⁴ The *Draft Pilbara Groundwater Allocation Plan* notes, in particular, that for 'fractured rock aquifers, where most mining occurs, water availability will be assessed on a case-by-case basis through licensing'.⁹⁵

The 'Supporting Detail' paper for the *Pilbara Water Plan* states that in the central Pilbara, where water resource development is driven by mining, there are 'rarely multiple interests seeking to access water from the same water resource and, as such, water management at mines is dealt with through the department's [Department of Water's] water licensing and required operating strategies'.⁹⁶ Yet,

through government, industry and community partnerships': Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, ix.

⁸⁸ The *Draft Pilbara Groundwater Allocation Plan* was made available for public comment on 31 October 2012: Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7. It is open for comment until 18 January 2013.

⁸⁹ Department of Water (WA), *Water Allocation Planning in Western Australia: A Guide to our Process* (November 2011) 4 <<http://www.water.wa.gov.au/PublicationStore/first/100774.pdf>>. *RIWI Act* div 3D.

⁹⁰ Gardner, Bartlett and Gray, above n 50, 420.

⁹¹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 66; Department of Water (WA), 'Water Resources Management Options' (Discussion Paper, November 2009) 11, 76; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 4.

⁹² Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 5.

⁹³ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, viii.

⁹⁴ *Ibid* ix, 16.

⁹⁵ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 66.

the same paper identifies the risk of ‘cumulative impacts of multiple mining operations on a catchment or sub-catchment, particularly from dewatering or infrastructure development...’, and that ‘[o]ne of the objectives of the plan is to ensure the cumulative impacts [of development activities] are managed to ensure long-term environmental health’.⁹⁷ It may be suggested that a key word in the former statement is ‘rarely’ and that ‘multiple interests’ should be interpreted separately to ‘multiple users’ (for example, multiple interests signifying different types of interests such as mining, residential, ports and industry)⁹⁸. Notwithstanding the Department of Water’s current overarching approach to mine water management in the central Pilbara, there is a clear focus on potential cumulative impacts of multiple mining projects in the *Pilbara Water Plan* and in the next policy document here discussed, the current *Pilbara Mining Guideline*.⁹⁹

B Regulatory Requirements of Mining Projects: *Pilbara Water in Mining Guideline*

The *Pilbara Mining Guideline* provides advice on how to meet the Department of Water’s regulatory requirements for mining projects and is aligned with the approval processes of other Western Australian Government agencies, including the Department of Mines and Petroleum, Department of Environment and Conservation, and the Environmental Protection Authority. Five stages are covered in the *Pilbara Mining Guideline*: from preliminary consultation through to construction and operation. It aims to provide guidance ‘on what is needed to scope the information and approvals requirements, submit the necessary information for licence assessment and to develop an operating strategy which sets out appropriate mine water management for the life of the mine’.¹⁰⁰ The *Draft Western Australian Water in Mining Guideline* adds a sixth stage — decommissioning and closure.¹⁰¹ The *Pilbara Mining Guideline and*

⁹⁷ Ibid 36, 56.

⁹⁸ This suggestion is supported by the *Pilbara Regional Water Plan*, which states that ‘water allocation plans will be developed for all areas where there are likely to be multiple interests (such as mining, towns and ports) seeking to use and/or abstract water from the same resource’: Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 5. Ibid 36, 56, 71; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 11; Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 39, 43–6.

⁹⁹ Ibid 36, 56, 71; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 11; Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 39, 43–6.

¹⁰⁰ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, vi.

¹⁰¹ There have been some minor changes to the stages in the new draft: Department of Water (WA), *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, iii.

