



Murray-Darling Basin water markets inquiry

Final report

February 2021



Australian Competition and Consumer Commission
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Overview

The Australian Competition and Consumer Commission (ACCC) conducted this inquiry in response to a direction by the Treasurer, the Hon Josh Frydenberg MP, to examine markets for tradeable water rights in the Murray–Darling Basin (the Basin). This report makes recommendations to enhance markets for tradeable water rights, including their operation, transparency, regulation, competitiveness and efficiency.

The report draws on the views of a broad range of stakeholders with interests in the use and trade of water in the Basin, analysis of wide-ranging water market data from 2012 onwards, and other information and documents gathered from various large water users, investors, market intermediaries and government entities. The ACCC thanks all those who contributed their views and information to this inquiry.

Summary

Basin water markets are critical to the efficiency and productivity of Australian agriculture.

Water trading in the Basin had its origins in informal arrangements between neighbouring farmers, where one farmer's surplus water could be transferred to a neighbour. Over the past two decades it has evolved into a complex, Basin-wide set of markets with an annual average value of more than \$1.8 billion per year.¹

Water trading has brought substantial benefits to many water users across the Basin. Water markets allow irrigators to increase their water supplies, to earn income by selling their water rights when they are more valuable to someone else, to expand production, or to release capital for investment in their businesses. In turn, water trading promotes efficiency of dependent industries and delivers broader benefits to the Australian economy.

The benefit of water markets is demonstrated by the fact that, despite tough and volatile climatic conditions, the value of production from irrigated agriculture in the Southern Basin has trended upwards in real terms since 2010–11.²

The benefits derived from water trading rely on fair and efficient water markets, underpinned by an environmentally healthy river system. This depends on:

- a governance framework that ensures trading rules and regulations are developed and implemented with a Basin-wide perspective, in close connection to the river system's physical characteristics and appropriately managing the impacts of trade
- a clear and consistent framework for trading across the Basin
- regulation that promotes open, fair and transparent trading, which is robustly and consistently enforced across the Basin.

1 ACCC analysis based on Bureau of Meteorology and Australian Bureau of Statistics, Cat. No. 6401. Average annual total real value of trade, 2012–13 to 2019–20, in \$2019–20 terms. Includes temporary and permanent trade, including irrigation right trade reported to the Bureau of Meteorology by irrigation infrastructure operators. This statistic has been revised since the interim report to take account of more recent data, and to account for inflation using 2019–20 as the basis, rather than 2018–19.

2 Since 2010–11, the Gross Value of Irrigated Agricultural Production (GVIAP) in the Southern Basin has increased on average 2.9% a year in real terms (adjusted for inflation to 2019–20 dollars). However, the GVIAP has not uniformly increased over this period, falling in 2011–12, 2013–14, 2015–16 and 2016–17. For further details, see section 3.2.2 of this report.

There are significant deficiencies in current water trading arrangements

Basin water markets lack many features that make markets work effectively. A range of deficiencies in the settings for and governance of, water trading undermine the efficiency of water markets and the agricultural industries that depend on them.

The ACCC found that:

- there is a lack of quality, timely and accessible information for water market participants
- there are scant rules governing the conduct of market participants, and no particular body to oversee trading activities, undermining confidence in fair and efficient markets. In particular, water market intermediaries such as brokers and exchange platforms currently operate in a mostly unregulated environment, resulting in a lack of clarity regarding the role brokers play and permitting undisclosed conflicts of interest to arise
- trading behaviours that can undermine the integrity of markets, such as market manipulation, are not prohibited, insider trading prohibitions are insufficient, and information gaps make these types of detrimental conduct difficult to detect
- differences in trade processes and water registries between the Basin States prevent participants from gaining a full, timely and accurate picture of water trade, including price, supply and demand
- irrigators and traders would benefit from governments providing better information on key policies and river operations as this information would help them to develop informed expectations about water supply and to make business decisions
- the complex nature of the Basin's market settings means the market's trading systems and opportunities are best understood and leveraged by professional traders and large agribusinesses with the time and knowledge to analyse and navigate them
- the way the Southern Basin's 'market architecture'³ manages the hydrological characteristics of storages and river systems does not always adequately reflect scarce storage and delivery capacity or signal the cost of trading decisions. This results from a series of 'disconnects' between the time of trade and the actual movement of water, leading to river channel congestion and negative impacts on other water users and the environment
- changing conditions, such as reduced inflows, shifts in water use, declining channel capacity and increasingly binding trade restrictions, are challenging key assumptions that underpin trade arrangements and the design of tradeable water rights. These assumptions need to be reassessed so that water markets operate more efficiently in close connection with the river system's physical characteristics into the future.

A serious additional consequence of these problems is that many water users reported that they do not trust that the markets and key institutions are fair or working to the benefit of water users, in particular irrigation farmers. Impediments to informed and confident trading caused by these problems are likely to impede investment that is important for efficient agricultural production.

In response to these concerns, some market participants have called for a return to the system where water ownership was tied to land, perhaps with some limited trade between water users only. The ACCC does not support this position. Dismantling existing water markets would mean the benefits that markets provide to many water users would be lost, and this would be to the detriment of the Australian economy. It would also significantly diminish the value of water entitlements, which make up a substantial proportion of the assets owned by irrigation farmers.

Instead, the ACCC has recommended a package of reforms which aim to restore confidence in water markets across the Basin, and to improve their operation and efficiency so that they work better for market participants and deliver enhanced benefits for the Australian economy.

³ That is, the rules, policies and arrangements that enable and support trade (see chapter 13).

Basin water markets need decisive and comprehensive reform

The settings for the markets for tradeable water rights need to change. This report contains a set of recommendations to enhance these markets. The ACCC's recommendations work together as a package to maximise the benefits from the proposed reforms. The recommendations centre around four themes:

- governance of the Basin water markets
- market integrity and conduct
- trade processing and water market information
- market architecture.

Governance of the Basin water markets

Proposed reforms to governance arrangements are central to the ACCC's recommendations. These reforms would give market design, integrity and oversight the prominence and coordination necessary to make water markets work effectively.

Market governance refers to the range of institutions, rules and processes through which decisions concerning water trade arrangements are made and implemented, and water markets are regulated.

The ACCC's analysis of governance improvements for water markets has focused on:

1. rule-making processes and how decisions impacting markets are made and communicated
2. the delivery of administrative, regulatory and other roles that support or contribute to the functioning of markets.

