Environmental Scan 2013

The Strategic Environment for Basin Plan Compliance

PROJECT REPORT

Final Version | 26 July 2013

Prepared by Sinclair Knight Merz

AusGOAL/Creative Commons Standard copyright and disclaimer statement

Published by the Murray-Darling Basin Authority

Postal Address: GPO Box 1801, Canberra ACT 2601

Telephone: (02) 6279 0100 international + 61 2 6279 0100 Facsimile: (02) 6248 8053 international + 61 2 6248 8053 Email: <u>info@mdba.gov.au</u> Internet: http://www.mdba.gov.au

All material and work produced for the Murray-Darling Basin Authority constitutes Commonwealth copyright. MDBA reserves the right to set out the terms and conditions for the use of such material.

With the exception of the Commonwealth Coat of Arms, photographs, the Murray-Darling Basin Authority logo or other logos and emblems, any material protected by a trade mark, any content provided by third parties, and where otherwise noted, all material presented in this publication is provided under a <u>Creative Commons</u> <u>Attribution 3.0 Australia</u> licence.



Attribution-NonCommercial-ShareAlike CC BY-NC-SA

http://creativecommons.org/licenses/by/3.0/au © Commonwealth of Australia (Murray-Darling Basin Authority) -2013

The Murray-Darling Basin Authority's preference is that you attribute this publication (and any Murray-Darling Basin Authority material sourced from it) using the following wording within your work:

Title: Environmental Scan 2013: The Strategic Environment for Basin Plan Compliance

Source: Licensed from the Murray-Darling Basin Authority under a Creative Commons Attribution 3.0 Australia Licence

Author: Sinclair Knight Merz (SKM)

As far as practicable, material for which the copyright is owned by a third party will be clearly labelled. The Murray-Darling Basin Authority has made all reasonable efforts to ensure that this material has been reproduced in this publication with the full consent of the copyright owners.

Inquiries regarding the licence and any use of this publication are welcome by contacting the Murray-Darling Basin Authority.

Disclaimer

The views, opinions and conclusions expressed by the authors in this publication are not necessarily those of the Murray-Darling Basin Authority or the Commonwealth. To the extent permitted by law, the Murray-Darling Basin Authority and the Commonwealth excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this report (in part or in whole) and any information or material contained within it.

Accessibility

Australian Government Departments and Agencies are required by the *Disability Discrimination Act* 1992 (Cth) to ensure that information and services can be accessed by people with disabilities. If you encounter accessibility difficulties or the information you require is in a format that you cannot access, please contact us.

Executive Summary

The Environmental Scan 2013 identified threats, trends and emerging issues over the next decade (2012 – 2022) that are likely to create risks of non-compliance with Basin Plan (Plan) obligations by Parties to the Basin Plan (Parties) (see Figure 1).

The Environmental Scan 2013 describes the strategic operating conditions confronting Parties and is informed by strategic intelligence gathered from informed stakeholders. By identifying and understanding the key emerging issues, trends, and threats to compliance with the Plan, the Murray-Darling Basin Authority (MDBA) is positioned to work effectively with Parties proactively to address these matters (minimise likelihood and consequence of potential future non-compliance).



Figure 1: Strategic operating environment for Plan compliance (emerging issues, trends and threats)

MDBA must be prepared to respond to four strategic threats to compliance

Four strategic threats to compliance with Plan obligations were identified and analysed. Based on this, the overall threat to Plan compliance is rated as moderate for obligations related to Water Resource Plans (WRPs) and Water Trade, and moderate to high for obligations related to Environmental Watering Plans (EWPs) and Water Quality and Salinity Management Plans (WQSMPs). Figure 2 summarises this overall threat in terms of factors related to likelihood and consequence.



Figure 2: Overall threat to compliance with Plan obligations

Four strategic threats may threaten compliance with Plan obligations by Parties (refer to Section 2):

- 1. Decline in current and future organisational capacity and capability of Parties This is a moderate/high compliance threat due to the current trend of declining organisational resources in the water and environmental related agencies. The threat could potentially impact all areas of the Plan.
- 2. Benefits and costs of non-compliance outweigh costs and benefits of compliance This is a moderate/high compliance threat with Environmental Watering and Water Trade being most vulnerable to perceived high compliance costs (eg political pressure applied by vested interests, legal challenges by impacted communities and industries). Environmental Watering Plans (EWPs) involve significant financial costs to hold and deliver entitlements, and the benefits are less amenable to quantification in dollar terms, creating further risks that costs in this area are seen to outweigh benefits.
- 3. Uncertainty regarding the impact of complying with Plan obligations combined with rapidly changing strategic operating conditions This is a moderate/high compliance threat with Environmental Watering obligations being most vulnerable. This is due to the highly prescriptive nature of Environmental Watering obligations and the potential difficulty in determining optimal Environmental Watering actions. Completion and accreditation of Water Resource Plans (WRPs) could also be under threat due to the time and cost required to resolve complex issues regarding interactions between consumptive use, environmental water use and water quality management.
- 4. **Perceived likelihood of detection is low –** The likelihood of non-compliance is greater if Parties perceive that there is a low likelihood of non-compliance being detected in a timely manner by MDBA. This is a **moderate compliance threat**, unlikely to escalate in the short to medium term and primarily relevant to WRPs and Water Quality and Salinity Management Plan (WQSMP) obligations.

Six actions will help prepare MDBA to respond to the threats to compliance

Preparation will greatly enhance the likelihood of implementing the cost effective interventions needed to avoid, mitigate, or minimise threats to compliance. The following actions will prepare MDBA to respond:

- Conduct risk assessments of threats on the basis of the significance of the Plan obligation Detailed risk assessments of the threats identified should involve the prioritisation of Plan obligations so that compliance resources are allocated according to risk. The level of priority given to an obligation (and thus compliance resources committed) should be related to the significance of the obligation to the Plan, its impact on Plan objectives, and its role in monitoring and regulating compliance.
- 2. **Be ready to respond** Interventions can be prepared in advance by using information gathered about the potential causes of threats (trends) and road-testing possible interventions based on plausible scenarios constructed using trends.
- 3. **Know when to respond** Closely monitor changes (trends) in the strategic operating environment (between 2012 and 2022), to identify the optimal "window of opportunity" to implement prepared and tested interventions.
- 4. Collaborate with Parties and key stakeholders to gather strategic intelligence regarding the challenges they face This will assist MDBA strengthen relationships with key stakeholders and Parties, which will deepen their strategic intelligence collection capability.
- 5. Clearly link threats to compliance with MDBA's Plan implementation performance Effective implementation of the Plan and compliance by MDBA with their own obligations is crucial in providing ongoing support and confidence to other stakeholders involved in implementation of the Plan. Furthermore, corrective actions resulting from MDBA's own non-compliance will reduce resources available for use to reduce the threat to Parties' compliance.
- 6. Leverage opportunities to make compliance easier and simpler The trends identified may provide opportunities to streamline and simplify Plan obligations. Future updates of the Environmental Scan will help to identify and leverage these opportunities.

Eight trends were identified that may result in conditions threatening Basin Plan compliance

Parties will confront a range of economic, social, environmental, political, technological, or legal changes over the next decade. Changes are likely to give rise to eight trends over the next decade (2012 - 2022). These eight trends have the potential to create threat(s) to Plan compliance (*refer to Section* 3).

TREND	DESCRIPTION OF TREND	EXAMPLE	PACE & SCALE
Trend 1 – Pushing the boundaries	New tradable water products that fall outside the capacity of Basin Plan water trade rules are developed. Trend may lead to water trade approvals, suspensions, or bans that are inconsistent with the Basin Plan water trade rules.	Expansion of trade into groundwater and unregulated water systems.	Slow pace. Southern connected Basin.
Trend 2 – Too much change too quickly	System conditions are changing at such a rapid pace and scale that Parties are unable to fully understand the impact of the changes. Trend may reduce the ability of Parties to develop and/or implement robust plans.	Agricultural sector rapidly expands or reduces depending on market conditions (e.g. food security issues in Asia, a lower Australian dollar, increase in government support for intensive agriculture).	Slow to moderate pace. Regional scale.
Trend 3 – Where have all the people gone	Resources become increasingly constrained to the extent that meeting Basin Plan compliance obligations may exceed future capacity (people with requisite skills, qualifications and experience). Trend may constrain the capacity of Parties to develop and/or implement robust plans.	Prolonged deficits lead to reduced government spending on water resource planning and Basin Plan implementation.	Fast pace. Basin wide scale.
Trend 4 – From public opinion to legal action	Community, industry and environmental lobby stakeholders become more likely to threaten and/or proceed with legal action in relation to environmental and industry issues. Trend may cause Parties to delay developing or implementing robust plans.	Growing advocacy and activism from environmental groups and communities concerned about environmental conservation and protection.	Slow to moderate pace. Regional scale.
Trend 5 – More forms, more reports, less time	The overall regulatory burden on Parties increases to the point that the cost of complying with Basin Plan obligations exceeds the benefits of compliance. Trend may result in Parties scaling back their commitment to developing and implementing robust plans.	Tighter regulation (e.g. approval trigger for water impacts under the EPBC Act) and growing monitoring and reporting requirements (e.g. water quality issues).	Slow to moderate pace. Basin wide scale.
Trend 6 – The modelling race	New technologies, assessment methods, and research are developed to improve / challenge assumptions and understanding of Basin conditions and Basin Plan compliance. Trend may cause greater political and community uncertainty regarding the efficacy of the Basin Plan, leading to delays in developing and implementing robust plans.	Enhanced water delivery monitoring enables more accurate monitoring of volumes and previously unmonitored extractions (i.e. stock and domestic supplies), challenging assumptions made in the development of the Basin Plan.	Slow pace. State specific.
Trend 7 – Changing perceptions of "value"	Community and political views becoming more focused on economic value of environmental watering. Trend may create the perception that environmental watering is of relatively lower importance, and Parties may be less likely to achieve sustainable diversion limits and / or prepare environmental watering plans.	Private sector finds the cost of complying with regulation relatively high and threatens to move their business to a more competitive location and/or reduce overall investment in a region.	Moderate to fast pace. Basin wide scale.
Trend 8 – Cannot measure, cannot comply	Parties reduce their investment (people, infrastructure, data) in monitoring and measuring related to the Basin Plan, thereby limiting their capacity to demonstrate compliance and the impact of Basin Plan interventions. Inability to demonstrate achievement of desirable outcomes compounds the trend by stakeholders questioning the need to continue with certain Basin Plan actions.	Increased remote monitoring could be used to detect water theft, but is viewed by law as an intrusion on privacy. During times of water scarcity, this may encourage increased water theft due to the perceived lack of enforcement capability.	Moderate pace. Basin wide scale.

Figure 3: Eight trends that could create future threats to Plan compliance

Assessment of emerging issues has informed the eight trends

No single issue will give rise to one of the eight trends; rather the collective impact of the emerging issues will create a trend. The eight forecasted trends were identified by analysing 100 emerging issues spanning six drivers of change (*refer to Section* 4), which are:

- 1. **Changes in land and water use** such as increasing global demand for food and fibre, which may cause changes in agricultural production (volume, location, industry mix) in response to global price movements. Such changes may lead to significant and difficult to forecast shifts in demand for water. For example, in the northern Basin policies are being suggested that would increase the intensity of agriculture (ie shifting from grazing to cropping). In the southern Basin, there is a growing cotton industry (eg in 2011-12 there was a record area of cotton planted in Southern NSW, with extensive areas planted in the Murrumbidgee, Lachlan and Lower Darling regions).
- 2. Changes in economic conditions such as reductions in Federal and State finances that lead to a reduction in the availability of funds and resources for Parties to implement the Plan (eg the Queensland government is budgeting for a fiscal deficit of \$7.7 billion in 2013-14 compared to a forecast of \$4.6 billion in 2012-13 as a result of flooding events and reduced revenue. In South Australia, the government recently announced a record budget deficit of \$1.3 billion for 2013-14, with South Australia Water required to save \$16 million in operating costs over the next three years).
- 3. Changes in community attitudes such as reduction in real wages and job losses are causing people to become more concerned about the state of the economy and job security, with the environment receiving less support as a priority issue. Farm cash income for irrigated horticulture producers in the Basin reduced by 15% between 2001-02 and 2008-09. Negative water quality events (natural, regulated, or environmental) such as black water events, salinity spikes and public health concerns (water borne illnesses) could lead to reduced community support for watering activities
- 4. **Major climatic events** such as an increase in temperature of 0.5-2.0% by 2030 and 0.8-6.5% by 2070 in inland regions of the Basin. Summer rainfall predictions range from decreases of 60% to increases of 40% in different parts of the Basin (by 2070), and evaporation is predicted to increase to 15% in 2030 and as much as 45% in 2070. The impact of these changes on the Basin is not yet fully understood, however they will add to water availability uncertainty in coming years.
- 5. **Changes in science and technology** could improve the measuring and monitoring of water use (eg measuring floodplain harvesting, advanced computing and high speed broadband, or monitoring of stock and domestic water), reduce the demand for water from industry (eg reduced need for water in mine processing), improve water quality (eg eliminating the risks of blue-green algae), and / or expand water grid connections (eg less expensive tunnelling and pipeline technology, reduced energy usage of conventional pumping technology).
- 6. Changes in institutional arrangements and relationships such as State-based laws and regulation for the water market could increase the complexity of water accounting and alter the behaviour of the water market. Examples include recognising water volumes returned to the same water source (ie net water licencing), recognising recycled water, expansion of the NSW embargo on water trade to the environment, and recognising transmission losses in water trade policy. Changes in community and industry trust/faith in government and the nature of Commonwealth and State/Territory relationships (co-operative versus competitive federalism) are key emerging issues to be monitored.

Figure 4 shows that the emerging issues will occur at varying geographical scales. They are likely to progressively unfold over the next five years with some clearly occurring now (eg reduction in Basin States' water planning and management capacity).



Figure 4: MDBA Environmental Scan 2013 Emerging Issues Wheel

Environmental Scan 2013 must be refreshed

Environmental scanning will remain a fundamental component of MDBA's Compliance and Assurance Strategy. Figure 4 (see below) describes the overall strategic operating environment for Plan compliance as of mid-2013. The strategic operating environment will change over the coming decade.

Emerging issues and trends should be periodically monitored to determine the pace and scale at which the trend is eventuating, and hence when a resulting threat may start to emerge. This should be complemented by regular, but less frequent, refreshing of the entire environmental scan to identify if new issues are emerging. Based on the nature of the emerging issues, trends and threats identified in this environmental scan, it is recommended that each trend is monitored every six months, and the entire environmental scan is refreshed every three years (see Figure 5).



There are many emerging issues spanning six strategic drivers of change...

Figure 5: Frequency of Environmental Scan Refresh

Given the complementary nature of the activities, it is recommended that the refresh of the environmental scan be timed to coincide with the audits of the Plan that will be carried out by the National Water Commission in accordance with the *Water Act 2007* (the Act).

Contents

Execu	itive Summary	i
1.	Supporting implementation of the Basin Plan through compliance and assurance	1
1.1	Compliance and assurance is critical to successful implementation of the Basin Plan	1
1.2	Compliance and Assurance Strategy is currently under development	1
1.3	The environmental scan has been systematically compiled	3
1.4	Out of scope	4
1.5	Stakeholder consultation was critical to identifying and assessing emerging issues and trends	5
1.6	Environmental scan can be used outside of Compliance and Assurance	6
2.	Threats to Basin Plan compliance	7
2.1	Lessons from COAG about implementing government reform helped identify types of threats	7
2.2	Four strategic threats to Basin Plan compliance	8
2.3	Threat 1 – decline in current and future organisational capacity and capability of Parties	9
2.4	Threat 2 – benefits and costs of non-compliance outweigh costs and benefits of compliance	12
2.5	Threat 3 – uncertainty regarding the impact of complying with Plan obligations combined with rapidly changing strategic operating conditions	15
2.6	Threat 4 – The perception of the likelihood of detection is low	19
2.7	Actions to prepare MDBA and Parties to respond to compliance threats	21
3.	Threats to compliance could eventuate if Parties are impacted by one or more of eight trends	25
3.1	Trend 1 – Pushing the boundaries	27
3.2	Trend 2 – Too much change too quickly	29
3.3	Trend 3 – where have all the people gone	32
3.4	Trend 4 – from public opinion to legal action	34
3.5	Trend 5 – more forms, more reports, less time	36
3.6	Trend 6 – the modelling race	38
3.7	Trend 7 – changing perceptions of "value"	40
3.8	Trend 8 – cannot measure, cannot comply	42
4.	Strategic operating environment will be influenced by a wide array of emerging issues	44
4.1	Prioritisation of emerging issues	45
4.2	Changes in land and water use	45
4.3	Changes in economic conditions	46
4.4	Changes in attitudes of communities	47
4.5	Major climatic events	48
4.6	Changes in science and technology	49
4.7	Changes in institutional arrangements and relationships	50
5.	Environmental scan must be refreshed to remain relevant and useful	51
5.1	Categories of emerging issues, trends, and threats to remain constant	51
5.2	Framework to refresh environmental scan	51
5.3	Environmental scan continuous improvement strategy	52
5.4	Phase One – Establishment	55
5.5	Phase Two – Implementation	56
5.6	Phase Three – Refresh	59
5.7	Phase Four – Rescan	60

Appendices

Appendix A. SKM's Environmental Scan Approach	62
Appendix B. Environmental scan methodology	63
Appendix C. Stakeholder consultation	70
Appendix D. Review of National Partnerships Agreement (Council of Australian Governments) performance reports	73
Appendix E. Environmental scan threat assessments	77
Appendix F. Example of linking trends to a threat	101
Appendix G. Constructing Compliance Scenarios	106
Appendix H. Environmental scan trend analysis	109
Appendix I. Environmental scan emerging issues	138
Appendix J. Environmental scan user requirements	168
Appendix K. References	171
Appendix L. List of abbreviations	174

Figures

Figure 1: Strategic operating environment for Plan compliance (emerging issues, trends and threats)	iii
Figure 2: Overall threat to compliance with Plan obligations	iv
Figure 3: Eight trends that could create future threats to Plan compliance	vi
Figure 4: MDBA Environmental Scan 2013 Emerging Issues Wheel	viii
Figure 5: Frequency of Environmental Scan Refresh	ix
Figure 6: Compliance planning process (Environmental Compliance Advisory Services for MDBA 2011)	2
Figure 7: Environmental scan completed over six tasks	3
Figure 8: Key environmental scan concepts (emerging issue, trend, threat and risk)	4
Figure 9: Overall threat to compliance with Plan obligations	8
Figure 10: Threat Rating - Compliance is threatened by decline in current and future organisational capacity and capability of Parties.	11
Figure 11: Threat rating - compliance is threatened if the costs and benefits of non-compliance outweigh costs and benefits of	
compliance	15
Figure 12: Threat rating – uncertainty regarding impact of compliance and rapidly changing operating conditions	18
Figure 13: Threat rating – compliance is threatened if perception of likelihood of detection is low	21
Figure 14: Cost of compliance is greatest if MDBA and Parties are ineffective in meeting their obligations	23
Figure 15: Eight identified trends likely to shape the strategic operating conditions for Plan compliance	25
Figure 16: Strategic drivers of change (emerging issues) pushing each of the eight trends	26
Figure 17: Strategic drivers of change and their key emerging issues and geographical origin	44
Figure 18: Framework for refreshing an environmental scan	52
Figure 19: Environmental scan four year work program milestones and timelines	53
Figure 20: How environmental scan threat identification and assessment can be used to inform risk identification and assessment	58
Figure 21: SKM's Environmental Scan Approach	62
Figure 22: The threat identification and assessment method	65

Tables

Table 1: Threat identification, example, and cause	9
Table 2: Risks to compliance - decline in current and future organisation capacity and capability of Parties	10
Table 3: Threat identification, example, and cause	12
Table 4: Risks to compliance - benefits and costs of non-compliance outweigh costs and benefits of compliance	12
Table 5: Threat identification, example, and cause	15
Table 6: Risks to compliance – uncertainty of impact of compliance and dynamic operating conditions	16
Table 7: Threat identification, example and cause	
Table 8: Risks to compliance - Perception of likelihood of detection is low	19
Table 9: Compliance opportunities created by emerging issues	24
Table 10: Brief profile of Trend 1 – pushing the boundaries	28
Table 11: Brief profile of Trend 2 – too much change too quickly	
Table 12: Brief profile of Trend 2 – where have all the people gone	
Table 12: Brief profile of Trend 4 – from public opinion to legal action	
Table 10: Brief profile of Trend 5 – more forms, more reports, less time	
Table 14: Dhei profile of Trend 6 the modelling race	
Table 16: Drief profile of Trend 7 _ changing percentions of "value"	
Table 10. Drief profile of Trend 9 connet measure connet comply	41
Table 17. Brief profile of Trend 6 – cannot measure, cannot compty	43
Table 10. Environmental scan outcomes	
Table 19: Phase One (Establishment) – environmental scan roles and resourcing	
Table 20: Phase Two (Implementation) – environmental scan roles and resourcing	54
Table 21: Phase Three (Refresh) – environmental scan roles and resourcing	54
Table 22: Phase Four (Rescan and Upgrade) – Environmental scan roles and resourcing	
Table 23: Existing MDBA content management systems	56
Table 24: All staff user requirements	56
Table 25: Potential upgrade areas for MDBA's environmental scan	60
Table 26: Emerging issue information	63
Table 27: Trend content required	64
Table 28: Rating used to determine level of threat to compliance	67
Table 29: Threat assessment – this assessment is completed for each trend across the four areas of the Plan (WRP, WQSMP, EV	VP,
and water trading rules)	68
Table 30: Threat 1 rating – Decline in current and future organisational capacity and capability	77
Table 31: Threat 2 rating – Benefits and costs of non-compliance outweigh costs and benefits of compliance	78
Table 32: Threat 3 rating – Uncertainty regarding impact of compliance combined with rapidly changing operating conditions	79
Table 33: Threat 4 rating – Perception of likelihood of detection is low	80
Table 34: Threat assessment – Water Resource Plans	82
Table 35: Threat assessment – Environmental Watering Plans	86
Table 36: Threat assessment – Water Trading Rules	92
Table 37: Threat assessment – Water Quality and Salinity Management Plans	96
Table 38: Threat 1 - Water resource planning	102
Table 39: Threat 1 – Environmental Watering	103
Table 40: Threat 1 - Water Trade	104
Table 41: Threat 1 - Water quality and salinity management	105
Table 42: List of relevant data sources for Trend 1	110
Table 43: List of relevant data sources for Trend 2	114
Table 44: List of relevant data sources for Trend 3	118
Table 45: List of relevant data sources for Trend 4	123
Table 46: List of relevant data sources for Trend 5	127
Table 47: List of relevant data sources for Trend 6	130
Table 48: List of relevant data sources for Trend 7	133
Table 49: List of relevant data sources for Trend 8	
	136
Table 50: Emerging issues – Changes in land and water use	136 138
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions	136 138 147
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions Table 52: Emerging issues – Changes in attitudes in communities	136 138 147 151
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions Table 52: Emerging issues – Changes in attitudes in communities Table 53: Emerging issues – Major climatic events	136 138 147 151 155
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions Table 52: Emerging issues – Changes in attitudes in communities Table 53: Emerging issues – Major climatic events Table 54: Emerging issues – Changes in science and technology	136 138 147 151 155 158
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions Table 52: Emerging issues – Changes in attitudes in communities Table 53: Emerging issues – Major climatic events Table 54: Emerging issues – Changes in science and technology Table 55: Emerging issues – Changes in institutional arrangements and relationships	136 138 147 151 155 158 158
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions Table 52: Emerging issues – Changes in attitudes in communities Table 53: Emerging issues – Major climatic events Table 54: Emerging issues – Changes in science and technology Table 55: Emerging issues – Changes in institutional arrangements and relationships Table 56: All staff user requirements	136 138 147 151 155 158 163 163
Table 50: Emerging issues – Changes in land and water use Table 51: Emerging issues – Changes in economic conditions Table 52: Emerging issues – Changes in attitudes in communities Table 53: Emerging issues – Major climatic events Table 54: Emerging issues – Changes in science and technology Table 55: Emerging issues – Changes in institutional arrangements and relationships Table 56: All staff user requirements Table 57: Additional functionality required for Environmental Scan Contributors	136 138 147 151 155 158 163 168 168
Table 50: Emerging issues – Changes in land and water use	136 138 147 151 155 158 163 168 168 168

1. Supporting implementation of the Basin Plan through compliance and assurance

1.1 Compliance and assurance is critical to successful implementation of the Basin Plan

The Basin Plan (Plan) was passed into law on 22 November 2012. The desired outcomes and objectives of the Plan¹ include:

- Optimising social, economic, and environmental outcomes to create a healthy working Basin
- Achieving environmental outcomes, water quality and salinity outcomes
- Ensuring environmentally sustainable limits on the take of water
- Creation of efficient and effective water markets

Further to these, providing greater certainty to water users is a common theme throughout the objectives.

In order to achieve these objectives and outcomes, the Plan places obligations on Parties to the Basin Plan (Parties). These Parties include:

- Murray-Daring Basin Authority (MDBA)
- Basin States / Territories
- Irrigation infrastructure operators.
- Water traders (buyers and sellers)
- Water trade approval authorities
- Commonwealth Environmental Water Holder

Encouraging and enabling Parties to comply with their obligations is critical to successful implementation of the Plan.

1.2 Compliance and Assurance Strategy is currently under development

MDBA has developed a Compliance and Assurance Strategy (currently in draft format) to support the implementation of the Plan and fulfil the requirements of the *Water Act 2007* (the Act). This strategy outlines MDBA's approach to compliance and assurance, with the goal of *credible cost-effective regulation that builds* stakeholder confidence in implementation of the Plan, and the compliance outcome sought that compliance with the requirements of the Plan is cost-effectively maximised by encouraging voluntary compliance and discouraging non-compliance.²

1.2.1 Environmental scan has two objectives

MDBA has chosen to undertake an environmental scan to specifically address two of the draft Compliance and Assurance Strategy priorities:

- Understanding MDBA's operating environment through an effective strategic intelligence capability
- Assessing and prioritising non-compliance risk.

Sinclair Knight Merz (SKM) was engaged by MDBA to conduct an environmental scan of the strategic operating environment that may confront Parties during the decade between 2012 and 2022. The environmental scan systematically identified and assessed emerging issues and trends, which if left unmonitored and unchecked over the next 10 years, could present a non-compliance threat – ie Parties being unable to, or choosing not to, comply with their obligations under the Act and the Plan.

¹ As outlined in Chapter 5 of the Basin Plan

² MDBA (2013) Compliance and Assurance Strategy (draft)

The environmental scan will contribute to the development and update of MDBA's strategic compliance plan. The plan will provide the framework to formulate and implement specific compliance responses particular instances of actual or potential non-compliance.

Compliance planning was addressed in a report to MDBA in 2011.³ A flowchart from the report illustrating the compliance planning process is reproduced below.



Figure 6: Compliance planning process (Environmental Compliance Advisory Services for MDBA 2011)

³ Environmental Compliance Advisory Services (2011)

1.3 The environmental scan has been systematically compiled

1.3.1 Environmental scan was completed over six phases

SKM's approach to the environmental scan is provided in Appendix A. Figure 7 highlights the six tasks conducted to complete the environmental scan.



Figure 7: Environmental scan completed over six tasks

1.3.2 Environmental scan focused on WRP, EWP, Water Trade, and WQSMP obligations

The Parties are regulated by the Act and specific Plan Chapters. The environmental scan assessed the threat to compliance with the following obligations:

- Water Act 2007:
 - Section 53 preparation of a Water Resource Plan (WRP)
 - Section 71 requires reporting at the end of the water accounting periods
- Basin Plan:
 - Chapter 8 obligations for the preparation and implementation of Environmental Watering Plans (EWPs)
 - Chapter 9 obligations relating to Water Quality and Salinity Management Plans (WQSMPs)
 - Chapter 10 obligations relating to WRPs
 - Chapter 12 obligations relating to water trade
 - Chapter 13 Plan reporting obligations

1.3.3 What is an environmental scan?

Environmental scanning is a strategic intelligence gathering exercise that focuses on future, big-picture issues. Key environmental scan concepts are illustrated in Figure 8 below. The curved line represents the evolution of the emerging issue into a trend and eventually a threat.

The methodology for conducting an environmental scan is provided in Appendix B. The key concepts used in the environmental scan include:

- Emerging issue: an emerging issue is a disruptive event. Emerging issues can take place across all spatial scales (global, national and local) and are caused by political, economic, social, technological, legal / regulatory and / or environmental change. The impact of the emerging issue on Parties is unclear and must be monitored to ascertain if, how and when it may impact the operating environment. Emerging issues can be grouped under strategic drivers of change (emerging issues relating to a common theme eg changes in land and water use, changes in institutional arrangements and relationships). Intelligence must be gathered to understand the pace and scale of the emergence of the issue.
- **Trend**: a trend is the change in conditions and/or behaviour of a Party as a result of how they choose to respond (or not) to an emerging issue. An emerging issue is differentiated from a trend on the basis of our

understanding of it. A trend is a mainstream occurrence with a large body of literature (grey and peer reviewed) available to help describe and analyse it. Trends must be **closely monitored** to ascertain when they may create a threat (tipping point / threshold). Interventions designed to mitigate, minimise, or avoid future threats can be **tested in order to be prepared** for the trend becoming a threat.

• **Threat:** the threat is how the continuation of the behaviour of the Party may adversely affect their capacity (physical, technical, organisational or individual motivation) to comply with the Plan obligation.



Figure 8: Key environmental scan concepts (emerging issue, trend, threat and risk)

1.4 Out of scope

1.4.1 Identifying and assessing compliance risks

Figure 8 illustrates the interaction between the environmental scan and the Compliance and Assurance Risk Management Framework. An environmental scan informs the Compliance and Assurance Risk Management Framework by identifying threats to compliance which need to be assessed at a more granular level (eg specific obligation, specific instance of potential non-compliance).

It is the role of the Compliance and Assurance Risk Management Framework to identify and assess compliance risks. **Compliance risks** are specific instances of non-compliance with specific breaches, and can be predicted (likelihood, frequency and consequence) with some degree of certainty.

The relationship between the environmental scan threat assessment and the Compliance and Assurance Risk Framework is described in section 5.5.1

1.4.2 Identifying and assessing interventions

The purpose of an environmental scan is not to identify potential interventions, rather it is intended to provide the context (emerging issues, trends and threats) that shape the requisite interventions (eg what factors will the intervention need to address to be effective, efficient, and workable).

Threats to compliance increase if the compliance obligations are ambiguous. Ambiguous compliance obligations can impact the confidence of Parties leading to delays in investing in the requisite capability to comply with their obligations.

It is the role of the Compliance and Assurance Risk Management Framework to determine the possible cost effective interventions based upon a closer analysis of the specific risk.

1.4.3 Legal opinion has not been provided regarding the wording of the statutory provisions

While no legal opinion is provided as part of the environmental scan, the style of drafting and terms used for the obligations within the Plan have been identified as an influence upon the level of threat to compliance.

The expression of statutory provisions that are unclear or open to various interpretations can provide grounds for debate over whether certain actions (or the absence of actions) constitute compliance (or non-compliance) and may ultimately lead to doubt, dispute or legal challenge.

In the case of the Plan the terms "*should*" and "*should not*", "*have regard to*" and "*is to be*" are used in a manner that, subject to their context, may or may not impose an obligation on relevant parties to act in a particular way (a mandatory requirement). This contributes to the potential for Parties to establish different interpretations of the obligations imposed by the Plan. As a consequence, there may be a lack of clarity or consistency between Parties with regard to what actions may be required to demonstrate compliance with an obligation.

Other instances raised by stakeholders included clear definitions of environmental works and measures, clear definition of what constitutes an irrigation infrastructure operator, and what the Commonwealth Environmental Water Holder can and cannot use their water assets for.

1.4.4 Compliance as distinct from Plan outcomes

The environmental scan has focused on *compliance* with the Plan rather than on *outcomes* of the Plan, and seeks to complement existing short, medium, and long-term planning activities for the physical hydrologic and water quality risks within the Plan.

The impact of non-compliance to achievement of Plan outcomes was a major consideration in prioritising the identified threats to compliance.

1.5 Stakeholder consultation was critical to identifying and assessing emerging issues and trends

Stakeholders hold significant strategic intelligence on emerging issues and trends. Their involvement has contributed to fostering a sense of buy-in to the environmental scan process. Stakeholder groups consulted include:

- AgForce Queensland
- Australian Competition and Consumer Commission
- Australian Conservation Foundation
- Australia Floodplain Association
- Australian Local Government Association
- Australian Forest Products Association
- Commonwealth Environmental Water Office (Commonwealth Environment Water Holder)
- Department of Agriculture, Fisheries and Forestry (Commonwealth)
- Department of Environment, Water and Natural Resources (South Australia)
- Department of Environment and Primary Industries (Victoria)
- Department of Natural Resources and Mines (Queensland)
- Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)
- Environment Victoria
- Minerals Council of Australia
- Murray-Darling Basin Authority
- National Farmer's Federation

- National Water Commission
- NSW Farmers Association
- NSW Irrigators Council
- Queensland Conservation Council
- The Wilderness Society South Australia

A full list of stakeholders who participated in the environmental scan is included in Appendix C.

1.6 Environmental scan can be used outside of Compliance and Assurance

The emerging issues and trends identified in the environmental scan can be used to inform other Plan implementation functions regarding possible changes to the strategic operating environment confronting the Basin and Parties.

2. Threats to Basin Plan compliance

The environmental scan revealed a range of threats to compliance with Plan obligations. This section describes the nature of the threats and the actions MDBA can take to prepare themselves and Parties to respond to the threats.

The threats to compliance have been derived using the method described in Appendix B. The results of the threat identification and assessment for each area of the Plan (water resource planning, environmental watering, water trade, and water quality and salinity management) are provided in Appendix E.

2.1 Lessons from COAG about implementing government reform helped identify types of threats

SKM conducted a literature review of performance reports prepared for National Partnership Agreements under the Council of Australian Governments (COAG). The purpose of this review was to identify common challenges and obstacles in implementing cross-jurisdictional reform that may also be relevant to implementation of the Plan. The findings have been used to help identify the possible types of threats to compliance that may confront the Plan (more detail on the review is provided in Appendix D).

There were a number of recurring themes that appear to contribute to difficulties in fully implementing crossjurisdictional agreements, including:

- Not enough certainty or specificity in defining problems and goals and setting strategic direction, which creates a situation where the perceived benefits (or lack thereof) do not justify the cost of implementation There are two issues which seem to cause this problem:
 - A lack of significant investment in developing a shared vision of the way forward and building sufficient evidence to demonstrate the potential benefits (and avoided costs) in undertaking the reform.
 - Setting goals that are too general or ambiguous and not clearly defining the scope of the proposed changes and activities.
- Unclear roles and responsibilities Jurisdictional accountabilities are either inaccurately, or simply not, specified, resulting in activities not being implemented. Furthermore, incentives need to be adequate and communicated to encourage jurisdictions to take on their responsibilities.
- No central coordination body with a strong role in detecting and mitigating risks to implementation A lack of a strong central coordination body or mechanism appears to lead to greater complexity in implementing activities, particularly in the later stages of reforms. Another associated outcome of this problem is that stakeholders (particularly private sector) tend to not be appropriately engaged.
- Unrealistic or ambiguous implementation timelines in complex operating environments Firstly, defining milestones that are specific, realistic, transparent, and uniform between jurisdictions seems to be a critical and often underestimated success factor in multi-jurisdictional reform. Secondly, delays in timelines should be expected and planned for when implementing activities for cross-jurisdictional reform, as the number of stakeholders and complexity involved makes delays inevitable.
- Lack of investment and effort in establishing performance systems and processes in the initial stages of the agreement / reform Enabling consistent comparison of performance across jurisdictions is a major challenge, with reforms tending to result in the collection of data that cannot be compared multilaterally and consequently has limited usability. Alternatively, in some cases attempts were made to amend these inconsistencies midway through the reform, but this loss of continuity meant that data could not be used to measure objectives or outcomes (ie comparing performance before and after the reform).

2.2 Four strategic threats to Basin Plan compliance

Four strategic threats to compliance with Plan obligations were identified. Based on the analysis of these threats, the overall threat to Plan compliance is rated as moderate for obligations related to WRPs and Water Trade, and moderate to high for obligations related to EWPs and WQSMPs. This implies that overall the trends threatening Plan compliance are affecting moderately to highly prescriptive obligations, and are occurring at a regional to Basin wide scale at a moderate to fast pace. The potential impacts of these threats could be that Plan outcomes are not achieved (or that their achievement requires significant additional MDBA resources), the Act is breached, and / or MDBA's legitimacy, integrity, objectivity, and independence are questions by many Parties. Figure 9 summarises this overall threat.



Figure 9: Overall threat to compliance with Plan obligations

The four strategic threats to compliance with Plan obligations that MDBA is likely to face are:

- 1. Decline in current and future organisational capacity and capability of Parties. This is a moderate/high compliance threat due to the current trend of declining organisational resources in the water and environmental related agencies. Within a short period of time this threat could potentially impact all areas of the Plan (refer to section 2.3)
- 2. Benefits and costs of non-compliance outweigh costs and benefits of compliance. This is a moderate/high compliance threat with Environmental Watering and Water Trade being most vulnerable to perceived high compliance costs (eg political pressure applied by vested interests, legal challenges by impacted communities and industries). EWPs involve significant financial costs to hold and deliver entitlements, and the benefits are less amenable to quantification in dollar terms, creating further risks that costs in this area are seen to outweigh benefits. This threat is most likely to emerge in the medium term (refer to 0)
- 3. Uncertainty regarding the impact of complying with Plan obligations combined with rapidly changing strategic operating conditions This is a moderate compliance threat with Environmental Watering obligations being most vulnerable. This is due to the highly prescriptive nature of Environmental Watering obligations and the potential difficulty in determining optimal Environmental Watering actions. The frequent action needed to develop annual watering priorities and conduct five-yearly reviews of long-term watering plans and strategies at State and Basin levels also increases the threat of non-compliance. Completion and accreditation of WRPs could also be under threat due to the time and cost required to

resolve complex issues regarding interactions between consumptive use, environmental water use, and water quality management. This threat is most likely to emerge in the medium term (refer to section 2.5)

4. **Perceived likelihood of detection is low.** The likelihood of non-compliance is greater if Parties perceive that there is a low likelihood of non-compliance being detected in a timely manner by MDBA. This is a **moderate compliance threat**, unlikely to escalate in the short to medium term and primarily relevant to WRPs and WQSMPs (refer to section 0).

2.2.1 An obligation's level of prescription influences the likelihood of risks to compliance

The extent to which a Plan obligation can accommodate change in operating conditions (its flexibility) is dependent upon its level of prescription. Changes in the pace and geographical scale of the trends creating the threats may move the threat beyond a "threshold/tipping point" and into the realm of specific and material risks to compliance. The "threshold/tipping point" for Plan obligation non-compliance is heavily influenced by its level of prescription. The test applied to determine the level of Plan obligation prescription is, do obligations (WRPs, EWPs, WQSMPs, and water trading rules) have a:

- 1. Low level of prescription? Obligation only sets out an action to be performed or output to be created and no timeline or standard is prescribed and therefore is able to accommodate greater change in operating conditions (most flexible).
- 2. **Medium level of prescription?** Obligation sets an action to be performed or output to be created as well as either a prescribed timeline or standard and therefore is able to accommodate moderate change in operating conditions.
- 3. **High level of prescription?** Obligation sets an action to be performed or output to be created within a required timeline and in accordance with a prescribed standard and therefore accommodate only a small amount of change in operating conditions (least flexible).

This test has been applied for each threat to inform "*likelihood of threat creating risks to compliance (threshold/tipping points)*" (refer to Appendix B for a detailed overview of the threat identification and assessment methodology).

2.3 Threat 1 – decline in current and future organisational capacity and capability of Parties

2.3.1 Threat identification and causes

The table below identifies the threat to compliance, provides an example of the threat, and lists the trend which may cause the threat.

Threat Identification	Threat Example	Trends which may cause threat
 Parties do not have the future capacity to comply with Plan obligations. Threat is primarily relevant to: Basin States/Territories Irrigation infrastructure operators Water trade approvers Commonwealth Environmental Water Holder 	Rural Water Corporation responsible for approving trades reduces the number of staff available to properly develop trade rules and undertake all appropriate activities to apply them eg training and educating water licence holders, processing, assessing and determining trade requests and providing the necessary reporting information.	Trend 3 – Where have all the people gone (Refer to Section 0)

Table 1: Threat identification, example, and cause

2.3.2 Risks to compliance

A lack of staff with the requisite skills, experience and qualifications creates risks to compliance across all four Plan areas.

Water resource planning	Environmental Watering	Water trade	Water quality & salinity management
 Delay in the development and / or implementation of a WRP. 	2. Delay in the development and / or implementation of an EWP. Parties lack the capacity and / or capability to adequately address all of the objectives and targets when preparing an EWP, or to undertake the research, analysis, and consultation required in support of a robust EWP.	3. Lack of resources may result in poor quality decision making. This could result in the incorrect or incomplete application of trading rules or delays in assessing trade applications and in forwarding information to MDBA.	4. Insufficient consideration of WQSMP targets when developing a WRP.

Table 2: Risks to compliance - decline in current and future organisation capacity and capability of Parties

2.3.3 Likelihood of threat creating risks to compliance (threshold/tipping points)

The likelihood of the threat creating risks to compliance is influenced by the level of prescription⁴ of the Plan obligations:

- WRP obligations have a medium level of prescription⁵. A moderate reduction in WRP resources may
 increase the likelihood of non-compliance. A moderate reduction could result from failure to recruit or
 replace key modelling staff needed to support the development of WRPs and their component rules. It could
 also involve failure to recruit or replace staff needed to undertake the modelling studies necessary to
 determine the annual maximum quantity of water allowed to be taken for consumptive use within the
 preceding water accounting period.
- 2. **EWP obligations** have a **low to medium level of prescription**⁶. A moderate to large reduction in environmental water resources may be needed to increase the likelihood of non-compliance. A moderate to large reduction could occur if staff are not available to prepare annual Environmental Watering priorities for each water resource WRP area to fully comply with the provisions of Chapter 8 of the Plan. It could also occur if there is insufficient staff to monitor and review the delivery of environmental water compared to the annual watering priorities and then report to MDBA on any watering actions that were not in accordance with the annual Environmental Watering priorities.
- 3. Water Trade obligations have a medium level of prescription⁷. A moderate reduction in water trade related resources may increase the likelihood of non-compliance. A small reduction could take the form of contraction of key resources for support and maintenance of State based water entitlement and trade registers. This could limit States' ability to effectively comply with the information and reporting requirements for water access entitlements and water trade prices set out in the Plan.
- 4. WQSMP obligations have a high level of prescription⁸ (eg required to identify measures and target values). A small reduction in WQSMP related resources may increase the likelihood of non-compliance. A small reduction could take the form of fewer key staff engaged in river system operational planning in either MDBA or Basin States, resulting in insufficient regard for the water quality targets (established in WQSMPs) when undertaking management of water flows.

For a more detailed example of what change is needed in a trend to push a threat beyond its tipping point/threshold refer to Appendix F.

2.3.4 Potential impact of non-compliance

The impacts of non-compliance could include:

⁴ Refer to page 71 for a definition of prescription of obligations

⁵ Refer to Appendix E for an assessment of the level of prescription of Water Resource Plan obligations

⁶ Refer to Appendix E for an assessment of the level of prescription of EWP obligations

⁷ Refer to Appendix E for an assessment of the level of prescription of Water Trade obligations

⁸ Refer to Appendix E for an assessment of the level of prescription of WQSMP obligations

1. Plan Outcome:

- a. Seriously impede the achievement of Plan outcomes as non-compliance with environmental water obligations will reduce the Plan's effectiveness.
- b. MDBA and Parties may be slow to respond to the water trade market or place unnecessary barriers to trade. This may threaten achievement of the objectives of the water trading rules.

2. Financial:

a. Significant financial costs for MDBA resulting from MDBA providing additional support resources or assuming responsibility for the development of plans in response to delays.

3. Reputational:

- a. Use of additional MDBA resources may lead to deterioration of relationships between the Parties and significant reputational damage with both the affected State and other States who may disapprove of the intervention.
- b. Lack of trade information from Basin States would constrain MDBA's capacity to assure the market and government that trade systems are operating effectively, efficiently and competitively.
- c. Delays in producing the required plans may limit MDBA's time to assess WRPs, preventing them from recommending the accreditation of the WRP within the required timeframe.