Western Australian Water in Mining Guideline also identify the Department of Water's options for the use and release of mine dewatering discharge.¹⁰²

As discussed above, one of the risks identified to the security of water in the Pilbara is the cumulative impacts of 'multiple mining operations on a catchment ... particularly from dewatering or infrastructure development...'.¹⁰³ A priority action identified in the *Pilbara Water Plan* was for the Department of Water to develop policies on managing cumulative impacts in collaboration with other agencies and industry partners.¹⁰⁴ The *Pilbara Mining Guideline* (and now the *Draft Western Australian Water in Mining Guideline*) outlines the Department of Water's policy on cumulative impacts.¹⁰⁵ The objectives of the policy include ensuring that cumulative impacts are managed and maximising 'cooperation in water management activities between mining operations, to reduce the impact on the environment'.¹⁰⁶ The *Pilbara Mining Guideline* and the *Draft Western Australian Water in Mining Guideline* provide that the Department of Water will 'regulate cumulative impacts of additional mining operations through the [section] 5C [of the *RIWI Act*] licensing process and through advice to the [Western Australian] Environmental Protection Authority' and that '[n]ew entrants to an area causing impacts beyond those agreed for current commercial abstraction and release will be responsible for investigating and identifying potential cumulative impacts'.¹⁰⁷ The guidelines also acknowledge that '[o]ngoing management and monitoring of impacts will require negotiation between the responsible operations'.¹⁰⁸ On a practical level, for example, the *Pilbara Mining Guideline* provides that the proponent must, at the 'preliminary consultation' stage, consider the cumulative impacts of the proposed project and other operations (and proposed operations) within the catchment and whether

¹⁰² Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 43–4; Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 40–1.

¹⁰³ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 36.

¹⁰⁴ Ibid xi; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 14.

¹⁰⁵ Department of Water (WA), *Water for the Future – Statutory Water Planning for the Pilbara* (October 2010) 22 <<http://www.water.wa.gov.au/PublicationStore/first/96172.pdf>>; Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 39, 43–6; Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 44.

¹⁰⁶ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 2; Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 2.

¹⁰⁷ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 45; Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 44. The licensing approach has been confirmed by the Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 24.

¹⁰⁸ Ibid.

there are opportunities for cooperation with other proponents.¹⁰⁹ This article will further consider the potential limitations of this approach in the context of the *Draft Pilbara Groundwater Allocation Plan*.

In addition to this cumulative impacts policy, and now in line with the *Draft Pilbara Groundwater Allocation Plan*, a group of government departments are working together to develop a separate guideline in relation to cumulative impacts on a particular geographical area with high ecological values, the Fortescue Marsh, which this article will soon discuss in more detail.¹¹⁰

V KEY DEVELOPMENTS IN PILBARA WATER MANAGEMENT

Currently, there are three key policy developments relevant to the Pilbara:

1. the preparation of the *Draft Pilbara Groundwater Allocation Plan*;¹¹¹
2. an inter-agency working group considering facilitating the use of mine dewatering surplus; and
3. development of a guidance note for environmental and water assessments relating to mining operations in the Fortescue Marsh area by relevant Western Australian government departments (Department of Water, Department of Environment and Conservation, Department of State Development, and Office of the Environmental Protection Authority).

From these developments, we can draw three themes which appear to be guiding water resource management in the Pilbara: preparation of limited water allocation plans; diversification of water supply sources and the associated removal of any potential legislative constraints with respect to the use of dewater; and management of cumulative impacts for specific geographical areas. These themes will be explored in the context of the key developments and, in the process, areas which require further investigation will be identified.

A *Preparation of Limited Water Allocation Plans: Pilbara Groundwater Allocation Plan*

As identified above, the *Pilbara Water Plan* provides that water allocation plans will be developed in areas where there are ‘multiple interests’ in the same

¹⁰⁹ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 10. See also Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 10.

¹¹⁰ Department of Water (WA), *Water for the Future – Statutory Water Planning for the Pilbara*, above n 105, 22; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 34.