Market arrangements are interlinked with water management more broadly.⁴ As governments have focused on critically important water management issues, particularly the implementation of the Basin Plan, the efficiency and effectiveness of water markets, and institutions to coordinate and oversee this, have not been prioritised.

This focus is understandable. However, the Basin water markets are now of a size and complexity that require recalibration of priorities. It is important that institutions and other governance arrangements are designed to focus on making the markets work – to ensure users are able to maximise the benefits, for themselves and for the economy, from vital, scarce resources.

The Basin's governance arrangements need to make sure due consideration is given to market issues, without overriding existing decision making powers. There is also a need to help manage regulatory and policy uncertainty for market participants, by improving transparency and communication around decision making processes.

To achieve this, the ACCC recommends:

1. establishing a new independent Basin-wide Water Markets Agency, that will focus on facilitating efficient water markets – by helping users to navigate markets, ensuring markets operate fairly and with integrity, and providing a market focused perspective for water management decisions through advice to governments
2. realigning processes across the Basin so that there is a consistent, clear, transparent and well understood process for amendments to trading rules and other decisions with significant impacts on water markets and where advice from the Water Markets Agency is considered, while existing decision makers retain current water management responsibilities.

The ACCC considers the proposed Water Markets Agency would be best established through a cooperative legislative scheme between the Australian and Basin State governments.

⁴ 'Water management' includes, for example: the management of Basin water resources to meet critical human water needs; the Basin Plan, which provides for limits on the quantity of water that may be taken from the Basin water resources; arrangements for sharing water between the Basin States; and management of water quality and salinity.

Market integrity and conduct

To strengthen market integrity, the ACCC recommends introducing new, Basin-wide legislation to address harmful conduct and practices. The ACCC recommends that the proposed Water Markets Agency administer and enforce this legislation.

Conducting this role will allow the proposed Water Markets Agency to improve transparency of market conduct through surveillance and regular reporting, pursue enforcement action if any detrimental conduct is identified, and help maintain the integrity of water markets. It would also equip the proposed Water Markets Agency with information to provide valuable insights about market behaviour and operations, to help it develop its approach to performing its other roles aimed at improving markets, and inform any advice to governments on potential reforms.

The new legislation should include an enforceable mandatory code for water market intermediaries. The legislation should more broadly include integrity protections such as price reporting requirements, and conduct prohibitions such as prohibitions of market manipulation and insider trading.

Trade processing and water market information

There is a need to improve the quality and flow of water market data and other related information, to reduce the complexity of trade for market participants and to ensure they have all the information they need to make efficient trading decisions. In addition, to achieve effective oversight of trading activity, it is critical that the quality of water market data is improved and that timely and robust data is available to the proposed Water Markets Agency.

Linked to the need to improve information is the need to improve trade services provided by private entities and government agencies.

There is an opportunity to build on recent public and private initiatives to improve trade services, and the quality and flow of water market information by:

- implementing Water Market Data Standards, to provide a consistent framework for collecting, storing and transmitting information; and requiring providers of trade services, including intermediaries and Basin State trade approval authorities, to comply with the standards
- upgrading trade processing systems and interoperability protocols, to ensure consistency for market participants wanting to trade across zones
- introducing mandatory service standards for trade approvals and prescribed rules and process for water market announcements
- implementing three new core digital technologies for trade services: a comprehensive 'Digital Messaging Protocol' which executes collection, storage, transmission and publication of water market data in a consistent way across all trade service providers; a 'Backbone Platform' to act as a single hub for trade processing and a single repository for water market data and related information; and a public-facing Water Market Information Portal
- introducing a Basin-wide water market education program.

The proposed Water Markets Agency should have a central role in progressing these trade data and information reforms, including involvement in setting data standards and in delivering trade data and information to market participants.

Market architecture

Problems with the design, development and functioning of the Basin's 'market architecture' – the framework of laws, rules, policies and arrangements for water markets – should be addressed to better align current market settings with the physical characteristics of the river system and manage the impacts of trade.

Improving market settings would deliver better signals to market participants about the costs of trade. This will improve market efficiency by ensuring the unpriced costs and benefits of trade are more effectively factored into decisions about the trade, use and delivery of water.

In some instances, changes to market settings may lead to a reduction in trade between regions. If this is the case, it would be because more accurate signals are provided to market participants about the costs of moving water between locations. This would direct investment to areas where water use would be more beneficial – not only to individuals but across the system as a whole.

Redesigning key market architecture elements to deliver clearer signals and be more efficient requires investing in, and developing, improved knowledge and tools to manage the impacts of trade. This report outlines a proposal for a two stream approach to enhancing the Southern Basin's market architecture. The first stream involves a range of investments and system enhancements to improve the functioning of the existing market architecture. The ACCC recommends:

- improving intervalley trade mechanisms, through changes to how access to trade opportunity is managed within system limits
- enhancing hydrological modelling capabilities to better reflect irrigator behaviour, help manage water deliveries and understand the impacts of trade, including on conveyance losses
- continuing to improve metering and monitoring of water take, including to support capturing improved time of use data and better modelling
- formalising and communicating plans for managing delivery shortfall risks, improving the understanding users have of those risks and actions to mitigate them
- updating guidance to more explicitly address how river operators should make trade-offs between different operational objectives
- increasing the transparency of water allocations decisions and improving information to help water users understand influences on supply.

The second stream of work involves further developing a range of technical options to deliver more comprehensive reforms. These options range from changes to water accounting to better align trade with delivery, to developing potential alternative market models that integrate coordination of trade and delivery. This work, which could be coordinated by the proposed Water Markets Agency, will enable governments – in consultation with stakeholders – to determine which of this second stream of proposed architecture reforms will provide the greatest benefits at least cost and should therefore be adopted.

Together, the recommended reforms will enhance the markets' operations, transparency, competitiveness, regulation and efficiency.

Findings and recommendations

The remainder of this overview discusses:

- the benefits provided by trade in water rights
- the increasing demand for water in the Basin, combined with long-term decline in supply and the resulting increase in water prices
- problems with water rights markets, leading to many market participants, particularly farmers, failing to experience their full benefits; and other harms and further problems arising
- details of the ACCC's proposed recommendations to improve the operation and efficiency of water markets.