2.3.5 Threat rating

The overall level of threat to compliance posed by a decline in current and future organisational capacity and capability of Parties is **moderate to high.** The diagram below indicates that water trade and WQSMP obligations could be threatened to a greater extent than WRP and EWP obligations (refer to Appendix E for threat rating assessment).



CONSEQUENCE

Figure 10: Threat Rating - Compliance is threatened by decline in current and future organisational capacity and capability of Parties

2.4 Threat 2 – benefits and costs of non-compliance outweigh costs and benefits of compliance

2.4.1 Threat identification and causes

The table below identifies the threat to compliance, provides an example of the threat, and lists the trends which may cause the threat.

Threat	Example	Trends which may cause threat
 The costs of compliance significantly exceed the benefits of compliance, and therefore Parties may be motivated to not comply (in part or in full). This threat is primarily relevant to: Basin States/Territories Irrigation infrastructure operators Water traders Commonwealth Environmental Water Holder 	If the costs of undertaking the required monitoring, reporting, and review of various elements of the Plan are high and perceived to outweigh benefits being realised, Basin States may not fully fund these activities. This may result in Basin States not fully meeting these obligations under the Plan. It could also result in States not investing (or under-investing) in the review and analysis of implementation activities, consequently limiting their ability to apply the best available scientific knowledge and information as required under a number of provisions in the Plan. The high cost of holding and applying "held" environmental water entitlements may encourage States (and / or Commonwealth Environmental water allocations to consumptive users to offset the costs. This may prevent them from fully meeting their EWPs and priorities.	Trend 2 – Too much change too quickly (<i>refer to Section 3.2</i>) Trend 4 – From public opinion to legal action (<i>refer to Section 0</i>) Trend 5 – More forms, more reports, less time (<i>refer to Section 3.5</i>) Trend 6 – The modelling race (<i>refer to Section 0</i>) Trend 7 – Changing perceptions of value (<i>refer to Section 0</i>)

2.4.2 Risks to compliance

The table below summarises the risks to compliance created by costs and benefits (legal, social, environmental, political or economic) of non-compliance outweighing the costs and benefits of complying with the Plan.

 Table 4: Risks to compliance – benefits and costs of non-compliance outweigh costs and benefits of compliance

Water resource planning	Environmental Watering	Water trade	Water quality & salinity management
 Basin States choose to allocate and licence water outside of their agreed sustainable diversion limit (SDL) cap because of the need for regulated land uses to specific approval conditions relating to the use of water in order for the activity to proceed in anticipation of sizeable economic benefits for a region (eg employment) and / or Basin State (eg 	 Basin States choose to reduce or change environmental releases in response to communities deprioritising Environmental Watering (particular risk to annual watering plans). Communities apply political pressure to local members to advocate on their behalf for changes to local and regional management practices 	 9. Due to excessive reporting requirements across the Plan, Basin States choose to partially complete Plan reporting requirements (a particular risk is reporting trade information to other areas given the limit of trade in some Basin States). 10. Communities apply political pressure to local members to advocate on their behalf for changes 	13. Basin States choose to reduce or change WQSMP actions and targets in response to vested interests (eg community action groups, industry bodies, or specific companies threaten or proceed with legal action, and the risks associated with potential court rulings outweigh the benefits of complying with Plan obligations).

Water resource planning	Environmental Watering	Water trade	Water quality & salinity management
 royalties, taxation revenue). Legal threats may result in Basin States being forced to slow or delay WRP preparation while legal action is resolved. Delays in publishing plans for public viewing. Ability to develop and implement WRPs is reduced because of changes in community views regarding the balance between consumptive and environmental water (SDLs) use. 	or priorities that are inconsistent with Plan obligations. 7. Legal threats may result in Basin States being forced to slow or delay environmental water plan preparation while legal action is resolved. 8. Delays in publishing plans for public viewing.	 to or suspensions of trading rules to limit potential economic consequences of trade activity, which are inconsistent with Plan obligations. 11. Court judgments may provide the basis to amend the Plan water trading rules, potentially creating regulatory uncertainty. 12. Disputes arise between the Basin State and MDBA regarding the acceptability of data used or information provided for establishing water trade parameters (eg determination of water allocation levels). This is most relevant during 2014-19. After 2019, rules for making water allocations must be set out in accredited WRPs. 	

2.4.3 Likelihood of threat causing risks to compliance (tipping point/threshold)

The likelihood of the threat creating risks to compliance is influenced by the level of prescription of Plan obligations⁹. Plan obligations are able to accommodate varying levels of change before the benefits of non-compliance outweigh the benefits of compliance:

- 1. WRP obligations have a medium level of prescription¹⁰ (eg must set out method used to determine take). Non-compliance with water resource planning obligations is likely if there is a moderate increase in the trend(s) impacting the balance between the political, social, economic, and environmental costs and benefits of non-compliance versus compliance. This could take the form of reduced compliance activity by Parties to ensure that take is managed in line with SDLs. For example, Parties may undertake less monitoring and compliance activity related to interception activities (construction of farm dams, establishment of plantations etc.). This could result in non-compliance with the levels provided for in WRPs, particularly where the volumes involved are seen as relatively minor and support significant economic activity. The likelihood of water resource planning non-compliance is compounded by the obligation to prepare a WRP (as specified in section 54 of the Act) not being couched in mandatory terms (no imposition of an obligation on Basin States).
- 2. EWP obligations have a high level of prescription¹¹ (eg they must be prepared and reviewed within specified timeframes and in accordance with specified principles). Non-compliance with environmental water obligations is likely if there is a small increase in the trend(s) impacting the balance between the political, social, economic, and environmental costs and benefits of non-compliance versus compliance. This could involve Parties failing to fully apply the specified principles for undertaking Environmental Watering or determining environmental priorities. Consideration of relative costs and benefits may result in

⁹ Refer to page 71 for a definition of prescription of obligations

¹⁰ Refer to Appendix E for an assessment of the level of prescription of WRP obligations

¹¹ Refer to Appendix E for an assessment of the level of prescription of EWP obligations

States reducing investment in community consultation and participation processes (sections 8.39 and 8.55) or modifying their assessment of the appropriate balance of environmental benefit to costs for watering (Section 8.37). Benefit to cost consideration could also lead to increased trading of environmental water allocations to consumptive users to help meet the charges and delivery costs associated with held environmental water entitlements, leading to an inability to fully meet Environmental Watering priorities.

- 3. Water trade obligations have a medium to high level of prescription¹² (eg may specify timeframes, principles and rules that must be followed). Non-compliance with water trade obligations is likely if there is a small to moderate increase in the trend(s) impacting the balance between the political, social, economic, and environmental costs and benefits of non-compliance versus compliance. For instance, Parties might change or suspend trading rules, making them inconsistent with Plan obligations to limit the economic consequences of trade activity in certain areas, or to avoid calls for government support for structural adjustment programs.
- 4. WQSMP obligations have a low to medium level of prescription.¹³ Non-compliance with WQSMP obligations is likely if there is a moderate to large increase in the trend(s) impacting the balance between political, social, economic, and environmental costs and benefits of non-compliance versus compliance. This could involve reduced expenditure on salinity management actions that control or limit river salinity levels. For example, States may reduce expenditure on operation of salt interception and disposal schemes. The potential for this type of action may increase where the benefits are perceived to accrue to another jurisdiction, which is not contributing to the direct cost of complying with management actions or targets.

For a more detailed example of what change is needed in a trend to push a threat beyond its tipping point/threshold refer to Appendix F.

2.4.4 Impact of non-compliance

The impacts of non-compliance could include:

1. Plan Outcome:

- a. Failure to comply with the SDLs established under WRPs could prevent the achievement of sustainable levels of take, with implications for achievement of restoration and protection of water dependent ecosystems outcomes.
- b. Failure to meet water trade obligations (eg delays in providing information to MDBA or imposing rules that are inconsistent with the Plan) may compromise achievement of the objectives of the water trade rules (ie equitable trade).
- c. Failure to prepare or implement any aspect of an environmental water plan (strategy, long-term plan, or annual priorities) would significantly threaten achievement of the objectives of the Plan.

2. Reputational:

- a. MDBA's ability to detect and respond to non-compliant trade rules is reduced due to lack of timely trade information caused by excessive reporting requirements (across all areas of the Plan). This renders water trade rules and regime inefficient, unreliable, and unaccountable.
- b. Legal action in one area (particularly if successful) may spread to other areas, creating further distrust.
- c. Failure to comply fully with SDLs in one or more WRP areas may lead to communities expressing concerns about equity and a lack of confidence in the Plan (and/or MDBA), increasing the prospect of SDL non-compliance.
- d. Failure to meet water trade obligations relating to sharing and publishing restrictions on trade, information about trades, and insider trading may result in a lack of market transparency and actual or perceived inequitable water trades.
- e. Uncertainty and lack of cohesion around the Plan is created by frequent or regular proposals by Basin States or vested interests for water resource planning amendments.
- f. Reduced stakeholder confidence and trust due to a lack of transparency created by not publishing any or all aspects of the WRPs or EWPs.

¹² Refer to Appendix E for an assessment of the level of prescription of Water Trade obligations

¹³ Refer to Appendix E for an assessment of the level of prescription of WQSMP obligations

g. Reduced stakeholder confidence and trust if divergent modelling methods emerge that result in disagreement between MDBA and Basin States regarding the appropriateness of a WRP.

3. Financial:

a. Significant legal costs incurred in determining legal positions related to threats of legal challenge or defending the Plan against legal challenge.

4. Legislative:

a. Failure to meet SDLs is in contravention of the Plan and requirements of the Act.

2.4.5 Threat rating

The overall level of threat to compliance with Plan obligations created by the costs and benefits of noncompliance outweighing the costs and benefits of compliance is **moderate to high.** The diagram below indicates that EWP and Water Trade obligations could be more at threat than WRP and WQSMP obligations (refer to Appendix E for threat rating assessment).



CONSEQUENCE

Figure 11: Threat rating – compliance is threatened if the costs and benefits of non-compliance outweigh costs and benefits of compliance

2.5 Threat 3 – uncertainty regarding the impact of complying with Plan obligations combined with rapidly changing strategic operating conditions

2.5.1 Threat identification and causes

The table below identifies the threat to compliance, provides an example of the threat, and lists the trends which may cause the threat.

Table 5: Threat identification,	example, and cause
---------------------------------	--------------------

Threat	Example	Trends which may cause threat
Parties may choose to delay their compliance actions or renegotiate their compliance obligations if the operating environment is highly complex, dynamic, and contentious; and if it is unclear whether	Expansion of coal seam gas production generates significant quantities of extracted groundwater, which is discharged to surface water sources and creates significant complexity in determining the appropriate SDL for the	Trend 1 – Pushing the boundaries (<i>refer to Section 3.1</i>) Trend 2 – Too much change too quickly (refer to Section 3.2)

Threat	Example	Trends which may cause threat
compliance with specific obligations may result in desirable or	surface water source and accounting for use against SDLs.	
unintended consequences or not.	Complexity of possible interactions	
This threat is relevant to all Parties.	between consumptive use, environmental	
	delivery, and water quality management	
	makes it difficult for WRPs to meet all	
	competing objectives. Community	
	agreement on plans is not achieved or	
	takes significantly longer to achieve.	

2.5.2 Risks to compliance

The risks to compliance created by the uncertainty associated with the impacts of compliance combined a highly dynamic operating conditions are described in Table 6 below.

Water resource planning	Environmental Watering	Water trade	Water quality & salinity management
 Basin States frequently revise their WRPs in reaction to changing conditions, or the WRPs do not accurately reflect the changing conditions. Both of these options could lead to mistrust among water users about the management of water resources, making implementation of the plans difficult and potentially inconsistent with Plan obligations. Basin States do not clearly set out the circumstances, resulting in unnecessary restrictions in groundwater trade and / or the development of non-accredited WRPs. 	 EWPs do not accurately reflect the changing conditions, leading to stakeholders blocking implementation or implementation not achieving the objectives of the Plan. Complex flow conditions for the delivery of water to wetlands and floodplains (including challenges related to measuring return flows from these features to river systems) creates significant complexity in accounting for environmental water use and creates risks that return flows will not be fully credited to the environment. Thus there is insufficient environmental water to comply with EWP priorities. 	5. Basin States fail to approve trades, or introduce trade bans and suspensions that are inconsistent with the Plan's water trading rules or reduce stakeholder confidence in the water market, preventing the achievement of Plan outcomes. ¹⁴	WQSMP risks are encompassed in WRP risks. Water quality and salinity issues are addressed in WQSMP which are incorporated into WRPs.

Table 6: Risks to compliance – uncertainty of impact of compliance and dynamic operating conditions

¹⁴ The risk of whether "new products" are adequately addressed by the current obligations of the Plan may result in the need for existing obligations to be amended. For example, would a "futures" product be subject to Plan obligations regulating water access rights and water access entitlements? That is, *does the purchase of a right that comes into effect in the future constitute the acquisition of a water access right?* If "yes", the risk becomes one of whether this may encourage non-compliance with existing obligations. If "no", the issue becomes one of whether the Plan requires amendment to ensure coverage of the new products/transactions.

2.5.3 Likelihood of threat creating risks to compliance (tipping point/threshold)

The likelihood of the threat creating risks to compliance is influenced by the level of prescription¹⁵ of the Plan obligations:

- 1. WRP obligations have a medium level of prescription¹⁶ (eg must set out circumstances). Non-compliance with water resource planning obligations is likely if there is a moderate increase in the identified trend(s). This could involve the need for detailed development and analysis in estimating appropriate SDL adjustments in response to water efficiency measures and / or supply measures across the Basin. This is likely to increase the complexity of WRP development, and may also give rise to calls to defer implementation of SDLs if significant supply measures are likely to be accredited, allowing an increase in SDLs.
- 2. Water Trade obligations have a medium level of prescription¹⁷ (eg Section 12.43 information about water access rights to be made available; and Section 12.46 Basin States to make water trading rules available). Non-compliance with water trade obligations is likely if there is a moderate increase in the identified trend(s). This could be experienced by a range of irrigation infrastructure operators facing additional complexity through new obligations associated with establishing and reporting on compliant rules for trade of irrigation rights and delivery rights. This obligation may represent significant additional business complexity particularly for small to medium operators. Additionally, trade of irrigation delivery rights is a new emerging area, and quantification of rights and specification of trading rules for delivery rights is likely to be more complex than water access entitlement trading.
- 3. **EWP obligations** have a **high level of prescription**¹⁸ (eg must be prepared within specified timeframes and in accordance with prescribed principles). Non-compliance with environmental water obligations is likely if there is a **small increase in the identified trend(s).** This could involve developing a range of efficiency measures for environmental water delivery based on creating new works and measures. Consequently, much existing knowledge about environmental water requirements for various levels of environmental benefit may be made redundant and require redevelopment, adding significant complexity to EWPs and creating risks of non-compliance with revised and untested arrangements.

For a more detailed example of what change is needed in a trend to push a threat beyond its tipping point/threshold refer to Appendix F.

2.5.4 Impact of non-compliance

The impacts of non-compliance could include:

1. Plan Outcome:

- a. May threaten achievement of the objectives of the water trading rules (ie free trade subject to reasonable restrictions).
- b. WRPs do not set out details of the circumstances under which sufficient connectivity within and between groundwater SDL units (and between groundwater and surface water SDL units) exists to support trade, resulting in unnecessary restriction of some forms of groundwater trades. This could constrain the ability to fully achieve the Plan outcomes for establishment of efficient and effective water markets.
- c. Ability to achieve all of the Plan's targets are limited because of the complexity of interactions between Environmental Watering, consumptive use (including agriculture, coal seam gas, mining), and water quality impacts.

2. Legislative:

a. Possible failure to prepare WRPs resulting from the need to resolve and / or undertake community consultation on complex issues delaying the preparation of plans. This could also limit MDBA's time to

¹⁵ Refer to page 71 for a definition of prescription of obligations

¹⁶ Refer to Appendix E for an assessment of the level of prescription of WRP obligations

¹⁷ Refer to Appendix E for an assessment of the level of prescription of Water Trade obligations

¹⁸ Refer to Appendix E for an assessment of the level of prescription of EWP obligations

assess the WRPs, limiting their ability to recommend the accreditation of the WRP within the required timeframe.

- b. Contravention of water trading rules due to circumstances¹⁹ not being set out, which could unnecessarily restrict some forms of groundwater trade.
- c. Failure to approve trades, trade bans, removal of inconsistent trade restrictions and / or suspensions resulting from inability to handle increased volumes of trade.
- d. Development of new water trading products may require amendments to the water trading rules.
- e. Shift in regulatory oversight from the Australian Competition and Consumer Commission (ACCC) to Australian Securities and Investment Commission (ASIC) depending on the new types of products developed.

3. Reputational:

- a. Perceived (or actual) unreasonable restrictions under the rules may lead to stakeholder dissatisfaction with the water market (and MDBA's regulation of it).
- b. Community concerns in relation to perceptions that complex issues have not been properly addressed and resolved lead to protests and challenges to Plan activities.
- c. Delays in resolving complex issues limits the progress in achieving Plan outcomes, leading to a lack of confidence in the Plan (and / or MDBA) and increasing the prospect of SDL non-compliance.

4. Financial:

a. Significant costs could be incurred by MDBA and Basin States to address the complexity and develop and implement compliant WRPs and EWPs.

2.5.5 Threat rating

The overall level of threat to compliance with Plan obligations posed by the combined complexity of the Plan obligations and the Basin operating environment are **moderate/high.** The diagram below indicates that EWP obligations are at the greatest threat of not being complied with as a result of both the complexity of obligations and of the Basin operating environment (refer to Appendix E for threat rating assessment).



CONSEQUENCE

Figure 12: Threat rating – uncertainty regarding impact of compliance and rapidly changing operating conditions

¹⁹ This relates to Sections 12.24 – 12.26 of the plan, which prohibit trade within and between groundwater SDL units unless there is sufficient connectivity, and trade won't result in groundwater resource condition limits being exceeded. If this issue isn't properly analysed and described, trade won't be allowed, so it's a risk to trade outcomes, as trade may be unnecessarily restricted in these cases.

2.6 Threat 4 – The perception of the likelihood of detection is low

2.6.1 Threat identification and causes

The table below identifies the threat to compliance, provides an example of the threat, and lists the trend which may cause the threat.

Table 7: Threat identification, example and cause

Threat	Example	Trend which may cause threat
The likelihood of non-compliance is greater if Parties perceive that there is a low likelihood of non- compliance being detected in a timely manner by MDBA. The threat to compliance applies to all Parties.	Water resource monitoring infrastructure within Basin States is not expanded to meet the additional needs arising from the Plan, is scaled back or not adequately maintained, rendering it difficult for States to fulfil their monitoring obligations under WRPs, or to demonstrate compliance.	 Trend 3 – Where have all the people gone (<i>refer to Section 0</i>). Trend 5 – More forms, more reports, less time (<i>refer to Section 3.5</i>). Trend 8 – Cannot measure, cannot comply (<i>refer to Section 0</i>)

2.6.2 Risks to compliance

The risks to compliance that may be caused by Parties perceiving the likelihood of detection being low are described in Table 8 below.

Water resource planning	Environmental Watering	Water trade	Water quality & salinity management
 Basin States do not monitor water resource planning outcomes in line with their Plan obligations and compliance vs. non-compliance cannot be clearly demonstrated. 	2. Basin States do not make watering priority decisions clear or transparent and there is a lack of evidence of watering actions.	3. Basin States do not fulfil all of their obligations in relation to oversight and reporting of trading rules. This could include failure to fully meet all information reporting and publishing requirements particularly in relation to trade activity or incremental changes to trade rules following initial implementation of Plan requirements. Jurisdictions may also fail to ensure effective Chinese wall arrangements are in place in relation to water announcements if chances of detection are low.	 Basin States inconsistently set and measure water quality targets leading to inconsistency with Plan obligations.

Table 8: Risks to compliance – Perception of likelihood of detection is low

2.6.3 Likelihood of threat creating risks to compliance (tipping point/threshold)

The likelihood of risks to compliance is influenced by the level of prescription²⁰ of the Plan obligations:

 WRP obligations have a medium level of prescription²¹ (eg specifies that monitoring must be undertaken). Non-compliance to water resource planning obligations is likely if there is a moderate increase in the identified trend. This could involve States not expanding water resource monitoring networks to meet the additional needs arising from the Plan or scaling back / not adequately maintaining

²⁰ Refer to page 71 for a definition of prescription of obligations

²¹ Refer to Appendix E for an assessment of the level of prescription of WRP obligations

existing networks. Consequently, it would be difficult for States to fulfil their monitoring obligations under WRPs or demonstrate compliance (whether it is achieved or not). Alternatively, States may fail to adequately monitor distributed activities, which creates risks to water resource availability, such as changes in catchment land use, construction of farm dams, or increased flood plain harvesting activities.

- 2. **EWP obligations have a high level of prescription**.²² Non-compliance to environmental water planning obligations is likely if there is a **small increase in the identified trend**. This could take the form of a failure to establish adequate and effective facilities to monitor the delivery of environmental water to key environmental assets. Therefore States may not be able to demonstrate:
 - Compliance with the annual watering priorities and EWP requirements of each asset.
 - The compliant application of principles relating to the use of adaptive management and best available information for the planning and use of environmental water.
- 3. **WQSMP obligations have a moderate level of prescription.**²³ Non-compliance to WQSMP obligations is likely if there is a **moderate increase in the identified trend**. This could involve a reduction in water quality monitoring networks, which may be related to potential reductions in water quantity monitoring networks.
- 4. Water Trade obligations have a moderate level of prescription²⁴ (e.g. Part 5 of Chapter 12 Information and reporting requirements). Non-compliance with Water Trading obligations is likely if there is a moderate increase in the identified trend(s) contributing to a reduction in the risk of detection of non-compliance. This could involve States or trade approval agencies failing to establish effective processes to monitor situations that trigger requirements for reporting or publication of information in accordance with the provisions in Chapter 12 of the Plan. States or approval agencies may not be able to demonstrate compliance with their obligations in relation to provision of information on trade activities and rule changes, or on their obligations to publish required information in a timely manner.

For a more detailed example of what change is needed in a trend to push a threat beyond its tipping point/threshold refer to Appendix F.

2.6.4 Impact of non-compliance

The impacts of non-compliance could include:

1. Plan outcomes:

a. May threaten achievement of the objectives of the water trading rules (ie facilitation of efficient water markets, including through good information flows in the market).

2. Reputational:

- a. MDBA's reputation is negatively affected by failure of Parties to undertake the required monitoring, making it difficult for MDBA to demonstrate compliance and assure broader stakeholders.
- b. Lack of clarity on watering priority decision and lack of evidence of achievement of watering actions may significantly decrease stakeholder satisfaction with the efforts / results of MDBA, given EWPs are critical to the success of the Plan.
- c. Lack of sufficient monitoring information to demonstrate compliance with WRP obligations and SDLs in some areas may create community concerns about equity and reduce confidence in the Plan (and/or MDBA).
- d. Reduced public confidence in water markets and trading if there is non-compliance with trading rules by Parties.

3. Legislative:

a. Inability of Parties to manage water flows in light of specified targets if data is unavailable to measure water quality against patterns.

²² Refer to Appendix E for an assessment of the level of prescription of EWP obligations

²³ Refer to Appendix E for an assessment of the level of prescription of WQSMP obligations

²⁴ Refer to Appendix E for an assessment of the level of prescription of Water Trade obligations

2.6.5 Threat rating

The overall level of threat to compliance with Plan obligations posed by a perception of a low likelihood of detection is **low to moderate.** The diagram below indicates that WRPs and WQSMP obligations could face a greater threat than EWP obligations (refer to Appendix E for threat rating assessment).



CONSEQUENCE

Figure 13: Threat rating – compliance is threatened if perception of likelihood of detection is low

2.7 Actions to prepare MDBA and Parties to respond to compliance threats

This environmental scan will assist MDBA and the Parties in anticipating and responding to threats to the objectives of the Plan and its intended outcomes. It will assist in the adoption of least-cost interventions to avoid, mitigate or minimise non-compliances with the Plan. The following sections outline possible actions to prepare for the threat.

2.7.1 Prioritise risks from threats and allocate compliance resources accordingly

Risk assessments informed by the threat identification and assessment information should be conducted with the MDBA area responsible for EWPs, Water Trade, WQSMPs, and WRPs.

Compliance risks should be prioritised on the basis of the importance of the obligation to achieving the Plan outcomes. Prioritising the provisions of the Plan for the purpose of monitoring any tendency towards (or vulnerability to) non-compliance with the Plan will enable MDBA to allocate resources accordingly.

As risk assessment are about identifying, assessing and treating actual or potential failure to comply with legal obligations, it is essential that the nature and extent of any apparent obligation contained in legislation is clear to MDBA.

Where MDBA has identified significant provisions of the Plan as being critical to maintaining the Plan's integrity and where non-compliance would consequently threaten that integrity, any doubt as to the mandatory nature of the provision should be clarified by appropriate legal advice.

Section 5.5.1 describes the process of applying the environmental scan threat identification and assessment information to the Compliance and Assurance Risk Assessment Framework and how to prioritise the importance of each Plan obligation.

2.7.2 Be ready to respond

Cost effective interventions to mitigate or avoid non-compliance can be scoped in advance by using information gathered about the potential causes of threats (trends) and road-testing possible interventions based upon plausible scenarios constructed using trends.

Following the completion of risk assessments efforts can be directed to planning, testing and documenting cost effective interventions.

Scenarios should be developed based upon the trends influencing each of the threats. Scenarios should vary in complexity. Low complexity involves responding to a slow moving single trend and high complexity should involve responding to fast moving multiple trends.

The method used to construct a scenario and an example of a scenario is described in Appendix F.

2.7.3 Know when to respond

By closely monitoring trends in strategic operating conditions affecting the Parties (between 2013 and 2022), MDBA can identify the optimal "window of opportunity" to implement prepared and tested interventions.

The environmental scan has revealed eight trends that are likely to influence the behaviour and actions of Parties. The eight trends are described in detail in section 3. The method to be used to monitor the trends is described in section 5. The baseline information currently held on each trend and information required to monitor changes in trends are outlined in Appendix H.

2.7.4 Collaborate with Parties to gather strategic intelligence regarding challenges they face

MDBA will strengthen its strategic intelligence collection capability by collaborating with Parties and key stakeholders to identify new emerging issues which may in turn lead to trends creating future threats to compliance.

Identifying and assessing emerging issues is neither a contentious nor divisive exercise. MDBA, other Parties, and key stakeholders can collaborate on what issues are emerging, why they may be emerging, what trends they could create, and what threats to compliance may result. These are areas that MDBA, Parties, and key stakeholders can share information, insight and intelligence about without needing to determine solutions. This type of information sharing is likely to result in all parties being more aware of potential trends that may pose threats to compliance and enable the parties to take early action to limit the emergence of significant threats to compliance.

The environmental scan identified over 100 emerging issues spanning six types of strategic drivers of change. The emerging issues are described in section 4. The method used to identify new emerging issues is described in section 5. The information required to identify a new emerging issue is outlined in Appendix B. The baseline information held about each emerging issue is contained in Appendix I.

2.7.5 Clearly link threats to compliance with MDBA's Plan implementation performance

The majority of Plan obligations pertain to MDBA. The threat of Parties not complying with their obligations increases if the regulator is unable to demonstrate compliance with its obligations. This may lead to Parties perceiving the regulator as ineffective, reducing their own motivation to comply with their obligations. Furthermore, it may appear that the regulator is too focused on their own compliance performance to sufficiently detect non-compliance by Parties or enforce consequences of non-compliance.

The primary consequence of MDBA not complying with their obligations represents a clear legislative breach and may greatly and may greatly increase the overall cost of Plan compliance. Not only could MDBA be committing resources to interventions interventions to reduce the threat of Parties not complying, additional resources may be needed to implement corrective corrective actions resulting from MDBA not meeting its own compliance obligations. In addition, a failure to adequately adequately address water trading restrictions which are inconsistent with the Water Trade Rules may result in claims for

claims for compensation against the commonwealth under section 12.05 of the Plan.



Figure 14 shows why it is critical that MDBA's Compliance and Assurance Strategy equally assess the risks to compliance from within (MDBA's own compliance) and outside (Parties).



Figure 14: Cost of compliance is greatest if MDBA and Parties are ineffective in meeting their obligations

The overall effectiveness of the implementation of the Plan was recognised by many stakeholders as a major influence on the willingness and capacity of Parties to comply with their obligations.

If Plan actions are not providing the desired outcomes in the anticipated timeframes, public, industry and other interest groups may begin to question the efficacy and legitimacy of the Plan. Any significant undermining of the Basin Plan may result in elected officials wishing to examine their level of on-going involvement in the Plan.

The perception of MDBA held by Parties may also influence the level of threat to compliance. If MDBA is perceived as favouring particular land uses or activities due to their water use and environmental impact, some Parties and stakeholders may use this as motivation to challenge Plan obligations.

2.7.6 Leverage opportunities to make compliance easier and simpler

Compliance and Assurance should use the on-going refresh of the environmental scan to identify opportunities to streamline or lessen compliance obligations due to changes in the strategic operating conditions confronting Parties. Emerging issues and trends not only present threats to compliance but may also create opportunities for compliance to become simpler and easier over time.

The vast majority of stakeholders engaged focused primarily on how emerging issues and trends could create threats to complying with Plan obligations. There were several examples of emerging issues and trends create opportunities for compliance. These are summarised in the table below.

Effective compliance by MDBA through the development of well-structured implementation and reporting processes, based on a strong understanding of their obligations, can provide a valuable "template" for good practice in compliance that can be picked up and adapted by other parties.

Emerging Issues (Strategic Drivers of Change)	Compliance Opportunity
Changes in land and water use	The integration of mining water requirements into regional WRP could make it easier to comply with SDL obligations.
Changes in economic conditions	Reduction in real prices received for agricultural commodities may reduce demand for water and reduce risk of non-compliance with water trading and SDL obligations.
Changes in community attitudes	Early, well reported successes from Environmental Watering activities could increase public support for Environmental Watering, improving the likelihood of compliance and reducing the prospects of legal challenges to the plan. Regional economic development based on enviro-tourism activities in benefiting wetlands could also help leverage changes in community attitudes.
	Popular recognition of the value of scarce water to both agricultural production and ecosystems.
Major climatic events	Return to water scarcity / drought may highlight the need for careful management of water resources and provide stronger support and funding for development of WRPs and compliance with SDL obligations.
	Greater unpredictability of weather patterns may encourage greater demand for compliance with water resource planning regimes (the Plan).
Changes in science	Improved modelling and measurement techniques (eg remote sensing).
and technology	Use of technology to improve water efficiency and water re-use (eg mining operations using town effluent, building some scale cost efficient water desalination plants and pipelines to obtain required water).
Changes in institutional arrangements and relationships	Government reforms including restructuring of agencies to merge water and environment agencies, could see improved co-ordination between water resource planning and environmental water planning activities. This could improve the likelihood of producing compliant plans within established timelines, and support more efficient monitoring and reporting activities.

Table 9: Compliance opportunities created by emerging issues

These emerging issues combined with the need for some plans to be regularly produced and reviewed enable Parties the opportunity to become proficient in meeting Plan obligations. For example, the regular production of EWPs creates repeatable processes, and once compliance is achieved subsequent refreshes of annual plans are likely to be compliant, as opposed to plans which are developed and reviewed less frequently.
3. Threats to compliance could eventuate if Parties are impacted by one or more of eight trends

Parties will confront a range of economic, social, environmental, political, technological, and legal challenges over the next decade. These challenges could significantly influence their capacity to comply with Plan obligations across Water Trade, WRPs, WQSMPs, and EWPs.

The environmental scan identified eight trends that may evolve over the next decade (2012 – 2022) to create conditions which conditions which could generate threats to Plan compliance. These trends are summarised in

TREND	DESCRIPTION OF TREND	EXAMPLE	PACE & SCALE
Trend 1 – Pushing the boundaries	New tradable water products that fall outside the capacity of Basin Plan water trade rules are developed. Trend may lead to water trade approvals, suspensions, or bans that are inconsistent with the Basin Plan water trade rules.	Expansion of trade into groundwater and unregulated water systems.	Slow pace. Southern connected Basin.
Trend 2 – Too much change too quickly	System conditions are changing at such a rapid pace and scale that Parties are unable to fully understand the impact of the changes. Trend may reduce the ability of Parties to develop and/or implement robust plans.	Agricultural sector rapidly expands or reduces depending on market conditions (e.g. food security issues in Asia, a lower Australian dollar, increase in government support for intensive agriculture).	Slow to moderate pace. Regional scale.
Trend 3 – Where have all the people gone	Resources become increasingly constrained to the extent that meeting Basin Plan compliance obligations may exceed future capacity (people with requisite skills, qualifications and experience). Trend may constrain the capacity of Parties to develop and/or implement robust plans.	Prolonged deficits lead to reduced government spending on water resource planning and Basin Plan implementation.	Fast pace. Basin wide scale.
Trend 4 – From public opinion to legal action	Community, industry and environmental lobby stakeholders become more likely to threaten and/or proceed with legal action in relation to environmental and industry issues. Trend may cause Parties to delay developing or implementing robust plans.	Growing advocacy and activism from environmental groups and communities concerned about environmental conservation and protection.	Slow to moderate pace. Regional scale.
Trend 5 – More forms, more reports, less time	The overall regulatory burden on Parties increases to the point that the cost of complying with Basin Plan obligations exceeds the benefits of compliance. Trend may result in Parties scaling back their commitment to developing and implementing robust plans.	Tighter regulation (e.g. approval trigger for water impacts under the EPBC Act) and growing monitoring and reporting requirements (e.g. water quality issues).	Slow to moderate pace. Basin wide scale.
Trend 6 – The modelling race	New technologies, assessment methods, and research are developed to improve / challenge assumptions and understanding of Basin conditions and Basin Plan compliance. Trend may cause greater political and community uncertainty regarding the efficacy of the Basin Plan, leading to delays in developing and implementing robust plans.	Enhanced water delivery monitoring enables more accurate monitoring of volumes and previously unmonitored extractions (i.e. stock and domestic supplies), challenging assumptions made in the development of the Basin Plan.	Slow pace. State specific.
Trend 7 – Changing perceptions of "value"	Community and political views becoming more focused on economic value of environmental watering. Trend may create the perception that environmental watering is of relatively lower importance, and Parties may be less likely to achieve sustainable diversion limits and / or prepare environmental watering plans.	Private sector finds the cost of complying with regulation relatively high and threatens to move their business to a more competitive location and/or reduce overall investment in a region.	Moderate to fast pace. Basin wide scale.
Trend 8 – Cannot measure, cannot comply	Parties reduce their investment (people, infrastructure, data) in monitoring and measuring related to the Basin Plan, thereby limiting their capacity to demonstrate compliance and the impact of Basin Plan interventions. Inability to demonstrate achievement of desirable outcomes compounds the trend by stakeholders questioning the need to continue with certain Basin Plan actions.	Increased remote monitoring could be used to detect water theft, but is viewed by law as an intrusion on privacy. During times of water scarcity, this may encourage increased water theft due to the perceived lack of enforcement capability.	Moderate pace. Basin wide scale.

Figure 15, and Figure 16 illustrates the type of issues (strategic drivers of change) that may potentially drive each of the eight trends. Each trend is discussed in the following section with a more detailed profile provided in Appendix H.

TREND	DESCRIPTION OF TREND	EXAMPLE	PACE & SCALE
Trend 1 – Pushing the boundaries	New tradable water products that fall outside the capacity of Basin Plan water trade rules are developed. Trend may lead to water trade approvals, suspensions, or bans that are inconsistent with the Basin Plan water trade rules.	Expansion of trade into groundwater and unregulated water systems.	Slow pace. Southern connected Basin.
Trend 2 – Too much change too quickly	System conditions are changing at such a rapid pace and scale that Parties are unable to fully understand the impact of the changes. Trend may reduce the ability of Parties to develop and/or implement robust plans.	Agricultural sector rapidly expands or reduces depending on market conditions (e.g. food security issues in Asia, a lower Australian dollar, increase in government support for intensive agriculture).	Slow to moderate pace. Regional scale.
Trend 3 – Where have all the people gone	Resources become increasingly constrained to the extent that meeting Basin Plan compliance obligations may exceed future capacity (people with requisite skills, qualifications and experience). Trend may constrain the capacity of Parties to develop and/or implement robust plans.	Prolonged deficits lead to reduced government spending on water resource planning and Basin Plan implementation.	Fast pace. Basin wide scale.
Trend 4 – From public opinion to legal action	Community, industry and environmental lobby stakeholders become more likely to threaten and/or proceed with legal action in relation to environmental and industry issues. Trend may cause Parties to delay developing or implementing robust plans.	Growing advocacy and activism from environmental groups and communities concerned about environmental conservation and protection.	Slow to moderate pace. Regional scale.
Trend 5 – More forms, more reports, less time	The overall regulatory burden on Parties increases to the point that the cost of complying with Basin Plan obligations exceeds the benefits of compliance. Trend may result in Parties scaling back their commitment to developing and implementing robust plans.	Tighter regulation (e.g. approval trigger for water impacts under the EPBC Act) and growing monitoring and reporting requirements (e.g. water quality issues).	Slow to moderate pace. Basin wide scale.
Trend 6 – The modelling race	New technologies, assessment methods, and research are developed to improve / challenge assumptions and understanding of Basin conditions and Basin Plan compliance. Trend may cause greater political and community uncertainty regarding the efficacy of the Basin Plan, leading to delays in developing and implementing robust plans.	Enhanced water delivery monitoring enables more accurate monitoring of volumes and previously unmonitored extractions (i.e. stock and domestic supplies), challenging assumptions made in the development of the Basin Plan.	Slow pace. State specific.
Trend 7 – Changing perceptions of "value"	Community and political views becoming more focused on economic value of environmental watering. Trend may create the perception that environmental watering is of relatively lower importance, and Parties may be less likely to achieve sustainable diversion limits and / or prepare environmental watering plans.	Private sector finds the cost of complying with regulation relatively high and threatens to move their business to a more competitive location and/or reduce overall investment in a region.	Moderate to fast pace. Basin wide scale.
Trend 8 – Cannot measure, cannot comply	Parties reduce their investment (people, infrastructure, data) in monitoring and measuring related to the Basin Plan, thereby limiting their capacity to demonstrate compliance and the impact of Basin Plan interventions. Inability to demonstrate achievement of desirable outcomes compounds the trend by stakeholders questioning the need to continue with certain Basin Plan actions.	Increased remote monitoring could be used to detect water theft, but is viewed by law as an intrusion on privacy. During times of water scarcity, this may encourage increased water theft due to the perceived lack of enforcement capability.	Moderate pace. Basin wide scale.

Figure 15: Eight identified trends likely to shape the strategic operating conditions for Plan compliance



Figure 16: Strategic drivers of change (emerging issues) pushing each of the eight trends

3.1 Trend 1 – Pushing the boundaries

3.1.1 Trend identification

Growing recognition of water as a commodity and the failure of current products to meet market needs could result in the development and adoption of new tradable water products, and changes in the appreciation of and participants in the water trade market. Potential products include options and futures, or the implementation of new carryover rules that differ between regions.

3.1.2 Parties' response

This could see Parties responding to:

- Increased volumes of trade, including in areas that have traditionally experienced low levels of trade.
- Trade in new water products that are not catered for under existing trade rules.

This could result in failure to approve trades, or trade bans and suspensions. Asymmetry of information on new water products could also result in perverse (and inefficient) market outcomes.

3.1.3 Representation of the trend

The trend could take the form of:

- Changes in land use bring new participants to the market in a specific region/area (eg mining, forestry, new/different agricultural land uses) who actively / aggressively pursue opportunities in the water trade market (eg participate in trials of experimental water products).
- Water brokers creating and actively promoting innovative water products such as leases and options, waste water products (stormwater runoff, treated wastewater), and trade into groundwater and unregulated water systems.
- Current and future State and Commonwealth budget constraints restrict spending on Plan implementation and compliance, resulting in the water trade market developing with little or poor regulation.
- Emergence of an advanced water trade market that uses a real-time online clearing house and / or a water grid that extends across state boundaries.

3.1.4 Key events that could change the pace and scale of the trend

A range of events could change the pace and scale of trend. These include:

- Increase the pace of the trend: industry purchasing significantly greater volumes of water entitlements than
 required; high utilisation of environmental water, location, volume and timing of Commonwealth
 Environmental Water Holder buy backs, reducing supply of allocation into traditional water market activity
 prompts exploration of new products like options to meet consumptive needs; return to drier seasonal
 conditions; shift towards a full cost recovery model for water
- Decrease the pace of the trend: exclusion of certain land uses, restricting the number of water trade market participants; Commonwealth sells their entitlements to raise revenue, allowing traditional market products to continue to meet demands; continuation of wetter conditions can be expected to dampen market pressure; lack of rules to enable water shepherding for the environment cause environmental water buyers to push against rapid development of the water market.
- *Increase the geographical scale of the trend:* emergence of new water trade market participants in the northern basin; completion of water grids.
- Decrease the geographical scale of the trend: water trade remains the domain of more traditional market participants (agriculture and environment); return to prolonged drought conditions causes water trade market participants to adopt protectionist behaviours.

The changes in the pace and scale of the trend can be predicted in strategic drivers of economic change (these are summarised in section 4.2 and detailed in Appendix I.

3.1.5 Profile of trend

A brief profile of this trend is provided in Table 10.

Table 10: Brief	profile of Trend 1 -	pushing the boundaries
-----------------	----------------------	------------------------

Profile	Comment
Key emerging issues that could give rise to trend	 Establishment of gateway reviews for natural gas from coal seam (NGCS) Increased foreign investment in land and water for agriculture Substantial reduction in public sector spending on water reform Willingness of governments to reconsider bulk water arrangements Establishment of a real-time electronic clearing house for the water market State water grids that span state boundaries are completed Recognition of recycled water or "new" water products from treated waste water Changes to entitlement structure in unregulated rivers and groundwater systems to unbundle or create more readily tradeable products Establishment of stock market for water trade that results in highly volatile market prices for water and separation of water ownership from end users Adoption of new water products such as leases and options Forestry and mining companies enter water market and create new products (eg treated water from coal seam gas)
Areas of the Plan affected	Water trading rules (and WRPs to the extent that they give effect to water trading rules)
Parties affected	Basin States Trade approval authorities
Current pace of trend	Slow – water trade market is still in a relatively early stage of maturity, so there is unlikely to be any significant developments or investments in new products until it is more stable / established. Furthermore, current relatively low returns in a range of irrigated agricultural sectors results in relatively low pressure on the development of new products.
Likely timeframe trend will emerge over	Starting in the medium term (2015-16 to 2016-17) – new trade rules provision commence in July 2014, and potential water trade market participants will then have more confidence in the market and will be able to identify potential new opportunities once they have more data about how the market behaves and is regulated.
Geographic scale of trend	Southern connected Basin. May affect the northern Basin in the future, but will likely lag behind the southern connected Basin given the relative state of the water trade markets.

3.2 Trend 2 – Too much change too quickly

3.2.1 Trend identification

Sudden, wide-scale changes in system operating conditions occur, resulting in changes in the understanding of the impact of interventions by Basin States, Commonwealth entities, and MDBA. The changes in system operating conditions could be naturally occurring, such as a return to Millennium drought conditions, or humaninduced, including significant changes to water flows and river system operations from new or relocated demands. Urbanisation, peri-urban development, coal seam gas, carbon farming, enhanced environmental water delivery, and global demand for particular foods and fibre are all potential catalysts for rapid change in water use patterns.

A small number of changes are likely to be manageable within the scope of the Plan; however multiple changes happening in parallel could lead to rapid and wide-scale changes, making it increasingly difficult for Parties to comply with their obligations.

3.2.2 Parties' response

This could see Parties needing to respond to the consequences of the changes or unforseen interactions of changed system operating conditions with components of the Plan. These interactions and consequences may be outside the scope of previous experience or the assumptions that guided the development of the Plan. This may lead to Basin States being unable to develop WRPs by the required deadline or that satisfy the requirements of the Plan as a result of increased complexity.