¹¹¹ Department of Water (WA), *Pilbara Groundwater Plan Area*, <<http://www.water.wa.gov.au/Managing+water/Allocation+planning/Pilbara+Region/Pilbara+groundwater/default.aspx>>.

resource.¹¹² Between 2007 and 2010 the Department of Water undertook a number of projects in relation to water in the Pilbara.¹¹³ The goal of these projects was to provide technical, hydrogeological, ecological and cultural information to assist in water planning. The first water allocation plan in the Pilbara, the *Draft Pilbara Groundwater Allocation Plan* was released for public comment on 31 October 2012.¹¹⁴

The *Draft Pilbara Groundwater Allocation Plan* area covers over 200 000 km² and sets allocation limits for ‘target groundwater resources’.¹¹⁵ The groundwater resources targeted in the *Draft Pilbara Groundwater Allocation Plan* are depicted in blue on a map of the Plan area on the Department of Water’s website, and centre on ‘critical existing or potential water sources for the coastal ports and towns’.¹¹⁶ They comprise the alluvial aquifers of the lower Fortescue, lower Robe, lower Yule, lower De Grey, lower Cane, lower Turner, the Millstream aquifer, and the Broome and Wallal sandstone sedimentary aquifers of the West Canning Basin.¹¹⁷ The *Draft Pilbara Groundwater Allocation Plan* will be used to ‘guide water licensing decisions and to manage and monitor groundwater resources and their dependent values’ in the remainder of the Plan area (depicted by green shading on the map), with the aim of improving water management across the whole region.¹¹⁸ Therefore, the remainder of the *Draft Pilbara Groundwater Allocation Plan* area (outside the target aquifers) will continue to be managed through the licensing system under the *RIWI Act* with guidance from the Plan, but without defining any allocation limits within the Plan.¹¹⁹ The *Draft Pilbara Groundwater Allocation Plan* specifically notes that allocation limits will not be set for fractured rock aquifers due to the characteristics discussed above, and also because dewatering ‘can be unsustainable in the long-term’.¹²⁰

¹¹² Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 5; Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 21.

¹¹³ Department of Water (WA), *Pilbara Groundwater Plan Area*, above n 111.

¹¹⁴ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7.

¹¹⁵ Department of Water (WA), *Pilbara Groundwater Plan Area*, above n 111.

¹¹⁶ *Ibid.* As the map is in colour and the colours represent aspects relating to the geographical applicability of the *Draft Pilbara Groundwater Allocation Plan*, it has not been reproduced in this article.

¹¹⁷ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, 3.

¹¹⁸ Department of Water (WA), *Pilbara Groundwater Plan Area*, above n 111; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, iii, 24.

¹¹⁹ Unlike the nine aquifers for which detailed planning is made and allocations are set: Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, viii.

¹²⁰ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, 16. Note also that the Plan area does not include the far eastern Pilbara, which will

Given the limited nature of the proposed water planning and the location of mining in the Pilbara,¹²¹ it was never likely that the dewatering occurring in the Pilbara region would be directly regulated by the *Draft Pilbara Groundwater Allocation Plan*. The focus of the *Pilbara Water Plan* and the *Pilbara Mining Guideline* on identifying and managing cumulative impacts of mining operations is commendable, but it is unclear why cumulative impacts from multiple mining operations are being distinguished from the ‘multiple interests’ that are recognised as requiring water allocation planning.

However, the *Draft Pilbara Groundwater Allocation Plan* has not ignored the issue of cumulative impacts. The Department has suggested a ‘staged approach’ that will ‘assess and license projects in ‘subregions’ where management of cumulative impacts is necessary’.¹²² This approach will involve identifying subregions that will require such management and then investigating data sharing options that will ‘facilitate the improved assessment of cumulative impacts’.¹²³ The *Draft Pilbara Groundwater Allocation Plan* makes note of the *Guidance for Environmental and Water Assessments Relating to Mining Operations in the Fortescue Marsh Area* (that the Plan notes is ‘EPA in prep.’), which this article discusses below.¹²⁴ Although licensing in subregions is a step in the right direction, this article argues with respect to the relevant Fortescue Marsh guidance that a more integrated approach, temporally and with respect to mining and other stakeholders, should be considered.