Water trade benefits users

Trading water rights can allow irrigators to supplement their water supply in the short and long term, expand production, develop new business models or free up capital that can be invested elsewhere in their businesses.

Water trading provides an opportunity not just for buyers but also for sellers, who can earn an income from selling their water rights when they are more valuable to someone else. This includes making water available for others to use when the original owner of the water rights scales down their business, decides not to plant a crop or leaves the industry or region. For example, selling water rights can provide farmers with income to transition their operations away from water intensive production.

Other groups who trade in water markets include:

- investors – that is, parties who hold and trade water assets for financial gain, not production
- irrigation infrastructure operators
- urban water authorities
- environmental water holders
- First Nations and Traditional Owner representative groups
- water brokers.

Particularly since the National Water Initiative⁵ was agreed in 2004, the Basin's water markets have developed and become more complex, and new market participants have emerged.

That is not to say that the benefits derived from water markets have been universal, or equally shared between participants and regions. Some individuals, industries and regions have experienced adverse consequences due to water markets.

The Treasurer's direction to the ACCC to conduct this inquiry specifically excluded analysis of the social and economic impact of water trading on communities in the Basin.⁶ In a separate process, in June 2019, the Australian Government established an independent panel to provide an assessment of social and economic conditions in the Basin's rural and regional communities.⁷

The panel's final report, also known as the Sefton Report, found that: 'sustained trading of water into a region increases economic activity in that region and leads to reductions in economic activity in regions from which the water is traded'; and there 'is clear evidence that market reforms have had uneven impacts, with some communities feeling like the collateral damage of improved outcomes in another region'.⁸

In situations where adverse socio-economic consequences emerge from markets (including water markets), governments may choose to implement policy measures to moderate these impacts via targeted policies that have specific distributional, equity and regional-development objectives. Where possible, it is preferable to use focused policy tools to achieve these objectives, rather than to use policies which undermine the efficient operations of markets, including water markets, to the disadvantage of all participants in those markets.

5 Council of Australian Governments, Intergovernmental Agreement on a National Water Initiative, <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/water/Intergovernmental-Agreement-on-a-national-water-initiative.pdf>, 2004, viewed 19 June 2020.

6 Competition and Consumer (Price Inquiry – Water Markets in the Murray–Darling Basin) Direction 2019, clause 5, available via <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/terms-of-reference>.

7 The report is available via: <https://basin-socio-economic.com.au/>. The Australian Government response to that report is available via: <https://www.awe.gov.au/about/reporting/obligations/government-responses/independent-assessment-social-economic-conditions-basin>.

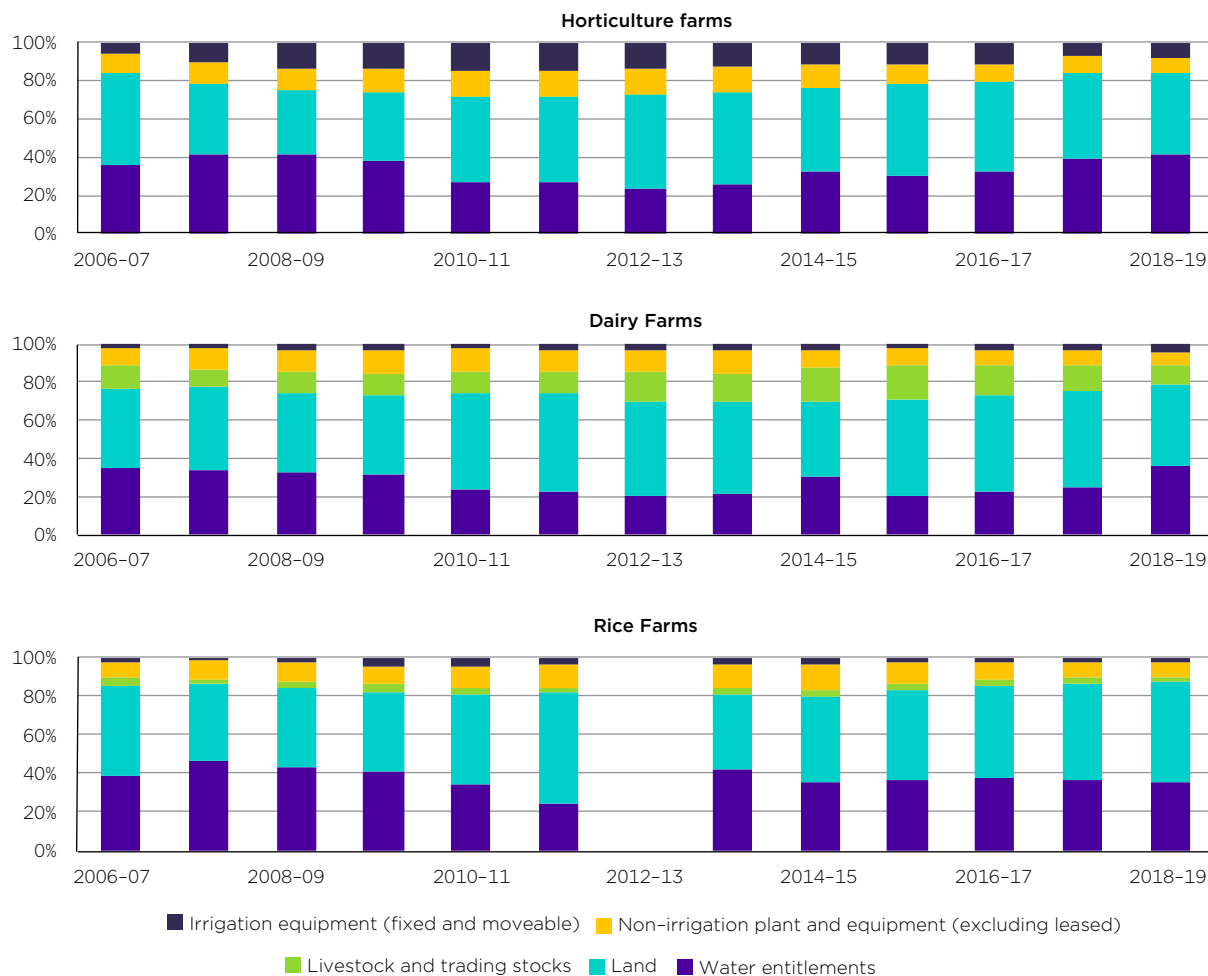
8 *Final Report: Independent assessment of social and economic conditions in the Basin*, April 2020, p. 59, https://s3-ap-southeast-2.amazonaws.com/ehq-production-australia/31d40b0e89a2de81b0b3b852267af296590ece7e/original/1599175006/Final_Report_%28Accessible%29_15_046KB.pdf_33dbb6cf593a857db27cf5dfe4a80e8f?1599175006, viewed 29 January 2021. The panel was chaired by Robbie Sefton.