3.2.3 Representation of the trend

The trend may take the following forms:

- Development of the water intensive industry (eg NGCS) and resulting impacts (eg treatment of water extracted for NGCS, de-watering of mines, accounting for surplus water, water quality).
- Agriculture sector rapidly expands or reduces depending on market conditions:
 - Expands: food security issues in Asia; a lower Australian dollar; government support for intensive agriculture increases in some states like Queensland, where it is the Government's stated intention to double food production by 2040²⁵.
 - Decreases: increased international competition lowers the returns on Australian agricultural products to the point that farmers diversify into new non-agricultural businesses; decline of population in the Basin particularly the number of younger people leaves a major resource gap in the agriculture sector.
- Water demand from traditionally water intensive sectors (eg some agricultural and forestry activities) decreases as a result of technological advancements (eg development of crop species that require less water, innovation in the use of biomass in forestry increases the yield per hectare).
- Changes in government policy lead to a greater focus on regional communities and the construction of dams for water supply, with less focus on environmental values.
- Clear reform fatigue illustrated by Parties and stakeholders who are indicating difficulty in keeping pace with changes to the Basin and responses being proposed by various stakeholders.

3.2.4 Key events that could change the pace and scale of the trend

A range of events could change the pace and geographical scale of the trend. Key events could include:

Increase the pace of the trend: high Australian dollar makes Australian agricultural or forestry exports less
attractive; removal of land tax on farm sale / purchase; collapse of production overseas resulting from
catastrophic event drives increased demand for Australian products; carbon farming initiative accepts the
classification of plantations as a "renewable"; change of Commonwealth government results in rapid
construction of dams (cumulative impact of industrialisation of the Basin); land use planning frameworks

²⁵ Liberal National Party (2012)

that promote co-existence (multiple land uses) rather than exclusion (eg adoption of National Minerals and Petroleum Sector Multiple Land Use Framework)²⁶; existing water planning and management processes are well established and therefore difficult to change; introduction of anti-dumping laws; increase in building construction; increase in unregulated interception activities; budget constraints, the increasing price of electricity, and the current effectiveness of salt interception schemes leads to a perception that salinity is no longer an issue that requires ongoing significant investment, resulting in a reduction in salt interception targets.

- Decrease the pace of the trend: rapid increase in renewable energy sources, or increased availability of alternative fossil fuel supplies (eg US shale gas) reduces demand for coal and NGCS, regulation of NGCS developments achieves acceptance quickly.
- Increase the geographical scale of the trend: policy and economic conditions encourage expansion or intensification of agriculture in the Northern Basin; inclusion of mining water requirements in regional water management plans; extreme weather events like bushfires or floods.
- Decrease the geographical scale of the trend: policy or economic conditions lead to a reduction of agricultural production in the Southern Basin, research into the cumulative impacts of industrialisation of the Basin (groundwater impacts etc).

Changes in the pace and scale of the trend can be predicted by monitoring strategic drivers of change relating to:

- Emerging issues regarding changes in economic conditions (these are summarised in section 4.2 and detailed in Appendix I)
- Emerging issues regarding change in land and water use (these are summarised in section 4.2 and detailed in Appendix I)
- Emerging issues regarding changes in science and technology (these are summarised in section □ and detailed in Appendix I).

3.2.5 Profile of trend

A brief profile of this trend is provided in Table 11.

Table 11: Brief profile of Trend 2 – too much change too quickly

Profile	Comment
Key emerging issues that could give rise to trend	 Development and expansion of coal seam gas mining activities Reduced / less profitable agricultural operations as a result of increased competition results in rapid diversification and restructuring of agricultural activities Increase in demand from Asia due to the collapse of their local agricultural market and Australia's free trade agreements with Asian countries Unintended feedback loops from climate change exacerbate water availability impacts (eg temperature-vegetation water use and survival relationships that are poorly understood at the moment) Development of crop species that require less water and are salt resistant Declining returns on agricultural products Major overhaul of Commonwealth and State taxation arrangements result in economic rentbased taxes being applied to all land uses Carbon farming makes commercial forestry sustainable and commercially viable by acknowledging plantations as a "renewable"
Areas of the Plan affected	Primarily WRPs, but may also affect WQSMPs, EWPs, and water trading rules (as water users seek to relocate demand).
Parties affected	Basin States Water system operating entities (river operators)

²⁶ Standing Council on Energy and Resources (2012)

Profile	Comment
Current pace of trend	Slow to moderate – some level of change is generally expected and accounted for, so it is only as several of these changes start to occur simultaneously that the trend will may become prominent.
Likely timeframe trend will emerge over	Medium term for the production of WRPs – the issues underlying this trend are unlikely to become major events in the short term as the impacts will take some time to influence changes in the behaviour of different Parties.
Geographic scale of trend	Will manifest as a result of different drivers in different regions across the Basin – in the northern Basin the development of NGCS and intensive agriculture is likely to be more predominant, and in the southern Basin the diversification of agricultural communities is likely to have a greater impact.

3.3 Trend 3 – where have all the people gone

3.3.1 Trend identification

The capacity of Parties to implement the Plan could be affected by:

- Changes in their permanent, casual or contracting staffing levels in areas of specialisation needed to comply with obligations under the Plan and the Act.
- Changes in operating budgets allocated to planning studies and investigations.

This trend may evolve as a result of the overall fiscal position of Parties and has the potential to impact all areas of Plan implementation and compliance, specifically the development and implementation of WRPs, WQSMPs, EWPs, and water trading rules.

3.3.2 Parties' response

This could manifest as Parties having insufficient resource capacity to:

- Prepare a plan required under the Plan.
- Prepare a plan of sufficient quality, or within the required timeframe.
- Implement or maintain a plan, including meeting monitoring and reporting requirements.

3.3.3 Representation of the trend

The trend could take following forms:

- Major re-organisation of public sector departments and agencies responsible for water resource planning and water quality management (separation or amalgamation).
- Delays in changing or updating operational plans and procedures relating to water resource management in a region slowing the "on the ground" implementation of Plan actions.
- Reduced revenue and Government objectives to return to surplus lead to reduced government spending on water resource planning, Plan implementation, and maintenance of existing and investment in new infrastructure.
- Further reductions in the role, internal capacity, and budget of catchment management authorities (CMAs) across many Basin States may continue. This could result in a loss of local knowledge of environmental assets and may reduce environmental oversight capability.
- Mass rationalisation, privatisation, or structural separation of rural water authorities as urban expansion into rural areas increases and the public sector attempts to unlock value in regulated assets and drive competition.

3.3.4 Key events that could change the pace and scale of the trend

The pace and geographical scale of the trend could be changed by the following events

- Increase the pace of the trend: extreme weather events place further unexpected constraints on resources; reduction government budget allocations to water management and the environment post current round of Plan implementation funding; skills shortages due to higher real wages in other sectors.
- Decrease the pace of the trend: development of enforcement and compliance remote sensing technologies may help to monitor water theft; fully automated customer billing and water delivery monitoring technologies are installed; renewable energy is commercially viable in the region and can be used to power the water supply system at an acceptable level of cost.
- *Increase the geographical scale of the trend:* restructuring or rationalisation of CMAs, rural water corporations, or state water resource and environment agencies.
- Decrease the geographical scale of the trend: greater accuracy and precision in identifying emerging risks to water availability, security, and reliability.

Changes in the pace and scale of the trend can be predicted by monitoring strategic drivers of change relating to emerging issues regarding changes in economic conditions (these are summarised in section 4.2 and detailed in Appendix I).

3.3.5 Profile of trend

A brief profile of this trend is provided in Table 12.

Table 12: Brief profile of Trend 3 – where have all the people gone

Profile	Comment
Key emerging issues that could give rise to trend	 Declining state revenue Water right holders cannot afford increases in tariffs to fund investment required to secure future water supply Decline in real wages causes communities to be more concerned about job security than stronger environmental or social regulations Substantial reduction in public sector spending on water reform Increased focus on protecting infrastructure and assets from natural disasters Catchment management authorities cease to exist and functions are reassigned / merged to another government agency Local council passes all statutory and regulatory responsibilities for water to rural water corporations
Areas of the Plan affected	WRPs WQSMPs EWPs Water trading rules
Parties affected	Basin States, water delivery agencies implementing actions under the Plan, and MDBA in relation to their ability to assess and recommend plan obligations for adequacy/suitability.
Current pace of trend	Fast – many of the factors which would increase the pace of this trend (eg skills shortages, slowing economic growth, growing government deficit etc.) are already apparent and show no signs of fading.
Likely timeframe trend will emerge over	Short-term – this is an immediate issue given government budget constraints and changing priorities, and is likely to be an ongoing issue as skilled workers may continue to find higher wages in capital cities and other sectors like mining.
Geographic scale of trend	Basin wide, but the magnitude of the trend will vary between States (and MDBA) – magnitude is likely to be greater in the northern Basin as there may be stronger competition for skills and labour given the development of NGCS projects.

3.4 Trend 4 – from public opinion to legal action

3.4.1 Trend identification

Communities, industry, and stakeholders are demonstrating a greater inclination to threaten and / or proceed with legal challenges to government decisions and actions that are somewhat untested in this context. Areas of the Plan most susceptible to legal challenge include Environmental Watering activities (ie inundation of private land, competing views on the prioritisation of watering activities), and the priority given to economic, social, and environmental considerations in plans, rules, and decisions.

For example, two irrigation farmers recently filed a case to the Federal Court (*Daniel Thomas Lee & Anor v Commonwealth of Australia & Anor,* 19 December 2012 – still under judicial review²⁷) claiming that the State water entitlement holder had used its trading and holding powers to obtain "*a position of dominance and control in the State water markets adversely affecting the price of water entitlements and allocations, access to water assets, and the value of such property*".

This trend could be strongly affected by changing community and political views towards the value, cost and benefit of environmental waters (Trend 7 – Changing perceptions of "value"). The polarisation of community attitudes into "pro-development" and "pro-environment" factions is also likely to drive this trend.

3.4.2 Parties' response

Increasing numbers of threatened or actual legal challenges could result in Basin States being unable to develop plans, or to implement already developed plans. Resources may be diverted to respond to legal challenges, constraints, and injunctions, threatening the overall implementation of the Plan by causing significant delays.

3.4.3 Representation of the trend

The trend could take the form of:

- Legal challenge to the amount of water to be returned to the environment (eg South Australia threatening a High Court legal challenge to the Plan based on the claim that not enough water is being returned to the Murray River for the environment).
- "Environmental defenders" threatening legal action on the basis that particular Plan actions may contravene international agreements such as the Convention on Wetlands of International Importance (Ramsar Convention).
- Legal challenge from landholders and / or industry groups to State or Commonwealth legislation including compulsory acquisition of land for planned works.
- Increasing incidence of appeals to administrative tribunals against actions to implement plan measures (eg Environmental Water delivery works approvals).

3.4.4 Key events that could change the pace and scale of the trend

The pace and geographical scale of the trend could be changed by the following events:

- Increase the pace of the trend: successful Land and Environment Court challenges to government
 approved development projects, growth in the complexity and quantity of competing interests as a result of
 urbanisation and / or industrialisation of rural areas; environmental issues become a top priority for voters;
 extreme weather events place extra pressure on water resources; increase in market prices for water,
 community or industry perception that water reform agenda is highly politicised and therefore their region or
 industry is being unfairly treated.
- Decrease the pace of the trend: current legal challenges to the Plan are unsuccessful and set precedence for future challenges (eg interpretation of "have regards to" in Section 8.25(2), which specifies the matters that a Basin State must have regard to in preparing annual environmental watering priorities. Justice

²⁷ Federal Court of Australia, Victoria Registry (2012)

Brennan said "a decision-maker who is bound to have regard to a particular matter is not bound to bring to mind all the minutiae within his knowledge relating to the matter"²⁸).

- Increase the geographical scale of the trend: changes in the number and location of threatened flora and / or fauna; expansion of native title claims over water; recognition of high value environmental assets in the Basin; perception that significant flooding of private land will occur.
- Decrease the geographical scale of the trend: continuation of wetter climatic conditions is likely to see environmental and consumptive demands more fully met, reducing scale of areas for disputation to more localised "hot spots"; failure of significant legal challenges may also strain the financial resources of litigants, leading some state based farmer or environmental peak bodies to abandon legal challenges.

Changes in the pace and scale of the trend can be predicted by monitoring strategic drivers of change relating to emerging issues regarding changes in community attitudes towards environmental values/assets (these are summarised in section 0 and detailed in Appendix I).

3.4.5 Profile of trend

A brief profile of this trend is provided in Table 13

Table 13: Brief profile of Trend 4 – from pr	oublic opinion to legal action
--	--------------------------------

Profile	Comment
Key emerging issues that could give rise to trend	 Development of/changes to existing multi-criteria analysis that takes social and economic impacts into greater account is developed for decision making regarding water allocation and planning Increased investment in land and water (and infrastructure investment) for agriculture Growth in metropolitan areas encroaches upon floodplains and catchments Peri-urban land is protected for residential growth by excluding land uses such as agriculture, forestry, and mining Change in the number and location of threatened species in Australia Change in obligations under international treaties such as the Ramsar Convention to combat climate change by increasing sites protected in exchange for compensation / funding from other countries Ongoing or increased degraded water assets (rivers and/or wetlands) Native title claims extend to rights over water Environmental issues (eg climate change) become a top priority for voters Communities seek more transparent and inclusive planning processes
Areas of the Plan affected	WRPs WQSMPs EWPs Water trading rules
Parties affected	Basin States, water delivery agencies implementing actions under the Plan, and MDBA in relation to their ability to assess and recommend plan obligations for adequacy/suitability.
Current pace of trend	Slow to moderate – initial legal decisions on challenges to the Plan will take some time to be reviewed and agreed upon.
Likely timeframe trend will emerge over	Short to medium term in relation to the development of plans – once initial decisions regarding legal challenges are made, precedents will be set and create more certainty regarding the possible outcome of future challenges to the plans. Long term in relation to the implementation of plans – legal challenges may arise from implementation activities as various interest groups begin to see changes in their operating environment as a result of the activities.
Geographic scale of trend	Regional or jurisdictional initially, could expand Basin wide if initial challenges are successful.

²⁸ High Court of Australia (1986)

3.5 Trend 5 – more forms, more reports, less time

3.5.1 Trend identification

A range of reforms and issues (including those related to the Plan as well as more broadly) could lead to increases in the reporting and regulatory obligations of Parties. This growing set of regulatory obligations may reduce the willingness and capacity of Parties to accept the regulatory obligations flowing from the Plan. Consequently, Parties may fully or partially fail to meet Plan obligations or pushback against new Plan obligations (this is linked to Trend 3 – Where have all the people gone).

3.5.2 Parties' response

This trend is likely to have a more significant impact on small to medium sized Parties that have limited capacity to respond effectively to new or changed regulations. Larger Parties generally have more flexibility in allocating resources to respond to new or changed regulations and are therefore less likely to prioritise the regulations they are able to comply with.

3.5.3 Representation of the trend

The trend may take the form of:

- Tighter regulation (eg approval trigger for water impacts under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) increases monitoring and reporting requirements for affected issues such as water quality.
- Wide range of Commonwealth and State regulators involved in regulating water trading (eg ACCC, ASIC, State Government Departments, Approval Authorities, State Government agencies responsible for consumer protection such as the Office of Fair Trading).
- Increases in water borne diseases require changes in water management regimes and intensive monitoring programs to minimise opportunities for vectors to reproduce and reduce the risks to public health.
- Overlap and duplication in water resource modelling and reporting among various government departments and agencies, particularly regarding groundwater modelling approaches (eg Department of Sustainability, Environment, Water, Population and Communities' (SEWPaC) Bioregional Assessments).
- New natural resource management actions relying on market based instruments (markets for pollution permits for salt, nutrients, vegetation, eco-system services, or biodiversity offsets) create additional administration regarding lodgement, processing, approving and reporting of "transactions".
- Tighter regulation for construction and maintenance of works for water supply (planning permits, environmental impact statements, EPBC approval, cultural heritage controls and permits etc).
- Adoption of international water efficiency standards creating significant compliance burden for agriculture sector and State regulators.
- Extension of carbon price and trading to include agricultural emissions or changes to emission thresholds that bring more entities into the trading and reporting regime (longer term trend as significant research and development is required to set agricultural emission baselines).

3.5.4 Key events that could change the pace and scale of the trend

The pace and geographical scale of the trend could be changed by the following events:

- Increase the pace of the trend: Unforeseen incidents resulting in harm to environment, public and/or public infrastructure leading to a response of tighter/greater regulation; greater regulation of interception activities (e.g. farm dams, floodplain harvesting).
- Decrease the pace of the trend: technological and data management improvements reduce the reporting burden on Parties. Smaller to medium size Parties derive their funding from user paid systems and end-users unwilling to pay increased charges to cover costs of resources to manage additional regulatory requirements leading to minor regulatory changes.

- *Increase the geographical scale of the trend:* States take proactive action to mitigate risk of isolated incidents recurring in their jurisdiction.
- Decrease the geographical scale of the trend: some States develop and implement effective "red-tape" reduction strategies resulting in less regulation for Parties to administer or comply with (eg Queensland are aiming to reduce regulation by 20%).

Changes in the pace and scale of the trend can be predicted by monitoring strategic drivers of change relating to emerging issues regarding changes in institutional arrangements and relationships (these are summarised in section \Box and detailed in Appendix I).

3.5.5 Profile of trend

A brief profile of this trend is provided in the table below.

Profile	Comment	
Key emerging issues that could rise to trend	 Greater emphasis on biodiversity offsets and corridors, and the value of ecosystem services Expansion of water borne diseases such as Barmah Forest Virus cause public health issues Tension between the role of Commonwealth and the role of State government in regulation, approvals, management of water, etc Rural water corporations expand products and services (eg renewable energy) Review of Strategic and Statutory Planning Systems Expansion of EPBC requirements to include consideration of water issues on large coal mining and coal seam gas developments (potential for this to extend into other regulated land and water uses) Market based instruments become the norm for achieving resource efficiency and natural resource management outcomes 	
Areas of the Plan affected	WRPs WQSMPs EWPs Water trading rules	
Parties affected	Basin States, trade approval authorities, water system operating authorities, irrigation infrastructure authorities.	
Current pace of trend	Slow to moderate – extent of additional burden on Parties may increase gradually over time as obligations and associated administration (reporting etc.) becomes clearer and expectations grow.	
Likely timeframe trend will emerge over	Short to medium term – additional regulatory requirements will begin to impact Parties as soon as they commence implementation of the Plan.	
Geographic scale of trend	Basin wide, with jurisdictional and regional variances – may have a greater impact on smaller corporations in more remote areas that have less access to resources (eg in the northern Basin).	

Table 14: Brief profile of Trend 5 - more forms, more reports, less time

3.6 Trend 6 – the modelling race

3.6.1 Trend identification

Parties and / or stakeholder groups with vested interests may seek to challenge implementation of the Plan by producing modelling that provides contradictory conclusions regarding the potential impact of implementation activities.

Rapid development and adoption of advanced computing capability, widespread updates of remote sensing data, and the application of new modelling techniques could create divergent views between States (and MDBA) regarding:

- Baseline conditions.
- Assessment of the magnitude and impact of interception activities.
- Assessment of SDL and compliance.
- Assessment of the effectiveness of watering plan actions.
- Allowable trade rules.

3.6.2 Parties' response

In response to divergent views, Basin States may slow (or cease) the development of WRPs and EWPs, and seek a review of guidelines or Plan obligations. This may also affect the process of MBDA reviewing and making recommendations on plans for accreditation and may result in MDBA activating the step in provisions in s.68 of the Act. Divergent views may also affect community, industry, and stakeholder confidence in the implementation of the Plan and associated planning activities.

3.6.3 Representation of the trend

The trend could take the form of:

- Improvements in the accuracy of accounting for floodplain harvesting targeted to improve the accuracy of the overall water balance (particularly water interception and take), and to allow accounting for net take for Environmental Watering in floodplain systems (environmental water requirements and use).
- Advanced computing and the provision of enhanced data (from government and / or commercial sector) enables deeper and more complex analysis, providing greater accuracy and precision in identifying emerging risks to water availability, security, and reliability.
- Enhancement to water delivery monitoring technologies allows more accurate monitoring of delivery volumes and cost-effective monitoring of previously unmonitored extractions (ie stock and domestic supplies), which challenges assumptions made in the development of the Plan.

3.6.4 Key events that could change the pace and scale of the trend

The pace and geographical scale of the trend could be changed by:

- Increase the pace of the trend: developments in modelling that provide a better understanding of the
 connectivity between surface and groundwater; stakeholder interest in climate change modelling; private
 sector investment in alternative datasets and modelling methods; high levels of media attention;
 endorsement of methods by national or international scientific communities without specific reference to the
 Basin context.
- Decrease the pace of the trend: stronger regulation around intellectual property and privacy may limit the data available or reduce the legitimacy of alternative models and datasets; costs for access to technology may reduce the uptake of new technologies.
- Increase the geographical scale of the trend: emergence of cost-effective satellite based remote sensing technologies for assessing environmental condition, water use and take could result in widespread uptake of new techniques across the Basin.
- Decrease the geographical scale of the trend: constrained resources in state and federal agencies may limit uptake of new modelling and monitoring techniques to only some jurisdictions, or may see these

techniques focused on only a few intensively developed WRP areas or very high value environmental assets (eg iconic sites).

Changes in the pace and scale of the trend can be predicted by monitoring strategic drivers of change relating to emerging issues regarding changes in science and technology (these are summarised in section 4.6 and detailed in Appendix I).

3.6.5 Profile of trend

A brief profile of this trend is provided in Table 15.

Table 15: Brief	profile of Trend	6 – the modelling race
-----------------	------------------	------------------------

Profile	Comment
Key emerging issues that could	 Advancements in technology reduce the cost of operations and increase the effectiveness of activities by Parties (eg rapid adoption of advanced computing capability)
rise to trend	 Significant advancement in technologies for floodplain water balance monitoring, and measurement of floodplain harvesting
	Fully automated customer billing and water delivery monitoring technologies are installed
	 Rapid adoption of advanced computing capability (cloud computing, high speed broadband, analysis of very large datasets, simulation and modelling)
	 Modelling is advanced to better understand the connectivity between surface water and groundwater
	 New surface water and catchment modelling tools are widely implemented in Basin states as a result of implementation of the National Hydrologic Modelling Strategy
	Communities and industries seek more transparent and inclusive planning processes
	 Local communities lack accurate and comprehensive information about government decisions affecting their community, and are influenced by outside interest groups providing alternate views
Areas of the Plan	WRPs
affected	WQSMPs
	EWPs
	Water trading rules
Parties affected	Basin States and MDBA.
Current pace of	Slow for research based areas - there is limited research investment in freshwater ecology.
trend	Potentially fast paced for advances in modelling methods – investments in remote sensing technology for water resources assessment are already occurring.
Likely timeframe trend will emerge over	Medium to long-term – technology and models will take time to be accepted by key institutes and organisations and significant investment in research and development (R&D) is required.
Geographic scale of trend	State specific, with potential for cascading response from other States – significant investment is already occurring in the southern Basin in relation to trials of the National Hydrologic Modelling Strategy tools, with potential for a cascading response from other State governments.

3.7 Trend 7 – changing perceptions of "value"

3.7.1 Trend identification

Change in community and political views regarding the value and benefits of economic development over the environment may delay or prevent the development and implementation of EWPs. Views may also be affected by social preferences that favour either a 'green' or 'brown' economy (driven by economic considerations) and the third-party impacts and values of Environmental Watering activities. This trend may also be influenced by the outcome of Trend 4 - From public opinion to legal action. If any legal challenges to the Plan are successful, this may play a role in influencing public perceptions of value that can be best achieved from the Plan.

3.7.2 Parties' response

This trend is likely to affect Basin States and environmental water holders, and may have follow-on implications for water recovery to achieve the targeted SDLs.

3.7.3 Representation of the trend

The trend could take the form of:

- Previously environment-focused policies are required to demonstrate stronger economic value (eg carbon farming amended to include forestry as renewables; active land management is shown to be more cost effective).
- Communities observing global (eg EuroZone decline, slowing in China's economic growth), national (eg rising unemployment tipped to be 6% by late 2014²⁹), and regional (eg closure in early 2013 of Cowra's Windsor Farm Foods resulting in loss of 70 jobs³⁰) economic problems reprioritise their values, becoming more concerned with job security than environmental outcomes.
- Private sector finds the cost of doing business (eg cost of electricity exceeds cost of water resulting in businesses focusing efforts on energy efficiency rather than water efficiency, cost of water in the Basin becomes so expensive some irrigators choose to leave their business which in turns increases water related charges for remaining irrigators and businesses) and complying with regulation relatively high and threatens to move their business to a more competitive business environment, essentially advocating for less regulation and greater flexibility.

3.7.4 Key events that could change pace and scale of the trend

The pace and geographical scale of the trend could be changed by:

- Increase the pace of the trend: pressure from industry to reduce environmental regulation; slow economic growth means that communities and governments are willing to accept a certain amount of damage to the environment; increase in local government planning approvals for development projects.
- Decrease the pace of the trend: increasing media attention on environmental assets in the Basin area; demographic and industry diversification in the Basin (eg increase in "tree change" residents who can utilise the National Broadband Network (NBN) for business); development of economically viable "green" industries (eg nature based tourism) across the Basin.
- Increase the geographical scale of the trend: test cases that challenge the prioritisation of values could initially be highly localised, but could rapidly expand if they set a precedent of Basin-wide importance; increased demand for Australian agricultural production could see significant increases in irrigated agriculture, demands for a focus on economic outcomes, and reduced support for environmental regulations and outcomes.
- Decrease the scale of the trend: land is set aside for biodiversity corridors and offsets (eg the Great Eastern Ranges initiative³¹, creating biodiversity corridors spanning western Victoria through to far north Queensland).

²⁹ NAB Group Economics (2013)

³⁰ "*The last order, the last line*" (2013) Cowra Guardian

³¹ The Great Eastern Ranges (n.d.)

Changes in the pace and the geographical scale of the trend can be predicted by monitoring strategic drivers of change relating to:

- Emerging issues regarding changes in institutional arrangements and relationships (these are summarised in section □ and detailed in Appendix I).
- Emerging issues regarding changes in economic conditions (these are summarised in section 0 and detailed in Appendix I).

3.7.5 Profile of the trend

A brief profile of this trend is provided in the table below.

Table 16: Brief profile of Trend	7 – changing	perceptions of	"value"
----------------------------------	--------------	----------------	---------

Profile	Comment
Key emerging issues that could give rise to trend	 Collapse in EuroZone creates another global financial crisis, significant slowdown in China's economic growth, United States relapses into recession Major population centres grow at the expense of regional and rural towns (ie migration to cities) Shifting rural demographics – tree change communities prioritising visual amenity of the land Decline in real wages of regional workforce Economic viability of coal mining e.g. structural change in global coal prices Greater emphasis on biodiversity offsets and corridors, and the value of ecosystem services Changes in State and / or Commonwealth governments give regional economies a greater political voice
	 Expansion of water borne diseases such as Barmah Forest Virus cause public health issues Lack of tangible initial response from the Plan Environmental Watering interventions
Areas of the Plan affected	EWPs WRPs
Parties affected	Basin States, Environmental water holders.
Current pace of trend	Moderate to fast paced – many of the issues that could give rise to the trend are present or emerging in the Basin.
Likely timeframe trend will emerge	Short to medium term in relation to the development of plans – plans will be developed in a period of ongoing economic uncertainty and shifting water use.
over	Long term in relation to the implementation of plans – perceptions of the merit and value of interventions arising from plan implementation is likely to will give rise to a further round of re- evaluation of the appropriateness of the balance between environment, economic, and social outcomes achieved from the current Plan.
Geographic scale of trend	Basin wide implications, with regional variances – northern Basin may focus more on economic opportunities, while some states affecting the southern Basin have demonstrated a preference for Environmental Watering.

3.8 Trend 8 – cannot measure, cannot comply

3.8.1 Trend identification

The availability of resources and technology for monitoring activities may affect the capacity and / or capability required of MDBA and Parties to effectively monitor Plan compliance. Inability to monitor and measure compliance would limit Parties' ability to demonstrate compliance (regardless of whether they have actually complied or not) and provides an incentive for non-compliant behaviour (if it is known that non-compliance cannot be proven).

3.8.2 Parties' response

Similarly, inability to prove (or disprove) compliance with the Plan may affect community confidence that Parties are 'doing the right thing', and inability to prove (or disprove) beneficial outcomes from implementation of the Plan may affect confidence in the appropriateness of the Plan itself. This trend may affect all Parties and all elements of Plan implementation. Conversely, an effective monitoring program may create an environment of high-detection, low-tolerance for non-compliance.

3.8.3 Representation of the trend

The trend could take the form of:

- Reduction in resources to enforce compliance with relevant legislation (eg unregulated interception activities are undetected and / or enforcement actions are limited).
- Critical maintenance of physical monitoring infrastructure being delayed and/or physical monitoring infrastructure not being expanded to adequately match the scope of various plans.
- Multiple water datasets being used and potential changes in water accounting standards are treated differently depending on the location and / or agency, making comparisons and benchmarking difficult.
- Increased remote monitoring could be used to detect water theft, however is legally viewed as an intrusion on privacy. During times of water scarcity, this may encourage increased water theft due to the perceived lack of enforcement capability.
- Restructuring of institutional arrangements for water management may create a knowledge gap that would reduce both the effectiveness and efficiency of monitoring efforts.

3.8.4 Key events that could change the pace and scale of the trend

The pace and geographical scale of the trend could be changed by:

- *Increase the pace of the trend:* return to drought conditions; significant institutional restructuring; resource and skill shortages (people and budget).
- Decrease the pace of the trend: confirmation that privacy laws do not pose a barrier to enhanced remote monitoring of compliance.
- Increase the geographical scale of the trend: continuation of or further reductions to constrained resourcing and budgets for water reform may result in a review and rationalisation of data monitoring networks, and a reduction in maintenance and consequent reliability of residual networks across the Basin.
- Decrease the geographical scale of the trend: return to drought conditions, possibly in conjunction with higher returns from irrigated agriculture, is likely to see strong community support for stronger monitoring and compliance enforcement in relation to water resource management and environmental water delivery.

Changes in the pace and geographical scale of the trend can be predicted by monitoring strategic drivers of change relating to:

- Emerging issues regarding major climatic events (these are summarised in section 4.5 and detailed in Appendix I).
- Emerging issues regarding changes in economic conditions (these are summarised in section 0 and detailed in Appendix I).

• Emerging issues regarding changes in science and technology (these are summarised in □ and detailed in Appendix I).

3.8.5 Profile of trend

A brief profile of this trend is provided in Table 17.

Table 17: Brief profile of Trend 8 – cannot measure, cannot comply

Profile	Comment
Key emerging issues that could rise to trend	 Privacy laws and policies allow greater use of electronic surveillance on private citizens Significant advancement in technologies for floodplain water balance monitoring, and measurement of floodplain harvesting Rapid adoption of advanced computing capability (cloud computing, high speed broadband, analysis of very large datasets, simulation and modelling) Fully automated customer billing and water delivery monitoring technologies are installed Establishment of a real-time electronic clearing house for the water market State water grids that span state boundaries are completed Catchment management authorities cease to exist and functions are reassigned / merged to another government agency
	 Reduced funding for water reform and ongoing constraint to water and environmental agency budgets Perception that funding for streamflow monitoring should be provided by the Commonwealth, conditioned by funding issued by the Bureau of Meteorology in recent years
Areas of the Plan affected	WRPs WQSMPs EWPs Water trading rules
Parties affected	All Parties
Current pace of trend	Moderate – the effects of monitoring on compliance will emerge once implementation activities have been running for a longer period of time.
Likely timeframe trend will emerge over	Long-term – this is likely to be an ongoing issue, as even with significant improvements in monitoring technology and capacity, there will constantly be new challenges that need to be addressed (eg complexity of ensuring continuity of data, development of methods and technology to avoid detection etc.).
Geographic scale of trend	Basin wide implications, with regional variances – highest current and future costs for monitoring are in the intensively developed regions of the southern Basin, and this is most likely the area where monitoring may be reduced. The consequences and risks to Plan outcomes are also commensurately greater in these intensively developed regions where SDLs will create the largest changes in water use.

4. Strategic operating environment will be influenced by a wide array of emerging issues

The eight trends were identified from an analysis of 100 emerging issues spanning six strategic drivers of change:

- 1. Changes in land and water use
- 2. Changes in economic conditions (global, regional, domestic)
- 3. Changes in the attitudes of communities
- 4. Major climatic events
- 5. Changes in science and technology
- 6. Changes in institutional arrangements and relationships



Figure 17 illustrates the geographical origin of the key emerging issues of each strategic driver of change.



Figure 17: Strategic drivers of change and their key emerging issues and geographical origin

4.1 Prioritisation of emerging issues

Emerging issues were extensively discussed by stakeholders as part of the consultation process. This provided valuable insight into which emerging issues were of highest priority to the different stakeholder groups consulted. This section provides a summary of the emerging issues but does not reflect the full list of issues, which is provided in Appendix I.

4.2 Changes in land and water use

The following emerging issues were commonly raised by stakeholders during the consultation process.

- Development of the coal and coal seam gas industry: rapid expansion of the industry is expected to lead to significant land and water use change both directly (from the industry's footprint) as well as indirectly (from increases in regional populations to provide support services). In Queensland for instance, as much as 40% of its Murray-Darling catchment area is reported to be covered by mining leases.³² Requirements to manage water resources associated with the new activities (ie the management of coproduced water) may also be introduced.
- Expansion of forestry: expansion of forestry in the Basin towards active forest management over passive forest management is potentially further supported through the Carbon Farming Initiative (by recognising

5

³² Sheehan, P (2013)

plantations as a way to reduce emissions from agriculture).³³ Increased competition from imported forest products may also see governments actively support the industry to avoid regional job losses associated with growing, processing, and exporting forest products.

- Global demand for food and fibre: may cause shifts in agricultural production (volume, location, industry mix) in response to global price movements. Such changes may lead to significant and difficult to forecast water demand. For example, in the northern Basin policies are being suggested that would increase the intensity of agriculture (from grazing to cropping). In the southern Basin, there is a growing cotton industry (eg in 2011/12 there was a record area of cotton planted in Southern NSW, with extensive areas planted in the Murrumbidgee, Lachlan and Lower Darling regions. 2011/12 also saw the first ever Southern NSW Cotton Expo which was well attended).
- **Growth in peri-urban development:** urbanisation in regional and rural areas drives growth in stock and domestic demands for basic water rights, which will need to be offset by reductions in other diversions to be compliant within SDLs. This is particularly relevant in Victoria and NSW, where plans like the Murray River Settlement Strategy are being developed to help encourage sustainable development along the cross-jurisdictional corridor.³⁴
- **Regional economic diversification:** there may be future diversification of businesses and industry within the Basin in response to government focus on regional economic development (eg support for eco-tourism, skills training in response to declines in traditional employment sectors, and programs like *evocities* to encourage "tree changes"³⁵) and the establishment of the NBN (eg appointment of NBN Readiness Coordinators in regional areas³⁶).

Collectively the emerging issues identified as strategic drivers of change in land and water use could give rise to Trend 2 – Too much change too quickly (refer to section 3.2).

³³ Australian Government (2013) *Carbon Farming Initiative*

³⁴ Victorian Department of Planning and Community Development (2012)

³⁵ Australian Government, NSW Government, and Regional Development Australia Riverina NSW (n.d.) *Country Change;* Evocities (n.d.)

³⁶ Regional Development Australia Riverina (2013)

4.3 Changes in economic conditions

Changes in economic conditions are one of the most common strategic drivers of change. The following emerging issues were commonly raised by stakeholders during the consultation process:

- Global economic conditions: uncertainty around global economic conditions (particularly after the 2008 global financial crisis) are impacting consumer and investor decisions that have the potential to affect Basin conditions, as well as the capacity of Parties to comply with the Plan. Specific events contributing to this uncertainty include the possibility of the collapse of the EuroZone, a high Australian dollar, and the uncertainty regarding the rate of growth of Asian economies combined with US economic recovery.
- **Demographic shifts:** while population growth in the Basin is slower (3%) compared to overall population growth in Australia (6%), there has been rapid growth in urban centres and towns in the Basin, which contained over 78% of the Basin population in 2006.³⁷ Stakeholders reported that the issue of an aging population and growth in urban centres at the expense of more rural and remote areas continues to have major impacts. Between 1996 and 2006 the number of people employed as farmers in the Basin decreased by 10%.³⁸
- State fiscal position: while most states experienced strong budget surplus figures in the early and mid-2000s, many now face budgetary problems as they attempt to recover from the impact of the global financial crisis in 2008 and recent extreme weather events.³⁹ For example, the Queensland government is budgeting for a fiscal deficit of \$7.7 billion in 2013-14 compared to the forecasted \$4.6 billion in 2012-13 as a result of flooding events and reduced revenue.⁴⁰ In South Australia, the government recently announced a record budget deficit of \$1.3 billion for 2013-14, with SA Water required to save \$16 million in operating costs over the next 3 years.⁴¹
- **Cost of doing business:** the cost of inputs to business (construction materials, water, electricity, transport, labour, etc.) have been rising, which when combined with increasing global competition has reduced the revenue and sustainability of some industries (eg manufacturing), and therefore reduces cash flow for rural water corporations. Some businesses have even been forced to close, such as the Heinz tomato sauce factory in northern Victoria, which resulted in the loss of 146 jobs as the factory was moved to New Zealand to be more competitive.⁴² The 2011 QLD Rural Debt Survey conducted by the Queensland Rural Adjustment Authority (QRAA) reported debt levels have had increased by 19% (\$2.6 billion) from 2009 to end of 2011 a \$1.07 million average debt per borrower.⁴³

Collectively the emerging issues identified as strategic drivers of change in economic conditions could give rise to:

- Trend 1 Pushing the boundaries (refer to section 3.1)
- Trend 2 Too much change too quickly (refer to section 3.2)
- Trend 3 Where have all the people gone (refer to section 0)
- Trend 7 Changing perceptions of "value" (refer to section 0)
- Trend 8 Cannot measure, cannot comply (refer to section 0)

 ³⁷ Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics, and Bureau of Rural Sciences (2009)
 ³⁸ Australian Bureau of Statistics (2008)

³⁹ Novak, J (2011)

⁴⁰ Queensland Government (2013)

⁴¹ Williamson, B (2013)

⁴² Heasley, A (2012)

⁴³ AgForce Queensland Industrial Union of Employers (2012)

4.4 Changes in attitudes of communities

The following emerging issues were commonly raised by stakeholders during the consultation process:

- Shifting community values and priorities: job losses are causing people to become more concerned about the state of the economy and job security, with the environment receiving less support as a priority issue. Farm cash income for irrigated horticulture producers in the Basin reduced by 15% between 2001-02 and 2008-09.⁴⁴ Additionally, negative water quality events (natural, regulated, or environmental) such as black water events, salinity spikes, and public health concerns (water borne illnesses) could lead to even further reduced community support for Environmental Watering activities.
- Changing role of communities / citizens in government decision making: communities now have greater opportunities to participate in government and private sector decision making processes. The Australian Government's reform blueprint *Ahead of the Game* (2010) placed significant emphasis on citizen-centric practices and citizen surveys to support reform.⁴⁵ In the Hunter Valley, the Upper Hunter Mining Dialogue used a partnership approach to bring together industry, stakeholders, and communities to help inform and collaborate on mining and water access issues in Naomi.⁴⁶

However, trust in government has also been declining over recent years, which may lead to campaigns against implementation of Plan activities. Research produced by Flinders University showed that groups that are disadvantaged are more likely to distrust government and that past negative experiences within government systems and processes make it difficult to increase trust in future government systems and processes.⁴⁷ Furthermore, an Australian National University (ANU) survey found that 18% of Australians think that "better government" is the most important problem facing Australia today, up from 5% in 2010 and demonstrating an increasing scepticism about government making fair and equitable decisions.⁴⁸

• Changing political positions towards water reform: during periods of prolonged drought, greater focus is placed on water management and often leads to more community support and government funding in this area (with the opposite also being true). During Australia's Millennium drought (1997-2009), major reform and investments in the water sector led to more than a 50% increase in productivity in the sector, contributing to Australia becoming one of the most water efficient (per head of capita basis) industrialised countries.⁴⁹ Changes in Commonwealth and / or State government could also have significant impacts on the direction of water reform in upcoming years. For instance, it was recently announced that the Coalition was considering a \$30bn plan to build 100 new dams across Australia to help prevent floods, fuel power stations, and irrigate food bowls.⁵⁰

Collectively the emerging issues identified as strategic drivers of change in community attitudes are most likely to give rise to:

- Trend 7 Changing perceptions of "value" (refer section 0)
- Trend 4 From public opinion to legal action (refer section 0)

The emerging issues may also play a role in changing the pace and scale of other trends such as:

- Trend 3 Where have all the people gone (refer section 0)
- Trend 5 More forms, more reports, less time (refer section 3.5)
- Trend 8 Cannot measure, cannot comply (refer section 0)

⁴⁴ Ashton D, Oliver M, and Formosa T (2011)

⁴⁵ Holmes, B (2011)

⁴⁶ NSW Minerals Council (n.d.)

⁴⁷ Blog at Flinders (2013)

⁴⁸ Berg, C (2012)

⁴⁹ Australian Government, Australian Trade Commission, Department of Innovation, Industry, Science and Research, and Australian Water Association (2011)

⁵⁰ "Coalition readies \$30b plan for 100 dams: report" (2013), *The Sydney Morning Herald: Environment*

4.5 Major climatic events

Major climatic events can create a number of emerging issues for the Basin. The following emerging issues were commonly raised by stakeholders during the consultation process:

- Increased impact and frequency of natural disasters: flooding and bushfire events have had significant impacts on the Basin over the last decade. Large-scale bushfires in water harvesting catchments has implications for water availability and quality both immediately (increases in rapid run-off immediately following the event, plus water quality issues associated with ash) and in the long-term (increased interception of water by new growth forests) as demonstrated. The 2011 floods in Brisbane are estimated to have caused \$5-6bn worth of total damage to public infrastructure across the state and caused negative impacts to downstream water quality because of increased sediment and nutrients in waterways.⁵¹
- **Gradual / incremental climatic changes:** temperatures are expected to rise by 0.5-2.0% by 2030 in inland regions of the Basin, and by 0.8-6.5% by 2070. Furthermore, summer rainfall predictions range from decreases of 60% to increases of 40% in different parts of the Basin (by 2070), and evaporation is predicted to increase to 15% in 2030 and as much as 45% in 2070.⁵² The impact of these changes on the Basin is not yet fully understood, however they will increase uncertainty around water availability in coming years.
- **Public health:** changes in climate may also create an environment in which certain water borne diseases are able to thrive due to impacts on virus replication, immunity of host animals, and mosquito breeding and survival. This increasingly unpredictable risk environment is particularly relevant to the Ross River virus, Barmah Forest virus, and Murray Valley encephalitis.⁵³

Collectively the emerging issues identified as strategic drivers of climate change are most likely to give rise to:

• Trend 2 – Too much change too quickly (refer to section 3.2)

The emerging issues may also play a role in changing the pace and scale of other trends such as:

- Trend 1 Pushing the boundaries (refer to section 3.1)
- Trend 7 Changing perceptions of "value" (refer to section 0)

⁵¹ Queensland Floods Science, Engineering and Technology Panel, Office of the Queensland Chief Scientist (2011)

⁵² CSIRO (2011)

⁵³ Woodruff R, and Bambrick H (2008)

4.6 Changes in science and technology

The Plan is underpinned by current knowledge and understanding. The following emerging issues were commonly raised by stakeholders during the consultation process:

- Technology increases water supply: there are a range of technologies being explored that could impact water supply. Examples include urban rainwater harvesting, evaporation control, accessing water in deep aquifers, and cloud seeding technology (this has been trialled by SnowyHydro in the Snowy Mountains and was found to increase snowfall by an average of 14% without negative environmental impacts⁵⁴). Furthermore, advancements in renewable energy and energy efficiency technology could decrease the costs of desalination or even replace hydropower demands.
- Technology improves the efficiency, measuring, and monitoring of water use: advancements in technology have the potential to reduce the demand for water from industry (eg biomass innovation could increase the output per hectare in forestry without requiring additional water), improve water quality (eg eliminating the risks of blue-green algae), increase connections throughout the water grid (eg less expensive tunnelling and pipeline technology; reduced energy usage of conventional pumping technology), and enable better water monitoring and accounting (eg measuring floodplain harvesting, advanced computing and high speed broadband, or monitoring of stock and domestic water).
- Emergence of an advanced water market: the development of a more sophisticated water trade market could emerge through use of a real-time online clearing house and a state water grid that extends across state boundaries. For instance, there are already a number of online water trading platforms initiated by private brokers in Australia, but in November of 2009 the Australian government announced the National Water Market System project which includes initiatives such as the development of a National Water Market website and improved interoperability between water registers.⁵⁵ Furthermore, a new interstate trade schedule was established by Murray-Darling Basin Ministerial Council at the beginning of the 2006/07 financial year.⁵⁶

Collectively the emerging issues identified as strategic drivers of change in science and technology are most likely to give rise to:

- Trend 2 Too much change too quickly (refer to section 3.2)
- Trend 6 The modelling race (refer to section 0)

The emerging issues may also play a role in changing the pace and scale of other trends such as:

- Trend 7 Changing perceptions of "value" (refer to section 0)
- Trend 8 Cannot measure, cannot comply (refer to section 0)

⁵⁴ Snowyhydro limited (2012)

⁵⁵ National Water Market (2012)

⁵⁶ MDBA (2013) Interstate water trade

4.7 Changes in institutional arrangements and relationships

Implementation of the Plan involves a large number of parties across the Basin. The institutional arrangements and relationships of those parties and how they interact will therefore have a strong influence on Plan compliance. The following emerging issues were commonly raised by stakeholders during the consultation process:

- Roles and responsibilities in regulating and managing water: roles and responsibilities regarding water vary across states and government agencies, with instances of overlapping roles and duplication in responsibilities occurring. This has been further complicated in recent years with the emergence of new or existing bodies playing a larger role in the water sector (eg relevance of Office of Fair Trading as a result of the water trade market), as well as actual and potential restructuring under various reforms (eg NSW plan to merge CMAs, Livestock Health And Pest Authorities, and parts of the Department of Primary Industries to form the Local Land Services⁵⁷; and more broadly the NSW Planning Review⁵⁸).
- Role, products, and services of rural water corporations: rural water corporations could face dramatic changes in the coming decades as a result of the privatisation of regulated services, increasing urbanisation leading to their rationalisation, or structural separation of their services in an attempt to unlock value and drive competition around regulated assets. These pressures may also lead rural water corporations to consider diversification of their product and service offerings, potentially into areas such as renewable energy.
- State-based laws and regulation for the water market: there are potential changes to state-based laws and regulation that could increase the complexity of water accounting and alter the behaviour of the water market. Examples include recognising water volumes returned to the same water source (ie net water licencing), recognising recycled water, expanding the NSW embargo on trade to the environment, and recognising transmission losses in trade policy.
- **Co-operative versus competitive Federalism:** Plan implementation and compliance could be affected by poor quality Commonwealth and State government relations (water management has been a fundamental State Government role). Relationships could be strained as a greater number of national reforms (eg Schools Education Improvement Reform, Health and Hospital Reform, GST Distribution, Environmental approvals for projects potentially impacting matters of national environmental significance etc.) become more contentious.