It may be suggested that the proposed licensing approach is simply an alternative ‘method’ of managing potential cumulative impacts of multiple mining interests. It appears that the ‘general logic’ is that water allocation planning is not required where there is only one interest taking water — namely, mining.¹²⁵ The Pilbara is ‘largely remote from highly developed water systems’.¹²⁶ However, there is potential for cumulative impacts on ‘water dependent ecosystems ... in some local areas’; for example, the Fortescue

continue to be managed through the Department of Water’s licensing system under the *RIWI Act* without particular guidance from the *Draft Pilbara Groundwater Allocation Plan*: Department of Water, *Pilbara Groundwater Plan Area*, above n 111. However, the majority of mining takes place in the central Pilbara: Department of Regional Development and Lands (WA), *Pilbara: A Region in Profile 2011*, above n 18.

¹²¹ See Department of Regional Development and Lands (WA), *Pilbara: A Region in Profile 2011*, above n 18.

¹²² Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 34.

¹²³ *Ibid.*

¹²⁴ *Ibid.*

¹²⁵ Hamstead and Fermio, above n 85, 55.

¹²⁶ *Ibid.* x, 22. ‘Highly developed water systems’ are defined as systems where ‘surface and/or groundwater is already highly or over allocated’: at x.

Marsh.¹²⁷ This ‘general logic’ in relation to water allocation planning ‘fails to address increasing competition for water between adjoining mines in remote areas’ and the impacts it may have on ecosystems.¹²⁸ A 2012 report, commissioned by the National Water Commission, that put forward ‘recommendations for fuller incorporation of water used by the mining sector in water planning and management processes’,¹²⁹ recommended that:

Improved water planning is needed in remote areas to address situations where mines cumulatively impact water systems, even if there are no other significant uses of water.¹³⁰

The basis for this recommendation is to ensure greater equity and guide decisions aimed at ‘managing the cumulative impacts of mining, particularly aquifer dewatering and reinjection, on aquifers and groundwater-dependent ecosystems’.¹³¹

Returning specifically to the Pilbara, it must be acknowledged that, on a practical level, water allocation plans focused on entitlements to a consumptive pool may be more difficult to implement in areas of fractured rock aquifers as the amount of water is hard to define.¹³² However, water allocation planning in such areas can be approached so that it is less about managing entitlements within a consumptive pool and more about managing cumulative impacts and ‘providing an independent and robust water management framework within which ... impacts of new or expanded projects can be evaluated’.¹³³ It appears that the substantive difference between water allocation planning (as set out in the NWI) and the licencing process proposed is that water allocation plans specify allocation limits that are set by government regulatory bodies (with stakeholder engagement during the drafting process), whereas the assessment of cumulative impacts under the *Draft Pilbara Groundwater Plan* and the *Pilbara Mining Guideline (and the Draft Western Australian Water in Mining Guideline)* shifts the responsibility for identification of cumulative impacts onto proponents. Such an approach necessitates effective data sharing. No ‘answers’ are provided in the *Draft Pilbara Groundwater Plan* as to what sort of data sharing arrangements

¹²⁷ Ibid 56. See also Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 34.

¹²⁸ Hamstead and Fermio, above n 85, 56.

¹²⁹ Ibid 69.

¹³⁰ Ibid xii–xiii.

¹³¹ Ibid xii–xiii.

¹³² Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 34; Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, 16. To see the extent of fractured rock aquifers in the Pilbara region see Figure 2 of the *Pilbara Groundwater Allocation Plan*.

¹³³ Hamstead and Fermio, above n 85, 56.

may be required. This will provide an interesting legal challenge into the future. The subregion approach may go some way to ameliorating the limitations of the licensing regime, but this depends on the type of management objectives provided and the development of a data sharing process. There are many gaps still to be filled in this regard.