Water rights are a significant asset for many farmers

Tradeable water rights are now a significant asset for many farmers. The value of water entitlements on issue across Australia in 2019–20, held by active and retired farmers and others, including environmental water holders, is estimated at \$26.3 billion.⁹

As figure 1 below indicates, water entitlements comprise a substantial proportion of the capital assets of most irrigated farms, although this varies by sector. The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) has found that on average in the Southern Basin in 2018–19, water entitlements comprised around 41% of capital assets for horticulture farms, 36% for dairy farms and 35% for rice farms. Importantly, for some farms, the value of their water entitlements is equal to or even exceeds the value of land assets. This means that improving the efficient operation of water markets is likely to enhance the financial position of many farmers, while impeding them is likely to have the opposite effect.

Figure 1: Average proportion of capital assets by asset class, by farm type, 2006–07 to 2018–19



Source: Australian Bureau of Agricultural and Resource Economics and Sciences irrigation survey, 2020, <https://www.agriculture.gov.au/abares/research-topics/surveys/irrigation>.

Notes: Average per farm. For horticulture: average of three regions (Goulburn, Murray and Murrumbidgee); for rice: average of two regions (Murray and Murrumbidgee); for dairy: average of two regions (Murray and Goulburn-Broken). Data for rice not available for 2012–13.

⁹ Aither, Water markets report, 2019–20 and 2020–21 outlook, see <https://www.aither.com.au/wp-content/uploads/2020/08/2020-Aither-Water-Markets-Report.pdf>, viewed 14 January 2021.

Demand for water is increasing, inflows are variable and limited, and prices are volatile

In most markets the primary driver of price is the balance of supply and demand, and water is no exception.

Water supply in the Basin is often scarce. The volume of surface water supply in the Basin is mainly determined by the amount of rain and snow that falls in water catchments. In recent years, supply has been especially limited, with many parts of the Basin experiencing a prolonged and severe drought. Average inflows into the Basin have declined in the last 20 years compared to the previous 100 years.

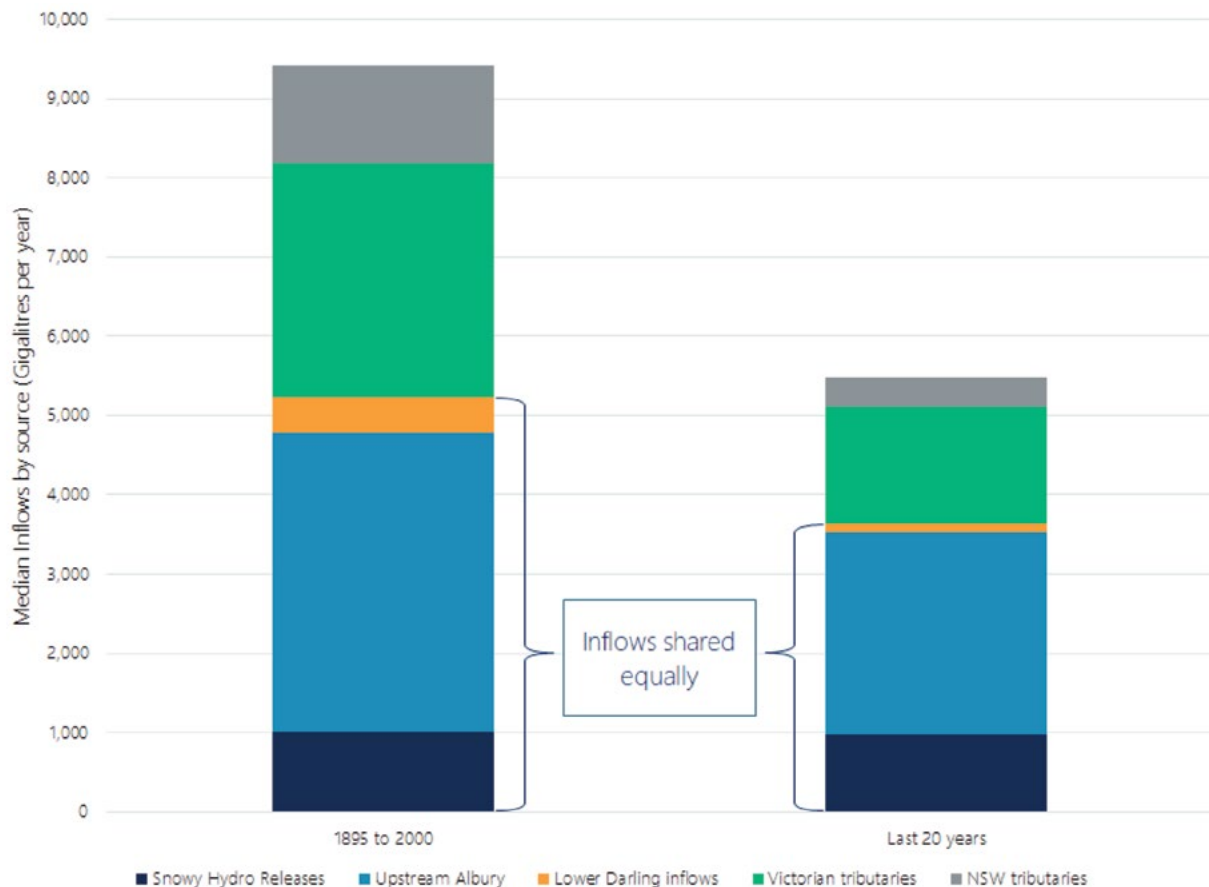
Climate analysis by the Bureau of Meteorology and the Commonwealth Scientific and Industrial Research Organisation indicates that April to October rainfall between 1999 and 2018 was either the lowest on record or very much below average across most of the Basin, compared to average rainfall since 1900.¹⁰

As noted in a 2020 report by then Interim Inspector-General of Murray-Darling Basin Water Resources, Mick Keelty AO, median inflows into the River Murray system in the last 20 years are significantly lower than during the preceding century (figure 2). Figure 2 also shows median inflows from the tributaries of New South Wales (in grey) are approximately 65% lower when comparing the same time periods. The report stated that irrigation expanded rapidly in a relatively wet period during the 1990s, and that many water users' memories of water availability may have been formed during this period, which had less frequent dry years than the period since. The report also found that dry periods in different parts of the Darling and the Murray are increasingly occurring at the same time.¹¹

¹⁰ Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation, *State of the Climate 2018*, 19 December 2018, <http://www.bom.gov.au/state-of-the-climate/australias-changing-climate.shtml>, viewed 18 June 2020.