Collectively the emerging issues identified as strategic drivers of change in institutional arrangements and relationships are most likely to give rise to:

- Trend 5 More forms, more reports, less time (refer to section 3.5)
- Trend 7 Changing perceptions of "value" (refer to section 0)

⁵⁷ Virtue, R (2012)

⁵⁸ Moore T, and Dyer R (2012)

5. Environmental scan must be refreshed to remain relevant and useful

An environmental scan must be periodically refreshed. Emerging issues, trends, and threats to compliance will change over time and it is essential that MDBA stay abreast of the pace and scale of change to inform risk assessments and cost effective interventions.

5.1 Categories of emerging issues, trends, and threats to remain constant

It is recommended that MDBA retain the structure underpinning the environmental scan of:

- Six types of strategic drivers of change emerging issues can be added to or removed from a strategic driver of change.
- **Eight trends** examples of how the trend materialises in relation to WRP, WQSMP, EWP, and water trade can be added or removed from a trend.
- Four threats to compliance specific risks to compliance that may eventuate from threats can be added to or removed from each type of threat.

The rationale for retaining the structure is:

- A common language and shared understanding within and outside of MDBA regarding what constitutes an emerging issue, trend, or threat will improve the efficiency and effectiveness of future scans.
- A simple narrative for the environmental scan and strategic operating environment for compliance can be conveyed (ie emerging issues can be grouped into strategic drivers of change, types of strategic drivers of change give rise to trends, trends can affect the behaviour and actions of Parties, continuation of actions and behaviour may present threats to compliance, and specific compliance risks flow from threats).

5.2 Framework to refresh environmental scan

This section outlines how MDBA can refresh the environmental scan through four phases:

- 1. **Phase One Establishment**: establish the necessary systems and processes to maintain the emerging issues, trends, and threats identified in this report.
- 2. **Phase Two Implementation**: disseminate the findings of the initial environmental scan and train selected staff in the processes of identifying, adding, and updating emerging issues, trends, and threats to compliance.
- 3. **Phase Three Refresh**: periodically refresh selected emerging issues, trends, and threats to compliance based on most recent available data and information.
- 4. **Phase Four Rescan**: conduct a full rescan of emerging issues, trends, and threats to compliance and upgrade MDBA's environmental scanning capabilities (people, processes, and systems).

Compliance and Assurance Environmental Scan Manager	Knowledge and Information Team Business Analyst	Content / Document Management System Developer	Environmental Scan Contributor	All MDBA staff	External stakeholders	ACTIVITY
٠	٠	•				PHASE 1: ESTABLISHMENT
•			•			PHASE 2: IMPLEMENTATION
•			•	•	•	PHASE 3: REFRESH TIMELITY TRENDS ISSUES every 6 months
•	•		•		•	PHASE 4: RESCAN & UPGRADE

Figure 18 illustrates the framework for refreshing an environmental scan.

Compliance and Assurance Environmental Scan Manager	Knowledge and Information Team Business Analyst	Content / Document Management System Developer	Environmental Scan Contributor	All MDBA staff	External stakeholders	ACTIVITY
•	•	•				PHASE 1: ESTABLISHMENT
•			•			PHASE 2: IMPLEMENTATION
•			•	•	•	PHASE 3: REFRESH THELATE TRENDS ISSUES
•	•		•		•	every 6 months PHASE 4: RESCAN & UPGRADE

Figure 18: Framework for refreshing an environmental scan



Figure 18 identifies the key personnel (roles) and stakeholders heavily involved in planning and delivering each phase.

5.3 Environmental scan continuous improvement strategy

5.3.1 Progress through the environmental scan framework should depend upon achieving specific outcomes

Table 18 outlines the outcomes for each phase of the environmental scan. The outcomes should be used to manage executive, staff, and external stakeholder expectations regarding the Compliance and Assurance team's progress through the four phases.

Environmental scan phase	Outcomes
Phase One – Establishment	 Emerging issues, trends, and threats to compliance are accessible and discoverable by MDBA staff.
	 Water trade, water quality and salinity management, water resource planning, and environmental water compliance risks are identified and recorded in the Compliance and Assurance Risk Register.
Phase Two – Implementation	 MDBA Business Units allocate a designated environmental scan contributor to work with the Compliance and Assurance team to refresh the scan.
	2. Each MDBA Business Unit has a trained environmental scan contributor.
	3. MDBA Business Units find practical application of the environmental scan to prepare and test possible interventions to prevent (avoid, reduce, minimise) non-compliance.
Phase Three – Refresh	 Emerging issue, trends, and threats to compliance have been periodically updated by an environmental scan contributor.
	Environmental scan emerging issues, trends, and threats to compliance have been regularly accessed by MDBA staff and used to inform external stakeholder engagement strategies.
	3. External stakeholders have participated in at least one refresh session focused on specific trends, threats to compliance, and risks.
	 MDBA Executive is able to use environmental scan findings to assist in prioritising Plan implementation resources.
Phase Four –	1. Environmental scan has been actively used to identify, assess, and prioritise compliance risks.
Rescan and Upgrade	2. Environmental scan has been actively used to prepare and test MDBA's readiness to respond to scenarios under which Parties may either:
	a) Not fulfil a compliance obligation.
	b) Take longer than required to fulfil a compliance obligation.
	c) Not meet a prescribed standard or guideline when fulfilling a compliance obligation.
	3. Environmental scan approach has proven to be an effective and efficient mechanism for collaborating with Parties.

Table 18: Environmental scan outcomes

П

5.3.2 Timelines



Figure 19 identifies the key milestones and timeline for each environmental scan phase. The diagram illustrates the proposed overall environmental scan work program for the next four years (2013-14 to 2016-17).



Figure 19: Environmental scan four year work program milestones and timelines

5.3.3 Roles and resourcing

The following tables outline the roles and responsibilities for each phase of the environmental scan and the number of staff required to perform each role.

Role	Description	Resourcing
Compliance and Assurance Environmental Scan Manager	 Scope environmental scan information management system functionality (user requirements). Oversee the development of environmental scan information management system. Coordinate the use of environmental scan content for compliance risks assessments. 	One
Knowledge and Information Team Business Analyst	 Prepare environmental scan business requirements document. Prepare environmental scan system design requirements. Prepare environmental scan information system costs. 	One
Content / Document Management System Developer	 Develop the environmental scan information system using existing MDBA systems. Test environmental scan information system. Deploy environmental scan information system. 	One

Table 19: Phase One (Establishment) - environmental scan roles and resourcing

Table 20: Phase Two (Implementation) - environmental scan roles and resourcing

Role	Description	Resourcing
Compliance and Assurance Environmental Scan Manager	 Develop environmental scan contributor role description. Prepare environmental scan contributor training materials. Engage with MDBA Business Units to identify staff member to fulfil the Environmental Scan Contributor role. Facilitate Environmental Scan contributor training. Organise and facilitate MDBA Business Unit environmental scan / risk assessment workshops. 	One
Environmental Scan Contributor	Participate in environmental scan training.	One per MDBA Business Area (water trade, environmental water, water quality and salinity management, water resource planning)

Table 21: Phase Three (Refresh) – environmental scan roles and resourcing

Role	Description	Resourcing
All MDBA staff	 Use emerging issues and trends information to inform engagement with Parties. Use emerging issues and trends information to identify compliance risks. 	All MDBA staff that engage directly with Parties
Compliance and Assurance Environmental Scan Manager	 Update environmental scan threats to compliance based on new information and update trends. Monitor the frequency of new emerging issues and trends being added. Monitor the frequency of updates to existing emerging issues and trends. Produce quarterly reports describing changes to emerging issues and trends. Promote the use and value of the environmental scan content to MDBA 	One

Role	Description	Resourcing
	 Participate in environmental scan initiatives and projects within Commonwealth Government. Respond to requests from external stakeholders and Parties regarding new and changes to emerging issues and trends. 	
Environmental Scan Contributor	 Liaise with Business Unit staff members to identify data and information relevant to emerging issues, trends, and threats to compliance. Add new emerging issues. Update existing emerging issues. Add new trends. Update existing trends. 	One per MDBA Business Area (water trade, environmental water, water quality and salinity management, water resource planning)
External stakeholders	Participate in environmental scan refresh session.	External stakeholders to be identified by MDBA Engagement Unit

Table 22, Dhees Esure	(Deeeen end linewede)	Environmental coop	rolog and recourding
Table ZZ: Phase Four	Rescan and Upprade) –	Environmental scan	roles and resourcing
			i oloo alla i oooalollig

Role	Description	Resourcing
Compliance and Assurance Environmental Scan Manager	 Scope the environmental scan information system functionality upgrade. Oversee upgrade to environmental scan information system functionality. Develop and implement the environmental scan rescan program. Prepare and conduct training for environmental scan contributors. 	One
Knowledge and Information Team Business Analyst	 Advise Compliance and Assurance Environmental Scan Manager regarding technology options. Prepare environmental scan upgrade business requirements document. Prepare environmental scan system design. Engage or procure the required technology solution. Oversee the development, implementation, testing, and deployment of the environmental scan technology solution. 	One
Environmental Scan Contributor	 Participate in the development of environmental scan upgrade business requirements. Participate in environmental scan rescan sessions with relevant external stakeholders. 	One per MDBA Business Area (water trade, environmental water, water quality and salinity management, water resource planning)
External stakeholders	Participate in environmental scan rescan session.	External stakeholders to be identified by MDBA Engagement Unit

5.4 Phase One – Establishment

5.4.1 Emerging issues, trends and threats must be discoverable and accessible

For an environmental scan to be effective and efficient:

- 1. All staff must be able to access the emerging issues, trends, and threats to compliance information.
- 2. Environmental Scan Contributors must be able to add new and update existing emerging issues and trends.
- 3. Compliance and Assurance staff must be able to add new and update existing threats to compliance.

The level of functionality required to establish an environmental scan should not exceed basic content management workflow functionality (such as view, create, edit, approve, publish). Until demand grows within MDBA and among external stakeholders regarding emerging issues and trends, it is difficult to justify significant expenditure on sophisticated environmental scan functionality. Such advanced functionality includes automated web-based searching for new data and information relating to emerging issues and trends, and spatial or visual representation of emerging issues and trends (refer to Section 5.7 regarding type of functionality that could be introduced as part of a future upgrade to the environmental scan).

5.4.2 Existing MDBA content management systems

Table 23 summarises the possible existing content/information management systems that are likely candidates for managing the environmental scan content (emerging issues, trends, threats to compliance).

System	Description
TRIM	TRIM is an information storage and retrieval system with metadata, and enables information to be stored, searched, and retrieved. TRIM would be a suitable system for storing information gathered to support environmental scanning activities, but it does not have the functionality required to act as an environmental scan database system (see user requirements below).
Other relational databases	MDBA operate several other relational and searchable databases. Other databases should be assessed against the user requirements described in Appendix J to determine whether they are fit for the intended purpose and could be customised to meet the requirements without significant cost or technical risk.

Table 2	23:	Fxisting	MDBA	content	manad	nement	systems
	-0.	LAISting		content	manay	jement	ayatema

5.4.3 Environmental scan user requirements

To effectively and efficiently manage the environmental scan information the different MDBA environmental scan roles must be able to perform critical information system functions. The table summarises the key functions that each user need to perform as part of the environmental scan establishment phase (refer to Appendix J for full set of user requirements).

Role	Key Functions		
All staff user requirements	 Search for and view an emerging issue. Search for a trend and view a trend. Search for and view threats to compliance. 		
Environmental Scan Contributors	 Add a new emerging issue. Edit an existing emerging issue. Add a new trend. Edit an existing trend. 		
Compliance and Assurance Environmental Scan Manager	Update a threat to compliance.Add new threat to compliance template.		

Table 24: All staff user requirements

5.5 Phase Two – Implementation

The implementation of the environmental scan involves:

- 1. Promoting the environmental scan capability and information to MDBA Business Units.
- 2. Training selected staff from each Business Unit to refresh the environmental scan.
- 3. Disseminating key environmental scan emerging issues and trends to external stakeholders.
5.5.1 Disseminating the environmental scan

Each MDBA Business Unit should be exposed to the environmental scan content via a structured workshop that:

- 1. Explains the emerging issues, trends, and threats identified.
- 2. Conducts a risk assessment (using the Compliance and Assurance risk framework) based on the threats to compliance.
- 3. Evaluates the level of readiness of the Business Unit to respond to a threat to compliance by testing different strategies that could be implemented to reduce the likelihood and / or consequence of potential non-compliance by a Party. This would involve constructing future scenarios using the information held about emerging issues and trends (refer to Appendix H and Appendix I).
- 4. Identifies a staff member from each Business Unit to be allocated the role of Environmental Scan Contributor.

5.5.2 Conduct risk assessment using threat identification and assessment information

If the strategic operating environment conditions resemble one or more of the threats identified and assessed by the Environmental Scan, MDBA should conduct a risk assessment of the threat. MDBA can undertake a risk assessment using the strategic information gathered about the trend(s) contributing to the threat to compliance to determine the:

- 1. Nature of the compliance risk what is the Party's action that may cause non-compliance?
- 2. Likelihood of the risk what is the likelihood that the action by the Party may result in non-compliance?
- 3. Frequency of the risk what is the likelihood of the risk recurring / repeating in other areas of Plan compliance?
- 4. **Consequence or impact of the risk** what is the financial, legislative, reputational, and Plan outcome impact of the risk eventuating?



Figure 20 illustrates how the key inputs from the environmental scan can be used to identify and assess compliance risks.



Figure 20: How environmental scan threat identification and assessment can be used to inform risk identification and assessment

Additional research and detailed analysis of each risk is needed to complete the risk identification and assessment. This would involve:

- 1. **Determining the nature of the compliance risk:** A single threat identified and assessed in the environmental scan can have three risks. These could be that a specific obligation under the Plan or the Act is:
 - not performed;
 - not performed within the prescribed timeframe; or
 - not performed in accordance with a prescribed standard or guideline.
- 2. **Prioritising the Plan obligation on the basis of its importance to achieving Plan outcomes:** The priority given to such a provision in applying compliance measures will depend on the significance of the provision to the Plan. On that basis, in addition to the issue of the extent of prescription, mandatory provisions of the Act should be prioritised on the basis of the following questions:
 - In the absence of compliance with (or in the case of breach of) the particular provision, could it reasonably be anticipated that the objectives of the Plan (specifically or generally) may be jeopardised?
 - Does the provision involve the forwarding of data to MDBA that is critical to monitoring compliance with the Plan?
 - In any other respect, is the provision designed to permit MDBA effective scrutiny of the actions of regulated agencies?

The output from the risk assessments should be a prioritised set of compliance risks documented in a risk register.

5.5.3 Training environmental scan contributors

At a minimum, an environmental scan contributor should exist for each of the four main compliance areas: ie WRP, WQSMP, EWP, and water trade. It is important that MDBA Business Units take ownership of identifying and updating emerging issues and trends and work closely with the Compliance and Assurance team.

To enable the environmental scan contributor to have a meaningful impact they must be trained to:

- 1. Produce a schedule for monitoring the change and identifying new emerging issues and trends. This is based upon the review frequency recommended for emerging issues and trends (refer to Section 5.6).
- 2. Review identified data and information to monitor change and identify new emerging issues and trends. The environmental scan contributor should record any changes in an emerging issue and/or trend.
- 3. Complete processes for adding new and updating existing emerging issues and trends.
- 4. Use environmental scan content as the basis for engaging external stakeholders.

5.5.4 Disseminating environmental scan information to external stakeholders

External stakeholders who were engaged in developing the environmental scan (see Appendix C) should be reengaged through a report summarising the key findings of the environmental scan.

To remain engaged with external stakeholders MDBA could publish a compliance discussion paper every quarter focusing on a specific threat and specific set of Plan obligations. The discussion paper could outline the emerging issues and trends giving rise to the threat, how the threat could potentially impact the area of Plan compliance and what could be done to mitigate its likelihood and impact.

5.6 Phase Three – Refresh

5.6.1 Internal management of the environmental scan

It is proposed the Compliance and Assurance team would oversee an environmental scan refresh program that involves:

- 1. Managing a schedule of emerging issue and trend updates that are to be completed by the relevant environmental scan contributors.
- 2. Monitoring the frequency of updates of emerging issues and trends based upon prescribed refresh frequency. If the environmental scan contributor has not updated the emerging issue or trend within the prescribed period, the Compliance and Assurance team may engage with the environmental scan contributor.
- 3. Conducting half yearly environmental scan refresh sessions involving all environmental scan contributors. The half yearly environmental scan refresh session should consider:
 - a. Extent (pace and scale) of change in existing emerging issues and trends.
 - b. Reprioritisation of emerging trends.
 - c. Updates to threats to compliance.
 - d. Identification and shaping of key messages to be provided to MDBA staff describing key changes observed in MDBA's strategic operating environment.
- Preparing and publishing half yearly environmental scan strategic operating environment conditions report. This should be a brief report (no more than 3 – 5 pages) that describes key changes observed and monitored in MDBA's strategic operating environment.

An excellent source of material to inform updates to threats, trends and emerging issues is Australian Policy Online (<http://apo.org.au/>). Australian Policy Online is a research and evidence base for individuals and organisations involved in and impacted by public policy development in Australia. It is an initiative of Swinburne Institute for Social Research. Australian Policy Online collates all the latest publicly available research into areas such as Economics, Environment, Indigenous, Politics, Social Policy and Urban Policy and Design. It is updated every two weeks.

5.6.2 Engage stakeholders

Following the release of the environmental scan key findings paper, the finalisation of the risk framework, and initial internal compliance risk assessments, external stakeholders should be provided with the opportunity to discuss the potential likelihood and consequence of the threats to compliance in greater detail.

At least once a year the relevant environmental scan contributor and a member of the Compliance and Assurance team should conduct a session with selected external stakeholders (Appendix C) to:

- 1. Analyse the potential likelihood and consequences of identified threats to compliance. This could be conducted in conjunction with risk assessment and analysis.
- 2. Discuss changes in the pace and scale of trends relevant to the external stakeholder.
- 3. Identify any new emerging issues or significant changes to existing emerging issues.
- 4. Review the suitability and appropriateness of the data and information sources being used by MDBA to monitor emerging issues and trends.

5.7 Phase Four – Rescan

5.7.1 Conduct a full rescan

In 2016/17 a full rescan should be conducted by MDBA. The environmental scan found that most trends are generally moving at a slow to moderate pace and therefore three years is an appropriate timeframe to conduct a full rescan.

A full rescan involves repeating the methodology used to develop the initial set of emerging issues, trends, and threats to compliance. In summary, this involves:

- 1. Desktop research using recognised data and information sources to identify new emerging issues or remove emerging issues no longer relevant.
- 2. Half day sessions with each MDBA Business Unit to review and update emerging issues.
- 3. Engagement with external stakeholders to review emerging issues, trends, and threats to compliance.

5.7.2 Upgrade environmental scan functionality

A full rescan should be accompanied by an upgrade to environmental scan information management functionality. Between now and 2016/17, information management (big data) technologies will continue to evolve at a rapid rate. "Big data" analytical advancements present significant opportunities to extract greater organisational value from environmental scans. Table 25 describes the four key potential upgrade areas for MDBA's environmental scan.

Potential upgrade area	Description
Automated scanning	Web 3.0 technology provides enormous potential for environmental scanning. The ability to automate searching of selected information repositories (within an organisation and external to an organisation) using key search words and terms provides the opportunity to scan vast amounts of data and information to identify:
	 Frequency of emerging issue being addressed in searched literature – if the frequency is increasing this demonstrates that the emerging issue is transforming into a trend.
	 Scale of the trend – frequency of information identified in publications produced in different regions demonstrates the geographical or institutional coverage of the trend.
	 Relevance of the trend to Party – capacity to undertake targeted automated searches enables data and information to be checked according to their relevance to specific Parties.
Automated alerts to inform MDBA staff of changes	Linked to automated scanning is the capacity to alert environmental scan contributors to changes in MDBA's strategic operating environment. The technology exists to provide automated alerts. The current limitation is the quality (relevance, timeliness etc.) of alert functionality.
to emerging issues, trends, and threats	Improved automated scanning (more targeted and relevant) creates the condition for alert functionality to reduce the manual time and effort spent by environmental scan contributors monitoring and recording changes in MDBA's strategic operating environment.

Table 25: Potential upgrade areas for MDBA's environmental scan

Potential upgrade area	Description
Identifying emerging issues and forecasting the pace and scale of emerging issues using social media	Social media (such as Facebook or Twitter) is recognised as offering huge potential in "spotting emerging issues" and observing the pace and scale of trends. At present, social media is one input for identifying emerging issues that involve community or non-governmental organisation participation. However the validity and reliability of social media constrains its current application to environmental scans. Advancements in rapid pattern analysis of social media (number, type, theme, location, author etc.) could overcome the limitations of using individual posts to social media forums.
Visual representation of emerging issues, trends, and threats	The initial environmental scan has endeavoured to present the key findings of emerging issues, trends, and threats to compliance visually. Given the large volume of data and information captured in an environmental scan, finding ways to present emerging issues, trends, and threats is fundamental to MDBA staff and external stakeholders engaging with the environmental scan. Advancements in modelling for environmental scans could enable emerging issues and trends to be presented visually and spatially, offering MDBA the opportunity to shift from a primarily a text-based representation of emerging issues and trends to visual representation (charts, graphs, pattern analysis etc.).

Appendix A. SKM's Environmental Scan Approach

The following figure outlines SKM's approach to conducting the environmental scan. It lists the outcomes of the project, inputs used to inform the scan, key tasks, techniques and tools applied, and the final output.



Figure 21: SKM's Environmental Scan Approach

Appendix B. Environmental scan methodology

The assessment approach adopted for this environmental scan was based on the Australian Joint Agencies Scanning Network methodology and the text *Questioning the Future: Methods and tools for organisational and societal transformation*⁵⁹. The environmental scan has been prepared in three parts:

- 1. Identify and assess emerging issues (full list of emerging issues are located in Appendix I)
- 2. Identify and assess trends (full list of trends are located in Appendix H)
- 3. Identify and assess threats to compliance (full list of threats to compliance are located in Appendix E)

The methods and approaches for each are detailed below.

B.1 Identify and assess emerging issues

Identifying and assessing emerging issues involves examining as many emerging issues across all spatial scales and the spectrum of the PESTLE⁶⁰ dimensions as possible. The identification of emerging issues involved:

- 1. **Outside in view:** what emerging issues outside of the Basin may create trends in the Basin (for example, global scale economic trends); and
- 2. **Inside out view:** what emerging issues from inside the Basin may create trends in the Basin (for example changes to structural arrangements for water management).

For each emerging issue identified, a high level summary is prepared documenting the pace, scale and potential impact of the emerging issue. The required information is documented in Table 26. Emerging issues were initially identified through research and review of available information from reports and literature. The list of emerging issues was then expanded and refined through extensive stakeholder consultation (refer to Appendix C and Appendix I).

In completing the list of emerging issues the key principle followed was - there are no right or wrong inclusions. This means that the list of emerging issues can identify a number of tenuous issues.

Content	Description
Strategic driver of change	The specific and broad strategic drivers or change that could give rise to emerging issues that may become trends.
Emerging issue	An emerging issue is the triggering or disruptive event. Emerging issues can take place across all spatial scales (global, national and local) and across spectrum of the PESTLE (Political, Economic, Social, Technological, Legal/regulatory and Environmental) dimensions.
Emerging trend	Emerging trend is the change in conditions or behaviour as a result of the emerging issue. How could the emerging issue contribute to an emerging trend?
Pace of trend	 How quickly could the emerging issue evolve into a trend? In other words, when might the emerging issue cause a change in conditions or behaviour? Fast paced: 1 to 2 years Moderate paced: 3 to 5 years Slow paced: more than 5 years

Table 26: Emerging issue information

⁵⁹ Inayatullah (2007)

⁶⁰ PESTLE is an acronym for Political, Economic, Social, Technological, Legal and Environmental

Content	Description
Scale of trend	If the emerging issue evolved into a trend, what geographic scale could if occur over? Basin wide Jurisdiction (State or Territory) Catchment Region Local
Impact	 What is the potential impact of the trend on compliance with the Plan across the four key focus areas: WRPs (SDLs), WQSMPs, EWPs, and water trade. High impact: if non-compliance occurs, impact may be irreversible Medium impact: if non-compliance occurs, impact may be reversible but will likely require significant investment (time or money) Low impact: if non-compliance occurs, impact likely to be reversible Minimal: compliance and assurance opportunity

The causes of emerging issues were examined and patterns identified regarding the type/nature of the cause of the emerging issue. Emerging issues were then categorised according to common causes of emerging issues and grouped as strategic drivers of change. A strategic driver of change is a grouping of emerging issues that share a common cause.

B.2 Identify and assess trends

The emerging issues identified were examined and interrogated for common themes. These common themes represent the possible future trends. The trends were extensively tested with stakeholders. For each trend a more detailed summary is prepared. The content required for a trend is documented in Table 27.

Content	Description	
Emerging issues	Insert brief description of the issue – what happened and how is it relevant to an activity regulated by the Plan?	
	The description should include the nature of the primary disruptive event and the Plan instrument used to regulate the trend.	
Data sources to quantify baseline conditions	Data and information sets.	
If the emerging issue(s) became a trend, how would it impact the behaviour of entities regulated by the Plan?	State how the behaviour of a regulated entity could be impacted if the issue evolved. State also the regulated entity(s) impacted by the trend (Basin States, water right holders, operating authorities etc.).	
Data sources to monitor the trend	Data and information sets.	
Factors that may contribute to the evolution of the trend	 Describe the key changes and factors that need to occur in order for the issue to be become a trend. Include information on: Current pace of change in the factors identified (slow, moderate or fast moving) Likely timeframe of direct impact on compliance and assurance (short term – within 2 years, medium term – within 5 years, longer term – by 2022) Geographical scale of trend (specific locations/areas or Basin wide) Primary scale of factors influencing the trend (global, Asia-pacific, national, regional, local) 	

Table 27: Trend content required

Content	Description
What is the regulatory and administrative capacity of the relevant jurisdiction(s) to address potential non- compliance resulting from the trend?	Description of capacity.
If left unaddressed, what is the potential impact of non- compliance?	Insert a list of Murray Darling Basin outcomes and indicate how non-compliant activity could adversely impact the achievement of the outcome? Include a comment on the severity of the potential non-compliant behaviour (severity is based upon risk – will the non-compliant behaviour lead to irreversible harm to the Basin?).
If left unaddressed, what is the potential for the trend to improve compliance or Plan outcomes?	Describe how the trend could lead to Plan rules and regulations being more effective (greatest chance of increased levels of compliance) and efficient (simpler and easier for regulated entity to comply with). Rate the opportunity for the trend to strengthen assurance and compliance: high, medium, or low.

B.3 Identify and assess threats to compliance

Once the trends are identified, the threat each trend poses to Plan compliance is assessed. Information on threats is then used to prioritise trends for monitoring.

Threats exist in the external environment (eg Parties in response to changes in operating conditions) and present a risk(s) to present a risk(s) to compliance and therefore Plan outcomes. The longer a threat is left unaddressed, the greater the likely cost greater the likely cost of preventative action.



Figure 22 summarises the method used to identify and assess threats to compliance.

The underlying principles of evaluating threats in the context of the environmental scan include:

- It is better to be broadly right, than precisely wrong: the level of precision in the threat assessment must not be so great that MDBA narrowly monitor emerging trends and miss other threats to compliance. The Compliance and Assurance Risk Management Framework is used to precisely identify and assess compliance risks.
- The frequency of monitoring a trend is informed by the threat: the greater the threat poses to Parties' ability or willingness to perform their obligations under the Plan and the Act, the more frequently the trend should be monitored.



Figure 22: The threat identification and assessment method



The threat identification and assessment is based upon four key questions (refer

Figure 22):

- 1. **Identification** could the Party respond to the changes (trends) in their strategic operating environment and would this lead them to become non-compliant with a Plan obligation?
- 2. Assessment the assessment involves examining the likelihood and consequence of the threat:
 - a. What is the direct relevance of the trend to WRP, WQSMP, EWP, and water trading obligations?
 - b. What is the pace and scale of the trend(s) causing threats to compliance? Are they fast-paced and Basin-wide scale, or slow-paced and localised?
 - c. What is the likelihood of non-compliance based upon the level of prescription of WRP, WQSMP, EWP, and water trading obligations? Do obligations have a:
 - i. *Low level of prescription?* Obligation only sets out an action to be performed or output to be created and no timeline or standard is prescribed.
 - ii. *Medium level of prescription?* Obligation sets an action to be performed or output to be created as well as either a prescribed timeline or standard.
 - iii. *High level of prescription?* Obligation sets an action to be performed or output to be created within a required timeline and in accordance with a prescribed standard.
- 3. **Consequence** what is the impact of non-compliance with the Plan obligation? Consequence of non-compliance is assessed on the basis of:
 - a. Plan outcome impact the effectiveness of the Plan in achieving its desired outcomes.
 - b. Financial impact on MDBA costs that MDBA may incur to implement corrective actions required.
 - c. Legislative impact on MDBA breaches of the Act by a regulated entity.

- d. **Reputational impact on MDBA** perceived harm to MDBA's legitimacy, integrity, objectivity, or independence.
- 4. **Threat Rating –** the table below summarises the rating used to assess the level of the threat to compliance. Greater priority is given to threats to non-compliance with Plan obligations that have a material impact on achieving Plan outcomes, as opposed to more procedural / administrative Plan obligations.

Table 28.	Rating use	d to determ	ine level of	threat to	compliance
I able 20.	Nating use		ine ievei ui	lineal lu	compliance

Level	Likelihood	Consequence
Extreme	 Generally fast paced trend(s) contributing to the threat Trend(s) is occurring at a Basin wide scale and is therefore likely to impact multiple Parties Threat is relevant to at least three of the four areas of the Plan (WRP, WQSMP, EWP, or water trade) The obligations potentially threatened tend to be highly prescriptive 	Plan Outcome – Non-compliance with obligations may have a severely detrimental impact (potentially irreversible) on achieving Plan outcomes
High	 Generally fast paced trend(s) contributing to threat Trend(s) is occurring at a Basin wide scale and is therefore likely to impact multiple Parties Threat is relevant to at least three of the four areas of the Plan (WRP, WQSMP, EWP, or water trade) The obligations potentially threatened tend to be highly prescriptive 	 Plan Outcome – Non-compliance with obligations will have a detrimental impact (reversible but involving significant remediation / intervention costs) on achieving Plan outcomes Financial Impact – Intervention to respond to non-compliance may require allocating significant additional MDBA resources (beyond current financial and personnel allocation) Legislative Impact – Non-compliance may result in a breach of the Act Reputational Impact – MDBA's legitimacy, integrity, objectivity and independence may be significantly impacted from the perspective of all Parties
Moderate	 Generally moderate paced trend(s) contributing to threat Trend(s) is occurring at a regional scale and is therefore likely to impact fewer Parties Threat is relevant to at least two of the four areas of the Plan (WRP, WQSMP, EWP, or water trade) The obligations potentially threatened tend to be moderately prescriptive 	 Plan Outcome - Non-compliance with obligations may have a detrimental impact on achieving Plan outcomes Financial Impact – Intervention to respond to non-compliance may require allocating moderate additional MDBA resources (beyond current and financial and personnel allocation) Reputational Impact – MDBA's legitimacy, integrity, objectivity and independence may be moderately impacted from the perspective of some Parties
Low	 Generally slow paced trend(s) contributing to threat Trend(s) is occurring at a localised scale and is therefore likely to impact few Parties Threat is relevant to one of the four areas of the Plan (WRP, WQSMP, EWP, or water trade) The obligations potentially threatened tend to be of a lower level of prescription 	 Plan Outcome - Non-compliance with obligations may have a minor impact on achieving Plan outcomes Financial Impact – Intervention to respond to non-compliance can be implemented within existing MDBA resources (current allocation of finances ad personnel) Reputational Impact – MDBA's legitimacy, integrity, objectivity and independence may be moderately impacted from the perspective of one Party

Trends are identified and assessed across the four areas of the Plan (WRP, WQSMP, EWP, and water trading rules) by investigating the information described in Table 29.

Table 29: Threat assessment - th	his assessment is completed for each trend across the four areas of the Plan (WR	P, WQSMP,
EWP, and water trading rules)		

Question	Description and assessment categories
Question 1 – Likelihood of trend impacting on compliance area?	 Some trends are more relevant to specific compliance areas than others. The four compliance areas covered are WRP, WQSMP, EWP, and water trading rules. The level of threat imposed by the trend directly impacting the compliance area is assessed based on its forecast pace and scale. Assessment categories: High – if the trend is left unaddressed it is most likely to impact Medium – if the trend is left unaddressed it is possible it will impact Low – if the trend is left unaddressed it is unlikely that it will impact
Question 2 – Likelihood of a trend resulting in a breach of compliance area obligations?	 Each compliance area contains a number of specific obligations that must be performed by Parties. In most cases, the specific obligations that are threatened (of being breached) by the trend will not be easily discernible. This question should only be answers for trends that pose a medium to high likelihood of impacting on the compliance area (Question 1). Assessment categories: Yes – specific obligations at threat can be identified No – specific obligations at threat cannot be easily discerned, or the trend may pose similar levels of threat to all obligations of the compliance area
Question 2a – If no, the likelihood of the trend breaching all compliance area obligations?	 If the specific obligations at threat cannot be easily discerned, or the trend may pose similar levels of threat to all obligation, describe the conditions needed for a regulated entity to breach the compliance obligations and indicate the likelihood that, if left unaddressed, the trend to evolve to those conditions. Brief description of conditions needed to non-compliance to occur Assessment categories: High – based on available information, it is highly likely that the trend will reach those conditions Medium – based on the available information, it is possible that the trend will reach those conditions Low – based on the available information, it is unlikely that the trend will reach those conditions

Question	Description and assessment categories
Questions 2b – If yes, indicate the compliance obligations that are more likely not to be performed by the regulated entity?	If the trend is likely to result in a beach of specific conditions (that can be identified), list the type of obligations that are most likely to be not performed due to the impact of the trend. If many types of obligations are identified, record the top four only. There are 18 types of obligations that must be complied with under the Plan: • Have regard to/consistent with/apply principles and methods/follow MDBA recommendations/regard to targets • Prepare a plan • Give Plan to Authority • Review and update Plan • Identify priorities • Basin State must receive information from an entity other than MDBA • Give Basin State feedback on priorities • No unreasonable restriction • Specify rights • Notify person and reasons for decision • Decide rights • Entitlements must be expressed in mega litres or a unit share • Disclose interest • Make information available • May instead give notice to the interstate authority, together with a request that it notify the interstate party on behalf of the restricting authority
Question 2c – Indicate the compliance obligations level of prescription	 Likelihood of compliance obligations not being performed is dependent on the level of prescription of the obligation. The higher the level of prescription, the greater the likelihood of non-compliance. Indicate the level of prescription of the specific obligations (Question 2b) or more generally for obligations of the compliance area. Assessment categories: Low level of prescription ie the regulated entity is required to perform an action Medium level of prescription ie the regulated entity is required to perform an action either within a specified timeframe or to a specified level of performance High level of prescription ie the regulated entity is required to perform an action within a specified timeframe and to a specified level of performance
Question 3 – What is the consequence of the compliance obligation not being performed	 Consequence is the second dimension to threat. Consequence is the impact of the regulated entity not performing a specific compliance obligation. Consequence is measured in terms of: Reputation – what is the impact on MDBA's reputation of the obligation not being performed Financial – what is the financial cost of the non-compliance Legislative – will the non-compliance result in MDBA's breaching its own legislative obligations Plan outcomes – will the non-compliance result in the Plan outcomes being unable to be achieved (reversible or irreversible impact) Indicate the type of consequence that could result from compliance obligations not being performed.

Appendix C. Stakeholder consultation

Extensive stakeholder consultation was undertaken to inform the environmental scan. SKM would like to thank the following organisations and individuals who contributed their time and thoughts to this environmental scan (in alphabetical order by organisation):

AgForce Queensland

• Dr Dale Miller – Senior Policy Advisor

Australian Competition and Consumer Commission

- Gennady Kliner Acting Director, Compliance and Enforcement team
- Gwen Rees Senior Analyst, Water Trading
- Nick O'Kane Water Branch

Australian Conservation Foundation

 Jonathan La Nauze – Acting Manager, Health Ecosystems Program

Australia Floodplain Association

• Terry Korn – President

Australian Local Government Association

- Josh Thompson Policy Advisor
- Rolf Fenner Senior Policy Advisor

Australian Forest Products Association

- Grant Johnson Manger, Policy
- Gavin Matthew Manager, Processing

Commonwealth Environmental Water Office

• Steve Costello – Assistant Secretary, Policy and Portfolio Management

Department of Agriculture, Fisheries and Forestry (Commonwealth)

- Sarah Bridge
- Alexandra Bunton
- Julie Gaglia
- Lachlan Ice
- Paul McNamara
- Lee Nelson
- Keith Robertson
- Steven Taylor
- Andrew Wilson

Department of Environment, Water and Natural Resources (South Australia)

- Lissa Arcoverde
- Di Favier Manager, Murray Darling Basin Policy
- Judith Kirk Program Leader, Salinity
- Laurie Poppleton
- Chris Wright

Department of Environment and Primary Industries (Victoria)

- Lousie Appleyard
- Julia Reed
- Graham Turner
- Mark Wood

Department of Natural Resources and Mines (Queensland)

- Kim Goble
- Ross Krebs
- Jim Weller
- Dianna Woods

Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)

- Yvette Blackman Office of Water Science
- Ebony Coote Office of Water Science
- Tim Fisher Assistant Secretary, Murray Darling Basin Reform
- Colin Mues Assistant Secretary, Water Recovery

Environment Victoria

• Juliet Le Feuvre – Campaigner, Health Rivers

Minerals Council of Australia

• Chris McCombe – Assistant Director, Environmental Policy

Murray-Darling Basin Authority

- Akhtar Abbas Assistant Director, Surface Water Planning
- Gemma Ansell Assistant Director, Water Quality and Salinity Management

- David Bell Director, Environmental Water Policy
- Anthony Bailey Assistant Director, Compliance and Assurance
- Kelly Benson Assistant Direct, Water Resource Plan Implementation
- Tapas Biswas Assistant Director, Water Quality and Salinity Management
- Sara Boles Compliance and Assurance
- Frederick Bouckaert Director, Sustainable Rivers Audit
- Linda Carruthers Acting Director, Water Resource Plan Implementation
- Lex Cogle Director, Information and Data
- Phil Cole Director, MDB Agreement
- Sarah Commens Assistant Director, Operations Review
- Heather Cotching Director, Water Markets
- Shireen Delaney
- Megan Douglas Director, Web Content and Communications
- Selase Dugloaza Assistant Director, Water Markets
- Kerry Greenwood River Murray Operations
- Simon Godschalx Assistant Director, Monitoring and Evaluation
- Amy Hankinson Assistant Director, Compliance and Assurance
- Giles Hartwell Assistant Director, SDL Adjustment
- David Hohnberg Assistant Director, TLM Environmental Monitoring
- Bill Johnson Director, EWP Implementation
- Asitha Katupitiya Director, Water Quality and Salinity Management
- Kris Kleemen Assistant Director, Basin Plan Implementation
- Siobhan Leslie Stakeholder Engagement
- Guy Lewis Director, Compliance and Assurance
- Katrina Maguire General Manager, Communications, Engagement, Research and Compliance
- Tony McLeod General Manager, Water Resource Planning

- Alice McRorie Water Resource Plan Implementation
- Alex Meehan Assistant Director, Environmental Water Policy
- Ian Neave Assistant Director, ESTL Science
 Base
- Alison Reid Assistant Director, Water Resource Plan Implementation
- Michael Peat Assistant Director, Environmental Water Policy
- Awadesh Prasad Director, Cap Transition
- Nadeem Samnakay Acting Director, Research
- Ben Seddon Sustainable Rivers Audit
- Robert Siwak Assistant Director, Compliance and Assurance
- Maryanne Slattery Director, TLM Environmental Water Policy
- Adam Sluggett Environmental Management
- Victor Smiles Water Accountant
- Celina Smith Assistant Director, Basin Plan Implementation
- Ingrid Takken Water Resource Modelled
- Julianne Tanner
- Katherine Tibbitts Environmental Management
- Alys Wall Sustainable Rivers Audit

National Farmer's Federation

 Deb Kerr – Manger, Natural Resource Management

National Water Commission

- Bronwyn Ray General Manager, Assessment and Policy Coordination Group
- Rebecca Smyth Assessment and Policy Coordination Group

NSW Farmers Association

• Danica Leys – Policy Director, Environment

NSW Irrigators Council

• Andrew Gregson – Chief Executive Officer

Other individuals

 Dr Cameron Holley –Senior Lecturer, Faculty of Law, UNSW

- John Pettigrew Goulburn Valley Environment Queensland Conservation Council Group and the Environmental Farmers Network
- Dr Jamie Pittock Senior Lecturer, Fenner School of Environment and Society, ANU
- Darren Sinclair Research Fellow, Fenner School of Environment and Society, ANU
- Nigel Parratt

The Wilderness Society – South Australia

Peter Owen

Appendix D. Review of National Partnerships Agreement (Council of Australian Governments) performance reports

SKM conducted a literature review of performance reports prepared for National Partnership Agreements under the Council of Australian Governments (COAG). The purpose of this review was to identify common challenges and obstacles in implementing cross-jurisdictional reform that may also be relevant to implementation of the Basin Plan. The National Partnership Agreements examined covered a range of sectors, including regulation and competition, education, and labour market reform.