The potential for water allocation planning to extend throughout the Pilbara has begun to be explored, particularly in the recent work of Natascha Sommer, but it needs to be further investigated.¹³⁴ Water allocation planning should adopt a ‘strategic, landscape scale, approach’ to the management of dewatering whereby water allocation planning is used to manage cumulative impacts of abstraction and to ‘identify projected excess water from mines ... that could be beneficially used for consumptive or environmental purposes, and provide guidance for discharge licencing authorities’.¹³⁵ Therefore, such water allocation planning must consider all aspects of mine dewatering including the on-use of dewater, a subject to which we now turn.

B Diversification of Water Supply Sources and the Associated Removal of Any Potential Legislative Constraints on the Use of Mine Dewater: Inter-Agency Working Group Considering Facilitating the Use of Mine Dewatering Surplus

Mine dewatering surplus presents a problem for the mining industry. By the same token, as identified above, it also presents a potential water resource in the Pilbara.¹³⁶ In fact, one of the *Pilbara Water Plan*’s objectives is to identify and explore ‘a more diverse range of management options for water supply’ such as third party supplies from mines.¹³⁷ Further, the *Draft Pilbara Groundwater Allocation Plan* notes that the ‘department supports the use of mine dewatering surplus by a third party for a purpose other than mining’ where it has social or environmental benefits.¹³⁸ Potential uses of dewater include agriculture, irrigation, drinking water or as a supply to other mines.

As discussed above, the *Pilbara Mining Guideline* (and the *Draft Western Australia Water in Mining Guideline*) identifies the Department of Water’s options for use and release of dewatering discharge as: impact mitigation, fit-for-

¹³⁴ Sommer, above n 6, 81–90.

¹³⁵ Ibid 85; Hamstead and Fermio, above n 85, 67–8.

¹³⁶ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 11.

¹³⁷ Ibid 11–13.

¹³⁸ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, 32. The *Draft Pilbara Groundwater Allocation Plan* notes that the Department of Water is working with the Department of Minerals and Petroleum, Department of State Development and Department of Regional Development and Lands to ‘clarify requirements for the use of mine dewatering surplus’: at 33.

purpose activities (for example, dust suppression), transfer to a third party (including other mining operations and public water supply), injection back into the aquifer, and controlled release into the environment.¹³⁹

The Department of Water, with the assistance of an inter-agency working group, is currently considering the issue of facilitating the on-use of mine dewatering surplus.¹⁴⁰ The *Pilbara Water Plan* states that in meeting the increased demand for water in towns and ports into the future, ‘non-traditional sources’ such as dewatering from mines should be considered as a potential water source option.¹⁴¹ However, consideration must be given to the characteristics of the dewater, including location of mine and recipient, unpredictability of supply, quality of the water and the timeframe associated with the life of the mine.¹⁴² The *Pilbara Water Plan* notes that water is expensive to transport, which will impact on feasibility, and that the ‘long-term access is dependent on [the] primary user’.¹⁴³ This last factor is not just a problem when we are considering water supply to towns or ports. One of the issues associated with releasing dewater to the environment is that the released water will create and sustain, for the life of the mine, an artificial water dependent ecosystem. This, in turn, will alter the natural environment.

There are a number of pieces of legislation that potentially create constraints on the use of dewater for non-mining purposes. The major potential legislative impediment is the *Mining Act*, in particular s 82(1)(b), which provides that every mining lease shall contain conditions that the lessee ‘use the land in respect of which the lease is granted only for mining purposes’ and also s 85(1)(c) which provides that water can be taken from a well or bore for domestic purposes or ‘for any purpose in connection with mining for minerals on the land’. This limitation is related to the concepts discussed above that, although the *RIWI Act* provides the basis for a grant of rights to take or use water, it does not provide the access to land which is necessary to make use of the water. Where the *Mining Act* provides the underlying tenure, there are limitations as to what the land can be used for and, therefore, what water can be used for. This article does not intend to