¹¹ Interim Inspector-General of Murray-Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray-Darling Basin Agreement*, 2020, p. 9, <https://www.igmdb.gov.au/reviews>, viewed 18 June 2020.

Figure 2: Change in River Murray system inflows, by source, 1895 to 2000 and past 20 years



Source: Interim Inspector-General of Murray-Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray-Darling Basin Agreement*, p. 9, https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf, viewed 18 June 2020.

The Bureau of Meteorology's *State of the Climate 2020* report stated that, over the coming decades, Australia is projected to experience a decrease in cool season rainfall across many regions of the south and east, likely leading to more time spent in drought.¹²

The volume of water that is available in a particular storage or river reach at any one time is influenced by:

- hydrology, or the amount and timing of water flows relative to the river's physical limits
- climatic conditions, such as heat that increases evaporation
- human decisions on water management.

Water markets in the Basin operate on a 'cap-and-trade' system, where the cap is a government-determined ceiling on how much water is made available for consumptive uses, and where trade in water rights can occur within the limits imposed by that cap. Most recently, governments have capped the total amount of water that can be extracted in the Basin through the Basin Plan 2012. Capping water extraction aims to balance the amount of water available for consumptive uses with the amount needed to ensure the environmental health of the Basin's rivers in the long term. Governments have established environmental water holders (EWHs), which have acquired significant volumes of water entitlements in the Basin, and manage the use of this water to achieve environmental outcomes. Acquisition of water entitlement by EWHs has decreased the amount of water available for consumptive use and for trade in the markets.

¹² Bureau of Meteorology, *State of the Climate 2020*, <http://www.bom.gov.au/state-of-the-climate/future-climate.shtml>, viewed 20 January 2021. Rain in the Southern Basin is 'winter dominant': that is, more rain falls in the winter there than in the summer, whereas rain in the Northern Basin is more summer dominant.

Rules and policies introduced by Basin State authorities and the Murray–Darling Basin Authority (MDBA) also strongly influence how much water is available in certain places and at given times. Examples include the determination of trading zones and intervalley trade limits.

On the demand side, fluctuating rainfall levels also impact water trade. For example, if rainfall levels are lower than a farmer needs to produce a crop, the farmer is more likely to purchase water through the markets.

Overall, there is a trend of intensifying demand for water in the Basin.

More farmers are trading water rights. In 2000, less than 10% of irrigators in the Basin had conducted a water trade. By 2015, 78% of Southern Basin irrigators had conducted at least one water allocation trade.¹³

In addition, it is clear that more of the water on issue is being traded. While the volume of water allocation trade depends on total water availability in a given year, the data indicate that volumes traded relative to the total water allocated to entitlement holders are growing.

Various other factors have driven more intense demand and higher participation in water markets in recent years.

These include the substantial expansion of the almond industry in the Southern Basin, concentrated on the Murray River below the Barmah Choke, and substantial plantings of cotton, rice and other broadacre crops in New South Wales. There are large agribusinesses with permanent plantations that rely heavily on the water allocation markets to meet their water needs. They purchase large parcels of water.

New entrants into water markets have also contributed to higher trade volumes. Investors, including fund managers and traders, now account for significant proportions of water allocation and water access entitlement trade in the Southern Basin.

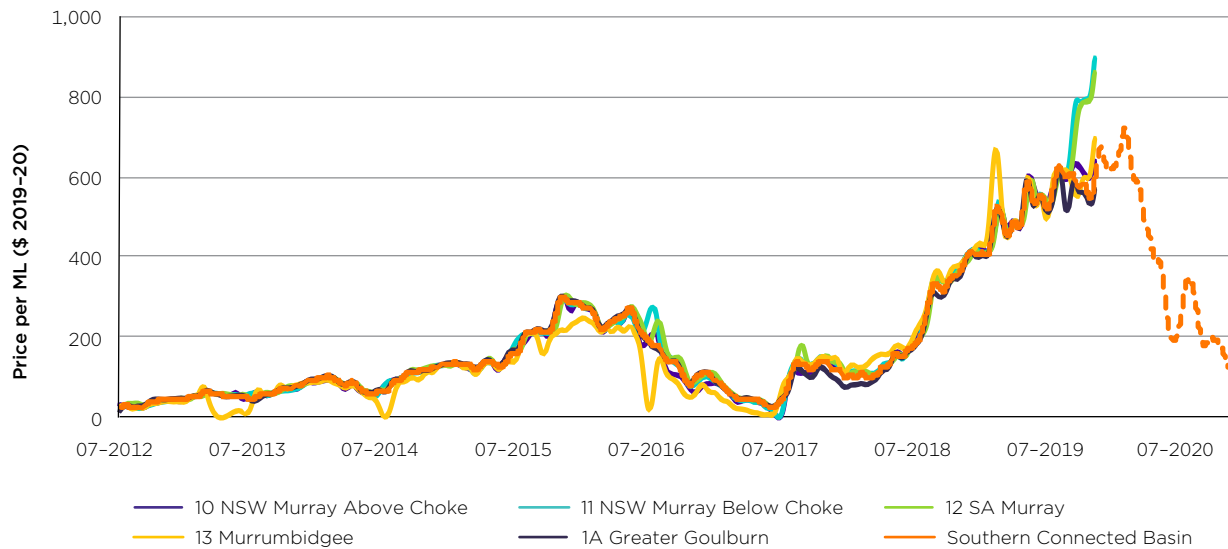
Water allocation prices in 2018–19 and the first half of 2019–20 were generally higher, and much more volatile, than in previous years. This trend is illustrated in figures 3 and 4 below, and is explained in more detail in chapter 3.