D.1 National Partnership Agreement to Deliver a Seamless National Economy: Performance report for 2009–10 (Report to COAG, 23 December 2010)

Under the National Partnership, the Commonwealth, States and Territories have agreed to implement 36 streams of regulation and competition reform. COAG has also agreed to progress three further regulatory reforms, which are also assessed in this report. Report includes findings on the 36 regulation and competition reforms covered by the National Partnership and three additional regulatory reforms on the BRCWG agenda.

Key implementation and reporting issues:

- Ambiguous or unclear milestone setting (Regulatory reforms): Lack of specification of output, milestones and deadlines for reform streams hampered performance reporting and put achieved of some reforms at risk. Amendments to milestones were suggested which include:
 - New interim or final milestones may need to be set in cases where reforms are off track
 - Extra interim milestones would be desirable so that key steps towards the final objective can be monitored
 - Milestones to be revised to be made consistent with other COAG agreements
- Vague articulation of reform agenda in implementation plans: A more coherent set of outputs and milestones in the implementation plan for Competition Reform was suggested to improve progress and achievement of reform outcomes.
- Inconsistency between National Partnership Agreement and National Agenda: Inconsistency between the commitments made by COAG—in the Australian Energy Market Agreement and National Partnership Agreement (to remove retail price regulation in electricity and gas markets) put at risk achievement of reforms.
- **Challenging deadlines and timeframes:** The timeframes for delivery of some reforms (ie heavy vehicle safety regulator reform) were considered challenging, delaying agreement on operational and funding arrangements.
- Inaccurate specification of jurisdictional accountability: Small number of instances where accountabilities were not clear in implementation impacting achievement of outcomes. As an example, there are instances where model and application laws are being used where a distinction is made between host and non-host jurisdictional obligations.
- Inadequate time for COAG council to review implementation plans: Suggested that implementation plans to be reviewed and updated before the end of next reporting period to provide a clear basis for public accountability before the end of the reporting period.

D.2 Seamless National Economy: Report on performance 2011–12 (Report to COAG, 28 November 2012)

In 2008, the Commonwealth, States and Territories agreed to implement regulation and competition reforms under the National Partnership Agreement to Deliver a Seamless National Economy (National Partnership). There are 45 separate reforms under the National Partnership:

- 27 deregulation priorities
- 17 areas of competition reform

• Reform to regulation making and review processes.

This report provides an assessment of progress against reforms over the period from 2008–09 to 2011–12 up to 17 August 2012.

Key implementation and reporting issues:

- Legislative uncertainty: Some state's not passing legislation within required period causing delays in submitting variations to agreement.
- Inadequate incentives (reward system): Reward payments were not necessarily enough to cover transition costs or provide incentives for jurisdictions to commit to reform. Suggested a need to improve the alignment of reward payments with reform objectives.
- Inadequate definition of problem: Some of the reforms generated significant costs to governments and transitional costs to business which may have outweighed the benefits of harmonisation. Key elements of successful reforms in the National Partnership were: a shared vision of what needed to happen, strong evidence to support the reform and a focus on the potential productivity gains when assessing reform options.
- **Number and scope of reforms too large:** A cluttered reform agenda made progress difficult with limited Government resources, particularly for smaller jurisdictions. Suggested that prioritisation of reforms was to be considered base on impact.
- Late engagement of businesses: Late engagement of business impacted level of commitment and ownership in achieving reforms. Suggested that the business community needs to be well-engaged to gain valuable insights into opportunities to lower costs and improve productivity.
- Limited use of regulatory impact assessments: Participants saw the regulatory impact statement processes as essential which could have been used more effectively if used earlier to inform the reform process and inform options. Impact statement should not just be limited to monitoring achievement of reforms.

D.3 National Partnership Agreement on Literacy and Numeracy: Performance report for 2011 (NPALAN) (Report to COAG, 30 April 2012)

The NPALAN is targeted at improving literacy and numeracy outcomes of students and schools with low levels of achievement. Second and final report, assessing whether States and Territories have met pre-determined performance benchmarks. Progress was assessed against 126 targets, which States and Territories agreed for the 2011 reporting period.

Key implementation and reporting issues:

- Lengthy negotiation of addendums: Negotiation and approval of addendums was protracted causing reporting and impacted the level of collaboration and knowledge sharing between States and Territories. Negotiation took 10 months. In 2011, the Commonwealth conducted bilateral negotiations with each State and Territory to agree revised measures and targets with a view to reflecting recent performance and the lessons from the first assessment cycle. All jurisdictions, except NSW, negotiated an addendum to the final implementation plan which detailed their revised set of measures and targets. NSW chose to keep the reward framework from its original implementation plan.
- Lack of transparency around publishing final agreements for 2011: Clause 55 of the Federal Financial Relations Circular 2011/03 requires public transparency of all implementation plans and project agreements on the Standing Council on Federal Financial Relations website (SCFFR 2011b, Cl. 55). Not required for sensitive information which can be made available upon request. Not all relevant information in final agreements was published on website at time of report. Additional non-sensitive information including:
 - Target setting methodologies and rationale
 - Funding formulae for partial improvement and gain measures
 - Statements relating to ambition of targets and their agreement prior to data being available
 - Dates the agreements were made

Report stated that this information is necessary to fully understand how targets are set, how targets are considered ambitious and how reward funding is calculated.

- **Disputed and ambiguous baselines:** Commonwealth and NSW disagreed about the appropriate baseline year for mandated NPALAN measures. Agreement could not be reached on any changes to the reward framework resulting in performance to be assessed against previously agreed measures, targets and baselines contained in the bilateral agreement. The Commonwealth and Tasmanian Governments disputed the baseline year for Tasmania's local measure, student attendance, after the data was provided to the council. This was resolved in discussion with both governments and this measure was assessed against a 2008 baseline. If baseline performance results are not clear, this impacts the council's ability to assess partial progress and failure to meet baseline performance.
- Loss of continuity between assessment cycles: The rationalisation of measures for 2011 resulted in some losses in continuity between 2010 and 2011 data. This was mainly due to implementation of a more "consistent reward framework" that incorporated changes in target year groups, baseline years, the level of aggregation across sectors and the removal of some measures.
- **Complex target calculation methods:** Complex target calculations make it difficult to understand and communicate results and manage public accountability and transparency requirements.

D.4 National Partnership Agreement on Improving Teacher Quality: Performance report for 2011 (Report to COAG, 30 April 2012)

The National Partnership Agreement on Improving Teacher Quality is aimed at driving and rewarding systemic reforms that improve the quality of teaching and leadership in Australian schools. Funding is provided to implement facilitation reforms and to reward the achievement of reform milestones. Third report assessing whether States and Territories have met pre-determined performance benchmarks assessed progress against 271 milestones, which States and Territories had agreed to for the 2011 reporting period.

Key implementation and reporting issues:

- No uniformity in reform milestones and timelines between jurisdictions: Each State and Territory has different milestones agreed under Bilateral Agreements and Implementation Plans. In addition, implementation plans and bilateral agreements had different timeframes for milestones, reporting dates, and reward payments amongst States and Territories.
- No clear link of milestones and activities to Partnership reform agenda: Significant variation in the number, type and scope of the activities captured by each milestone with some having no clear connection with the reform agenda.
- Varied level of aggregation of milestones: Some milestones are discrete steps in the process of achieving one specific outcome confusing the articulation and reporting of achievement of outcomes.
- **Clarity of activity and timeframes:** Some milestones lacked specific timeframes, making it challenging to assess performance over time (ie benchmarks).
- **Milestones lack ambition:** Many milestones lacked a reasonable level of ambition with an emphasis on minor processes or cautious quantitative targets. Most jurisdictions created easily achievable milestones as opposed to significant milestones that are more difficult to accomplish which lead to greater achievement of reforms.
- No independent assessment of ambition of milestones: No independent assessor (like for NPALAN) reduces the level of public accountability and increases the resource dependence on Council.
- **Milestones were limited to the reward component of the agreement:** Milestones did not cover facilitation reforms or the activities of the Commonwealth Government.
- No multi-lateral performance comparison: There was a lack of multilateral opportunities to compare teacher quality reforms as milestones were bilaterally negotiated with the Commonwealth.

D.5 Skills and Workforce Development 2010: Comparing performance across Australia (National Agreement for Skills and Workforce Development, Report to COAG, 30 September 2011)

The Agreement aims to ensure all Australians of working age have the opportunity to develop the skills and qualifications needed to enable them to be effective participants in and contributors to the modern labour market. The third annual report on the National Agreement for Skills and Workforce Development provides a comparative analysis on the outcomes which are highly relevant to achieving the National Agreement's overall objectives and support the reporting of change over time.

Key implementation and reporting issues:

- Inconsistent reporting timeframes: Annual reports for some of the jurisdictions were not available either because the dates for reporting did not align with the reporting timeframe under the National Agreement or the reports were not ready for release.
- Lack of robust measures: Instances where there was neither a complete absence of robust measures nor any data to report against an outcome.
- **Ambiguous or vague targets:** Some outcomes had lacked specific targets or indicators for measuring progress. As an example; the Agreement acknowledges the interrelationship between education, vocational education and training, workforce development and other factors on workforce participation. However, there are no specific indicators or targets relating to higher education in the Agreement.
- **No short-term progress trajectories:** Without national and jurisdictional trajectories agreed for each target the ability to demonstrate progress against long-term targets is difficult.
- Limited usability of data: The types of data, such as reliance of survey data in small jurisdictions
 restricted the ability to measure impact of outcome and trends over time (ie time series analysis).
 Suggested that additional disaggregation of data should be used to provide more objectivity and
 robustness (ie additional data on employer satisfaction with training as a way of meeting skills needs).

D.6 Skills and Workforce Development 2011: Comparing performance across Australia (Report to COAG, 28 September 2012)

The revised Agreement aims to produce a Vocational Education and Training (VET) system that delivers a productive and highly skilled workforce and which enables all working age Australians to develop the skills and qualifications needed to participate effectively in the labour market and contribute to Australia's economic future; and supports achievement of increased rates of workforce participation. Fourth report on the National Agreement for Skills and Workforce Development and the first since an updated agreement was approved by COAG on 13 April 2012. The signing of a new agreement in 2012 provided an opportunity for COAG to address all but one of the challenges and recommendations outlined in the 2010 report.

Key implementation and reporting issues:

- Limited usability of data (assessment of impact of skills development): The type of data collected
 restricted the ability to measure impact of outcomes and trend over time. Additional disaggregation of data
 that provides more objective and robust indicators are needed, such as:
 - Data to describe level of qualification
 - Data to describe the skills of the working age population in 5 year age cohorts
 - Data to describe the industry sector of the skills held, or being attained

Appendix E. Environmental scan threat assessments

E.1 Threat rating assessments

The threat rating assessments have been derived using the method described in section Appendix B3 and the information contained in Appendix E2, E3, E4 and E5.

Plan area	Likelihood	Consequence	Rating
Water Trade	 Trend 3 - Prescription – High, Pace of trend – Fast (High), Scale of trend – Basin wide (High) 	Trend 3 - <i>Plan Outcome</i> – High, <i>Financial Impact</i> – High, <i>Reputation Impact</i> – Moderate, <i>Legislative Impact</i> – Moderate	High
Water Quality and Salinity Management	 Trend 3 - Prescription – High, Pace of trend – Fast (High), Scale of trend – Basin wide (High) 	Trend 3 - <i>Plan Outcome</i> – High, <i>Financial Impact</i> – High, <i>Reputation Impact</i> – Moderate, <i>Legislative Impact</i> – Moderate	High
Water Resource Plan	• Trend 3 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – Fast (High), Scale of trend – Basin wide (High)	• Trend 3 - <i>Plan Outcome</i> – High, <i>Financial Impact</i> – High, <i>Reputation Impact</i> – Moderate, <i>Legislative Impact</i> – Moderate	Moderate to High
Environmental Watering	• Trend 3 - <i>Prescription</i> – Low to medium, <i>Pace of trend</i> – Fast (High), <i>Scale of trend</i> – Basin wide (High)	Trend 3 - <i>Plan Outcome</i> – High, <i>Financial Impact</i> – High, <i>Reputation Impact</i> – Moderate, <i>Legislative Impact</i> – Moderate	Moderate to High

Table 30: Threat 1 rating – Decline in current and future organisational capacity and capability

Table 31: Threat 2 rating – Benefits and costs of non-compliance outweigh costs and benefits of compliance

Plan area	Likelihood	Consequence	Rating
Water Trade	 Trend 2 – Prescription – Medium, Pace of Trend – Slow/moderate, Scale of trend – Regional Trend 4 – Prescription – Medium, Pace of trend – Slow to moderate, Scale of trend - Regional Trend 5 – Prescription – High, Pace of trend – Slow to moderate, Scale of trend – Basin Wide Trend 6 – Prescription – Low, Pace of trend – Slow to moderate, Scale of Trend - Regional Trend 7 – Prescription – N/A, Pace of trend – N/A, Scale of Trend – N/A 	 Trend 2 - Plan Outcome – Moderate, Financial Impact – N/A, Reputation Impact – High, Legislative Impact – Moderate, Trend 4 –Plan Outcome – Moderate, Financial Impact – Moderate, Reputational Impact – High, Legislative Impact – High Trend 5 –Plan Outcome – High, Financial Impact – High, Reputational Impact – Moderate, Legislative Impact – N/A Trend 6 –Plan Outcome – Low, Financial Impact – Low, Reputational Impact – High, Legislative Impact – Low, Reputational Impact – High, Legislative Impact – Low Trend 7 – Plan Outcome – NA, Financial Impact – NA, Reputational Impact – NA, Legislative Impact – NA 	Moderate to High
Water Quality and Salinity Management	 Trend 2 - Prescription – Medium, Pace of trend – slow/moderate, Scale of trend – Regional, Trend 4 - Prescription – Medium, Pace of trend - slow/moderate, Scale of trend – Regional Trend 5 - Prescription – Medium, Pace of trend - slow/moderate, Scale of trend – Basin Wide Trend 6 - Prescription – Low, Pace of trend - slow to moderate, Scale of trend – regional Trend 7 - Prescription – Medium, Pace of trend - slow to moderate, Scale of trend – regional 	 Trend 2 – Plan Outcome – High, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – N/A Trend 4 – Plan Outcome – High, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – N/A Trend 5 – Plan Outcome – Moderate, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – N/A Trend 6 – Plan Outcome – Low, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – N/A Trend 7 – Plan Outcome – High, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – N/A 	Moderate
Water Resource Plan	 Trend 2 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – slow/moderate, <i>Scale of trend</i> – Regional Trend 4 - <i>Prescription</i> – High, <i>Pace of trend</i> – Slow to moderate, <i>Scale of trend</i> – Regional Trend 5 - <i>Prescription</i> – N/A, <i>Pace of trend</i> – NA, <i>Scale of trend</i> – NA Trend 6 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – slow to moderate, <i>Scale of trend</i> – Basin Wide Trend 7 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – slow to moderate, <i>Scale of trend</i> – Regional 	 Trend 2 – Plan Outcome – High, Financial Impact – High, Reputation Impact – High, Legislative Impact – High Trend 4 – Plan Outcome – High, Financial Impact – High, Reputation Impact – High, Legislative Impact – Moderate Trend 5 – Plan Outcome – NA, Financial Impact – NA, Reputation Impact – NA, Legislative Impact – NA Trend 6 – Plan Outcome – Low, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – Low Trend 7 – Plan Outcome – High, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – Moderate, Reputation Impact – High, Legislative Impact – High 	Moderate to High

Plan area	Likelihood	Consequence	Rating
Environmental Watering	• Trend 2 - <i>Prescription</i> – High, <i>Pace of trend</i> – slow/moderate, <i>Scale of trend</i> – Regional	• Trend 2 – <i>Plan Outcome</i> – High, <i>Financial Impact</i> – Moderate, <i>Reputation Impact</i> – High, <i>Legislative Impact</i> – Moderate/Iow	Moderate to High
	 Trend 4 - Prescription – High, Pace of trend – slow to moderate, Scale of trend – Regional 	• Trend 4 – <i>Plan Outcome</i> – High, <i>Financial Impact</i> – High, <i>Reputation Impact</i> - High, <i>Legislative Impact</i> – moderate/low	
	Trend 5 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – slow to moderate, <i>Scale of trend</i> – Basin wide	Trend 5 – <i>Plan Outcome</i> – Moderate, <i>Financial Impact</i> – Moderate, <i>Reputation Impact</i> - Moderate, <i>Legislative Impact</i> –	
	 Trend 6 - Prescription – High, Pace of trend – slow to moderate, Scale of trend – Regional Trend 7 - Prescription – High, Pace of trend – slow to 	 N/A Trend 6 – Plan Outcome – High, Financial Impact – Moderate, Reputation Impact - High, Legislative Impact – NA 	
	moderate, Scale of trend – Regional	• Trend 7 – <i>Plan Outcome</i> – High, <i>Financial Impact</i> – High, <i>Reputation Impact</i> – High, <i>Legislative Impact</i> –N/A	

Table 32: Threat 3 rating – Uncertainty regarding impact of compliance combined with rapidly changing operating conditions

Plan area	Likelihood	Consequence	Rating
Water Trade	• Trend 1 - Prescription – Medium , Pace of trend – Slow, Scale of trend – Regional	 Trend 1 - Plan Outcome – High, Financial Impact – High, Reputation Impact – High, Legislative Impact – High 	Moderate to High
	 Trend 2 - Prescription – Medium, Pace of trend – Slow to moderate, Scale of trend – Regional 	 Trend 2 - Plan Outcome – Low, Financial Impact – Low, Reputation Impact – High, Legislative Impact – N/A 	
Water Quality and Salinity Management	Trend 1 - <i>Prescription</i> – N/A, <i>Pace of trend</i> - Slow to moderate, Scale of trend – Regional	 Trend 1 - Plan Outcome – N/A, Financial Impact – N/A, Reputation Impact – N/A, Legislative Impact – N/A 	Moderate
	 Trend 2 - Prescription – Medium, Pace of trend – Slow to moderate, Scale of trend – Regional 	 Trend 2 - Plan Outcome – High, Financial Impact – Moderate, Reputation Impact – High, Legislative Impact – N/A 	
Water Resource Plan	Trend 1 - Prescription – Medium, Pace of trend – Slow, Scale of trend – Regional	Trend 1 - <i>Plan Outcome</i> – High, <i>Financial Impact</i> – Moderate, <i>Reputation Impact</i> – High, Legislative Impact – High	Moderate to High
	 Trend 2 - Prescription – Medium, Pace of trend – Slow to moderate, Scale of trend – Regional 	 Trend 2 - Plan Outcome – High, Financial Impact – High, Reputation Impact – High, Legislative Impact – N/A 	
Environmental Watering	 Trend 1 - Prescription – N/A, Pace of trend – N/A, Scale of trend – N/A 	 Trend 1 - Plan Outcome – N/A, Financial Impact – N/A, Reputation Impact – N/A, Legislative Impact – N/A 	Moderate to High
	 Trend 2 - Prescription – High, Pace of trend – Slow to moderate, Scale of trend – Regional 	 Trend 2 - Plan Outcome – High, Financial Impact – High, Reputation Impact – High, Legislative Impact – N/A 	

Basin Plan Area	Likelihood	Consequence	Rating
Water Trade	 Trend 8 - Prescription – N/A, Pace of trend – N/A, Scale of trend – N/A 	 Trend 8 - Plan Outcome – N/A, Financial Impact – N/A, Reputation Impact – N/A, Legislative Impact – N/A 	N/A
Water Quality and Salinity Management	Trend 8 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – Medium, <i>Scale of trend</i> – Basin scale	Trend 8 - <i>Plan Outcome</i> – Moderate, <i>Financial Impact</i> – Low, <i>Reputation Impact</i> – Moderate, <i>Legislative Impact</i> – N/A	Moderate
Water Resource Plan	Trend 8 - <i>Prescription</i> – Medium, <i>Pace of trend</i> – Medium, <i>Scale of trend</i> – Basin scale	Trend 8 - <i>Plan Outcome</i> – Moderate, <i>Financial Impact</i> – Low, <i>Reputation Impact</i> – Moderate, <i>Legislative Impact</i> – N/A	Moderate
Environmental Watering	• Trend 8 - <i>Prescription</i> – High, <i>Pace of trend</i> – Medium, <i>Scale of trend</i> – Basin scale	Trend 8 - <i>Plan Outcome</i> – Moderate, <i>Financial Impact</i> – Moderate, Reputation Impact – High, <i>Legislative Impact</i> – N/A	Moderate

E.2 Threat assessment: Water Resource Plans

Chapter 10 of the Basin Plan sets out the WRP requirements including the 14 matters that a WRP must comply with as follows:

- 1. The identification of the WRP area and other matters
- 2. The incorporation, and application, of the long-term annual diversion limit for each SDL resource unit in the WRP area
- 3. The sustainable use and management of water resources of the WRP area within the long-term annual diversion limits
- 4. The regulation, for the purpose of managing Basin water resources, of interception activities with a significant impact (whether on an activity-by-activity basis of cumulatively) on those water resources
- 5. Planning for Environmental Watering
- 6. Water quality objectives for the WRP area
- 7. The circumstances in which tradeable water rights in relation to the WRP area may be traded, and the conditions applicable to such trades
- 8. The broad approaches to the way risks to the water resources of the WRP area should be addressed
- 9. Information about measuring the water taken from the water resources of the WRP area and monitoring the water resources of the WRP area
- 10. Reviews of the WRP and amendments of the plan arising from those reviews
- 11. The scientific information or models on which the WRP is to be based
- 12. Planning for extreme events
- 13. Indigenous values and uses

The Plan does not, however, specify responsibility for preparing a WRP. Under the Act, a WRP may be prepared by a Basin State, or alternatively by MDBA (Section 53). This threat assessment has been prepared assuming that the WRP will be prepared by the Basin States and addresses how the trends may affect (threaten) the ability, or willingness, of the Basin States to prepare and implement a WRP.

Table 34: Threat assessment – Water Resource Plans

Water Resource Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
1 – Nature of threat posed by the trend to the area of the Plan?	Moderate	High	High	Moderate	Low	Moderate	Moderate	Moderate
2 – General risk to compliance caused by the threat?	N/A	General threat to the development and implementation of a WRP – ability to prepare robust WRPs that adequately deal with the changing conditions. May also make it difficult for States to comply with obligations imposed by WRP.	General threat to the development and implementation of a WRP – ability of Basin States to prepare WRP with available resources. May also restrict resources available to implement a WRP.	General threat to the development and implementation of a WRP – legal threats may result in Basin States being forced to slow or delay WRP preparation while legal action is resolved. Implementation may also be affected if threatened by legal action.	N/A	General threat to the development and implementation of WRP – ability to develop and implement WRP when understanding of conditions and take are changing or under dispute.	General threat to the development and implementation of WRP – ability to develop and implement WRPs given changing community views on the balance between consumptive and environmental water use (SDLs).	N/A
3 – Can specific areas of obligation at threat be identified?	Yes	Yes	No	Yes	N/A	Yes	No Section 10.52 - indigenous interests is an example of an obligation under the Plan that may be affected by shifts in	Yes

Water Resource Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
							community values.	
3a – If yes, indicate the compliance obligations that are more likely not to be performed by the Party	Sections 10.37- 10.39	Section 10.05 ⁶¹ Section 10.08 Section 10.09 Section 10.10 Section 10.13 Section 10.14	N/A	Section 10.13. A high level of prescription in a mandatory provision provides an opportunity for litigation in the case of non- compliance. Section 10.52 – Indigenous Australian interests	N/A	Section 10.10 Section 10.12 Section 10.15 Section 10.48 Section 13.14	N/A	Section 10.15 (determination of actual take) Sections 10.24 Section 10.46 Section 13.14 (Section 71 of the <i>Water Act</i> requires reporting at the end of water accounting periods that includes measurement)
3b – If yes, indicate the compliance obligations' level of prescription	Medium – must set out circumstances	Medium – must "describe", "have regard to", "identify" etc. But note that Section 10.10 (annual determination of permitted water take) must be based on specific criteria in Column	N/A	High – obligations set by reference to specific requirements of Schedule 3.	N/A	Medium – must set out method	Medium – must identify certain factors, must have regard to other factors via consultation.	Medium – must specify the monitoring that will be done

⁶¹ The inclusion of these provisions assumes that rapidly changing conditions in the Basin may make it very difficult for the Basin States to produce viable Water Resource Plan because the new conditions do not reflect the assumptions made in the Basin Plan.

Water Resource Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
		2, Schedule 3.						
4a – <u>Reputational</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	If circumstances are not set out (or are poorly set out) it may provide a barrier to trade and lead to stakeholder dissatisfaction with the water market (and MDBA's regulation of it).	If a produced WRP cannot deal with the changing conditions faced within a plan area, the WRP may need to be regularly revised, leading to uncertainty for water users and reducing water user confidence in MDBA's ability to manage water resources.	If a Basin State fails to produce a plan (or an adequate plan), MDBA may need to step in. This will likely lead to degradation of relationships and significant reputational damage with both the affected State and other States who may disapprove of intervention.	Legal action in one area (particularly if successful) may spread to other areas, spreading further distrust.	N/A	Development of new methods may require revision of the WRP, leading to uncertainty for water users and reducing water user confidence in MDBA's ability to manage water resources (account for take etc.). If divergence in methods between States and MDBA emerge, it could lead to disagreement as to whether a WRP is appropriate, reducing confidence (and trust) in MDBA.	If a Basin State fails to produce a plan (or produces a non-compliant plan), MDBA may need to step in. This will likely lead to degradation of relationships and significant reputational damage with both the affected State and other States who may disapprove of intervention.	Failure to specific required monitoring may lead to inability to demonstrate compliance and outcomes which may negatively affect the reputation of MDBA (trust).
4b – <u>Financial</u> consequence of the obligation not being performed? (consequence is noted from the	May require additional MDBA resources to address / manage	May require additional MDBA resources to address / manage	May require additional MDBA resources to address / manage	May require additional MDBA resources to address / manage	N/A	May require additional MDBA resources to address / manage	May require additional MDBA resources to address / manage	May require additional MDBA resources to address / manage

Water Resource Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
perspective of MDBA)								
4c – <u>Legislative</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	If circumstances are not set out, the some forms of groundwater trade may be unnecessarily restricted (in contravention to water trading rules)	N/A	Minimal	Interpretation by courts of provisions of the Plan and its relationship to WRPs may require legislative amendment.	N/A	Minimal	Potential threat of producing a non- compliant plan, and/or failing to meet SDLs, in contravention of the Basin Plan and Water Act requirements	N/A
4d – <u>Plan</u> <u>outcome</u> consequence of the obligation not being performed (consequence is noted from the perspective of MDBA)?	If circumstances are not set out, could result in non-accreditation of the WRP and may unnecessarily restrict some forms of groundwater trade restricted. Possible constraint on achievement of <i>Water Act</i> objectives, Schedule 3, clause 3.	If a produced WRP cannot deal with the changing conditions faced within a plan area, the targeted outcomes of the Plan may be threatened.	Could lead to non- production of a WRP by a State (or production of a non-compliant WRP). This may threaten the targeted outcomes of the Plan.	Challenges relating to the validity of the Plan or SDLs may also significantly threaten the targeted outcomes of the Plan.	N/A	Minimal impact on the actual outcomes, but significant potential for disagreement about what the outcome is.	Could lead to non- production of a WRP by a State (or production of a non-compliant WRP). This may threaten the targeted outcomes of the Plan.	Failure to specific required monitoring may lead to inability to demonstrate achievement of outcomes.

E.3 Threat assessment: Environmental Watering Plans

Chapter 8 of the Plan sets out the overall environmental objectives for water-dependent ecosystem, the targets by which to measure progress towards those objectives, the method to be used to identify environmental assets requiring Environmental Watering and the principles and methods to be applied to determining priorities for applying environmental water. Specific obligations for the preparation and implementation of EWPs (long term and annual watering priorities) are set out in Part 4 (of Chapter 8) – Environmental Management Framework. In short:

- MDBA is obligated to prepare (Sections 8.13 8.15), publish (Section 8.16) and review and update (Section 8.17) a Basin-wide Environmental Watering strategy
- Basin States are obligated to prepare (Sections 8.18 8.20), provide to MDBA and publish (Section 8.21) and review and update (Section 8.22) long-term EWPs
- Basin States are obligated to identify (Sections 8.23 8.24), prepare (Section 8.25) and provide to MDBA (Section 8.26) annual Environmental Watering priorities;
- MDBA is obligated to prepare (Section 8.27 8.29), publish (Section 8.30) and review and update (Section 8.31) Basin annual Environmental Watering priorities
- The Plan stipulates a range of principles to be applied in Environmental Watering (Chapter 8, Sections 8.33-8.43). For the purposes of this Threat Assessment Template it is assumed that the Division is intended to impose obligations on Parties in the process of Environmental Watering.

This threat assessment has been prepared to evaluate how the trends may affect (threaten) the ability, or willingness, of the Basin States to meet their obligations with regard to the Basin-wide Environmental Watering strategy, long-term watering plans, or annual Environmental Watering priorities.

Environmental Watering Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
1 – Nature of threat posed by the trend to the area of the Plan?	Low	Moderate	High	Moderate	Moderate	Moderate	High	Moderate
2 – General risk to compliance caused by the threat?	Possibility of new products circumventing the Plan's controls on	General risk to the development and implementation of	General risk to the development and implementation of	General risk to the development and implementation of	Increased regulatory burden may reduce the capacity of	General risk to the development and implementation of	General risk to the development and implementation of	General risk to the development and implementation of EWP – monitoring

Table 35: Threat assessment – Environmental Watering Plans

Environmental Watering Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
	water trading and diverting or limiting the delivery of environmental water.	EWP – ability to understand how to deliver watering activities in a rapidly changing environment. The critical shift from consumptive water regulation to environmental water delivery may also reflect rapid changes that are not readily adapted to by regulators and consumers.	EWP – ability to take into account all of the objectives and targets when preparing EWPs and undertake the necessary research, analysis and consultation to support robust EWPs. Capacity to deliver environmental water on the basis of principles such as "adaptive management" may prove difficult.	EWP – ability to develop and implement EWPs if faced with legal threats against specific actions and more general / wide spread principles. Litigation may be encouraged by those sectors who have difficulty transitioning from a water consumptive regime to one that focuses on environmental outcomes. Note threat of third party legal intervention.	environmental water managers to effectively meet the environmental water requirements of the Plan. Extra layers of planning and risk management could make Environmental Water managers less responsive to opportunities for watering and so reduce outcome / miss cues for maximising outcomes.	EWP – ability to develop and implement EWPs when understanding of requirements to meet objectives is changing or under dispute. Conversely, improved modelling may enhance the capacity to protect and delivery environmental water.	EWP – ability to develop and implement EWPs given changing community views on the principles and priorities for Environmental Watering. A particular threat to annual watering plans	will provide important information to inform watering plans and annual priorities. Lack of monitoring information may create difficulties in making informed, evidence based, decisions about watering priorities. Issues of being unable to determine unauthorised take of environmental water. Inadequate measuring facilities may also impede detection of unlawful use of environmental water.
3 – Can specific areas of obligation at threat be identified?	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3a – If yes, indicate the	N/A. Note Section	Section 13.14 Section 8.18	Sections 8.22- 8.24	Sections 8.13- 8.15	Sections 8.16 Section 8.21	Sections 8.13- 8.15	Sections 8.13- 8.15	Section 8.22 (Review and update

Environmental Watering Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
compliance obligations that are more likely not to be performed by the Party	10(8)(2) (WRPs) requiring the holder of a water access right to comply with any condition imposed by that right. Rapid increase in water products and limited capacity to regulate may result in conditions critical to Environmental Watering not being complied with. ⁶²	Section 8.22 Section 8.23 Section 8.35? Section 8.40?	Sections 8.26- 8.29 Section 8.31 Section 13.14	Sections 8.17- 8.20 Sections 8.22- 8.24 Sections 8.26- 8.29 Section 8.31 Section 8.35? Section 8.40?	Section 8.25 Section 8.30 ⁶³	Sections 8.17- 8.20 Sections 8.22- 8.24 Sections 8.26- 8.29 Section 8.31	Sections 8.17- 8.20 Sections 8.22- 8.24 Sections 8.26- 8.29 Section 8.31	of long-term watering plans) Cross reference to 10/08(2)
3b – If yes, indicate the compliance obligations' level of prescription	N/A	Overall - High Must prepare and review within specified timeframes and in accordance with specified principles Sections 8.19 &	Overall - Moderate Section 8.18 – High Section 8.22 – Low Section 8.23 – High Section 13.14 -	Overall Moderate– must prepare and review within specified timeframes and in accordance with specified principles (note Environmental	Overall Moderate – must provide and publish within specified timeframes	Overall moderate – must prepare and review within specified timeframes and in accordance with specified principles	Overall moderate-must prepare and review within specified timeframes and in accordance with specified principles. (note environmental	Overall - Low

⁶² This obligation could also apply to the threat assessment for Water Trade obligations.

⁶³ The trend "more forms, more reports and less time" mean that increased regulatory burden from any source could result in a limited capacity for Parties to the Basin Plan to meet their obligations under the Plan. These sections identify reporting obligations in the Plan as being at possible threat by a general increase in regulatory burden.

Environmental Watering Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
		8.20 add a significant degree of prescription to Section 8.18 Sections 8.24 and 8.25 amplify the nature of the obligation under section 8.23 with respect to content and preparation of AEW Priorities	Low Sections 8.33-43 - Medium	Watering principles)			water principles)	
4a – <u>Reputational</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	N/A	Failure to prepare or implement any aspect of an EWP (strategy, long- term plan or annual priorities) would likely lead to significant stakeholder dissatisfaction with the efforts/results of MDBA, given EWPs are critical to the success of the Plan. Environmental water managers in effectively planning for and	Failure to prepare or implement any aspect of an EWP (strategy, long- term plan or annual priorities) would likely lead to significant stakeholder dissatisfaction with the efforts/results of MDBA, given EWPs are critical to the success of the Plan. Failure to comply with environmental water principles	Legal action in one area (particularly if successful) may spread to other areas, spreading further distrust.	If an aspect of an EWP is not published, it may raise concerns about the transparency of the process etc. This may lead to a lack of confidence and trust in the process (and hence MDBA)	Failure to prepare or implement any aspect of an EWP (strategy, long- term plan or annual priorities) would likely lead to significant stakeholder dissatisfaction with the efforts/results of MDBA, given EWPs are critical to the success of the Plan.	Failure to prepare or implement any aspect of an EWP (strategy, long- term plan or annual priorities) would likely lead to significant stakeholder dissatisfaction with the efforts/results of MDBA, given EWPs are critical to the success of the Plan. Failure to comply with environmental water principles	Given that EWPs are critical to the success of the Plan, lack of clarity on watering priority decisions, plus lack of evidence of achievement of watering actions may create significant stakeholder dissatisfaction with the efforts/results of MDBA. Inability to know if environmental water is being taken or not possibly leading to criticism

Environmental Watering Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
		delivering environmental water with consequential criticism of MDBA's implementation of the Plan.	may attract considerable criticism.				may attract considerable criticism.	of MDBA being ineffectual. Lack of knowledge about whether environmental water is being unlawfully taken and, if so to what extent, may lead to criticism that MDBA is not sufficiently informed to carry out its obligations.
4b – <u>Financial</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	N/A	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.
4c – <u>Legislative</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	N/A	N/A	N/A	Judgments of the courts may argue for legislative amendment to particular provisions.	N/A	N/A	N/A	N/A
4d – <u>Plan</u>	N/A	Failure to prepare	Failure to prepare	Failure to prepare	Failure to publish	Failure to prepare	Failure to prepare	Inability to

Environmental Watering Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
outcome consequence of the obligation not being performed (consequence is noted from the perspective of MDBA)?		or implement any aspect of an EWP (strategy, long- term plan or annual priorities) would significantly threaten achievement of the objectives of the Plan.	or implement any aspect of an EWP (strategy, long- term plan or annual priorities) or to undertake Environmental Watering in conformity with stated principles would significantly threaten achievement of the objectives of the Plan.	or implement any aspect of an EWP (strategy, long- term plan or annual priorities) or to undertake Environmental Watering in conformity with stated principles would significantly threaten achievement of the objectives of the Plan.	an aspect of an EWP would have minimal consequences for achievement of the objectives of the Plan.	or implement any aspect of an EWP (strategy, long- term plan or annual priorities) or to undertake Environmental Watering in conformity with stated principles would significantly threaten achievement of the objectives of the Plan.	or implement any aspect of an EWP (strategy, long- term plan or annual priorities) would significantly threaten achievement of the objectives of the Plan.	demonstrate outcomes of the Plan will seriously threaten achievement of specified Plan outcomes and in particular the environmental objectives for water-dependent ecosystems (see Chapter 8, Part 2).
E.4 Threat assessment: Water Trading Rules

Chapter 12 of the Plan sets out the water trading rules. In addition to specifying the water trading rules, Chapter 12 specifies the obligations that apply to Parties. Parties with obligations under Chapter 12 include the MBDA, Basin States, irrigation infrastructure operators, approval authorities, individuals involved in a water trade (individual buyers and sellers) and persons who make water announcements. This threat assessment has been prepared to evaluate how the trends may affect (threaten) the ability, or willingness of Parties meeting their obligations under Chapter 12.

Water Trading Rules Question **Pushing the** Too much Where have all From public More forms, The modelling Changing Cannot boundaries change too opinion to more reports, race perceptions of the people measure "value" auickly legal action less time cannot comply aone 1 - Nature of Hiah Moderate Moderate Moderate High Moderate Low Low threat posed by the trend to the area of the Plan? 2 – General risk General threat to N/A General threat to Uncertainty and Delavs to Dispute between N/A General threat to to compliance the intent of the the development delay as legal processing/approv the Basin State the consistent. caused by the water trading rules and challenges are ing trade and MDBA as to accurate threat? - ability to implementation of resolved. transactions. the acceptability application of trading rules, and process increased water trading of data used to Court judgments Delavs in volumes of trade the proper rules, as well as establish water may provide the providing required and trade of new the management trade parameters: reporting of basis to amend information to of trade approvals products not eq determination changes to rules the Plan, Water MDBA and of water allocation and other required currently catered etc. - availability Trading Rules etc. otherwise. for under the rules of resource to levels information if prepare and appropriate monitoring assess trade rules processes not in (including allowable place. restrictions on trade) as well as participate in the trade approvals process.

Table 36: Threat assessment – Water Trading Rules

Water Trading Rules									
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply	
3 – Can specific areas of obligation at threat be identified?	Yes	Yes	Yes	No	Yes	Yes	N/A	Yes	
3a – If yes, indicate the compliance obligations that are more likely not to be performed by the Party	Section 12.06- 12.17 Section 12.28 Section 12.43 Section 12.46 Section 12.47	Section 12.28	Section 12.43 Section 12.46 Section 12.47	N/A	Sections 12.19- 12.20 Section 12.22 Sections 12.28- 12.30 Sections 12.32- 12.35 Sections 12.37- 12.39 Sections 12.43- 12.44 Sections 12.46- 12.48 Sections 12.50-12.52	Section 12.44	N/A	Section 12.28 Section 12.30 Section 12.33 Sections 12.37 – 12.39 Sections 12.46 - 12.48 Sections 12.50 – 12.51	
3b – If yes, indicate the compliance obligations' level of prescription	Overall – Medium Section 12.06 - 12.17 – N/A Section 12.28 – Medium Section 12.43 – Medium Section 12.46 – Medium Section 12.47 – High	Overall – Medium Section 12.28 - Medium	Overall – Medium Section 12.43 – Medium/high Section 12.46 – Medium Section 12.47 – Medium	Medium – based on assumption that all Sections addressed here impose obligations and are therefore potentially subject to challenge.	Mix of medium and high, many specify timeframes and principles, rules etc. that must be followed	Low	N/A	Mix of medium and high, many specify timeframes and principles, rules etc. that must be followed.	

Water Trading Rules									
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply	
4a – <u>Reputational</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	Cannot cope with new products could lead to failure to approve trades, or trade bans and suspensions. Inability to handle increased volumes of trade may also lead to failure to approve trades, or trade bans and suspensions. Both outcomes may present a perceived (or actual) unreasonable restriction under the rules and lead to stakeholder dissatisfaction with the water market (and MDBA's regulation of it).	Authority cannot amend Rules sufficiently quickly to maintain regulatory control.	Poor development of water trading rules, particularly (questionable?) restrictions on trade may lead to trades being prevented unnecessarily, or conversely inappropriate trades being allowed. May lead to stakeholder dissatisfaction with the water market (and MDBA's regulation of it).	A critical element of the Plan (open water trade, largely) may be impeded as legal disputes are resolved.	These obligations primarily relate the sharing and publication of restrictions on trade, information about trades undertaken and insider trading. Failure to meet these obligations may prevent essential transparency in the market and may lead to actual or perceived inequitable trades. This is a serious reputational risk to MDBA.	Authority "tested" or challenged by Basin States relying on alternative modelling and data.	N/A	Inability to demonstrate compliance with trading rules provisions may reduce public confidence in water markets and trade.	
4b – <u>Financial</u> consequence of the obligation not being	May require additional MDBA resources to address /	N/A	May require additional MDBA resources to address /	Costs involved in contesting legal challenges (Basin States and	May require additional MDBA resources to address /	N/A	N/A	N/A	

	Water Trading Rules								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply	
performed? (consequence is noted from the perspective of MDBA)	manage.		manage.	MDBA).	manage.				
4c – <u>Legislative</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	Development of new products may require amendments to the water trading rules. Depending on the types of new products developed, may shift oversight responsibility to ASIC (from ACCC).	Rapid development of new products may outstrip the capacity of the Plan to effectively manage and encourage water trade.	Minimal.	Authority unable to enforce compliance with Chapter 12 because of legal uncertainties.	N/A	N/A	N/A	N/A	
4d – <u>Plan</u> <u>outcome</u> consequence of the obligation not being performed (consequence is noted from the perspective of MDBA)?	May threaten achievement of the objectives of the water trading rules (free trade subject to reasonable restrictions).	Object of Schedule 3 of the Act and Chapter 12 of the Plan (right to trade free of certain restrictions) may be undermined.	May be slow to act in response to the water trade market, or place unnecessary barriers to trade. This may threaten achievement of the objectives of the water trading rules. Eg (Water Act, Schedule 3, clause 3).	May delay meeting of objectives of Chapter 12.	These obligations are essential for the implementation of the Plan water trade rules. Failure to meet these obligations may compromise achievement of the objectives of the Plan water trade rules (equitable trade).	N/A	N/A	May threaten achievement of the objectives of the water trading rules (i.e. facilitation of efficient water markets, including through good information flows in the market).	

E.5 Threat assessment: Water Quality and Salinity Management Plans

Chapter 9 of the Plan sets out water quality and salinity management objectives but does not require the development of a specific WQSMP. Rather, Division 3 of Chapter 9 specifies the water quality targets to be used to inform the development of WRPs (Sections 9.15 – 9.18) while Part 7 of Chapter 10 (Section 10.29) specifies that a WRP must include a water quality management plan. Threats to the development of WRPs more broadly were assessed in Appendix F.1 and are not repeated here. This assessment evaluates threats specifically related to Division 7 of Chapter 10, as well as the following specific obligations from Chapter 9:

- MDBA, Basin Officials Committee, Basin States and holders and managers of environmental water must have regard to specified water quality targets (Section 9.14) and MDBA, Basin Officials Committee and Basin States are to apply the specified end-of-valley targets in performing long-term salinity planning and management functions (Section 9.19)
- MDBA must estimate salt export, annually assess the achievement of the salt export objective and publish the assessment on its website (Section 9.09
- MDBA must monitor and assess compliance with specified salinity targets, and publish the findings (Section 9.14)

Table 37: Threat assessment – Water Quality and Salinity Management Plans

Water Quality and Salinity Management Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
1 – Nature of threat posed by the trend to the area of the Plan?	Low	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
2 – General risk to compliance caused by the threat?	N/A	General threat to the development and implementation of WQSMP – ability to understand water quality implications of a rapidly changing environment.	General threat to the development and implementation of WQSMP – ability to take into account all of the objectives and targets when preparing WQSMP and	General threat to the development and implementation of WQSMP – ability to develop and implement WQSMP if faced with legal threats against specific actions and more	N/A	General threat to the development and implementation of WQSMP – ability to develop and implement WQSMPs when understanding of requirements to meet objectives is	N/A	N/A

Water Quality and Salinity Management Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
			undertake the necessary research, analysis and consultation to support robust WQSMPs.	general / wide- spread principles.		changing or under dispute.		
3 – Can specific areas of obligation at threat be identified?	N/A	No	Yes	No	Yes	Yes	No	Yes - This response assumes that the measurement issue here is not directly related to the preparation of WQSMPs but compliance with them (see below). If measurement is required to develop WQSMPs then Sections 10.30-33 of the Plan may become relevant.
3a – If yes, indicate the compliance obligations that are more likely not to be performed by the Party	N/A	N/A	Section 10.30 (Identification of causes of water quality degradation) Section 10.31 (Measures for addressing water quality risks) Section 10.32 (Identification of	N/A	Section 9.09 Section 9.14	Section 10.48 (amendment to WRPs)	No	Sections 9.09 Section 9.14

Water Quality and Salinity Management Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
			water quality target values) Section 10.33 (Identification of measures to achieve water quality objectives) Section 10.34 (target values for irrigation water) Section 10.35 (impact of WQSMPs on other Basin States) Section 13.14 (reporting requirements)					
3b – If yes, indicate the compliance obligations' level of prescription	N/A	Medium ⁶⁴	Overall – high Sections 10.30- 10.33 – High Section 13.14 – Low	Medium ⁶⁵	Medium – must be completed within specified timeframes	Low	Medium ⁶⁶	Medium – must be completed within specified timeframes
4a – <u>Reputational</u> consequence of the obligation	N/A	If a produced WRP cannot deal with the changing	If a Basin State fails to produce a plan (or an	Legal action in one area (particularly if	These obligations primarily relate the sharing and	Development of new methods for assessing baseline	Community concern with economic	Inability to monitor and assess compliance with

⁶⁴ Based on the assumption that all or any provisions (sections) could be subject to non-compliance if this trend impacts.