¹³⁹ Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 43–4. See also Department of Water (WA) *Western Australian Water in Mining Guideline: Draft for Public Comment*, above n 7, 40–1. Note that the idea behind ‘fit-for-purpose’ use is that the water is ‘of suitable quality for the end use’ (which must be demonstrated by the proponent); and, therefore, that high quality water is not used for activities that could use low quality water. Further note that injection back into the aquifer and releases to the environment need to be assessed and agreed to by the Department of Water, and may need to be approved by the Department of Environment and Conservation (WA): Department of Water (WA), *Pilbara Water in Mining Guideline*, above n 7, 44; and *Environmental Protection Act 1986* (WA) s 57.

¹⁴⁰ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, 33.

¹⁴¹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 11.

¹⁴² *Ibid.*

¹⁴³ *Ibid.*

explore this legal issue or the extent to which specific activities can be undertaken, but suggests that given this issue is being actively considered, and the Department of Water has a broader commitment to identifying non-traditional sources of water, there seems to be a push to examine how such potential legal barriers can be overcome.

The 2012 report that was commissioned by the National Water Commission (and to which reference was earlier made) observes:

Overall, it seems that current practices are positively geared towards excess mine water being wasted through evaporation, discharged into high diluting flows in receiving surface waters where they have less quantitative benefit, or used to dilute poor quality water to meet discharge requirements.¹⁴⁴

In response to this, the report recommended that approvals for mines in all jurisdictions should provide flexibility to deal with on-supply of surplus water and that 'legislative barriers to the on-supply of excess mine water should be removed in all jurisdictions' so that the potential for beneficial uses is facilitated rather than impeded.¹⁴⁵

There are already a number of projects underway in the Pilbara that demonstrate how mine dewatering surplus can be used. For example, Hamersley Iron Pty Ltd (the licensed water service provider pursuant to the *Water Services Licensing Act* for Dampier, Tom Price and Paraburdoo and the Ashburton Aboriginal Corporation in Tom Price) is trialling the use of mine dewater to grow *Moringa oleifera* that is harvested for biofuel.¹⁴⁶

Arguably, consideration of the on-use of mine dewater is currently being undertaken without reference to broad water allocation planning due to the limited nature of the *Draft Pilbara Groundwater Allocation Plan* licensing approach. Licences are not required from the Department of Water for third party use of mine dewater.¹⁴⁷ There are benefits in integrating the concepts of water allocation planning and management of excess mine dewater, not least in gaining an insight into the total water balance and water 'opportunities' in an area.

¹⁴⁴ Hamstead and Fermio, above n 85, 62.

¹⁴⁵ Ibid 63.

¹⁴⁶ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 45; Shire of Ashburton, *Shire News: Ashburton Aboriginal Corporation Biodiesel Plant Underway* (3 December 2010) <<http://www.ashburton.wa.gov.au/news-article/31/ashburton-aboriginal-corporation-biodiesel-plant-underway/>>; Barber and Jackson, above n 12, 61–2.

¹⁴⁷ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above, n 7, 32. The *Draft Pilbara Groundwater Allocation Plan* notes, however, that parties should do this in consultation with the Department so that the Department can advise 'on water issues and management in the catchment': at 32.

Management of excess mine dewater has generally fallen outside water planning regimes but this is a lost opportunity as there are ‘potential benefits ... offered by excess mine water within a water system’.¹⁴⁸ It seems that the Western Australian authorities are content to proceed with water allocation planning without full clarification of how mine dewatering surplus can be managed and used (in both a legal and policy sense).