The red line in figure 3 below shows the average price for water allocations, per megalitre in 2019–20 dollars, in the Southern Connected Murray–Darling Basin from mid-2012 to the end of 2020.¹⁴

13 S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Water Market inquiry, 2020, p. xi. 2015 is the most recent year for which this data is available.

14 At the time of the previous drought in the Basin, the Millennium Drought 1996 to 2010, prices rose to similar levels to those seen in 2018–19.

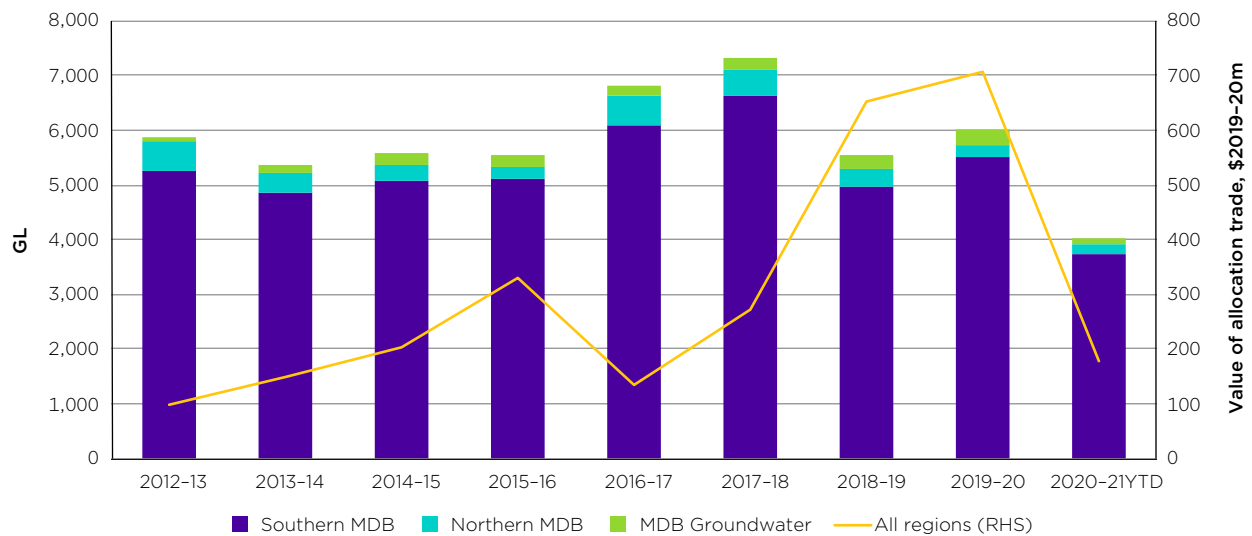
Figure 3: Average allocation prices, by selected trading zones, and average for Southern Connected Basin (\$2019–20)



Source: ACCC analysis based on NSW, SA and Victoria response to voluntary information request, Waterflow data and Australian Bureau of Statistics data.

Notes: Basin State voluntary information request data used up until 1 November 2019 (solid lines); Waterflow data thereafter (dashed line). Daily zone and Southern Connected Basin (all zones) price series derived using ABARES GAM methodology. Excludes zero dollar trades.

Figure 4: Allocation trade volumes and total value (\$2019–20 million), 2012–13 to 2020–21



Source: ACCC analysis based on BOM and ABS data.

Note: YTD = year to date (2020–21 year to 31 December 2020).

When average water prices are high, the main reasons are strong demand and weak supply. However, the markets' current problems exacerbate issues when, for example, supply is tight or demand is changing. They make a difficult situation worse.

The system has been built for water management, but not for efficient trading

The ACCC found that there are significant problems in the markets for water rights in the Basin that need to be addressed. These problems undermine the efficiency of water markets and the industries that depend on them.

Water markets are complex, made more so by a web of governance and regulatory arrangements in place to manage water trading across the Basin. This complexity, combined with a lack of rules and oversight of trading conduct, may create potential opportunities for some participants to exploit market flaws.

The ACCC notes that stakeholders' concerns about the conduct of some market participants and the impacts of current market architecture and governance arrangements were stronger in the Southern Basin than in the Northern Basin. This reflects that water markets in the Southern Basin are larger, more active and have more participants, and that issues such as deliverability risk and management of intervalley trade are more acute in the Southern Basin.

Effective governance of Basin water markets is impeded by fragmented roles and responsibilities, and differing rules, as well the inconsistent enforcement of those rules.

The complexity of water markets is increased by ineffective and opaque governance arrangements, and the roles of numerous Australian and state government agencies which sometimes overlap or conflict.

This situation is partly due to how water markets have evolved over time.

While water management in the Basin has been in place for more than 100 years, through arrangements between Basin States to share the Basin's water, water trading is relatively new. It was first introduced on a small scale during the 1980s and 1990s, at different times in different regions, to enable trading of small volumes of water between irrigators within the same region; and to help manage the impacts of drought.

From the early days of water trading, water markets have expanded and developed as part of broader water management reform.

The Council of Australian Governments' 1994 water reform framework and the 2004 National Water Initiative were landmarks in encouraging national solutions to Australia's chronic and complex water problems.¹⁵

The *Water Act 2007* (Cth) (Water Act) and the Basin Plan sought to address the 'over-allocation' of water in the Basin, and to put the management of the Basin's scarce water resources on a more sustainable footing. The market was viewed as an important means to efficiently allocate scarce water to its most economically valuable use. But the markets' efficient operation has always been secondary to the broader reforms.

Market settings, regulation and governance in each jurisdiction evolved from existing structures and arrangements, or were introduced along with new institutions and arrangements that were primarily focused on dealing with broader issues in the management of water resources in the Basin.

Sound water management remains a fundamental priority. But a sharper focus on the mechanics of water trading arrangements, and how these can be better integrated with water management will deliver better outcomes for water users and the economy.

¹⁵ Australian Government Productivity Commission, *National Water Reform – inquiry Report, Overview & Recommendations*, p. v, https://www.pc.gov.au/__data/assets/pdf_file/0009/228177/water-reform-overview.pdf.