⁶⁵ Based on assumption that all sections addressed here impose obligations and are therefore potentially subject to challenge

⁶⁶ Based on assumption that compliance with obligations imposed by any or all sections may be influenced by changes in community values

Water Quality and Salinity Management Plans									
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply	
not being performed? (consequence is noted from the perspective of MDBA)		conditions faced within a plan area, the WRP may need to be regularly revised, leading to uncertainty for water users and reducing water user confidence in MDBA's ability to manage water resources.	adequate plan), MDBA may need to step in. This will likely lead to degradation of relationships and significant reputational damage with both the affected State and other States who may disapprove of intervention.	successful) may spread to other areas, spreading further distrust.	publication of information on compliance with water quality targets. Failure to publish information will not affect compliance, but may affect stakeholder awareness (and hence confidence and trust) about whether the specified water quality targets are being achieved.	conditions or impact of actions may require WRPs to be revised (leading to uncertainty for water users). If divergence in methods between States and MDBA emerge, it could lead to disagreement as to whether a WRP is appropriate, reducing confidence (and trust) in MDBA.	security may result in water quality issues being regarded as secondary. Authority may need to strongly encourage Basin States to adhere to the water quality requirements of the Plan.	specified water quality objectives would create uncertainty about whether the objectives are being achieved. This would affect stakeholder confidence and trust about the actions of MDBA/Basin States etc. with regard to water quality targets.	
4b – <u>Financial</u> consequence of the obligation not being performed? (consequence is noted from the perspective of MDBA)	N/A	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	May require additional MDBA resources to address / manage.	N/A	May require additional MDBA resources to address / manage.	
4c – <u>Legislative</u> consequence of the obligation not being performed?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Water Quality and Salinity Management Plans								
Question	Pushing the boundaries	Too much change too quickly	Where have all the people gone	From public opinion to legal action	More forms, more reports, less time	The modelling race	Changing perceptions of "value"	Cannot measure cannot comply
(consequence is noted from the perspective of MDBA)								
4d – <u>Plan</u> outcome consequence of the obligation not being performed (consequence is noted from the perspective of MDBA)?	N/A	Failure to develop a WQSMP (as part of a WRP) would significantly threaten achievement of the objectives of the Plan.	Failure to develop a WQSMP (as part of a WRP) would significantly threaten achievement of the objectives of the Plan.	Challenges relating to the validity of the Plan or SDLs may also significantly threaten the targeted outcomes of the Plan.	Failure to publish outcomes of the Plan would have minimal consequences for achievement of the objectives of the Plan.	Minimal impact on the actual outcomes, but significant potential for disagreement about what the outcome is.	Achievement of water quality objectives of the Plan may be jeopardised or delayed while water quality provisions of WRPs are attended to.	Inability to measure and monitor water quality in relevant Basin waters will inhibit determinations of whether the Plan is achieving water quality targets (Chapter 9, Part 4).

Appendix F. Example of linking trends to a threat

The following tables provide a worked example of the direct connections and relationships between trends and threat 1 (compliance is threatened if current and future organisational capacity and capability of Parties declines). The information contained in the tables are drawn from the following parts of this report:

- Stakeholders subject to the threat section 2.3.1, threat identification and causes
- For each area of the Plan:
 - Relevance of the threat to compliance with the particular area of the Plan section 2.3.2, *risks to compliance*
 - Likelihood section 2.3.3, likelihood of threat creating risks to compliance
 - Trend section 2.3.1, threat identification and causes
 - Factors section 3.1.4 (equivalent section should be referred to depending on the trend(s) identified as above)
 - Monitoring Appendix H, *issues* under *relevant data and sources* (equivalent section should be referred to depending on the trend(s) identified as above)

F.1 Threat 1 – Compliance is threatened if current and future organisational capacity and capability of Parties declines

The threat of Parties lacking capacity to comply with Plan obligations is primarily relevant to:

- Basin States/Territories
- Irrigation infrastructure operators
- Water trade approvers
- Commonwealth Environmental Water Holder

F.1.1 Water resource planning

This threat may delay the development and / or implementation of a WRP.

Table 38: Threat 1 - Water resource planning

Likelihood	Trend	Factors	Monitoring
 Level of prescription of obligations: medium. Increase the likelihood of noncompliance: moderate reduction in water resource planning resources. Examples: Failure to recruit or replace key modelling staff that are required to support the development of WRPs and their component rules. Failure to recruit or replace key modelling staff to undertake the modelling studies necessary to determine the annual maximum quantity of water allowed to be taken for consumptive use within the preceding water accounting period. 	Trend 3 – Where have all the people gone	 Increase pace and scale: Extreme weather events place further unexpected constraints on resources Slow economic growth and increasing community concern over job security reduces government budget allocations to water management and the environment Skills shortages due to higher real wages in other sectors Restructuring or rationalisation of CMAs, rural water corporations, or state water resource and environment agencies. Decrease pace and scale: Development of enforcement and compliance remote sensing technologies may help to monitor water theft Fully automated customer billing and water delivery monitoring technologies are installed Renewable energy is commercially viable in the region and can be used to power the water supply system at an acceptable level of cost Greater accuracy and precision in identifying emerging risks to water availability, security and reliability. 	 Percentage of WRPs which require significant amendment before receiving accreditation Number of WRPs accredited and passing audits Extensions and changes to timelines for WRP or EWP development (timetables for WRP development) New and procedures or techniques for water management in the Basin Level of Federal Government funding for Plan activities (\$ and FTEs) State and Territory funding for Plan activities (\$ and FTEs) Implementation Agency Budgets Significant re-organisation or restructuring of jurisdictional agencies involved in water and environment issues. Media reports of staff cutbacks especially in regional delivery agencies, or reports on reductions to front-line services in these agencies. No. of FTEs in consultant organisations supporting Plan activities Value of consultancies supporting Plan activities Changes to Australian and regional demographics (ie aging population) Changes to labour market, including declines in real wages No. of graduates and post-graduates in water resource and environmental management in Australia No. of job advertisements for water resource management and environmental/ ecologist roles in Basin states.

F.1.2 Environmental Watering

This threat may delay the development and / or implementation of an EWP, as Parties may lack the capacity and / or capability to adequately address all of the objectives and targets when preparing an EWP, or to undertake the research, analysis, and consultation required in support of a robust EWP.

Table 39: Threat 1 – Environmental Watering

Likelihood Tre	rend	Factors	Monitoring
 Level of prescription of obligations: low to medium. Increase the likelihood of noncompliance: moderate to large reduction in environmental water resources. Examples: Staff are not available to prepare annual Environmental Watering priorities for each WRP area to fully comply with the provisions of Chapter 8 of the plan. Insufficient staff to monitor and review the delivery of environmental water compared to the annual watering priorities and then report to MDBA on any watering actions that were not in accordance with the annual Environmental Watering priorities. 	rend 3 – Where ave all the eople gone	 Increase pace and scale: Extreme weather events place further unexpected constraints on resources Slow economic growth and increasing community concern over job security reduces government budget allocations to water management and the environment Skills shortages due to higher real wages in other sectors Restructuring or rationalisation of CMAs, rural water corporations, or state water resource and environment agencies. Decrease pace and scale: Development of enforcement and compliance remote sensing technologies may help to monitor water theft Fully automated customer billing and water delivery monitoring technologies are installed Renewable energy is commercially viable in the region and can be used to power the water supply system at an acceptable level of cost Greater accuracy and precision in identifying emerging risks to water availability, security and reliability. 	 Extensions and changes to timelines for WRP or EWP development (timetables for WRP development) Compliance with SDLs Quality of EWPs and monitoring of implementation Level of Federal Government funding for Plan activities (\$ and FTEs) State and Territory funding for Plan activities (\$ and FTEs) Implementation Agency Budgets Significant re-organisation or restructuring of jurisdictional agencies involved in water and environment issues. Media reports of staff cutbacks especially in regional delivery agencies, or reports on reductions to front-line services in these agencies. No. of FTEs in consultant organisations supporting Plan activities Value of consultancies supporting Plan activities Changes to Australian and regional demographics (ie aging population) Changes to labour market, including declines in real wages No. of job advertisements for water resource management and environmental/ ecologist roles in Basin states.

F.1.3 Water Trade

This threat may result in poor quality decision making, leading to the incorrect or incomplete application of trading rules or delays in assessing trade applications and in forwarding information to MDBA.

Table 40: Threat 1 - Water Trade

Likelihood	Trend	Factors	Monitoring
 Level of prescription of obligations: high. Increase the likelihood of noncompliance: small reduction in water trade related resources. Example: Contraction of key resources for support and maintenance of state based water entitlement and trade registers. This could limit States' ability to effectively comply with the information and reporting requirements for water access entitlements and water trade prices set out in the Plan. 	Trend 3 – Where have all the people gone	 Increase pace and scale: Extreme weather events place further unexpected constraints on resources Slow economic growth and increasing community concern over job security reduces government budget allocations to water management and the environment Skills shortages due to higher real wages in other sectors Restructuring or rationalisation of CMAs, rural water corporations, or state water resource and environment agencies. Decrease pace and scale: Development of enforcement and compliance remote sensing technologies may help to monitor water theft Fully automated customer billing and water delivery monitoring technologies are installed Renewable energy is commercially viable in the region and can be used to power the water supply system at an acceptable level of cost Greater accuracy and precision in identifying emerging risks to water availability, security and reliability. 	 Reported time for processing trades Level of Federal Government funding for Plan activities (\$ and FTEs) State and Territory funding for Plan activities (\$ and FTEs) Implementation Agency Budgets Significant re-organisation or restructuring of jurisdictional agencies involved in water and environment issues Media reports of staff cutbacks especially in regional delivery agencies, or reports on reductions to front-line services in these agencies No. of FTEs in consultant organisations supporting Plan activities Value of consultancies supporting Plan activities Changes to Australian and regional demographics (ie aging population) Changes to labour market, including declines in real wages.

F.1.4 Water quality & salinity management

This threat may result in insufficient consideration of water quality and salinity management targets when developing a WRP.

Table 41: Threat 1 - Water quality and salinity management

Likelihood	Trend	Factors	Monitoring
 Level of prescription of obligations: high. Increase the likelihood of non-compliance: small reduction in water quality and salinity management related resources. Example: Fewer key staff engaged in river system operational planning in either MDBA or Basin States, resulting in insufficient regard for the water quality targets (established in WQSMPs) when undertaking management of water flows. 	Trend 3 – Where have all the people gone	 Increase pace and scale: Extreme weather events place further unexpected constraints on resources Slow economic growth and increasing community concern over job security reduces government budget allocations to water management and the environment Skills shortages due to higher real wages in other sectors Restructuring or rationalisation of CMAs, rural water corporations, or state water resource and environment agencies. Decrease pace and scale: Development of enforcement and compliance remote sensing technologies may help to monitor water theft Fully automated customer billing and water delivery monitoring technologies are installed Renewable energy is commercially viable in the region and can be used to power the water supply system at an acceptable level of cost Greater accuracy and precision in identifying emerging risks to water availability, security and reliability. 	 New and procedures or techniques for water management in the Basin Level of Federal Government funding for Plan activities (\$ and FTEs) State and Territory funding for Plan activities (\$ and FTEs) Implementation Agency Budgets Significant re-organisation or restructuring of jurisdictional agencies involved in water and environment issues Media reports of staff cutbacks especially in regional delivery agencies, or reports on reductions to front-line services in these agencies No. of FTEs in consultant organisations supporting Plan activities Value of consultancies supporting Plan activities Changes to Australian and regional demographics (ie aging population) Changes to labour market, including declines in real wages No. of graduates and post-graduates in water resource and environmental management in Australia No. of job advertisements for water resource management and environmental/ ecologist roles in Basin states.

Appendix G. Constructing Compliance Scenarios

G.1 Overview of method to develop a scenario

Scenario planning provides a means to plan for different "futures". By exploring the joint impact of relevant trends and uncertainties (local, regional, national and global), scenario planning can capture a range of future possibilities. MDBA can use scenario planning to "test" the medium to longer term suitability of possible interventions.

The steps involved in developing compliance scenarios are:

- 1. Select an area of the Plan eg WRP, WQSMP, EWP, or Water Trade
- 2. Identify the threats that are relevant to the area of the Plan
- 3. Select a threat and identify the trends which are contributing to the threat
- 4. Construct four different scenarios using information gathered about the trends. The four scenarios should be:
 - a. The scenarios don't eventuate and business as usual prevails
 - b. A particular trend is the dominant trend moving at a faster pace and a greater scale than other trends
 - c. The trends identified eventuate at their predicted pace and scale
 - d. One of the identified trends doesn't eventuate at predicted pace and scale and all other trends do eventuate
- 5. Outline the likely responses (behaviours and actions) from Parties impacted by the trends. These should be broadly consistent with the nature of the threat and types of risks to compliance. They should provide a level of detail regarding the rationale for Parties to respond
- 6. Develop possible interventions this should involve what type of intervention is needed (education/training, resource support, change in regulatory obligation, use of any enforcement powers, production of more explicit guidance etc.), how it would be implemented, time it would take to develop and implement the intervention
- 7. Test the intervention in the context of the four scenarios. For each scenario answer the following three questions:
 - a. What would happen if we continue to deliver our current compliance and assurance activities ie business as usual?
 - b. What would happen if we implemented possible interventions ie how would Party to the Plan respond, what would it cost MDBA, how would others perceive the intervention, what type of Ministerial support would be needed etc.?
 - c. What would happen if we choose not to respond and accept that these risks don't eventuate ie do nothing?
- 8. Document the intervention into the form of an action plan so that it is ready for implement should the trends and threat(s) begin to eventuate.

G.2 Example of a compliance scenario

Trend No. 3 – "Where have all the people gone" becomes the dominant trend – moving at a faster pace and a greater scale than other trends. A possible scenario for the development of this trend could be as described below.

In response to declining demand for Australian commodities in China and renewed debt concerns in the Eurozone, economic growth in Australia reduces. Mining revenues and associated tax income to government declines, whilst at the same time consumer confidence in the broader community declines, leading to a reduction in retail spending and an increase in personal savings. Revenue from GST, minerals resource rent tax, personal income tax and company tax sources declines significantly.

In order to maintain favourable credit ratings, state and federal governments seek to deliver small budget surpluses. Given the shrinkage in revenues, one of the few options left to governments is to reduce spending to achieve a budget surplus.

With intergovernmental agreements in place between Federal and state governments for increase co-funding of education, health and disability service, state and federal governments prioritise spending in these areas, requiring heavy cuts to other programs in order to avoid deficits.

Significant population growth continues in major urban centres, whilst rural and regional centres shrink and decline in population and service. In order to meet the demand for services in growing urban centres, government capital expenditure is focused on delivering new hospitals, schools, roads and public transport services.

Spending on natural resource management declines in response to budget cuts and governments announce 20% staff cuts to their water and environment agencies, with no reduction in front line service delivery. Voluntary and compulsory redundancies are announced, and older, longer serving (and more experienced) staff form a major component of the redundancies. In order to meet the target of no reduction to frontline services, expenditure reductions focus on planning and policy staff, environmental monitoring and reporting activities.

Within water agencies, given the budget cuts and continued population growth in major urban centres, staff previously working in rural water are shifted to concentrate on urban water issues such as water supply security, providing flood mitigation services in developing suburbs and ensuring urban water supply and waste water assets are appropriately protected from extreme weather events and climate change impact (eg rising sea levels).

State governments restructure and re-organise departments, seeking efficiencies and savings. Where it has not already happened, water and environment agencies are combined and as departments seek "innovation" to respond to funding limitations, existing senior managers are not appointed to new roles in the restructured agencies, with significant experience in water reform and policy development exiting the public sector. Central agencies cut funding to CMAs and Natural Resource Management Boards, and these organisations contract to concentrate on statutory obligations in relation to land and water management, including pest plant and animal control and native vegetation clearing assessments etc.

As a result of staff reductions, Basin state governments find that:

- They fall below critical mass in their rural water system modelling and water resource planning areas.
- Freshwater ecologists leave the public sector to secure jobs overseas or in on-going mining operations in Western Australia and Queensland.

The consequences of this for the Plan may be as follows:

- Water trading rules come into force in 2014 as planned, but there are limited resources available to review and update trading rules or further develop water markets. Central water registers continue to operate, but with no funds for development, the focus is on ensuring trading transactions can still be processed, but the development of reporting on entitlements, trade and prices paid for water products etc. does not occur.
- Development of WRPs is affected:
 - The lack of key modelling staff hampers development of WRPs for surface and groundwater SDL units.
 - Departure of experienced staff reduces resources available for community consultation and engagement around WRPs.
 - Jurisdictions advise MDBA that only 25% of surface water and groundwater WRPs will be completed by 2019.
- Environmental monitoring is severely reduced, and cuts to ecology and planning roles begin to affect preparation of annual watering priorities.
 - Long term watering strategies are largely completed for most SDL areas before funding cuts start to bite.

- Annual watering priorities are based on prior year plans, but are not informed by effective condition monitoring of environmental assets. Basin states report that they are unable to prepare the required annual Environmental Watering priorities by the due dates, affecting development of basin annual Environmental Watering priorities.
- Plans that are prepared do not benefit from adaptive management, due to the lack of monitoring of the outcomes of previous watering activities. The reduction in planning staff also limits the ability to apply newly emerging knowledge/science coming out of research universities on environmental water requirements for wetlands and floodplains.
- In order to meet the bulk water charges for held environmental entitlements, states enter water markets and sell up to 20% of available allocation volumes in order to generate funds to cover charges.
- Annual reporting on Plan implementation under Schedule 12 is reduced to the minimum possible, and some of the reporting is incomplete or based on limited data and monitoring. Additionally, jurisdictions struggle to meet deadlines and final reports are usually not available until at least 6 months after the end of the financial year.

Appendix H. Environmental scan trend analysis

Note – Each trend features an assessment of the potential impact on compliance if the trend eventually became a threat to compliance. The assessment has been further refined and analysed during the threat assessment phases of the environmental scan and therefore may not directly correlate with the threat assessment findings.

H.1 Trend 1 – Pushing the boundaries

Increased recognition of the value of water products as a tradable commodity and / or failure of current market products to meet trade needs in a cost effective manner drives interest into new products or opportunities for trade. The primary disruptive events will be economic or regulatory in nature. The Plan instrument used to regulate the trend is water trading rules (and WRPs to the extent that they give effect to water trading rules).

H.1.1 Impact on the behaviour of Parties

Development and adoption of new tradable water products could lead to changes in the understanding, appreciation and take up of water trade markets or products. Potential products include options, futures, or new carryover rules, which differ between regions. This could see Parties needing to respond to:

- Increased volumes of trade, including in areas that have traditionally experienced low levels of trade
- Trades in new water products that are not catered for under existing trade rules

This could result in failure to approve trades, or trade bans and suspensions. Asymmetry of information on new water products could also result in perverse (and inefficient) market outcomes.

Parties impacted by this emerging issue and trend:

• Basin states and approval authorities.

H.1.2 Regulatory and administrative capacity to address potential non-compliance resulting from the trend

- Resource for trade approvals are relatively constrained, so major increases in activity could result in an inability to process trades, with a risk of non-compliance.
- Emergence of unforeseen consequences of high volumes of trade or impacts of trade in new "products" could prompt jurisdiction to impose trade bans or suspend trade.
- Emergence of new products which moves water trade from current goods exchange model into a financial product and traders model requires ASIC Australian Financial Services Licences to operate, leading to significant issues in managing compliance in relation to who can act as a broker in the market. Basin States have relatively limited expertise in dealing with this type of regulatory/licensing regime in relation to water resource management.

H.1.3 Impact of not addressing trend

Compliance:

- The main threat associated with this trend is that trade rules will become harder to enforce. The Plan outcomes potentially affected by non-compliant activity:
 - Creation of efficient markets non-compliance with water trade rules (eg through trade bans) may prevent water moving to its most productive use.
 - Long term SDLs significant increases in trade which are not effectively regulated and accounted for could put achievement of SDLs at risk is some WRP areas.
- The severity of the potential non-compliant behaviour is medium impacts are likely to be reversible, but
 may incur significant time or cost.
- Under current enforcement protocols proposed by MDBA the potential non-compliant behaviour is a moderate – major breach of rules and regulations.
- The opportunity for the trend to strengthen assurance and compliance is rated as low.

Plan outcomes:

• If left unaddressed, the trend is unlikely to improve effectiveness or efficiency of currently proposed rules. Most likely result is a requirement to modify or amend Plan rules to accommodate changed trade behaviours (to the extent possible) and to cover new products.

H.1.4 Factors affecting the trend

The key factors that need to occur for this issue to become a trend include one or more of:

- Recurrence of severe drought conditions boosting water demands
- Increased returns for irrigated agricultural produce on local and global markets
- High utilisation of environment water reducing supply of allocation into traditional water market activity
- Industry demand for alternative water products

Current pace of change in the factors identified:

Slow

Likely timeframe of direct impact on compliance and assurance:

• Ongoing, starting in medium term

Geographical scale of trend:

• Southern connected basin – may affect northern basin at some future time, but emergence of trend likely to lag behind southern basin significantly given relatively low level of development of northern markets

Primary scale of factors influencing the trend:

Regional

H.1.5 Relevant data sources

Table 42: List of relevant data sources for Trend 1

Issues	Source
 Cost of Doing Business (Changes in Economic Conditions) Introduction of waste water products (ie waste water products) Adoption of innovative water products to the market (ie leases and options) Outcomes of trials of experimental water products 	 Information on products provided by water brokers including Water Trading Australia http://www.watertradingaustralia.com.au/ Australian Water http://www.australianwaterinvestments.com.au/water_markets Waterbrokers http://www.waterbrokers.com.au/ Greeneye Markets Pty. Ltd. (GEM) http://www.greeneye.com/index.php Waterfind http://www.waterfind.com.au/index.html
 Global Economic Conditions (Changes in Economic Conditions) Prices of water entitlement trades, including prices for buy and sell bids Australian water markets volume data 	 Water market and trading information Market price information for Murray-Darling Basin Water Entitlements, SEWPAC

Issues	Source
 Volume of industry trading water trading (ie Forestry and mining companies enter water markets) Structural changes to water markets (ie establishment of stock market, entitlement structure etc.) 	 Population and Communities http://www.environment.gov.au/water/policy-programs/urban-reform/nwi-pricing-principles.html State Water Registers Victorian Water Register http://waterregister.vic.gov.au/ WaterConnect, South Australian Water Register https://www.waterconnect.sa.gov.au/Pages/default.aspx) Qld Water Allocations Register http://www.nrm.qld.gov.au/water/trading/register.html Water Access Licence Register, New South Wales Water Register http://registers.water.nsw.gov.au/wma/AccessLicenceSearch.jsp?selectedRegist er=AccessLicense Water Resources Act Register, ACT Water Register http://www.environment.act.gov.au/water/act.water_resources/epa_search
 State Fiscal Positions (Changes in Economic Conditions) Level of foreign investment in land and water for agriculture Level of public sector spending on water reform Project investment announcements by Federal and State Water Authorities (ie State Water Grids) 	 National and State Economic Activity Australian Bureau of Statistics, National and State http://www.abs.gov.au/AusStats/ABS@.nsf/MF/5204.0 http://www.abs.gov.au/AusStats/ABS@.nsf/MF/5220.0 Federal and State funding Australian Budget Papers http://www.budget.gov.au Victorian State Budget Papers http://www.vic.gov.au/government-economy/victorian-government/budget-papers.html Queensland State Budget Papers http://budget.qld.gov.au/ South Australian State Budget Papers http://www.statebudget.sa.gov.au/ South Australian State Budget Papers http://www.statebudget.sa.gov.au/ ACT Budget Papers http://apps.treasury.act.gov.au/budget Access Announcements by Federal and State Water Authorities Media Centre, Australian Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC) http://www.environment.gov.au/about/media/index.html News, Queensland Department of Natural Resources and Mines (DNRM) http://www.dnrm.qld.gov.au/news Media Centre, South Australia Department of Environment, Water and Natural Resources (DEWNR) http://www.environment.sa.gov.au/About-us/Media-Releases/default.aspx Media Release, Victorian Department of Environment and Primary Industries (DEPI) http://www.dse.vic.gov.au/about-depi/media-releases Media Centre, Environment and Sustainabile Development Directorate (ESDD) http://www.environment.act.gov.au/about/media_centre

H.2 Trend 2 – Too much change too quickly

Sudden wide scale changes in system operating conditions occur and result in changes in the understanding and appreciation of the impact of interventions by Basin States, Commonwealth entities and MDBA. The changes in system operating conditions could be either naturally occurring, such as a return to Millennium drought conditions, or could be as a result of man-made interventions including significant changes to water flows and river system operation due to significant new demands or relocation of traditional demands. Urbanisation, peri-urban development, coal seam gas, carbon farming, enhanced environmental water delivery and global demand for particular foods and fibre are all potential catalysts for rapid change in water use.

This could see Parties needing to respond to consequences of these new demands or the unforseen interaction of changed system conditions with components of the Plan. These interactions and consequences may be outside the scope of previous experience or the assumptions which guided the development of the Plan.

The primary disruptive events can be economic, environmental or social in nature. The Plan instrument used to regulate the trend include: WRPs and SDLs, water quality and salinity management components of the WRPs, water trading rules, and EWPs.

H.2.1 Impact on the behaviour of Parties

Development of significant new demands for water in areas of the Basin could require Parties needing to respond to:

- Changes in land and water use to support new agricultural enterprises in different areas of the Basin
 compared to the historic patterns with associated increases in water use. This could trigger increased nontraditional water trade activity to support new uses, increased interception through changes in crop water
 use, increased development of farm dams, and increased harvesting of floodplain flows. This would require
 states to modify existing estimation and reporting systems or develop new processes to estimate the
 impact of these changes on water usage and SDL compliance.
- Complex changes in water use for mining developments could result in Parties needing to respond to (or plan for) impacts on groundwater use versus SDLs for dewatering for mining and NGCS activities. Where extracted water is discharged to surface or groundwater sources, this could give rise to complex water accounting issues which may be outside the scope of WRP competed or in preparation.
- Development of effective EWPs that meet the objectives of the Plan may become significantly more complex and challenging for states if significant changes occur in system operating conditions (eg due to changed consumptive demand patterns).
- Application of water to environmental assets and potentially in combination with significantly changed system flows may make it difficult for states to develop water quality measures in WRPs that meet the quality targets in the WQSMP.

This could result in states being unable to develop WRPs that satisfy the requirements of the Plan, or being unable to develop plans by the required deadlines as a result of increased complexity. Where these changes in system conditions occur after development of a WRP, Basin States may be unable to manage compliance with SDLs in the manner contemplated in the WRP. These changes in system conditions or water demands may also contribute to pressures on trading systems and regulatory arrangements (refer to Trend No.1 "Pushing the boundaries").

Parties impacted by this trend:

- Basin States and water system operating agencies (eg South Australia Water, Goulburn-Murray Water, State Water)
- MDBA

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

• Jurisdictional and Authority resources are likely to be relatively constrained, particularly in the skill areas needed to respond to significantly increased complexity or uncertainty in relation to development of WRPs. This may increase the likelihood of plans not being developed within deadlines.

- Changes in land use and water demands particularly where these affect interception activities are difficult to monitor and regulate, especially in their emerging phases and may pose significant challenges for Basin States.
- Emergence of unforeseen consequences of high volumes of trade or trades in non-traditional areas could prompt jurisdiction to impose trade bans or suspend trade.

H.2.2 Impact of not addressing trend

Compliance:

- Plan outcomes potentially affected by non-compliant activity:
 - Long term SDLs significant changes in water demands, increase in interception activity and complex water extraction and return transactions for mining activities could put achievement of SDLs at risk is some WRP areas.
- Significant changes in system conditions or unforeseen consequences of changes may make achievement
 of water quality and environmental objectives set out in the Plan difficult. This may arise as a consequence
 of non-compliant activity, but such failures to achieve objectives may also arise even if actions under
 WRPs and SDLs are compliant.
- Severity of the non-compliant behaviour is likely to be moderate at a jurisdictional scale, but could be major at a regional scale.
- Impacts are likely to be reversible, but may incur significant time or cost, especially if solutions require review and amendment of Plan.

Plan outcomes:

 If left unaddressed, the trend is unlikely to improve effectiveness or efficiency of currently proposed rules. There may be isolated exceptions where disposal of groundwater from NGCS activities to surface water systems assists with SDL compliance and achievement of environmental objectives. Most likely result is a requirement to modify or amend Plan rules to accommodate new targets or measures to address the unforeseen extent of system change.

H.2.3 Factors affecting the trend

The key changes and factors that need to occur in order for the relevant issues to become a trend include one or more of:

- Recurrence if severe drought conditions boosting water demands.
- Increased returns for irrigated agricultural produce on local and global markets.
- Climate change resulting in changes to the zones where crops can be grown. (eg southward movement of cotton growing, relocation of stone fruits crops to "cooler" regions, development of cropping in non-traditional areas in upper catchments.
- Increased global demand for mining products (eg coal and NGCS) produced from within the Basin.

Current pace of change in the factors identified:

• Slow to moderate

Likely timeframe of direct impact on compliance and assurance:

- Medium term in relation to failure to produce WRPs
- Long term in relation to potential non-compliance with SDLs

Geographical scale of trend:

• Basin wide, but will manifest in different regions due to different drivers.

• Northern basin trends may be affected by mining and NGCS driven trends, whilst southern basin trends may be the result of changes in agricultural demands and production locations

Primary scale of factors influencing the trend:

• Global demands for agricultural and mining products, and domestic migration

H.2.4 Relevant data sources

Table 43: List of relevant data sources for Trend 2

Issues	Source
 Cost of doing business (Changes in Economic Conditions) Level of diversification in agricultural industries Scale of industry restructures, specifically affecting agricultural activities Level of interest group or protest activity calling for less regulation on farming activities Level of co-operation and engagement between MDBA and States 	 Industry reports IBIS WorldAU Industry Reports http://www.ibisworld.com.au/ Australian Industry Group http://www.aigroup.com.au/policy/reports Farmers interest group activity and advocacy National Farmers Federation www.nff.org.au/ NSW Farmers Association www.nswfarmers.org.au South Australian Farmers Federation www.saff.com.au/ Victorian Farmers Federation www.vff.org.au Australian Dairy Farmers www.australiandairyfarmers.com.au/ All Australian, State, Territory and Regional news and media publications
 State fiscal position (Changes in Economic Conditions) Changes to federal and state taxation arrangements Changes to state, regional planning and priorities (ie land use and water plans) Amendments to regulation that affect land use and interception activities Level of approvals of new farm dams 	 Federal and State Taxation Offices Australian Taxation Office http://www.ato.gov.au/ Victorian State Revenue Office http://www.sro.vic.gov.au New South Wales State Revenue Office http://www.osr.nsw.gov.au/ South Australian State Revenue Office http://www.revenuesa.sa.gov.au/ Queensland State Revenue Office www.osr.qld.gov.au ACT Revenue Office http://www.revenue.act.gov.au/ Federal, State regional planning information Regional Development Australia www.rda.gov.au/ Victorian Department of Planning and Community Development http://www.gov.au Victorian Department of Planning and Community Development http://www.planning.nsw.gov.au/regional-strategies New South Wales Government; Strategic Regional Land Use http://www.ngv.au/strategicregionallanduse South Australian Department of Planning, Transport and Infrastructure http://www.dpti.sa.gov.au/ ACT Planning and Land Authority, Environment and Sustainable Development Directorate http://www.actpla.act.gov.au/ Information on farm dams Victorian Department of Environment and Primary Industries; Dams http://www.water.vic.gov.au/saving/farms/dams

Issues	Source
	http://www.nrm.qld.gov.au/
	 South Australian Government, Farm dams http://www.sa.gov.au/subject/Water,+energy+and+environment/Water/Water+us e+for+irrigators/Farm+dams
	 New South Wales Department of Primary Industries, Dams and Storage http://www.dpi.nsw.gov.au/agriculture/resources/water/storage
 Demographic shifts (Changes in Economic Conditions) Changes in industrial water use due to increased demand for mining products Major shifts in demand patterns and locations of demand for water Changes to urban and peri-urban population 	 Information mining activity and products Association of Mining and Exploration Companies https://www.amec.org.au/publications Minerals Council of Australia www.minerals.org.au/ Australian Mines and Metals Association www.amma.org.au/ Austmine Smart Mining http://www.austmine.com.au/ Information on water supply and demand Water for Agriculture, Water for Environment, Water for Cities and Homes Publications, Australian Department of Sustainability, Environment, Water, Population and Communities http://www.environment.gov.au/water/publications/agriculture/index.html http://www.environment.gov.au/water/publications/long/urban/index.html ABS Water Account, Australia http://www.abs.gov.au/ausstats/abs@.nsf/mf/4610.0 Information on Australian Demographics ABS, Australian Demographic Statistics MBS, Australian Demographic Statistics
Gradual/incremental climatic	http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0 Information Assets and Priorities
 changes (Major Climatic Events) Changes to environmental water priorities and assets Forecasts of plantings, yield estimates and 	 Water Policy and Programs – Water in Our Environment, Australian Department of Sustainability, Environment, Water, Population and Communities http://www.environment.gov.au/water/policy-programs/environment Water Publications, Australian Department of Sustainability, Environment, Water, Population and Communities http://www.environment.gov.au/water/publications Water for Futures Initiative, Australian Department of Sustainability, Environment, Water, Population and Communities;
commodity price outlooks for irrigated crops affecting water use	 http://www.environment.gov.au/water/australia/ Information on plantings and yield ABARES reporting and forecasts of plantings, yield estimates and irrigated crop
 Drought analysis and rainfall deficiency reporting for detection of severe climate conditions outside BP assumptions Changes to general water 	 Murray Darling Basin Sustainable Yields Project, Australian Department of Sustainability, Environment, Water, Population and Communities www.environment.gov.au/water/policy-programs/sustainable- yields/mdb.html
• Changes to general water use patterns and availability	 Information on water and climate conditions Australian Bureau of Meteorology drought analysis and rainfall deficiency reports http://www.bom.gov.au/climate/drought.
	 Adapting to Climate Change, Australian Department of Industry, Innovation, Climate Change, Science, Research and Territory Education http://www.climatechange.gov.au/climate-change/adapting-climate-change
	 Climate Commission http://climatecommission.gov.au/effects/droughts-rainfall/ Geoscience Australia http://ga.gov.au/

Issues	Source
	- South Eastern Climate Initiative http://www.seaci.org
	Information on water storage and use
	 Groundwater Dependent Ecosystem Atlas Australian Bureau of Meteorology http://www.bom.gov.au/water/groundwater
	- Water Storage http://nwc.gov.au/organisation/useful-resources
	- Source Modelling Platform http://www.ewater.com.au/
Emergence of an advanced	Information on carbon farming initiatives and market
water market (Changes in Science and Technology)	 Clean Energy Future http://www.cleanenergyfuture.gov.au/carbon-farming- initiative/
Introduction of	- Horticulture Australia http://www.horticulture.com.au/reports/
market due to carbon	- Carbon Farmers of Australia http://www.carbonfarmersofaustralia.com.au
farming Reported developments 	 Australian Department of Agriculture, Fisheries and Forestry http://www.daff.gov.au/forestry/national
of new crops that require	Information on crop developments
less water and are salt resistant	 CSIRO Crop Biofactories Initiative http://www.csiro.au/science/BioeconomyCropBiofactories
	 South Australian Research and Development Institute Field Crop Improvement Centre
	http://www.sardi.sa.gov.au/about_us/facilities/field_crop_improvement_centre
	 Grains Research and Development Corporation http://www.grdc.com.au/Research-and-Development/National-Variety-Trials
	- Crop Life Australia http://www.croplifeaustralia.org.au

H.3 Trend 3 – Where have all the people gone

Change in the permanent, casual or contracted staffing levels of Parties in areas of specialisation needed to comply with obligations under the Plan and the Act and change in operating budgets allocated to planning studies and investigations.

The primary disruptive events are likely to be economic or political in nature. The Plan instruments used to regulate the trend include: WRPs and SDLs, water quality and salinity management components of the WRPs, water trading rules, and EWPs.

H.3.1 Impact on the behaviour of Parties

Parties would have insufficient resources to:

- Prepare a plan
- Prepare a plan of sufficient quality in all required areas
- Implement or maintain the plan
- Process trades

Parties experiencing resourcing pressures may also start to reduce monitoring and reporting activities as the first "lower impact" stage of a reduction in Plan related activity.

Parties impacted by this trend:

- Basin states
- Water delivery agencies implementing actions under the plan
- MDBA (and the Australian Government) in relation to the adequacy/suitability of plan obligations

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

- Basin States have a range of possible opportunities to address this trend, including:
 - Recruiting additional staff
 - Implementing policies to retain staff
 - Outsource skill requirements
- However, if the trend is being driven by constraints in government revenues, there may be limited capacity to implement such measures.

H.3.2 Impact of not addressing trend

Compliance:

- Plan outcomes potentially affected by non-compliant activity:
 - Research and development into continually improving water management not undertaken
 - Items of lesser priority not undertaken (eg WQSMPs not development)
 - Increased activities required at times of change (eg during drought) are not undertaken
 - Poorly prepared WRPs that do not meet minimum standards during audits
 - Insufficient resources to develop or implement plans could mean that SDLs are not implemented, or are not enforced, with consequences for environmental outcomes
- The severity of the potential non-compliant behaviour is medium impacts are likely to be reversible, but
 may incur significant time or cost.
- Addressing the impacts of this trend may involve significant time, regardless of the funds available for remedial action, as rebuilding capability in some specialist areas will require significant lead times, particularly in skill areas where commercial outsourcing is not an option.

Plan outcomes:

- If left unaddressed, the trend is unlikely to improve effectiveness or efficiency of currently proposed rules, because continuous improvement is likely to be one of the first areas to be affected by insufficient resources.
- If left unaddressed, the opportunity for the trend to strengthen assurance and compliance is rated as low.

H.3.3 Factors affecting the trend

The key factors that need to occur for these issues to become a trend include one or more of:

- Substantial reduction in public sector spending on water reform
- This may or may not be attributable to declining state or federal government revenue
- Political restructuring of provision of water management services associated with change in government priorities
- Skill shortage due to higher wages and greater opportunities in other sectors of the economy (eg mining)
- Trend would be discounted if the same quality of services is being provided more efficiently

Current pace of change in the factors identified:

• Fast (as occurred during the mining boom and subsequent global financial crisis)

Likely timeframe of direct impact on compliance and assurance:

Ongoing

Geographical scale of trend:

• Will most likely be State specific, with potential for cascading response from other State governments

Primary scale of factors influencing the trend:

• Factors influencing the trend include the global economy, the Australian economy, leadership capabilities within MDBA and Basin States, and political priorities.

H.3.4 Relevant data sources

Table 44: List of relevant data sources for Trend 3

Issues	Source
 Cost of doing business (Changes in Economic Conditions) Percentage of WRPs which require significant amendment before receiving accreditation Number of WRPs accredited and passing audits Extensions and changes to timelines for WRP or EWP development (timetables for WRP development) Compliance with SDL Reported time for processing trades Quality of Environmental 	 Information on Murray Darling Basin water resource management Murray Darling Basin Implementation Report, National Water Commission http://www.nwc.gov.au/publications/topic/audit-reports/murraydarling-basin-plan- implementation-initial-report National Water Planning Report Card, National Water Commission http://archive.nwc.gov.au/library/topic/planning/report-card Commonwealth Environmental Water Office http://www.environment.gov.au/ewater/ Trade Processing Times – standards and performance http://www.nationalwatermarket.gov.au/water-market-reports/trade- processing.html

Issues	Source
 Watering Plans and monitoring of implementation New and procedures or techniques for water management in the Basin 	
 State fiscal position (Changes in Economic Conditions) Level of Federal Government funding for Plan activities (\$ and FTEs) State and Territory funding for Plan activities (\$ and FTEs) Implementation Agency Budgets Significant re- organisation or restructuring of jurisdictional agencies involved in water and environment issues. Media reports of staff cutbacks especially in regional delivery agencies, or reports on reductions to front-line services in these agencies. No. of FTEs in consultant organisations supporting Plan activities Value of consultancies supporting Plan activities 	 Federal and State funding Australian Budget Papers http://www.budget.gov.au Victorian State Budget Papers http://www.vic.gov.au/government-economy/victorian-government/budget-papers.html Queensland State Budget Papers http://budget.qlo.gov.au/ South Australian State Budget Papers http://www.statebudget.sa.gov.au/ New South Wales State Budget Papers http://www.budget.nsw.gov.au/ ACT Budget Papers http://apps.treasury.act.gov.au/budget State and Territory Implementation Agencies The Basin Plan, Australian Department of Sustainability, Environment, Water Population and Communities http://www.environment.gov.au/water/basin-plan/index.html Murray Darling Basin, The New South Wales Office of Water http://www.water.nsw.gov.au/Water-management/Basins-and-catchments/Murray-Darling-Basin/Murray-Darling-Basin Murray Darling Basin Plan, Our Future Our Water, Victorian Department of Environment and Primary Industries http://www.water.vic.gov.au/governance/murray-darling-basin-plan Queensland Department of Environment and Resource Management http://www.waterforgood.sa.gov.au/ Murray Darling Basin Plan, South Australia Water For Good http://www.environment.act.gov.au/water Federal, State and Territory Government Announcements Press Office, Prime Minister of Australia http://www.pn.gov.au/press-office Media Releases, Victorian Office of Premier and Cabinet http://www.dpc.nsw.gov.au/announcements Media Statements, NSW Office of Premier and Cabinet http://www.dpc.nsw.gov.au/ Premier and Cabinet Circulars South Australia Department of Premier and Cabinet http://www.dpc.au/aunonucements Media Statements, NSW Office
 Demographic shifts (Changes in Economic Conditions) Changes to Australian and regional demographics (ie aging population) Changes to labour market including declines 	 Demographic information ABS Australian Demographic Statistics http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0 Information on labour markets ABS, Wage Price Index Statistics (6345.0) http://www.abs.gov.au/ausstats/abs@.nsf/mf/6345.0 ABS Australian Labour Force Statistics (6202.0) http://www.abs.gov.au/AUSSTATS/abs@.nsf/exnote/6202.0

Is	sues	Source	
•	in real wages No. of graduates and	 Australian Government, Skills I Info (Labour Market Information) http://www.skillsinfo.gov.au/labour-market-information 	
	post-graduates in water resource and	 Australian Productivity Commission Annual Reports http://www.pc.gov.au/annual-reports 	
	environmental	Information on water resource and environmental management jobs	
 No. of job advertisement for water resource management and environmental/ ecologis 	No. of job advertisements for water resource management and environmental/ ecologist	 Graduate Careers Australia; Australian Graduate Survey www.graduatecareers.com.au/research/surveys/australiangraduates y Envirojobs http://envirojobs.com.au/ 	urve
	roles in Basin states	 Waterjobs_http://www.waterjobs.com.au/ 	
		 NRMjobs http://www.nrmjobs.com.au/ 	

H.4 Trend 4 – From public opinion to legal action

This trend involves changes in the propensity of communities, industries and stakeholders to threaten and/or proceed with legal challenges to the interpretation of legal instruments untested in different operating contexts/environment eg risk of flooding from environmental water flows, whether WRPs give sufficient due regard to environmental needs or socio-economic impacts etc.