C Management of Cumulative Impacts for Specific Geographical Areas with Ecological Significance: Guidance for Environmental and Water Assessments Relating to Mining Operations in the Fortescue Marsh Area

We have seen that one of the priority actions identified in the *Pilbara Water Plan* was for the Department of Water to develop policies and guidelines on managing cumulative impacts in collaboration with other agencies and industry partners.¹⁴⁹ In addition to the cumulative impact policy outlined in the *Pilbara Mining Guideline* (and *Draft Western Australian Water in Mining Guideline*), the Western Australian Government agencies of the Department of Water, the Department of State Development, the Department of Environment and Conservation, and the Office of the Environmental Protection Authority are in the process of finalising a guideline on the management of cumulative impacts relating to mining on the Fortescue Marsh (*Fortescue Marsh Strategic Guidance*).¹⁵⁰ As discussed above, the *Fortescue Marsh Strategic Guidance* was noted as part of the subregion approach in the *Draft Pilbara Groundwater Allocation Plan*.¹⁵¹

The Fortescue Marsh is a wetland located north of Newman in the Central Pilbara. The Marsh has been identified in a number of Western Australian Government documents as a proposed Ramsar wetland.¹⁵² The wetland is also listed by the Western Australian Department of Environment and Conservation as a ‘Priority 1 Ecological Community’.¹⁵³ Fortescue Marsh is surrounded by mining activity, road and rail infrastructure and pastoral activities. There are a

¹⁴⁸ Hamstead and Fermio, above n 85, 67–8.

¹⁴⁹ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030*, above n 1, 14.

¹⁵⁰ Stakeholder consultation was conducted in 2011–2012 and the Guidance is being finalised: Office of the Environmental Protection Authority (WA), *Environmental Protection Authority and Office of the Environmental Protection Authority 2011–2012 Annual Report*, above n 3, 23.

¹⁵¹ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 34.

¹⁵² Department of Environment and Conservation (WA), *Resource Condition Report for Significant Western Australian Wetland: Wetlands of the Fortescue River System*, above n 1, 2.

¹⁵³ Department of Environment and Conservation (WA), *Priority Ecological Communities List* (April 2012) 3, accessible at <<http://www.dec.wa.gov.au/content/view/849/2017/>>.

number of iron ore mines operating in the area that may be affecting groundwater systems which may, in turn, impact on the groundwater-dependant ecosystem of the Fortescue Marsh.¹⁵⁴

The aim of the *Fortescue Marsh Strategic Guidance* is to provide guidance to agencies and proponents to streamline assessment and approvals processes so as to manage the cumulative impacts of mining on the environmental values of Fortescue Marsh. As the title suggests, the document will provide guidance and is not intended to be a prescriptive management plan or ‘binding’ policy. The *Fortescue Marsh Strategic Guidance* aims to identify the environmental values and corresponding management objectives of the Fortescue Marsh with respect to mining and related approvals. The process of identifying the environmental values will not only enable development of a better understanding of cumulative impacts on the Fortescue Marsh, but also allow for the identification of knowledge gaps in scientific information.

The *Fortescue Marsh Strategic Guidance* will identify a particular management area, rather than the whole of the Fortescue River catchment. However, similar to the *Pilbara Groundwater Allocation Plan*, those outside the specified area could still take the guidance into account. The *Fortescue Marsh Strategic Guidance* does not intend to formulate an integrated resources approach to the area, but is focused on mining and related activities.¹⁵⁵ Therefore, it will not consider issues such as pastoral activities, Indigenous interests and tourism. This seems at odds with the *Pilbara Water Plan* (in particular, objective two which aims to ensure that water use is ‘balanced to meet environmental, social, cultural and economic values’) and also with the overall objectives of water allocation planning in the NWI.¹⁵⁶ At this stage, it is unclear whether the *Fortescue Marsh Strategic Guidance* will integrate beneficial uses of mine dewater.