Basin State governments have long agreed on objectives for the Basin water markets. The Water Act specifies that the objectives of the water market and trading arrangements for the Basin are:

- to facilitate the operation of efficient water markets and the opportunities for trading, within and between Basin States, where water resources are physically shared or hydrologic connections and water supply considerations will permit water trading
- to minimise transaction cost on water trades, including through good information flows in the market and compatible entitlement, registry, regulatory and other arrangements across jurisdictions
- to enable the appropriate mix of water products to develop based on water access entitlements which can be traded either in whole or in part, and either temporarily or permanently, or through lease arrangements or other trading options that may evolve over time
- to recognise and protect the needs of the environment, and
- to provide appropriate protection of third-party interests.¹⁶

Although governments have attempted to pursue these objectives, many have not been achieved. The ACCC's recommendations would help to attain these objectives.

Governance arrangements need to enable a greater focus on water markets

Water markets continue to evolve in their of sophistication and levels of trading activity. However, the governance arrangements for water markets have not adapted in line with this evolution. As such, there are significant deficiencies associated with the settings and governance of water trading, which undermines the efficiency of water markets and their dependent industries.

Water **management** governance and water **markets** governance are inherently linked. Under current arrangements, critically important water management issues are often prioritised. However, with the emergence of water markets, governance structures also need to enable a focus on market issues in order to maximise market benefits, without overriding existing water management decision making powers and processes.

The ACCC believes that Basin water markets need a robust and fit-for-purpose market governance framework to help ensure that market regulation and decision-making realises potential market benefits. Without such a framework, the ACCC believes water markets may remain inefficient, and continue to be perceived by many participants as inconsistent and unfair. This would entrench deficiencies in market confidence and public support for the water markets, resulting in an environment that impedes beneficial investment in industry and agriculture and prevents their flow-on benefits to regional communities and the wider economy.

The ACCC considers that many of the challenges facing water markets are caused by underlying governance problems. Several aspects of the existing market governance arrangements impede the fair and efficient working of the Basin water markets. These are:

- a lack of prioritisation of water trade and markets policy
- a lack of focus on delivering administrative functions in a manner that makes it easier for participants to engage in water markets
- differences in rulemaking processes used by Basin governance bodies
- insufficient transparency over existing intergovernmental processes and responsibilities.

¹⁶ Schedule 3 of the *Water Act 2007* (Cth).

Institutional and procedural reform is needed

The ACCC considers that institutional and procedural reforms are required to address the current governance deficiencies.

The ACCC recommends establishing a Water Markets Agency to create a trade-focused regulatory entity to proactively focus on water markets. The ACCC considers this should be established through a cooperative legislative scheme between the Australian and Basin State governments.

The proposed agency's functions would include new functions that have been identified throughout this inquiry, as well as combining functions that currently sit with other bodies. This will help to reduce fragmentation of water markets governance. The proposed functions and their benefits are:

- **Market regulation and surveillance functions** – ongoing monitoring of market activities, investigating allegations of potential market misconduct (such as market manipulation and insider trading), and undertaking enforcement action as required. The Water Markets Agency would also publicly report outcomes of its surveillance and enforcement activities.
 - *Benefits:* These functions would improve market integrity and create a more equal playing field for market participants, and thereby enhance market confidence. It would also enable the identification of any conduct that reduces market efficiency or causes harm.
- **Market information functions** – The Water Markets Agency would provide a 'one-stop-shop' for water users to access market information, such as pricing and availability (timely historical data on approved trades as well as current bids and offers), water storage information, announced allocations and access to policy documents such as for carryover and trade allocation. In addition, it could provide water users with practical guidance on water trading matters, and undertake direct educational campaigns and community engagement.
 - *Benefits:* This would enhance the quality and accessibility of market information, which is critical to the efficient operation of markets as it enables participants to make informed decisions. This would improve market confidence, increase competition and encourage efficient allocation and use of water resources.
- **Market evaluation functions** – proactively undertake whole-of-basin market evaluation and reporting of trading market issues and cross-jurisdictional trade impacts. This would include researching complex trade issues and market design, with a focus on achieving greater cross-jurisdictional coordination and harmonisation. These functions would assist in identifying market issues and trends to inform the Water Markets Agency's advisory, advocacy and regulatory functions.
 - *Benefits:* As water markets continue to develop, market evaluation would allow market problems to be identified, assessed and addressed before they lead to significant harm to markets or market participants. It would also enable the Water Markets Agency to identify opportunities to further improve how the water markets work for their users.
- **Advisory and advocacy functions** – Provide expert and technical advice to the Australian and Basin State governments to support and drive improvements to market architecture design and trade rules. The Water Markets Agency will also advocate for the interests of water markets in broader policy discussions.
 - *Benefits:* This is critical to ensure that governments properly consider water market impacts in broader water policy development processes.

In addition, the ACCC recommends procedural reform so that state and federal decision-makers consider independent and expert evidence from a market perspective. Consistency and transparency in rule making processes will improve the ability of market participants to understand and manage these rule changes.

The proposed Water Markets Agency would not itself be a rule making body. However, the ACCC proposes that for certain types of rule changes, rule makers must obtain and have regard to the advice of the Water Markets Agency before making changes to trading rules. This function would be an addition to state-based rule making process.

Lastly, the ACCC considers that procedural reform will assist market participants to understand the role of key decision making bodies. The ACCC recommends that the Ministerial Council and Basin

Officials Committee publish procedural documents to improve the transparency of the roles, functions and strategic priorities of their intergovernmental committees. This will improve market participants' understanding of these bodies, and increase market confidence.

The ACCC considers that implementing these reforms will be a further important step in the Australian and Basin State governments delivering on the Basin water market and trading objectives specified in the Water Act.

Lack of oversight and market transparency leads to concerns about and opportunities for misconduct and reduces confidence in the market

Many irrigators hold strong concerns about the role of water investors in water markets. These included concerns that investors are using their market power to influence prices and that their trading behaviour artificially inflated prices.

The ACCC did not find evidence that investors exercised market power or manipulated markets to increase water prices in the Southern Connected Basin.

The ACCC undertook extensive analysis to reach this conclusion. The ACCC used its information gathering powers to obtain data from investors and exchange platforms, as well as other information and documents, to supplement the Basin State data. The ACCC also conducted private hearings with representatives of a large investor to examine its investment and trading strategy and activities.

In 2018-19, institutional investors accounted for an estimated 11% of water allocation volumes purchased and 21% of water allocation volumes sold.¹⁷

There are four large water investors in the Basin who collectively held 7% of high reliability entitlements in the Southern Connected Basin as at 30 June 2019. However, there is also a variety of small investors, individuals and small trading firms operating in Basin water markets. Some own little or no entitlements but are active traders. Some actively trade allocation alongside their farming activities.