This trend can emerge from a number of diverse disruptive issues. The emergence of protest movements and farmer action groups calling for less regulation on farming activities and less impact on water availability for consumptive use could be one issue leading to an increase in legal challenges to the Plan. This issue may be heightened if farm revenues are also declining at the same time.

Alternatively, environmental issues eg climate change become the top priority for voters and/or growing public awareness and support for the importance of the Basin's environmental values could place significant pressure on government to ensure the long term survival of those environmental assets. This may also lead concerned groups to legally challenge the Plan obligations for not going far enough to protect basin environmental assets.

The primary disruptive events are social in nature, but may also have strong influences from economic issues. The Plan instrument used to regulate the trend include: WRPs and SDLs, water trading rules, and EWPs.

H.4.1 Impact on the behaviour of Parties

A trend involving legal challenges or threats of challenges to the Plan obligations could see Parties needing to respond to the following issues:

- The development of state based plans to implement the Plan (eg development of WRPs) may be slowed or stopped because of threatened or actual legal action, and jurisdictional resources diverted away from plan development to legal actions.
- If challenges were launched against the appropriateness of the Plan as a means to achieve the objectives set out in the Act, this could halt or delay action to develop subsidiary implementation arrangements in states. MDBA may also see its resources diverted to legal proceedings.
- Water delivery agencies may be the target of injunctions to prevent water delivery actions to environmental assets whilst other challenges are in progress.

This could result in Basin States being unable to develop plans, or to implement actions under plans already developed either through diversion of resources or due to legal constraints on actions. Additionally, MDBA may find itself with insufficient resources available to develop guidelines needed to enable states to prepare WRPs etc. or unable to accredit WRPs prepared by states.

Parties impacted by this trend:

- Basin States
- Water delivery agencies implementing actions under the plan
- MDBA (and Australian Government) in relation to the adequacy/suitability of plan obligations

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

- Parties will generally have access to suitable resources to address legal challenges should they emerge, however expert witnesses to analyse and address substantive issues of some challenges may tax jurisdictional resources.
- Despite best endeavours by Parties, communities may withdraw from and embargo participation in planning activities. If coupled with legal actions, Basin States would have little ability to proceed with plan development or implementation.
- Addressing the causes of the discontent and engaging communities in development of alternative solutions that avoid legal action is possible, but requires significant time and skilled resources which may not be readily available in all (or any) jurisdiction. The more that MDBA and Basin States can circumvent potential legal challenges through enhanced communication with the community, the less likely this trend is to emerge.

H.4.2 Impact of not addressing trend

Compliance:

- Legal challenges may limit or stop progress towards achieving a range of Basin Plan outcomes including:
 - Preparation of WRPs and EWPs within specified timelines.
 - Where plans are developed but implementation is blocked, achievement of SDL compliance or achievement of environmental objectives could be affected.
 - Severity of the potential non-compliant behaviour could be medium to high impact. If legal action prevents environmental water delivery to refuges during a drought, there could be high impacts on some species.
 - Under current enforcement protocols proposed by MDBA the potential non-compliant behaviour could be a moderate to major breach of rules and regulations. Parties prevented from undertaking compliant actions due to legal challenge could be expected to seek special consideration for impediments beyond their control.

Plan outcomes:

 If left unaddressed, the trend is unlikely to improve effectiveness or efficiency of currently proposed rules. Most likely result is a requirement to modify or amend Plan or some obligations to accommodate the outcomes of legal challenges. These may enhance the effectiveness of Basin water management, but will be implemented inefficiently due to high costs of implementation through courts. In extreme cases the impact of the trend may be to require changes or review of the Plan, or legislation in Basin States.

H.4.3 Factors affecting the trend

The key changes and factors that could contribute to the relevant issues becoming a trend include one or more of:

- The initial changeover to new regulatory instruments under the Plan may be a catalyst for legal challenges
- Increase in market prices for water due to perceived link to the buy-back of licences for Environmental Watering
- Recurrence of severe drought conditions leading to shortages and increased competition for access to water
- Reduction in prices received for agricultural commodities on world markets, which could lead to pressure to reduce water recovery for the environment
- Acceleration of climate change, with increased pressure on governments to address associated environmental impacts. If this was also accompanied by positive response from government to implement climate change measures, this could lead to attention and legal challenge efforts being targeted at Plan as "the next big issue"
- Emergence of strong environmental and high value eco-tourism sectors reliant on basin assets.

Current pace of change in the factors identified:

Slow to moderate

Likely timeframe of direct impact on compliance and assurance:

- Short to medium term in relation to challenges to the production of WRPs actions
- Long term in relation to potential prevent actions necessary for compliance with the Basin Plan (eg implementation of environmental works and water deliveries, or challenges to Plan suitability)

Geographical scale of trend:

• Regional or individual States initially, but could expand basin wide if initial legal actions are successful.

Primary scale of factors influencing the trend:

• Regional and national, although underling economic drivers and rising activism could also be global in scale

H.4.4 Relevant data sources

Table 45: List of relevant data sources for Trend 4

Issues	Source
 Shifting community values and priorities (Changes in attitudes of communities) Reporting of community issues and perceptions impacting the Murray Darling Basin, including; climate change, natural resource management, Environmental Watering activities Level of general community and environmental interest group activity 	 All Australian, State, Territory and Regional news and media publications Information on local community advocacy Riverland West Local Action Planning Association http://www.rwlap.org.au/ Renmark to the Border Local Action Planning http://www.renmarkparinga.sa.gov.au/RenmarktotheBorderLAP Mid Murray Local Action Planning Committee http://wwr.midmurraylap.org.au/ Berri Barmera Local Action Planning Association http://www.bblap.org.au/ Berri Barmera Local Action Planning Inc. http://www.bblap.org.au/ Murray Mallee Local Action Planning Inc. http://www.malleefutures.org.au/ MurrayCare http://www.murraycare.com.au/ Goolwa to Wellington Local Action Planning Association http://www.gwlap.org.au/ Loxton to Bookpurnong Local Action Planning Committee http://www.lblap.org.au/ Coorong Districts Local Action Plan Committee http://www.coorong.sa.gov.au Conservation Council South Australia http://www.conservationsa.org.au Voices for the Murray-Darling; http://lifeblood.org.au Basin Pulse, http://www.landcareonline.com.au Trees for life, http://www.treesforlife.org.au Friends of Parks www.communitywebs.org
 Growing role of communities/ citizens in government decision making (Changes in attitudes of communities) Delays or court challenges to state or federal water legislation, including compulsory acquisition of land for plan works Incidence of planning appeals or administrative tribunal challenges against actions to implement plan measures (eg environmental water delivery works approvals etc.) Number of formal public submissions to MDBA Legal fees paid by MDBA and Basin States 	 Information on legal proceedings and court appeals Victorian Civil and Administrative Tribunal http://www.vcat.vic.gov.au/ New South Wales Planning and Assessment Commission http://www.pac.nsw.gov.au/ Queensland Planning and Environment Court http://www.courts.qld.gov.au/courts/planning-and-environment-court South Australian Environment, Resources and Development Court (ERD) http://www.courts.sa.gov.au/OurCourts/ERDCourt Australian High Court Cases, http://www.hcourt.gov.au/cases/current-cases- submissions Annual Report, Murray Darling Basin Authority, http://www.mdba.gov.au/annualreports/2010-11/index.html Murray Darling Basin Implementation Report, National Water Commission http://www.nwc.gov.au/publications/topic/audit-reports/murraydarling-basin- plan-implementation-initial-report Murray Darling Basin Authority, Basin Plan Consultation http://www.mdba.gov.au/what-we-do/basin-plan/consultation
Changing political decisions towards water reform	Information on potential water reforms Water, Climate Change and the Environment Reform Agenda, Council of

Issues	Source
 Issues (Changes in attitudes of communities) Major water and environmental reforms, including extending Native title claims to water rights Change in obligations under international climate change and environmental treaties 	Source Australian Governments http://www.coag.gov.au/water_climate_change_and_the_environment - Australian Law Reform Commission http://www.alrc.gov.au/ Information on International Environmental Conventions and Treaties - International Network of Environmental Compliance and Enforcement http://inece.org/ - Ramsar Convention on Wetlands http://www.ramsar.org - United Nations Framework for Convention on Climate Change_http://unfccc.int - Kyoto Protocol to the Framework Convention on Climate Change http://unfccc.int/kyoto_protocol - One of the transition bittp://unfccc.int/
	 Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that deplete the Ozone Layer http://untreaty.un.org/cod/avl/ha/vcpol/vcpol.html Stockholm Convention of Persistent Organic Pollutants http://www.pops.int/

H.5 Trend 5 – More forms, more reports, less time

A range of reforms and issues (including the Plan and more generally) may lead to increases in the reporting and regulatory obligations of Parties. This increasing overall regulatory burden reduces the willingness of these entities to accept the regulatory obligations flowing from the Plan.

The primary disruptive events can be economic, environmental or social in nature. Basin Plan instruments used to regulate the trend include: WRPs and SDLs, water quality and salinity management components of the WRPs, water trading rules, and EWPs.

H.5.1 Impact on the behaviour of Parties

A trend of increased regulatory burdens could see Parties needing to respond to an increased in reporting on a range of issues, including many that have traditionally not been of interest to governments. This could include:

- New natural resource management actions relying on market based instruments markets in pollution permits for salt, nutrients, vegetation, eco-system services
- Regulatory requirements and approvals processes for construction and maintenance of works for water supply – planning permits, environmental impact statements, EPBC clearances, cultural heritage controls and permits.
- Extension of carbon price and trading to include agricultural emissions; or changes to emission thresholds that bring more organizations into the reporting and payment regime.
- Reform to taxation systems that applies economic rent based taxes to land or users of environmental assets.

These changes could result in Parties struggling to meet new obligations with existing or declining resources. This could result in full or partial failure to meet these new obligations, or generate active "push-back" against new obligations.

This may lead to a plan not being prepared because Parties are unable or unwilling to comply with the collective regulatory burden of the Act, the Plan and other new Commonwealth and State regulations. Alternatively a prepared plan is not implemented because a change in a Commonwealth or State regulation creates uncertainty regarding the legality and/or effectiveness of proceeding with implementation of the plan.

In the event that required actions are implemented, entities may not monitor and report on their actions and the outcomes achieved under the Plan, with the result that the extent of compliance with the Plan obligations cannot be assured to stakeholders and third parties (even if compliant actions have been implemented).

Parties impacted by this trend:

- Basin States
- Trade approval authorities,
- Operating Authorities
- Irrigation Infrastructure Authorities

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

- Small to medium sized Parties will have limited capacity to respond effectively to a trend of increasing
 regulatory burdens. Many of these organisations also derive some or all of their funding from users of their
 services, and resistance to increased charges is likely to be high in the short to medium term.
- Larger agencies will generally have sufficient resources to be able to prioritise legal and compliance obligations ahead of other more discretionary activities. These types of organisations will also be more concerned over reputational risks associated with non-compliant behaviours.

H.5.2 Impact of not addressing trend

Compliance:

- Plan outcomes potentially affected by non-compliant activity:
 - Failure to produce plans, implement plans or report on actions risks non-compliance with SDLs, EWP requirements and water trading rules.
 - Plan objectives, particularly those in relation to environmental outcomes are likely to not be fully achieved if regulatory obligations around SDL compliance are not met.
 - Water trading and efficient market objectives will not be achieved if reporting on trade volumes or price is not complied with.
 - Monitoring and evaluation processes established in the Plan to support the adaptive management requirements under the Act will not be effective if entities fail to comply with reporting obligations.
- Severity of the non-compliant behaviour is likely to be moderate to major at a jurisdictional scale or basin scale. Impacts are likely to be reversible, but may incur significant time or cost, especially if regulatory or reporting obligations in the Plan require amendment to enable compliance. Alternatively, provision of extra financial support to non-compliant entities to enable compliance is likely to be costly.
- Under current enforcement protocols proposed by MDBA the potential non-compliant behaviour could be a moderate to major breach of rules and regulations.
- The opportunity for the trend to strengthen assurance and compliance is rated as low.

Plan outcomes:

• If left unaddressed, the trend is unlikely to improve effectiveness or efficiency of currently proposed rules.

H.5.3 Factors affecting the trend

The key changes and factors that need to occur in order for the relevant issues to become a trend include one or more of:

- Significant reforms being implemented simultaneously. The potential for this situation may increase following a change of government at state or federal level.
- Increased pressure on the funding/pricing and cost base of Parties, leading to inability or reluctance to accommodate additional regulatory obligations

Current pace of change in the factors identified:

Slow to moderate

Likely timeframe of direct impact on compliance and assurance:

Short to medium term

Geographical scale of trend:

• Jurisdictional and/or basin wide

Primary scale of factors influencing the trend:

• National and state based

H.5.4 Relevant data and sources

Table 46: List of relevant data sources for Trend 5

Issues	Source
 Roles and responsibilities regulating and managing water (Changes in Institutional Arrangements and Relationships) Number of enforcement actions launched by federal or state agencies against entities regulated under the Plan Annual reporting of Plan non-compliance or failure to meet regulatory obligations. Self-reporting of breaches by Parties Emergence and establishment of state or local government sponsored "red-tape reduction" projects 	 Information on Murray Darling Basin implementation and enforcement Murray Darling Basin Implementation Report, National Water Commission http://www.nwc.gov.au/publications/topic/audit-reports/murraydarling-basin-plan- implementation-initial-report National Water Commission http://nwc.gov.au Commonwealth Environmental Water Office http://www.environment.gov.au/ewater/ State and Territory Implementation Agencies The Basin Plan, Australian Department of Sustainability, Environment, Water Population and Communities http://www.environment.gov.au/water/basin- plan/index.html Murray Darling Basin, The New South Wales Office of Water http://www.water.nsw.gov.au/Water-management/Basins-and- catchments/Murray-Darling-Basin/Murray-Darling-Basin Murray Darling Basin Plan, Our Future Our Water, Victorian Department of Environment and Primary Industries http://www.water.vic.gov.au/governance/murray-darling-basin-plan Queensland Department of Environment and Resource Management http://www.water.vic.gov.au/water/index.html Murray Darling Basin Plan, South Australia Water For Good http://www.waterforgood.sa.gov.au/
	 ACT Environment and Sustainable Development Directorate, Water http://www.environment.act.gov.au/water
 Role, products & services of rural water corporations (Changes in Institutional Arrangements and Relationships) Information on products provided by water brokers Reporting of price increases for irrigation infrastructure operators and water supply agencies due to administrative/ regulatory costs Media reports of excessive "red-tape" and reporting requirements on small rural water organisations 	 Information on products provided by water brokers including Water Trading Australia http://www.watertradingaustralia.com.au/ Australian Water http://www.australianwaterinvestments.com.au/water_markets Waterbrokers http://www.waterbrokers.com.au/ Greeneye Markets Pty. Ltd. http://www.greeneye.com/index.php Water find http://www.waterfind.com.au/index.html Water market and trading information Market price information for Murray-Darling Basin Water Entitlements, SEWPAC – quarterly reports http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/market-prices.html Annual Report Australian Water Markets, National Water Commission http://nwc.gov.au/publications/topic/water-industry/water-markets in Australia) http://www.nationalwatermarket.gov.au/ Australian Water Initiative, Department of Sustainability, Environment, Water, Population and Communities http://www.environment.gov.au/water/policy-programs/urban-reform/nwi-pricing-principles.html
-	 Qld SunWater http://www.sunwater.com.au/ NSW State Water Corporation https://www.statewater.com.au/ SA Water http://www.sawater.com.au/sawater/ Victoria Goulburn-Murray Water http://www.g-mwater.com.au/ Victoria Grampians Wimmera Mallee Water http://www.gwmwater.org.au/ Victoria Lower Murray Water http://www.lmw.vic.gov.au/
Issues	Source
--	---
	 ACT ACTEW Water http://www.actew.com.au/ All Australian, State, Territory and Regional news and media publications
 State based laws and regulation for the water market (Changes in Institutional Arrangements and Relationships) Major items in Government and Regulatory Agency reports and information Evidence of peak bodies/industry associations contributing to policy and regulatory reform. 	 Information from Regulatory Agencies Improving Water Information, Bureau of Meteorology http://www.bom.gov.au/water/?ref=ftr National water trading and taxation - Australian Water Summit - November 2004 Australian Taxation Office, http://www.ato.gov.au/businesses/content.aspx?doc=/content/52585.htm&pc=00 1/001/001/002/002&mnu=0&mfp=&st=&cy= Water - Australian Competition and Consumer Commission http://transition.accc.gov.au/content/index.phtml?itemId=809334&Go.x=12&Go.y =6 New South Wales Office of Environment and Heritage http://www.environment.nsw.gov.au/ South Australia Environmental Protection Authority http://www.epa.sa.gov.au/ Victorian Environmental Protection Authority http://www.epa.sa.gov.au/ Queensland Department of Environment and Heritage Protection http://www.ehp.qld.gov.au/ ACT Environment Protection Authority http://www.ehp.qld.gov.au/ Information from Water Associations Water Industry Operators Association http://www.wioa.org.au/ Australian Water Association, http://www.awa.asn.au/ Institute of Water Administration http://iwa.org.au/ Water Services Association of Australia. http://iwa.org.au/
	- Water Industry Alliance http://www.waterindustry.com.au

H.6 Trend 6 – The modelling race

This trend relates to the rapid adoption of advanced computing capability, widespread uptake of remote sensing data or robotics, development and application of new modelling techniques.

The primary disruptive events are likely to be technological in nature. The Plan instruments used to regulate the trend include: WRPs and SDLs, water quality and salinity management components of the WRPs, water trading rules, and EWPs.

H.6.1 Impact on the behaviour of Parties

Could create divergent views with MDBA on:

- Baseline conditions
- Assessment of impacts of intervention activities
- Assessment of SDL volumes and compliance
- Assessment of effectiveness of watering plan actions
- Allowable trade rules

In response to such divergent views, Basin States may slow or cease development of WRPs, EWPs and Basin States may seek review of guidelines or Plan obligations.

This trend could create opportunities for water right holders to increase level of take because of improved monitoring accuracy or delivery efficiency, which would have a flow on effect for distribution of resources. Alternatively, a trend to apply new monitoring or modelling techniques could see Parties promoting new proposals/techniques for SDL offset works or measures that will deliver environmental outcomes with lower water inputs.

Parties impacted by this trend:

• Basin states and approval authorities.

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

- Basis States can appropriately invest to ensure that any advancements in data and modelling are technically sound and independently verified as fit for purpose prior to adoption
- Basin States can be stakeholders in the development of new techniques so that they have a thorough understanding of the nature of the technology, potential benefits and timeframes for likely practical application of the technology
- It is possible that Basin States may be also keen to promote such a trend if it is seen as improving the knowledge base for better natural resource outcomes.

H.6.2 Impact of not addressing trend

Compliance:

- If Plan outcomes potentially affected by non-compliant activity:
 - SDLs breached by Basin States on the basis of new assessments not endorsed by MDBA. If SDLs are not subsequently adjusted, there may be an imbalance that affects other water users.
 - Continually shifting goalposts for water users and State/Federal disagreement could undermine confidence in basin planning processes.
- The severity of the potential non-compliant behaviour is medium impacts are likely to be reversible, but may incur significant time or cost.

Plan outcomes:

If left unaddressed, the trend may improve the effectiveness and efficiency of the Plan, particularly if these
advancements reduce uncertainty. Accounting for basin resources could be significantly improved. MDBA
and Basin States have the opportunity to be early adopters of new technology, cementing MDBA's place
internationally as an innovator in water resource management.

H.6.3 Factors affecting the trend

The key factors that need to occur for the relevant issues to become a trend include one or more of:

- Greater access to enhanced data for consultants, researchers and government. This may come from research/scientific sources, but may also come via commercial sector (eg Google Earth with weekly imagery updates)
- Development of new assessment tools/techniques that have not yet undergone extensive testing
- Intellectual property or privacy issues which prevent independent verification of assessments
- Endorsement of methods by broader national or international scientific community but without verification in areas of the Murray-Darling Basin
- Presentation of enhanced outcomes without due consideration of uncertainty in the assessment

Current pace of change in the factors identified:

• Slow, moderate or fast, depending on the nature of the technological advancement. Given the limited research investment in freshwater ecology, this area of the trend is likely to be slow. Remote sensing techniques for monitoring and improved modelling for water resources assessment are more likely to be fast to moderate paced.

Likely timeframe of direct impact on compliance and assurance:

Medium to long term

Geographical scale of trend:

• Will most likely be State specific, with potential for cascading response from other State governments

Primary scale of factors influencing the trend:

• Factors influencing the trend include the global economy, the Australian economy, computing and instrumentation advancements, remote sensing technological advancements and costs

H.6.4 Relevant data and sources

Table 47: List of relevant data sources for Trend 6

Issues	Source
Technology increases water supply (Changes in Science and Technology)	 Information on water smart technologies Water Smart Australia, Australian Department of Sustainability, Environment, Water, Population and Communities
 Number of fully automated customer billing and water delivery monitoring technologies installed 	 http://www.environment.gov.au/water/policy-programs/water-smart Australian Water Management Review http://www.awmr.com.au/water-news Water Technology http://www.water-technology.net Water monitoring information – data and tools
 Improved data on the connectivity between surface water and groundwater 	 Groundwater Dependent Ecosystem Atlas Australian Bureau of Meteorology http://www.bom.gov.au/water/groundwater Water Storage http://nwc.gov.au/organisation/useful-resources
 Uptake of new surface water and catchment 	 Source Modelling Platform http://www.ewater.com.au/ Groundwater - surface water interactions http://www.csiro.au/en/Organisation- Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Water-Resources-

Issues	Source
 modelling tools Media reports of conflicting science that challenges the assumptions underpinning the Plan 	 Assessment/GWSWInteractions_WfHC_event.aspx Water for Cities and Towns, CSIRO http://www.csiro.au/science/WaterSupply All Australian, State, Territory and Regional news and media publications
underpinning the Plan Technology improves the efficiency, measuring and monitoring of water use (Changes in Science and Technology) Federal and state government investment in new data collection and modelling techniques Industry research and development funding directed to water monitoring technology, eg Australian Research Council linkage grants, Cooperative Research Centres No. of submissions from jurisdictional outlining alternate monitoring or modelling tools as part of proposals to review plan requirements WRP audits identifying alternative assessment techniques being used No. of legal challenges to MDBA arising from different technology used in assessments Level of representation by research organisations, universities and consultants to MDBA on new technologies	 Government and Industry Water Technology Funding and Research National Water Knowledge and Research Platform, Australian Department of Sustainability, Environment, Water, Population and Communities http://www.environment.gov.au/water/policy-programs/nwkrp/index.html Smart Water Fund http://www.smartwater.com.au/ Water Quality Research Australia http://www.qra.com.au/research/research- programs/ Australian Research Council, Australian Government www.arc.gov.au/ncgp/ Cooperative Research Centres, Australian Government, http://www.crc.gov.au/Pages/default.aspx Water Information Systems, ww.csiro.au/Outcomes/Water/Water-information- systems.aspx International Congress on Modelling and Simulation (MODSIM2011) Conference Papers http://www.mssanz.org.au/modsim2011/index.htm Australian Society of Limnology Congress Papers http://www.asl.org.au/ International Riversymposium, http://riversymposium.com/ Information on Murray Darling Basin implementation and enforcement Murray Darling Basin Implementation Report, National Water Commission http://www.nwc.gov.au/publications/topic/audit-reports/murraydarling-basin-plan- implementation-initial-report National Water Commission http://nwc.gov.au Commorwealth Environmental Water Office http://www.environment.gov.au/water// State and Territory Implementation Agencies The Basin Plan, Australian Department of Sustainability, Environment, Water Population and Communities http://www.environment.gov.au/water/basin- plan/index.html Murray Darling Basin, The New South Wales Office of Water http://www.water.vic.gov.au/water/management/Basins-and- catchments/Murray-Darling-Basin/Murray-Darling-Basin Murray Darling Basin Plan, Our Future Our Water, Victorian Department of Environment and Primary Industries http://www.water.vic.gov.au/waterrindex.html <
	 http://www.waterforgood.sa.gov.au/ ACT Environment and Sustainable Development Directorate, Water http://www.environment.act.gov.au/water

H.7 Trend 7 – Changing perceptions of "value"

Changes in community and political views towards the value, cost, and benefit of Environmental Watering could emerge from a number of diverse disruptive issues including:

- Environmental issues become a top priority for votes, or alternatively economic conditions decline and environmental values are lowered in preference for economic development. This can be referred to as the balance between a 'green' and 'brown' economy
- Strong Australian dollar leading to low returns for agricultural production, creates incentives for increased production to offset declining margins
- Expansion of water borne diseases such as Barmah Forest Virus reduces social acceptance of managed 'standing water' watering activities
- Wide-scale fish fills from blackwater events (from natural, regulated or environmental flows) cause the community to question the benefit of large-scale environmental water activities
- Increased eco-tourism imposes greater restrictions on the preferable timing of Environmental Watering activities. This is also an example of an issue that may increase social opinion on Environmental Watering where the eco-tourism benefits from the outcomes of watering activities

The primary disruptive events can be social, environmental, political or economic in nature. The Plan instruments used to regulate the trend include: WRPs and SDLs, and EWPs.

H.7.1 Impact on the behaviour of Parties

This trend could delay, or stop, the development of EWPs or lead to development of non-compliance with EWPs. This trend may also affect social and political willingness to progress towards achieving the sustainable diversion limits. Alternatively, the issue could cause a re-prioritisation of current watering priorities or SDL volumes required to meet community expectations for Environmental Watering.

Parties impacted by this trend:

- Basin States
- Environmental water holders

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

 A lack of community support for Environmental Watering activities may increase the difficulty of implementing EWPs. Community campaigns against planned watering activities may result in delays to, or cancelling, of planned activities. Community campaigns against previous watering activities may have reputational impacts for involved agencies (such states, water holders, MDBA).

H.7.2 Impact of not addressing trend

Compliance:

- Plan outcomes potentially affected by non-compliant activity:
 - EWPs not developed or not implemented in line with the Plan
- The severity of the potential non-compliant behaviour is medium impacts are likely to be reversible, but may incur significant time or cost.

Plan outcomes:

• Shifts in community values will require a corresponding shift in Plan specifications.

H.7.3 Factors affecting the trend

The key factors that need to occur for the relevant issues to become a trend include one or more of:

- SDLs are not achieved, or EWPs not prepared or implemented because social opinion on the value and desirable application of environmental water shifts to an extent not covered by the Plan.
- Lack of tangible positive outcomes from an EWP causes influential stakeholders to campaign that future actions should be abandoned resulting in broad community pressure being applied to politicians for cessation of, or changes to, Environmental Watering activities and SDL volumes.

Current pace of change in the factors identified:

Slow

Likely timeframe of direct impact on compliance and assurance:

• Medium to long term

Geographical scale of trend:

Basin wide implications

Primary scale of factors influencing the trend:

• National and regional

H.7.4 Relevant data and sources

Table 48: List of relevant data sources for Trend 7

Issues	Source
 Demographic Shifts (Changes in Economic Conditions) Shift in rural demographics Reported declines in real wages – increasing value of job security 	 Demographic data Australian Bureau of Statistics Australian Demographic Statistics http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0
 State Fiscal Position (Changes in Economic Conditions) Level of foreign investment in agricultural activities Restructuring of federal, state and territory departments and agencies 	 Economic activity data Australian Bureau of Statistics, Wage Price Index Statistics (6345.0) http://www.abs.gov.au/ausstats/abs@.nsf/mf/6345.0 Australian Bureau of Statistics Australian Labour Force Statistics (6202.0) http://www.abs.gov.au/AUSSTATS/abs@.nsf/exnote/6202.0 Australian Bureau of Statistics, National and State http://www.abs.gov.au/AUSSTATS/Abs@.nsf/MF/5204.0 http://www.abs.gov.au/AusStats/ABS@.nsf/MF/5220.0 Federal, State and Territory Government Announcements: Press Office, Prime Minister of Australia http://www.pm.gov.au/press-office Media Releases, Victorian Office of Premier and Cabinet http://www.premier.vic.gov.au/media-centre/media-releases.html Memoranda & Circulars, NSW Office of Premier and Cabinet http://www.dpc.nsw.gov.au/announcements Media Statements, The Queensland Cabinet and Minister Directory, http://statements.qld.gov.au/ Premier and Cabinet Circulars South Australia Department of Premier and Cabinet http://dpc.sa.gov.au/premier-and-cabinet-circulars Communication and Events, ACT Government Chief Minister and Treasury

Issues	Source
	Directorate http://www.cmd.act.gov.au/communication
 Shifting community values and priorities (Changes in Attitudes of Communities) Level of political and industry advocacy to 'sacrifice' supply to environmental assets Reporting of community priorities around environmental and economic values (ie socioeconomic surveys etc.) Reporting of public meetings in regional locations advocating more consideration of the socio-economic impacts of the Basin Plan Reporting of incidence of water borne diseases such as Barmah Forest Virus cause public health issues 	 Industry advocacy National Farmers Federation www.nff.org.au/ NSW Farmers Association www.nswfarmers.org.au South Australian Farmers Federation www.saff.com.au/ Victorian Farmers Federation www.vff.org.au Australian Dairy Farmers www.australiandairyfarmers.com.au/ Public health information OECD better life index http://www.oecdbetterlifeindex.org/countries/australia/ Public health Data, Australian Institute of Health and Welfare http://www.aihw.gov.au/data/ Community interest group activity and community values surveys Riverland West Local Action Planning Association http://www.rwlap.org.au/ Renmark to the Border Local Action Planning http://www.relap.org.au/ Berri Barmera Local Action Planning Committee http://www.bblap.org.au/ Berri Barmera Local Action Planning Inc. http://www.malleefutures.org.au/ Murray Mallee Local Action Planning Inc. http://www.malleefutures.org.au/ Murray Care http://www.murraycare.com.au/ Goolwa to Wellington Local Action Planning Committee http://www.loblap.org.au/ Loxton to Bookpurnong Local Action Planning Committee http://www.loblap.org.au/ Coorong Districts Local Action Planning Committee http://www.loblap.org.au/ Coservation Council South Australia http://www.conservationsa.org.au Voices for the Murray-Darling; http://lifeblood.org.au Basin Pulse, http://www.lasinpulse.com.au Landcare Australia http://www.landcareonline.com.au Trees for life, http://www.teresforlife.org.au Friends of Parks www.communitywebs.org
Roles and responsibilities in regulating and managing water (Changes in Institutional Arrangements and Relationships)	 Save the Murray http://www.savethemurray.com.au Information on Murray Darling Basin implementation and enforcement Murray Darling Basin Implementation Report, National Water Commission http://www.nwc.gov.au/publications/topic/audit-reports/murraydarling-basin-plan- implementation-initial-report National Water Commission http://nwc.gov.au
 Delays in preparation of Environmental Watering Plans Delays in undertaking Environmental Watering activities or progressing towards SDLs 	- Commonwealth Environmental Water Office http://www.environment.gov.au/ewater/

H.8 Trend 8 – Cannot measure, cannot comply

Changes in capacity or capability to monitor Plan compliance are likely to occur due to issues affecting the availability of resources for monitoring activities. This includes funding for monitoring equipment and information collation, as well as resource capacity and capability for assessing compliance. New technology can introduce improved monitoring accuracy but may be at substantially higher cost.

The primary disruptive events are economic in nature. This emerging issue may affect all areas of the Plan with a compliance element: WRPs, WQSMPs, water trading rules, and EWPs.

H.8.1 Impact on the behaviour of Parties

- Poor availability of monitoring infrastructure creating uncertainty in the impact of interventions / actions resulting in Parties ceasing or scaling back actions until adequate monitoring can be provided.
- Poor availability of monitoring data limits each Parties' ability to demonstrate compliance with plans (regardless of whether they have actually complied or not).
- Difficulty in measuring compliance may also create opportunities for non-compliance (ie if a party knows that non-compliance cannot be proven).

Parties impacted by this trend:

• All Parties will potentially be impacted

Regulatory and administrative capacity to address potential non-compliance resulting from the trend:

- Inability to prove, or disprove, compliance with the Plan may affect confidence that the Parties are 'doing the right thing'. A lack of confidence could arise from community, industry, stakeholders or even other Parties. This is often referred to as a social licence to operate.
- Inability to prove, or disprove, the outcomes of the Plan may have similar effects.

H.8.2 Impact of not addressing trend

Compliance:

- Inability to measure compliance with (and outcomes of) the Plan may affect all areas of the Plan.
- The severity of the potential non-compliant behaviour is medium impacts are likely to be reversible, but
 may incur significant time or cost.

Plan outcomes:

• Without appropriate monitoring, the administrators of the Plan will be "flying blind". The creation and adoption of low cost monitoring that is demonstrated to be of similar or improved accuracy could lead to improved compliance or Plan outcomes without intervention.

H.8.3 Factors affecting the trend

The costs of monitoring may change, particularly for new technologies, to be either higher or lower than existing monitoring costs.

Current pace of change in the factors identified:

• Likely to take some time to evolve, but may then be medium to fast paced

Likely timeframe of direct impact on compliance and assurance:

Long term

Geographical scale of trend:

• Basin wide implications

Primary scale of factors influencing the trend:

• National and regional

H.8.4 Relevant data sources

Table 49: List of relevant data sources for Trend 8

ls	sues	S	purce
Sta (C Cc	ate Fiscal Position hanges in Economic inditions)	•	Current state (and Commonwealth) monitoring networks (reported on Federal and State water and environment websites) Federal and State funding
•	 Reductions in funding allocated to monitoring and compliance activities Reductions in regional resources and staffing for to monitoring and compliance activities Changes to monitoring and measuring processes and tools 	•	 Australian Budget Papers http://www.budget.gov.au Victorian State Budget Papers http://www.vic.gov.au/government- economy/victorian-government/budget-papers.html Queensland State Budget Papers http://budget.qld.gov.au/ South Australian State Budget Papers http://www.statebudget.sa.gov.au/ New South Wales State Budget Papers http://www.budget.nsw.gov.au/ ACT Budget Papers http://apps.treasury.act.gov.au/budget State and Territory Implementation Agencies
			 The Basin Plan, Australian Department of Sustainability, Environment, Water Population and Communities http://www.environment.gov.au/water/basin- plan/index.html Murray Darling Basin, The New South Wales Office of Water http://www.water.nsw.gov.au/Water-management/Basins-and- catchments/Murray-Darling-Basin/Murray-Darling-Basin
			 Murray Darling Basin Plan, Our Future Our Water, Victorian Department of Environment and Primary Industries http://www.water.vic.gov.au/governance/murray-darling-basin-plan
			 Queensland Department of Environment and Resource Management http://www.nrm.qld.gov.au/water/index.html
			 Murray Darling Basin Plan, South Australia Water For Good http://www.waterforgood.sa.gov.au/ ACT Environment and Sustainable Development Directorate, Water
			http://www.environment.act.gov.au/water
		•	Murray Darling Basin Catchment Management Authorities
			 Condamine Catchment Management Association http://www.condaminecatchment.com.au/
			- South West NRM http://www.southwestnrm.org.au/
			- Border Rivers Gwydir CMA http://brg.cma.nsw.gov.au/
			- Namoi Catchment Management Authority http://www.namoi.cma.nsw.gov.au/
			- Central West Catchment Management Authority http://cw.cma.nsw.gov.au/
			 Vestern Catchment Management Authority http://www.western.cma.nsw.gov.au/ Lachlan Catchment Management Authority http://www.lachlan.cma.nsw.gov.au/
			- Murray Catchment Management Authority http://www.dernan.cma.nsw.gov.au/
			 Murrumbidgee Catchment Management Authority http://www.murrumbidgee.cma.nsw.gov.au/
			 SA Natural Resources Management Board – South Australian Murray Darling Basin http://www.naturalresources.sa.gov.au/samurraydarlingbasin/home
			- Mallee Catchment Management Authority http://www.malleecma.vic.gov.au/
			- Wimmera Catchment Management Authority http://www.wcma.vic.gov.au/

Issues	Source	
	 North Central Catchment Management Authority http://www.nccma.vic.gov.au/index.aspx 	
	 Goulburn Broken Catchment Management Authority http://www.gbcma.vic.gov.au/default.asp?ID=home 	
	- North East Catchment Management Authority http://www.necma.vic.gov.au/	
	Information on water smart technologies	
	 Water Smart Australia, Australian Department of Sustainability, Environment, Water, Population and Communities 	
	http://www.environment.gov.au/water/policy-programs/water-smart	
	- Australian Water Management Review http://www.awmr.com.au/water-news	
	 Water Technology http://www.water-technology.net 	
	 Water monitoring information – data and tools 	
	 Groundwater Dependent Ecosystem Atlas Australian Bureau of Meteorology http://www.bom.gov.au/water/groundwater 	
	- Water Storage http://nwc.gov.au/organisation/useful-resources	
	- Source Modelling Platform http://www.ewater.com.au/	
	 Groundwater - surface water interactions http://www.csiro.au/en/Organisation- Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Water-Resources- Assessment/GWSWInteractions_WfHC_event.aspx 	,
	- Water for Cities and Towns, CSIRO http://www.csiro.au/science/WaterSupply	

Appendix I. Environmental scan emerging issues

Note - The list of emerging issues includes an initial judgement of the potential impact on compliance if the emerging issue resulted in a trend and the trend eventually became a threat to compliance. The initial impact assessment has been further refined and analysed during the trend analysis and threat assessment phases of the environmental scan and therefore may not directly correlate with the threat assessment findings.

I.1 Changes in land and water use

Table 50: Emerging issues – Changes in land and water use

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Coal and natural gas from coal seam (NGCS)	Economic	Establishment of gateway reviews	Fast	NSW (Liverpool Plains)	Reduced encroachment of non-primary production uses (particularly mining) onto defined "high value", "prime" or "strategic" land. Affects the number of participants in water trade markets	Medium May affect the efficacy of water trade and transfer market.
Coal and NGCS	Economic	Development and expansion of NGCS mining activities	Moderate	Jurisdictional Qld	Increased demand for water from NGCS and Shale and other mining activities. Most of the water use lies outside of the Basin Plan compliance framework and could affect SDL compliance	Medium Implications for SDL accounting.
Coal and NGCS	Economic	Development and expansion of NGCS mining activities	Moderate	Jurisdictional Qld & NSW	Expansion of NGCS industry results in the production of significant amounts of water (move from groundwater to surface water) of variable water quality	Medium Implications for SDL compliance (pressure of water resources) and water quality and salinity.
Coal and NGCS	Economic	Development and expansion of NGCS mining activities	Moderate	Jurisdictional Qld & NSW	Expansion of NGCS industry results in the production of significant amounts of non- water resource waste streams that require special treatment and management	Minimal Implications for WQSMPs.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Coal and NGCS	Economic	Development and expansion of NGCS mining activities	Moderate	Jurisdictional Qld & NSW	Changes to water rights for NGCS to bring in line with the Act rather than Minerals and Resources Act	Minimal May bring NGCS water use into the SDL compliance/ accounting framework.
Coal and NGCS	Economic	Economic viability of coal mining associated with mining costs (including carbon tax) changes	Slow	Qld & NSW	Change to coal mining production volumes, with associated change to water resource requirements (demands and discharge)	Medium Implications for SDL compliance (pressure of water resources) and water quality and salinity.
Coal and NGCS	Economic	Advancements in measuring and monitoring the cumulative impact of multiple extraction activities on groundwater	Slow	Basin wide	Advancements to cumulative impact assessment requirements associated with applications for extraction activities (ie mining), with possible changes to the EPBC Act to have regard for water allocation related issues.	Minimal May improve certainty in assessment of groundwater SDL (setting and compliance).
Coal and NGCS	Economic	Rapid increase in renewable energy sources – bio-fuels, solar, wind or emergence of lower cost energy sources (eg United States' (US) shale gas) lead to reduced demand for NGCS and coal mining	Slow	Basin wide	Slow or reversal of trends associated with NGCS and/or coal mining	Minimal
Forestry	Political / economic	Policy announcements favour managed forests. Furthermore, costs of active land management versus passive land management become clearer	Slow	Basin wide	Perception of MDBA that they have a significant bias towards more environmentally friendly land uses that do not support the increase in demand for active forestry management.	Medium May affect water resource availability with implications for SDL compliance. May cause delays in implementation due to lack of support from industry on key decisions.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Forestry	Technological	Remote sensing technology is used to inform water use by plantations, leading to efficiencies in water use in forestry	Moderate	Basin wide	Expansion in forested areas, which 'consume water' and reduce water availability. Changes to water availability due to changes in forested areas / water consumption by forestry is outside of the SDL compliance framework.	Medium May affect water resource availability with implications for SDL compliance.
Forestry	Political	Multi-criteria analysis that takes social and economic impacts into greater account is developed for decision making regarding water allocation and planning	Moderate	Basin wide	Expansion in forested areas, which 'consume water' and reduce water availability. Changes to water availability due to changes in forested areas / water consumption by forestry is outside of the SDL compliance framework.	Medium May affect water resource availability with implications for SDL compliance.
Forestry	Social / economic	Decline of regional and rural communities that rely on forestry (growing, processing, exporting)	Moderate	Forestry- dependent LGAs (eg South east region of South Australia)	Loss of regional jobs that require State Government to take action to help industry transition.	Medium May affect water resource availability with implications for SDL compliance.
Forestry	Economic	Increase in cheaper forestry product imports	Moderate	Basin wide	Loss of regional jobs that require State Government to take action to help industry transition.	Medium May affect water resource availability with implications for SDL compliance.
Agriculture (food and fibre production)	Economic	Reduced and / or less profitable agricultural operations to competition for land from other sectors (mining, regional growth centres etc), and / or low cost competitors and a return to protectionism	Moderate	Basin wide	Reduced demand for water by agriculture	Minimal May reduce pressure on water resources with implications for SDL compliance.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Agriculture (food and fibre production)	Economic	Decreased agricultural production in the south	Moderate	Southern Basin	Reduced demand for water by agriculture	Minimal May reduce pressure on water resources with implications for SDL compliance.
Agriculture (food and fibre production)	Economic	Agricultural development in the north expands (greater footprint) and/or intensifies (ie from grazing to cropping)	Moderate	Northern Basin	Increased demand for water by agriculture	Medium May increase pressure on water resources with implications for SDL compliance.
Agriculture (food and fibre production)	Political / economic	Increased agricultural output is encouraged as a result of Commonwealth level policy announcements that favour intensive agriculture, and / or increased global demand to compensate for a collapse of Asian food production for environmental reasons and to leverage free trade agreements with Asian countries	Moderate	Basin wide	Increased demand for water by agriculture	Medium May increase pressure on water resources with implications for SDL compliance.
Agriculture (food and fibre production)	Economic	Changes in global commodity markets alter the mix of agricultural activities (ie change in crop types)	Moderate	Basin wide	May change the pattern of demand for water across the year (timing) and/or across the Basin (location) depending on the nature of the shift	Medium May affect pressure on water resources with implications for SDL compliance.
Agriculture (food and fibre production)	Technology	Development of crop species that require less water and are salt resistant	Moderate	Basin wide	May change the pattern of demand for water across the year (timing) and/or across the Basin (location) depending on the nature of the shift	Medium May affect pressure on water resources with implications for SDL compliance.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Agriculture (food and fibre production)	Technology	Biotechnology changes improve the viability of crops in different areas	Moderate	Basin wide	May change the pattern of demand for water across the year (timing) and/or across the Basin (location) depending on the nature of the shift	Medium May affect pressure on water resources with implications for SDL compliance.
Agriculture (food and fibre production)	Technology	Investment in infrastructure and technology enables more efficient irrigation (delivery systems and on-farm efficiencies)	Moderate	Basin wide	Improved irrigation efficiency increases the volume of agricultural production for a given volume of water resource consumption. May affect demand for water by agriculture and/or agricultural production	Medium May affect pressure on water resources with implications for SDL compliance.
Agriculture (food and fibre production)	Social	Declining farm returns leads to the emergence of protest movements and farmer action groups calling for less regulation on farming activities	Moderate	Basin wide	Jurisdictional governments are unable to achieve community agreement to WRP arrangements, return of water to environment and other key elements of basin plan	Medium May affect ability to establish WRPs with implications for SDL and EWP compliance.
Agriculture (food and fibre production)	Economic / Political	Increased foreign investment in land and water (and infrastructure investment) for agriculture	Moderate	Basin wide (less likely in high value crop areas)	Foreign investment seen in other regions in Australia (Ord, Tasmania) funding large developments. Potential change to demand pattern and irrigator behaviour to water management and trade.	Medium Change in water demand patterns (implications for SDL) and attitude to infrastructure development and trade.
Agriculture (food and fibre production)	Economic	Market based instruments become the norm for achieving resource efficiency and natural resource management outcomes	Slow	Basin Wide	Changes to the nature and location of agricultural activity (and water demands) and implications for land use as areas move from agricultural activities to delivering eco-system services.	Medium May affect pressure on water resources with implications for SDL compliance.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Agriculture (food and fibre production)	Economic	Major overhaul of Commonwealth and State taxation arrangements result in economic rent-based taxes being applied to all land uses. A tax-free threshold based on the per-square-metre value of the land is set such that there would be no tax liability on most agricultural and other low-value land.	Slow	Basin Wide	Removal of land tax on farm sale/purchase supports movement of new entrants into agriculture and also encourages relocation of farm businesses to more favourable locations, with increased demand for water and changing locations of demand	Medium May affect pressure on water resources with implications for SDL compliance. Diversions to new demand points may affect flows in some river reaches, impacting on environmental water requirements and delivery, with implications for EWP compliance.
Carbon farming	Economic	Provision of base income for innovative multiple land uses results in growth in carbon farming	Moderate	Basin wide	Carbon farming is associated with a higher frequency of change in land use, with land owners more willing to innovate. Also contributes to better land stewardship, particularly soil management	Medium May affect land (soil) management with implications for water quality and salinity
Carbon farming	Economic	Concerns about the lack of available land for biodiversity offsets causes slow growth in carbon farming	Moderate	Basin wide	Land owners look at alternative methods for more productive land use, which may or may not increase water use	Minimal May increase pressure on water resources
Carbon farming	Economic	Carbon farming makes commercial forestry sustainable and commercially viable by acknowledging plantations as a "renewable"	Slow	Basin wide	Expansion in forested areas, which 'consume water' and reduce water availability. Changes to water availability due to changes in forested areas / water consumption by forestry is outside of the SDL compliance framework.	Medium May affect water resource availability with implications for SDL compliance
Carbon farming	Economic	Carbon farming reduces access to native forests and other lands for hardwood plantations (harvesting)	Slow	Basin wide	Expansion in forested areas, which 'consume water' and reduce water availability. Changes to water availability due to changes in forested areas / water consumption by forestry is outside of the SDL compliance framework.	Medium May affect water resource availability with implications for SDL compliance