It seems that the *Fortescue Marsh Strategic Guidance* will be a ‘test case’ of sorts. The knowledge gathering process undertaken with respect to this guidance will be highly valuable. Even so, however, the Environmental Protection Authority and Office of the Environmental Protection Authority admit that more work needs to be undertaken in regard to the hydrogeology of the region.¹⁵⁷

Similarly to the *Pilbara Water in Mining Guideline*, the focus of the *Fortescue Marsh Strategic Guidance* on cumulative impacts is commendable; however, a more integrated approach, with respect to mining and other

¹⁵⁴ Hamstead and Fermio, above n 85, 56.

¹⁵⁵ Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 34.

¹⁵⁶ Department of Water (WA), *Pilbara Regional Water Plan 2010–2030: Supporting Detail*, above n 3, 66.

¹⁵⁷ Office of the Environmental Protection Authority (WA), *Environmental Protection Authority and Office of the Environmental Protection Authority 2011–2012 Annual Report*, above n 3, 23.

stakeholders, should be considered. A wider temporal issue is also raised. Currently, the *Draft Pilbara Groundwater Plan* presents an incomplete approach to the management of cumulative impacts in the Pilbara. There are large gaps as to the content of these additional guidelines and how objectives for management will be defined. There are also unanswered questions as to effective data sharing. This temporal issue, coupled with the lack of clarity regarding beneficial use of mine dewater, leaves stakeholders and the community without the full picture as they comment on the draft, and arguably, impacts on the overall effectiveness of water planning in the region.¹⁵⁸

VI THE WAY FORWARD

The three key themes drawn from these recent developments in the Pilbara are interrelated. The policy work being done in the Pilbara with respect to water resource management is commendable, particularly the focus on cumulative impact management and facilitation of the beneficial use of excess mine dewater, as well as the associated knowledge gathering that is being undertaken. However, the current ‘ad hoc’ approach has left noticeable gaps in what would usefully be an integrated process. In particular: providing for water allocation planning where there are ‘multiple interests’ but not where there are multiple *mining* interests; working towards the removal of constraints on the use of excess mine dewater but not considering how this beneficial use ‘fits’ into a broader water allocation planning scheme; and providing guidance on cumulative impacts of mining rather than an approach which integrates all water users (as well as the temporal issue related to what these guidelines will contain).

Through each of these themes, this article explored the relationship between the current approach to management of mine dewatering in the Pilbara and NWI based water allocation planning. The overarching theme of NWI based water allocation planning is an integrated and strategic approach. In this respect, this article also identified some gaps that could be filled and considered suggestions to draw the use of surplus dewater into the water allocation planning framework to ensure that any potential benefits of this water are taken into account in the planning process.

As mining operations in the Pilbara expand, there appears to be an increasing acknowledgement of the potential cumulative impact of mine dewatering. The current framework in the Pilbara does not ensure an integrated or strategic approach. The potential to implement NWI based water allocation planning to manage cumulative impacts of mine dewatering in the Pilbara requires further

¹⁵⁸ Another part of the *Draft Pilbara Groundwater Allocation Plan* that is not finalised is that ‘Monitoring program to support the Pilbara groundwater allocation plan (DOW in prep)’: Department of Water (WA), *Pilbara Groundwater Allocation Plan: For Public Comment*, above n 7, 50.

investigation, particularly in light of the discussion above with respect to cl 34 of the NWI,¹⁵⁹ the National Water Commission's position statement on mining,¹⁶⁰ the recommendations in the National Water Commission's recent report¹⁶¹ and, with respect to the Pilbara, the work of Natascha Sommer.¹⁶² Such an investigation is likely to be supported by stakeholders given that the National Water Commission's report concluded that the 'recommendations were generally ... supported by government agency and mining industry personnel' who were consulted.

¹⁵⁹ National Water Commission, *Intergovernmental Agreement on a National Water Initiative*, above n 80.

¹⁶⁰ National Water Commission, *Mining Position Statement*, above n 85.

¹⁶¹ Hamstead and Fermio, above n 85.

¹⁶² Sommer, above n 6.

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