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Urbanisation	Social / Economic	Significant growth in population in regional centres and peri-urban development areas	Fast	Basin wide	Increase in pollution in regional centres (urban water demand) and peri-urban areas (farm dam demand and groundwater bores) may affect pressure of water resources	Medium May affect pressure on water resources with implications for SDL compliance.
Urbanisation	Economic	Growth in metropolitan areas encroaches upon floodplains and catchments	Slow	Basin wide	Shift in catchment land use may affect water availability (volume and pattern of availability). May also affect demand for water ie increased demands for urban water supply and reduced demand for agricultural supply. Floodplain development may also create additional constraints on delivery of environmental water.	Medium May affect water resource availability and pressure on water resources with implications for SDL compliance and EWP compliance
Urbanisation	Social	Peri-urban land is protected for residential growth by excluding land uses such as agriculture, forestry, and mining	Fast	Basin wide	Exclusion and singular long-term land uses. May reduce trade efficacy with fewer buyers for water entitlements. May also affect market stability and predictability	Medium May impact water trading markets
Conservation	Environmental	Change in the number and location of threatened species in Australia	Slow	Basin wide	Change in presence of threatened impacts on drivers for Environmental Watering activities. This may affect both the magnitude of environmental water required and the way in which it is used (location, timing and patterns).	Medium Implications for environmental water requirements (SDL) and use (EPWs)
Conservation	Environmental	Change in the number and location of pest and invasive species in Australia	Slow	Basin wide	Change in presence of pest and invasive species may affect the viability of agricultural enterprises, water quality and environmental water outcomes	Medium May affect pressure of water resources (SDL), environmental water requirements and use (SDL and EWPs) and water quality

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Conservation	Environmental	Change in obligations under international treaties such as the Ramsar Convention to combat climate change by increasing sites protected in exchange for compensation / funding from other countries	Slow (speculative)	Basin wide	Global trend for reduction in vegetation cover leads to Australian response of increasing protection areas. Protection areas require environmental water to maintain / achieve obligations	Medium Implications for environmental water requirements (SDL) and use (EWPs)
Conservation	Environmental	On-going or increased degraded water assets (rivers and/or wetlands)	Slow	Basin wide	Degradation of water assets may affect both the magnitude of environmental water required and the way in which it is used (location, timing and patterns).	Medium May affect environmental water requirements (SDL) and use (EWPs)
Conservation	Environmental	Planned Environmental Watering activities lead to unintended / undesirable outcomes	Moderate	Basin wide	Environmental Watering activities may lead to unintended, undesirable outcomes such as black water events or support expansion of invasive species over natives	Medium May require modifications to EWPs and /or WQSMPs
Indigenous land use	Social	Native title claims extend to rights over water	Moderate	Basin wide	Introduction of cultural flows in water planning	High Could create legal obligations to deliver water for cultural flows that are not allowed for in the SDL calculation at the moment, may be addressed by increased bypass
Eco-tourism	Social	Increased demand for eco-tourism results in key landscapes, cultural and heritage sites, and recreational assets being protected from inconsistent developments	Moderate	Basin wide	Increased demand for eco-tourism may increase social and political focus on environmental assets, which may affect both the magnitude of environmental water required and the way in which it is used (location, timing and patterns)	Medium May affect environmental water requirements (SDL) and use (EWPs)

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Defence owned land	Economic	Rationalisation of Defence owned land	Moderate	Basin wide	Divestment of Defence owned land in rural areas. May present an opportunity for agricultural development. May also affect support towns and cities, reducing their viability with direct impact on water demands as a result of population migration	Medium May affect pressure on water resources and water demand patterns (implications for SDL)
Skills and resources	Social / economic	Continual changes in land use alter skill and labour needs / demand in the Basin	Fast	Basin wide	Increasing demand for arrangements whereby skills can be shared between different industries and are transferable	High Will affect ability of relevant agencies to comply with / implement the Plan
NBN	Social / economic	Establishment of NBN results in business diversification opportunities in higher value / value-add activities	Slow	Basin wide	Regional / rural demographic changes shifting community priorities away from productive land use	Minimal May lead to community preferences for Environmental Watering

I.2 Changes in economic conditions

Table 51: Emerging issues – Changes in economic conditions

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Global economic conditions	Economic	Collapse in EuroZone creates another global financial crisis	Moderate	Basin wide	Reduces the economic viability of agricultural production (depending on impact on markets) Changes in government investment in public infrastructure for 'offset works'	High May affect compliance with and review of SDLs associated with potential offset works
Global economic conditions	Economic	Australian dollar remains high	NA	Basin wide	Reduces the economic viability of agricultural production as Australian exports become too expensive and foreign imports to Australia highly competitive	Medium May affect pressure on water resources with implications for SDL compliance
Global economic conditions	Economic	Rebound in US economy and strong growth in Asian gross domestic product results in above trend world economic growth	Slow	Basin wide	Improves the economic viability of agricultural production (depending on impact on markets)	Medium May affect pressure on water resources with implications for SDL compliance
Demographic shifts	Social	Rapidly aging population in the region	Slow	Basin wide	Ageing populations leads to increased water consumption in regional urban systems. May also impact water consumption for agricultural production if associated with a shift in farming populations (including shift from individuals to commercial farming)	Medium May affect pressure on water resources (SDL)

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Demographic shifts	Social	Major population centres grow at the expense of regional and rural towns (ie migration to cities)	Slow	Basin wide	Change in population balances may affect pressure on water resources (ie supply of Basin water to cities outside of the Basin). Uncertainty in timing and scale of migration makes associated water resource planning difficult.	Medium May affect pressure on water resources with implications for SDL compliance. Diversions to new demand points may affect flows in some river reaches, impacting on environmental water requirements and delivery, with implications for EWPs.
Demographic shifts	Social	East coast population increases more than expected	Slow	Basin wide	Change in population balances may affect pressure on water resources (ie supply of Basin water to cities outside of the Basin). Uncertainty in timing and scale of migration makes associated water resource planning difficult.	Low May affect water pressure on water resource with implications for SDL compliance. Diversions to new demand points may affect flows in some river reaches, impacting on environmental water requirements and delivery, with implications for EWP compliance.
Demographic shifts	Social / Economic	Increase in high and medium density residential living in inner cities	Fast	Basin wide	Increase or constrain water efficiency improvements depending on whether market favours improved urban water use or affordable housing.	Medium May affect pressure on water resources with implications for SDL compliance.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
State fiscal position	Economic	Declining state revenue	Fast	Basin wide	Prolonged deficits lead to reduced government spend on water resource planning and Plan implementation	High May affect all aspects of Plan implementation and compliance
Cost of doing business (inputs – electricity, water, transport, labour; government support and assistance)	Economic	Lack of local demand, increased international competition, and the rising costs of materials causes a decline in construction and manufacturing (and other industry)	Fast	Basin wide	Decline in construction and manufacturing lead to a change in industrial water use in the Plan	Medium May affect pressure on water resources with implications for SDL compliance
Cost of doing business (inputs – electricity, water, transport, labour; government support and assistance)	Economic	Cost of business increases dramatically (petrol, labour etc.) and reduces cash flow (debt collection) for rural water corporations	Moderate	Basin wide	Changing variability of water right holders business may affect demands for industrial and agricultural water. Reduced demands, or increased debt to rural water corporations, reduces funding available to rural water corporations for Plan compliance and monitoring activities	High May affect capacity for Plan compliance and monitoring activities
Cost of doing business (inputs – electricity, water, transport, labour; government support and assistance)	Economic	Water right holders cannot afford increases in tariffs to fund investment required to secure future water supply	Slow	Basin wide	Budget constraints limit funding on infrastructure (maintenance of existing infrastructure and investment in new infrastructure)	Low

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Cost of doing business (inputs – electricity, water, transport, labour; government support and assistance)	Economic	Diversification in business due to structural adjustment in industry and local economies	Slow	Basin wide	Diversification of business may affect demands for industrial water	Minimal May affect pressure on water resources with implications for SDL compliance
Cost of doing business (inputs – electricity, water, transport, labour; government support and assistance)	Economic	Dramatic cost increase and reduced availability of critical materials (cost of carbon, electricity, commodities (steel), oil, labour) for construction	Moderate	Basin wide	Declining condition of critical water infrastructure, affecting security of water supply. Consequences may affect water availability and ability to deliver water entitlements.	Medium Loss of critical water infrastructure may affect water availability (SDL). May also ability to deliver water to environmental assets (EWPs).

I.3 Changes in attitudes of communities

Table 52: Emerging issues – Changes in attitudes in communities

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Changes in community values and priorities	Social	Environmental issues (eg climate change) become a top priority for voters	Slow	Basin wide	Lack of progress on climate change actions results in increasing demand by political parties for economic and social reforms to achieve environmental outcomes Adjustment mechanisms implemented to allow Plan to adapt to climate change	High May require substantial revision to the Plan
Changes in community values and priorities	Economic	Decline in real wages causes communities to be more concerned about job security than stronger environmental or social regulations	Moderate	Basin wide	Economic situation means compliance and assurance obligations become too onerous for water holders in the Basin who choose not to comply	High May result in significant non-compliance or may require substantial revision to the Plan
Changes in community values and priorities	Social	Threatened with no water, public choose to "sacrifice" some of the region's environmental assets, reducing environmental water requirements	Moderate	Basin wide	'Qualification of rights' and suspension of water sharing plans during previous droughts to prioritise consumptive demands over environmental water	High May lead to wide spread, significant non-compliance with multiple elements (SDLs, EWPs, water quality)
Changes in community values and priorities	Social	Increase in people moving to the Basin for a "tree change" places greater focus on visual amenity than productive land use	Moderate	Basin wide	Regional / rural demographic changes shifting community priorities away from productive land use	Minimal May lead to community preferences for Environmental Watering
Changes in community values and priorities	Social	Growing public awareness of the region's environmental values leads to pressure on government and rural water corporations to ensure the long term survival of those environmental assets	Moderate	Basin wide	None	High Possible reassessment of SDL or increased private investment in environmental water

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Changes in the role of communities / citizens in government decision making	Social	Communities seek more transparent and inclusive planning processes	Fast	Basin wide	Increasing participation of citizens and communities in government and private sector decisions	Moderate May cause delays or alter outcomes in implementing the Plan
Changes in the role of communities / citizens in government decision making	Social	Local communities lack accurate and comprehensive information about government decisions affecting their community, and are influenced by outside interest groups providing misinformation	Fast	Basin wide	Communities seek legal action against government decisions affecting their community	Moderate May cause delays or alter outcomes in implementing the Plan
Changes in political positions towards water reform	Political	Substantial reduction in public sector spending on water reform	Fast	Basin wide	Current and future State (and Federal) budget constraints restrict spend on Plan implementation and compliance	High May result in significant non-compliance (ie limit state ability to develop WRPs, impact on management of water trade)
Changes in political positions towards water reform	Political	Willingness to reconsider bulk water arrangements	Slow	Basin wide	Format of bulk water sharing arrangements considered in light of other recent policy reforms. May include development of streamlined interstate arrangements for water allocations, carryover, accounting, trade and delivery, or movement to creation of capacity shares for SA and the environment.	Medium Potential impact on SDL accounting process and trade rules

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Changes in political positions towards water reform	Environmental	Recycled water is recognised as an environmental flow	Moderate	Basin wide	Increasing acceptance of non-conventional water sources, especially for non-potable applications.	Medium May affect volume of environmental water requirements (SDL offsets/ adjustments) and use (EWPs). Possible implications for water quality depending on standards for recycled water returned to rivers.
Changes in political positions towards water reform	Political	Changes in State and / or Commonwealth governments give regional economies a greater political voice	Fast	Basin wide	More emphasis on investment and water for economic development and job creation in regional areas, and less emphasis on Environmental Watering	
Changes in political positions towards water reform	Economic / environmental	Greater emphasis on biodiversity offsets and corridors, and the value of ecosystem services	Slow	Basin wide	Higher economic value placed on ecological assets	Medium Could change decision making processes of Basin states – may support or challenge Plan obligations
Changes in political positions towards water reform	Political	Move towards a pro-dam policy	Slow	Basin wide	Coalition policy documents indicate that dam development will be reconsidered	Medium May impact system operation and the distribution of water availability affecting ability to comply with SDL. Further change to flow patterns also creates implications for compliance with EWP

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Public versus private rights	Regulatory	Privacy laws and policies allow greater use of electronic surveillance on private citizens	Slow	Basin wide	Increased remote monitoring to detect water theft is viewed by the law as an intrusion on privacy Increased theft during times of increased scarcity of water available for consumptive causes due to perceived lack of enforcement capability of MDBA and States/Territories Development of enforcement and compliance remote sensing technologies may help to monitor theft. The application of these technologies would also be useful to environmental water managers monitoring extent of inundation of ecological assets, so cost sharing opportunities	Low Water theft affects total water consumption (SDL) Enhanced monitoring to inform effective environmental water management (EWPs)

I.4 Major climatic events

Table 53: Emerging issues – Major climatic events

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Increased impact and frequency of natural disasters	Environmental	Climate change and/or extreme climate sequences (drought and flood)	Moderate	Basin wide	Climate change, a return to prolonged, extreme drought conditions, or the occurrence of a prolonged, extreme wet period may shift climate (and hence water availability) conditions outside of the tolerance of the Plan. May affect compliance with SDLs and EWPs	High A shift in climate conditions outside the tolerance of the Plan may lead to wide-spread non- compliance and/or require substantial revisions to the Plan
Increased impact and frequency of natural disaster	Environmental	Increased focus on protecting infrastructure and assets from natural disasters (including setting aside a greater proportion of storage for flood protection)	Slow	Basin wide	Brisbane floods. More frequent bushfire events creates short term water quality implications and longer-term yield reductions	Medium/High Reduction in allocations for consumptive use could create social impacts not allowed for in setting SDL. Yield impacts create implications for SDL compliance and require extensive revision to the Plan
Increased impact and frequency of natural disaster	Environmental	Geological event significantly changes geomorphology of the Basin	Slow (speculative)	Basin wide	None	Potential impacts not well understood. Could re- distribute water availability and distribution infrastructure

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Increased impact and frequency of natural disaster	Social	Increased impact or expectations of Australia's role in global or regional conflict and large scale environmental catastrophe (eg acceptance of refugees from events overseas)	Slow (speculative)	Basin wide	None	Low May affect pressure on water resources, likely to be handled by water markets but could force government to intervene in water markets to achieve social outcomes in a short space of time
Increased impact and frequency of natural disaster	Technology	Ability to fight bushfires dramatically improved through development of fire retardation or fighting technology	NA	Basin wide	Mature forests may consume more water than periodically burned forests	Medium May affect water resource availability with implications for SDL compliance
Increased impact and frequency of natural disaster	Environmental / economic	Increased intensity of bushfires and huge costs associated with protecting and recovering from bushfires	Moderate	Basin wide	More frequent bushfire events creates short term water quality implications and longer- term yield reductions	Medium / High Yield impacts create implications for SDL compliance and require extensive revision to Plan
Gradual / incremental climatic changes	Social	Recycling of treated wastewater and use of storm water becomes economically, socially, and politically acceptable	Slow	Basin wide	Increasing acceptance of non-conventional water sources, especially for non-potable applications. Reduces demand on conventional water sources.	Medium May affect pressure on water resources with implications for SDL compliance
Gradual / incremental climatic changes	Environmental	Unintended feedback loops from climate change exacerbate water availability impacts (eg temperature- vegetation water use and survival relationships that are poorly understood at the moment)	Slow	Basin wide	Current research topic	Potential impacts not well understood

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Public health	Environmental	Expansion of water borne diseases such as Barmah Forest Virus cause public health issues	NA	Basin wide	Increase in some water borne diseases	High Change in water management regime to minimise opportunities for vectors to reproduce could alter perceptions of wetlands and hence the environmental flows implicit in the SDL and EWPs

I.5 Changes in science and technology

Table 54: Emerging issues – Changes in science and technology

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Technology increases water supply	Political / Environmental	Integrated urban water cycle management embraced by State Governments	Moderate	Urban areas throughout the basin	Increased rainwater harvesting in urban areas. Such water use is outside of the SDL compliance framework and accounting would be challenging. Also implications for water quality (reduce water quality risks)	Medium May affect water resource availability with implications for SDL compliance. Potential impacts offset to some degree by increased potential runoff from expanded urban areas. May also affect (improve) catchment water quality
Technology increases water supply	Technology	Advances in evaporation control measures such as micro- and mono-layer products	Slow	Basin wide	Ongoing research into reducing evaporation losses from water bodies. Reduced evaporation losses increases water availability	Medium May affect water resource availability with implications for SDL compliance
Technology increases water supply	Technology	Technology advancements reduce energy usage of desalination plants	Slow	Basin wide	Desalination costs significantly decrease, leading to increase in production of desalinised water. Reduces pressure on other Basin water resources. May increase demand for water from brackish groundwater resources.	Medium May affect pressure on water resources with implications for SDL compliance
Technology increases water supply	Technology	Treatment of water extracted for NGCS and de-watering of mines produce surplus water	Slow	Basin wide	Increase in water availability, which will also have implications for water quality and products.	Medium Saline aquifers may fall within the boundary of the
Technology increases water supply	Technology / regulatory	Technology advancements enable access to water in very deep aquifers	Slow	Basin wide	Increase in water availability, which will also have implications for water quality and products.	Basin so industry may require incentives to encourage use of lower quality water.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Technology increases water supply	Technology	Cloud seeding technology improves to increase water availability	Slow	Basin wide	Increase in water availability, which will also have implications for water quality and products.	Low Could re-distribute or increase water availability, so unlikely to be a compliance issue unless one community is affected at the expense of another.
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Significant advancement in technologies for floodplain water balance monitoring, and measurement of floodplain harvesting	Slow	Basin wide	Improvements in the accuracy of accounting for floodplain harvesting targeted to (a) improve the accuracy of the overall water balance, particularly water interception and take (SDL accounting and compliance) and (b) allow accounting for net take for Environmental Watering in floodplain systems (environmental water requirements (SDL) and use (EWPs))	Medium May affect the magnitude of, and compliance with, the SDL. May also affect environmental water requirements (SDL) and deliveries (EWPs) or affect overall understanding of water balance resulting in need to revise SDLs and the Plan.
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Rapid adoption of advanced computing capability (cloud computing, high speed broadband, analysis of very large datasets, simulation and modelling, virtual reality, ubiquitous computing, grid computing, optical computing, biocomputing, quantum computing)	Fast	Basin wide	Greater accuracy and precision in identifying emerging risks to water availability, security and reliability	Medium Enhances regulator capacity. Conversely, may provide water right holders opportunities for new non- compliance behaviours.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Technology advancements reduce the energy usage of conventional water pumping technologies	Slow	Basin wide	Reduced costs improve the economic feasibility of pumping infrastructure, allowing further development and expansion of the water grid. Could affect pressure on water resources in the Plan as the cost of pumping to other areas (including to/from the Basin) reduce. May also allow environmental water to be moved more flexibly.	Medium May affect pressure on water resources with implications for SDL compliance
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Fully automated customer billing and water delivery monitoring technologies are installed	Slow	Basin wide	Enhancement to water delivery monitoring technologies to allow more accurate monitoring of delivery volumes and cost- effective monitoring of previously unmonitored extractions (ie stock and domestic supplies). Improves overall accounting of water take and use. Automation may also allow more frequent, cost-effective monitoring of extractions, allowing earlier detection of potential non- compliance.	Medium Enhances compliance and enforcement capacity, may reduce the risk of non-compliance and allow for earlier detection of non-compliance
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Tunnelling, pipeline or pumping technologies reduce in cost, promoting inter-basin connections across the Great Dividing Range	None	Basin wide	None	Medium Would allow water to be transferred to new areas, opening up irrigated agriculture, or to/from the Murray-Darling Basin. Impact on compliance would depend on pace of technological development. Could allow environmental water to be sourced more readily from elsewhere.

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Innovation in biomass for forestry products and efficiencies in harvesting and haulage improve productivity and efficiency in forestry	Slow	Basin wide	None	Low Would reduce the impact of competing water uses (forest industry – environment)
	Technology	Modelling is advanced to better understand the connectivity between surface water and groundwater	Moderate	Basin wide	Developments in modelling could improve or challenge assumptions of Basin conditions and Plan compliance	Medium to high May require amendments / revisions to obligations
Technology improves the efficiency, measuring, and monitoring of water use	Technology	Water quality treatment technologies eliminate blue-green algae risks	None	Basin wide	None	Low Reduced need for dilution flows, which is likely to increase compliance rather than decrease it
Emergence of an advanced water market	Technology	Establishment of a real-time electronic clearing house for the water market	Moderate	Basin wide	Development of online water registers, interstate compatibility etc.	Medium Increase to ease of water trade leading to expansion of temporary trades
Emergence of an advanced water market	Economic	State water grids that span state boundaries are completed	Slow	Peripheral	Increasing connectedness of water supply systems (development of integrated water grids)	Medium May affect pressure on water resources with implications for SDL compliance
Renewable energy technologies change the way water is used	Economic	Solar or other energy technologies overtake hydropower making the Snowy Mountains Scheme redundant	NA	Southern Basin	None	Low May increase pressure for return of flows to the Snowy, reducing water availability in the Murray/ Murrumbidgee, leading to pressure on SDLs

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Renewable energy technologies change the way water is used	Economic	Renewable energy is commercially viable in the region and can be used to power the water supply system at an acceptable level of cost	Slow	Basin wide	Costs associated with operation of water assets reduce	Medium

I.6 Changes in institutional arrangements and relationships

 Table 55: Emerging issues – Changes in institutional arrangements and relationships

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Roles and responsibilities in regulating and managing water	Economic	Catchment Management Authorities cease to exist and functions are reassigned / merged to another government agency	Moderate	Basin wide	The role, internal capacity and budget of CMAs across many Basin States have been reduced in recent years, with suggestions this may continue into the future. The loss of CMAs results in a loss of local knowledge of environmental assets. Merger into other agencies (eg water authorities) may also create poacher/gamekeeper pressures and reduce environmental oversight.	High May affect the compliance obligations of the merged agency (capacity) May affect the effective development and application of EWPs
Roles and responsibilities in regulating and managing water	Regulatory	Development of overlaps and duplications in the roles and responsibilities associated with regulating water	Slow	Basin wide	More prescriptive regulation	Medium May increase the complexity and burden of compliance with Plan obligations
Roles and responsibilities in regulating and managing water	Political	Tension between the role of Commonwealth and the role of State government in regulation, approvals, management of water, etc.	Moderate	Basin wide	Increasing complexity in regulation and uncertainty around government direction and decisions	Medium May lead to some States questioning prior Plan agreements
Roles and responsibilities in regulating and managing water	Political	All water managed at Basin scale and State water laws are fully repealed	None	Basin wide	Unlikely	High The Plan would need to be rewritten
Role, products, and services of rural water corporations change	Political	Local Council passes all statutory and regulatory responsibilities for water to rural water corporations	Slow	Basin wide	Council rationalisations	High May increase RWC compliance obligations
Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
---	--------------------	---	---------------	-------------------	---	--
Role, products, and services of rural water corporations change	Economic	Mass rationalisation of rural water corporations as more systems become connected and urban water authorities take over the functions of rural authorities	Moderate	Basin wide	Urban expansion into previously rural areas, with different priorities and needs for water (shift from agricultural demands to stock and domestic demands)	Medium Implementation of the Plan may require cooperation with 'new' corporations/ authorises not previously involved who may have different priorities
Role, products, and services of rural water corporations change	Economic	Full privatisation of rural water authorities (ie private company delivering all water services)	Slow	Basin wide	Privatisation of regulated services in Australia and overseas	High Willingness of private organisations to fund high cost compliance obligations and opportunities (eg cross- subsidisation no longer allowed)
Role, products, and services of rural water corporations change	Economic	Structural separation of rural water authorities (ie separate authorities responsible for water storages, water distribution, and water retailing)	Slow	Basin wide	Public sector drive to unlock value in regulated assets and drive competition (eg attempts in Qld)	Medium Complexity of regulation and managing entitlement use
Role, products, and services of rural water corporations change	Economic	Rural water corporations expand products and services (eg renewable energy)	Slow	Basin wide	Financial pressure on water corporations leading interest in developing alternative/ complementary products	Minimal Provided that RWCs remain focused on core business
NSW planning review	Regulatory	Establishment of Regional Planning Boards	Moderate	NSW	Better appreciation of the local consequences of development	Minimal Compliance opportunity
NSW planning review	Social	Development of long term regional growth plans	Moderate	NSW	Improved capacity to include all users water needs into regional planning activities	Minimal Compliance opportunity

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
NSW planning review	Social	Greater local government, community and environmental group participation in planning	Moderate	NSW	Increases in delays to development approvals Greater legitimacy of development decisions Heavier focus of environmental water needs	Minimal Compliance opportunity
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Regulatory	Recognition of water volumes returned to same resource	Fast	Basin wide	Net water licencing has the potential to allow significant increase economic outcomes through improved access to water. Complexity of water accounting increases significantly.	Medium If developed, expected to be managed within WRPs with minimal impact for SDL compliance
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Economic	Changes to water licence fees	Moderate	Basin wide	Water licence fees increase due to greater costs associated with water delivery (infrastructure, environment and regulator), affects demand for water licences and costs associated with trading	Medium May affect pressure on water resources with implications for SDL compliance
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Regulatory	Recognition of recycled water or "new" water	Slow	Basin wide	Potential creation of water rights around stormwater runoff. Interception of stormwater may reduce water availability. The creation of a new water product may also reduce pressure on existing water resources.	Medium May affect water availability and pressure on water resources with implications for SDL compliance

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Regulatory	Restrictions on intended use of water to limit environmental purchases	Fast	Basin wide	Expansion of the NSW embargo on trade to the environment (3% limit) etc.	High Limit ability of buyback with implications for SDL compliance. In conflict with water trade rules
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Regulatory	Changes to entitlement structure in unregulated rivers and groundwater systems to unbundle or create more readily tradeable products	Moderate to Slow	Basin wide	Expansion of trade in unregulated and groundwater water systems	Medium Increased trade activity, increased options for environmental water entitlements in unregulated river systems
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Regulatory	Recognition of transmission losses in trade policy	Slow	Basin wide (particularly southern- connected)	Inclusion of transmission losses in consideration of options to trade (as a physical barrier) and contribution of trade water to conveyance flows	Medium Implications for complexity of trade rules and increase complexity of compliance management.
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Regulatory	Adoption of new water products such as leases and options	Slow	Basin wide	None	Low Potential implications for SDLs and water trade

Key topics	Nature of issue	Emerging issue	Pace of issue	Scale of issue	Emerging trend	Impact
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Economic	Commodification of water markets, including the establishment of stock market for water trade that results in highly volatile market prices for water and separation of water ownership from end users	Slow	Southern Basin	Diversification of water market products. Trends in other commodities (eg wheat)	High Would require de- construction of existing water market / trade rules to achieve desired social outcomes
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Economic	Water market fails because existing water entitlements become locked into high value uses with negligible trade	Moderate	Southern Basin	Unclear. Volume of trade is consistent but not sure when limits could be reached	High Would require de- construction of existing water market / trade rules to achieve desired social outcomes
Changes in state based laws and regulation to recognise 'new' water products and establish an effective water market	Economic	Forestry and mining companies enter water market and create new products (eg treated water from CSG)	Moderate	Basin wide	None	Medium May require revision of water market trade rules to account for new products

Appendix J. Environmental scan user requirements

The tables below summarise the user requirements that need to be fulfilled as part of the environmental scan establishment phase.

Function	User requirement
Searching for and viewing emerging issues	 Enable staff to access an environmental scan homepage and view a list of emerging issue categories (see six strategic drivers of change described in previous sections). Enable staff to select a category and view the list of emerging issues Enable staff to select an emerging issue Enable staff to view the emerging issue information
Searching for a trend and viewing trends	 Enable staff to access an environmental scan homepage and view a list of trends – each trend should have a short description Enable staff to select a trend and view the trend information Enable staff to view the list of emerging issues linked to the trend Enable staff to select an emerging issue and view the information about the emerging issue
Searching for and viewing threats to compliance	 Enable staff to access an environmental scan homepage Enable staff to select from the following options: Water trade WRPs WQSMPs EWPs Enable staff to view the threats to compliance for the area selected Enable staff to view the list of trends related to the threat to compliance

Table 56: All staff user requirements

Table 57: Additional functionality required for Environmental Scan Contributors

Function	User requirement
Add a new emerging	Enable a contributor to view an Environmental Scan Contributor homepage
issue	Enable a contributor to add a new emerging issue
	Enable a contributor to complete a new emerging issue template
	Enable a contributor to select one or more existing trends and link the emerging issue
	• Enable a contributor to submit the emerging issue template (see Appendix B) for approval by Compliance and Assurance Environmental Scan Manager.
	 Enable a contributor to have emerging issue template automatically checked to ensure that all fields have been populated
	 Enable Compliance and Assurance Environmental Scan Manager to either approve or reject the emerging issue. Rejection is on the basis of:
	- Emerging issue already exists – contributor receives a message that emerging issue has been rejected and information provided should be added to current emerging issue
	 Incomplete information – contributor receives message that incomplete information has been provided
	• Enable contributor to view that the emerging issue has been added to environmental scan site
Edit an existing	Enable a contributor to select an emerging issue
emerging issue	Enable a contributor to edit emerging issue
	 Enable a contributor to create a new version of the emerging issue. The system must retain versions of all emerging issues
	• Enable a contributor to update the new version of the emerging issue. The system must record by whom and when the new version was updated

Function	User requirement
	Enable a contributor to submit emerging issue for approval by Compliance and Assurance Environmental Scan Manager
	• Enable Compliance and Assurance Environmental Scan Manager to receive request to approve or reject updated emerging issue. Updated emerging issue can be rejected on the basis of:
	 Incomplete information – contributor receives message that incomplete information has been provided and is required to provide all information and resubmit
	Enable an Environmental Scan Editor to approve updated emerging issue
	Enable contributor to receive a message that emerging issue has been updated
Add a new trend	Enable a contributor to view an Environmental Scan Contributor homepage
	Enable a contributor to select and add a new trend
	Enable a contributor to complete a new trend template (see Appendix B)
	Enable a contributor to select one or more existing emerging issues to link to the trend
	Enable a contributor to select one or more existing threats to link to the trend
	Enable a contributor to submit the new trend template for approval by the Compliance and Assurance Environmental Scan Manager
	• Enable a contributor to have a trend template automatically checked to ensure that all fields have been populated
	• Enable Compliance and Assurance Environmental Scan Manager to either approve or reject the new trend. Rejection is on the basis of:
	 Trend already exists – contributor receives a message that trend has been rejected and information provided should be added to existing trend
	 Incomplete information – contributor receives message that incomplete information has been provided
	Enable contributor to view that the trend has been added to the Environmental Scan site
	Enable Compliance and Assurance Environmental Scan Manager to receive a message that
	the new trend has been added and that a new threat may also need to be added
Edit an existing	Enable a contributor to select an existing trend
trend	Enable a contributor to select and edit trend
	 Enable a contributor to create a new version of trend. The system must retain versions of all trends
	• Enable a contributor to update the new version of the trend. The system must record by whom and when the new version was updated
	• Enable a contributor to submit trend for approval by Compliance and Assurance Environmental Scan Manager
	 Enable Compliance and Assurance Environmental Scan Manager to receive a request to approve or reject updated trend. Updated trend can be rejected on the basis of:
	 Incomplete information – contributor receives message that incomplete information has been provided and that additional information should be included and trend resubmitted
	Enable Compliance and Assurance Environmental Scan Manager to approve updated trend
	Enable contributor to receive a message that trend has been updated
	• Enable Environmental Scan Editor to receive a message that updated trend has been added and that the linked threats and opportunities should be reviewed

Function	User requirement			
Update a threat to compliance	 Enable a Compliance and Assurance Environmental Scan Manager to: View and select an existing threat template 			
	 Update existing information contained in the threat template Record a new version of the threat template. All past versions of a threat template must be held by the system. The date the threat template is updated and by whom must be recorded 			
	Publish the updated threat template			
Add new threat to compliance template	 Enable a Compliance and Assurance Environmental Scan Manager to: Select and create a new threat template Populate a threat template 			
	 Publish the new threat template 			

Table 58: Additional functionality required for Compliance and Assurance Environmental Scan Manager

Appendix K. References

AgForce Queensland Industrial Union of Employers (2012) Queensland's agriculture strategy: a 2040 vision to double the value of production, Response to the discussion paper for consultation, <u>http://www.agforceqld.org.au/file.php?id=2018&open=yes</u>, accessed 1 July 2013.

Ashton D, Oliver M, and Formosa T (2011) Overview of recent changes in irrigated agriculture in the Murray– Darling Basin: 2006–07 to 2008–09, Waterlines report, National Water Commission, Canberra.

Australian Bureau of Statistics (2008) 4610.0.55.007 Water and the Murray-Darling Basin – A statistical profile, 2001-01 to 2005-06, <u>http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4610.0.55.007Main+Features12000-01%20to%202005-06?OpenDocument</u>, accessed 24 June 2013.

Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics, and Bureau of Rural Sciences (2009) Socio-economic context for the Murray– Darling Basin – Descriptive report, Report to the Murray–Darling Basin Authority, Canberra.

Australian Government (2013) Carbon Farming Initiative, Clean Energy Future, <u>http://www.cleanenergyfuture.gov.au/carbon-farming-initiative/</u>, access 21 June 2013.

Australian Government, Australian Trade Commission, Department of Innovation, Industry, Science and Research, and Australian Water Association (2011) Australia's dynamic water industry: fostering excellence in water management, Australian Government, Canberra.

Australian Government, NSW Government, and Regional Development Australia Riverina NSW (n.d.) Country Change, <u>http://www.countrychange.com.au/</u>, accessed 24 June 2013.

Berg, C (2012) "The dramatic collapse of trust in government", The Drum, ABC, 25 January, <u>http://www.abc.net.au/unleashed/3790244.html</u>, accessed 24 June 2013.

Blog at Flinders (2013) "Trust in government linked to services", Flinders University, 21 May, <u>http://blogs.flinders.edu.au/flinders-news/2013/05/21/trust-in-government-linked-to-services/</u>, accessed 21 June 2013.

CSIRO (2011) Planning for climate change in the Murray-Darling Basin, <u>http://www.csiro.au/en/Organisation-</u> <u>Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Sustainable-Yields-Projects/Murray-Darling-climate-</u> <u>change.aspx#a2</u>, accessed 24 June 2013.

Environmental Compliance Advisory Services (2011) Murray Darling Basin Authority as a Regulator for the Basin Plan – Compliance Issues and Challenges: A guide to developing a compliance and enforcement regime.

Evocities (n.d.) Wagga Wagga, http://www.evocities.com.au/locations/wagga-wagga/, accessed 24 June 2013.

Federal Court of Australia, Victoria Registry (2012) Daniel Thomas Lee & Anor v Commonwealth of Australia & Anor, <u>https://www.comcourts.gov.au/file/Federal/P/VID1129/2012/actions</u>, accessed 21 June 2013.

Heasley, A (2012) "146 jobs to be lost as Heinz closes tomato sauce factory", The Age, 3 January, <u>http://www.theage.com.au/victoria/146-jobs-to-be-lost-as-heinz-closes-tomato-sauce-factory-20120102-</u> <u>1pigb.html</u>, accessed 21 June 2013.

High Court of Australia (1986) Minister for Aboriginal Affairs v. Peko-Wallsend 162 CLR per Brennan J: Department of Defence v. Fox (1997) 24 AAR 171

Holmes, B (2011) Citizens' engagement in policymaking and the design of public services: Research paper no. 1 2011-12, Parliament of Australia,

http://www.aph.gov.au/About Parliament/Parliamentary Departments/Parliamentary Library/pubs/rp/rp1112/12 rp01# Toc299099877, accessed 21 June 2013.

Inayatullah S (2007) Questioning the Future: Methods and Tools for Organisational and Societal Transformation, 3rd Edition, Tamsui, Tamkang University, Australia.

Liberal National Party (2012) The CanDo LNP Agricultural Strategy, <u>https://lnp.org.au/state-election-2012/grow-a-four-pillar-economy/the-cando-lnp-agriculture-strategy/</u>, accessed 8 July 2013.

Moore T, and Dyer R (2012) The way ahead for planning in NSW: recommendations of the NSW Planning System Review, NSW Government, <u>http://www.planningreview.nsw.gov.au/LinkClick.aspx?fileticket=p-c_QPFXVNM%3d&tabid=77</u>, accessed 24 June 2013.

Murray-Darling Basin Authority (2013) Basin Plan, Australian Government, <u>http://www.mdba.gov.au/what-we-do/basin-plan</u>, accessed 12 June 2013.

Murray-Darling Basin Authority (2013) Compliance and Assurance Strategy, 2013 – 2019, working draft version 5.7, draft document provided by MDBA for this project.

Murray-Darling Basin Authority (2013) Interstate water trade, Australian Government, http://www.mdba.gov.au/what-we-do/managing-rivers/water-trade/interstate, accessed 24 June 2013.

NAB Group Economics (2013) Global & Australian Forecasts – NAB Business Research and Insights, National Australia Bank, <u>http://business.nab.com.au/global-australian-forecasts-january-2013-2639</u>, accessed 8 July 2013.

National Water Market (2012) About us: the National Water Market System project, Australian Government, <u>http://www.nationalwatermarket.gov.au/site-information/index.html</u>, accessed 24 June 2013.

No author (2013) "Coalition readies \$30b plan for 100 dams: report", The Sydney Morning Herald: Environment, 14 February, <u>http://www.smh.com.au/environment/water-issues/coalition-readies-30b-plan-for-100-dams-report-20130214-2edtv.html</u>, accessed 24 June 2013.

No author (2013) "The last order, the last line" (2013) Cowra Guardian, 22 May, <u>http://www.cowraguardian.com.au/story/1519970/the-last-order-the-last-line/</u>, accessed 8 July 2013.

Novak, J (2011) Next generation state budgets: stronger fiscal rules for better budgetary outcomes and more prosperous states, Institute of Public Affairs, http://www.ipa.org.au/library/publication/1303961136_document_paper_-_next_generation_state_budgets.pdf, accessed 21 June 2013.

NSW Minerals Council (n.d.) Upper Hunter Mining Dialogue, <u>http://www.nswmin.com.au/Policy-and-Advocacy/People-and-Communities/Upper-Hunter-Mining-Dialogue/Upper-Hunter-Mining-Dialogue/default.aspx</u>, accessed 24 June 2013.

Queensland Floods Science, Engineering and Technology Panel, Office of the Queensland Chief Scientist (2011) Understanding floods: questions and answers, Queensland Government, http://www.chiefscientist.qld.gov.au/publications/assets/understanding-floods.pdf, accessed 24 June 2013.

Queensland Government (2013) Budget strategy and outlook 2013-14, <u>http://budget.qld.gov.au/budget-papers/2013-14/bp2-1-2013-14.pdf</u>, accessed 21 June 2013.

Regional Development Australia Riverina (2013) RDA-Riverina support for Riverina projects, <u>http://www.rdariverina.org.au/projects.aspx</u>, accessed 24 June 2013.

Sheehan, P (2013) "We'll reap what we deserve", The Sydney Morning Herald, February 18, <u>http://www.smh.com.au/opinion/politics/well-reap-what-we-deserve-20130217-2el38.html</u>, accessed 21 June 2013.

Snowhydro limited (2012) "Cloud seeding in the Snowy Mountains now permanent", Media release, 14 September, <u>http://www.snowyhydro.com.au/wp-content/uploads/2012/09/Cloud-Seeding-14092012.pdf</u>, accessed 24 June 2013.

Standing Council on Energy and Resources (2012) Multiple Land Use Framework, <u>http://www.scer.gov.au>/workstreams/land-access/mluf/</u>, accessed 8 July 2013.

The Great Eastern Ranges (n.d.) Great Eastern Ranges Initiative, <u>http://www.greateasternranges.org.au/</u>, accessed 8 July 2013.

Victorian Department of Planning and Community Development (2012) Murray River Settlement Strategy, <u>http://www.dpcd.vic.gov.au/planning/plansandpolicies/ruralandregionalplanning/murray-river-settlement-strategy</u>, accessed 21 June 2013.

Virtue R (2012) "Ag body to retain local focus", ABC News, 9 October, <u>http://www.abc.net.au/news/2012-10-09/cma-focus/4302838</u>, 24 June 2013.

Williamson, B (2013) "SA Budget 2013: What's in it for you?", 891 ABC Adelaide, 6 June, http://www.abc.net.au/local/stories/2013/06/05/3775172.htm, accessed 21 June 2013.

Woodruff R, and Bambrick H (2008) Garnaut Climate Change Review: climate change impacts on the burden of Ross River virus disease, <u>http://www.garnautreview.org.au/ca25734e0016a131/WebObj/03-BRossRivervirus/\$File/03-B%20Ross%20River%20virus.pdf</u>, accessed 24 June 2013.

Appendix L. List of abbreviations

ACCC	Australian Competition and Consumer Commission
ANU	Australian National University
ASIC	Australian Securities and Investment Commission
СМА	Catchment Management Authority
COAG	Council of Australian Governments
EWP	Environmental Watering Plan
FTE	Fulltime equivalent
LGA	Local Government Area
MDBA	Murray-Darling Basin Authority
NBN	National Broadband Network
NGCS	Natural Gas from Coal Seam
NPALAN	National Partnership Agreement on Literacy and Numeracy
Parties	Parties to the Basin Plan
Plan	Murray-Darling Basin Plan
QRAA	Queensland Rural Adjustment Authority
R&D	Research and Development
RWC	Rural Water Corporation
SDL	Sustainable Diversion Limit
SEWPaC	Department of Sustainability, Environment, Population and Communities
The Act	Water Act 2007
US	United States
VET	Vocational Education and Training
WQSMP	Water Quality and Salinity Management Plan
WRP	Water Resource Plan