The ACCC found that one large investor was the largest trader of water allocation in 2018-19. During the first half of the 2018-19 water year when prices were lower, the large investor was a net buyer, accumulating water allocations, but maintaining an active role as a seller. During the second half of the water year when water prices were higher, it was a net seller but it continued to buy water allocations. During this period there were a large number of competing sellers of water allocations in the markets. Even large buyers of water were not forced to purchase water allocations from the one large investor or any one of the other water sellers.

The ACCC found that the difference in price between sell orders and buy orders on exchange platforms was wide. This can result in large movements in trade prices, but may be attributed to low liquidity in water markets rather than trader misconduct.

Water markets are opaque because of poor quality public data. A lack of market transparency also contributes to misconceptions and misinformation about the conduct of market participants.

The perception of misconduct by water investors has reduced water users' confidence in the water markets. Greater market transparency and effective oversight, including data analysis, investigations, and regular reporting, are necessary to build and maintain confidence in water markets.

The ACCC's efforts to gather and analyse trading data and other information to assess the impacts of market conduct made it clear that the current information and data collection arrangements across the Basin are insufficient. This made the analysis of market participants' trading behaviour challenging. Further, while the ACCC was able to scrutinise market activity using the compulsory powers available to it under this inquiry, it only provided a snapshot for a given period of time. Data limitations and the passage of time since the trades occurred meant it was not possible to investigate certain allegations of misconduct about other market participants that the ACCC received.

¹⁷ See section 4.3.2 of this final report. Excludes zero dollar trades.

Ongoing monitoring and reporting of market activities is needed to maintain irrigators' confidence in the integrity and fairness of the water markets over time.

There is currently no single entity responsible for, or capable of, gathering the necessary data to conduct ongoing, effective monitoring of trading behaviour in the Basin, and the current poor quality and siloed state of water market data pose significant practical challenges. Improving data collection and coordination across the Basin is therefore as essential for effective market oversight as creating the oversight role itself.

A lack of obligations on intermediaries and inadequate oversight can harm market participants and damage confidence in markets

There is a strong basis for concerns about the lack of obligations owed by water market intermediaries to their clients, and inadequate regulatory oversight of intermediaries' practices. Regulatory safeguards, such as those which currently apply to intermediaries in other markets, including real estate agents, stock brokers and stock and station agents, do not apply to water market intermediaries. This creates opportunities and incentives for brokers and exchange platforms to engage in behaviours that would not be permitted in other markets.

The ACCC found that:

- brokers' roles are often unclear as contracts will not commonly set out the obligations brokers owe to their clients. While clients may mistakenly believe their broker is acting solely in their best interests, it is uncommon for such fiduciary responsibility (which is normal for brokers operating in most other markets) to arise within this relationship
- there are perceived or real conflicts of interest arising for intermediaries. These include intermediaries taking a personal position in a trade or brokers providing services to both parties in a trade. For example, a broker is not required to disclose to the other party to a trade that it is trading its own water rights. If a broker's water account is used, the other party to the trade would not be able to confirm if the broker is simply using the account to facilitate the trade or if the broker is a principal in the trade
- intermediaries hold significant amounts of client funds and client water rights on intermediary accounts without any trust-accounting obligations
- information asymmetries exist between intermediaries and water market participants, conferring a significant market advantage on intermediaries
- some market participants rely on intermediaries for market information and advice and this information cannot be verified by clients. This creates an opportunity for intermediaries to provide incomplete or misleading information. There are also no record-keeping requirements for intermediaries, which affects the quality of price-reporting audits and enforcement.

Market participants, brokers and exchange platforms have all called for regulation to address these issues, that undermine confidence and trust in intermediaries. This in turn reduces confidence in the market and its integrity, likely inhibiting full participation by parties that may otherwise engage in trade. To address these concerns, the ACCC recommends the introduction of a mandatory code specific to water-market intermediaries.

Basin-wide legislation is needed to prohibit detrimental conduct and strengthen integrity

There is not a cohesive regulatory framework for Basin water markets comparable to those that exist for other markets, such as the financial services and energy markets. There is a need for new centralised Basin-wide legislation, to prohibit misconduct such as manipulation and to strengthen integrity in Basin water markets. The legislation would be best established through a cooperative legislative scheme, and enforced by a centralised regulator – the proposed Water Markets Agency.

While the ACCC was able to scrutinise market activities under this inquiry, this process only provided a snapshot for a given period of time. Ongoing surveillance is needed. This would help to maintain market

confidence and support market participants to make efficient trading and investment decisions, in water as well as further investment in irrigated agriculture to increase productive output.

The new legislation should include an enforceable mandatory code for intermediaries to address the detrimental conduct and practices identified by the inquiry, and ensure that intermediaries are subject to the standard safeguards that apply in similar industries.

The existing price reporting obligations and insider trading prohibitions in the Basin Plan Water Trading Rules should be removed from these rules, incorporated in the new water market conduct and integrity legislation, and should be broadened and strengthened. The new legislation should also include new prohibitions on market manipulation.

The new legislation should require exchange platforms and Basin State approval authorities to provide trade data to the proposed Water Markets Agency, following proposed improvements to data sharing arrangements. The proposed Water Markets Agency should be given access to this data for surveillance, reporting and enforcement purposes. The proposed Water Markets Agency should also be given compulsory information gathering powers and appropriate enforcement powers.

The legislation should require the proposed Water Markets Agency to issue a unique common identifier to each market participant, to enable trades to be traced and traders to be identified. Traders should be required to include a unique common identifier on trade forms. This could be their ABN, ACN and/or the unique identifier issued to them by the proposed Water Markets Agency. Without the ability to trace trades, enforcement of measures to improve market integrity would be challenging.

Again, the ACCC considers that implementing these reforms will be a further important step in the Australian and Basin State governments' pursuit of the objectives of water markets and trading, specified in the Water Act.

Water trade services impact transaction costs and information transparency

Trade services in the Basin include advising, matching, clearing, settlement, registration and information, and are provided by a range of private and public entities with diverse technological capabilities. It is not always clear who provides which service and, at times, some service providers may perform conflicting roles.

Intermediaries such as exchange platforms and brokers provide advisory and information services, services to match buyers with sellers, and generally manage the financial settlement of trades they strike. Intermediaries also provide some clearing services, but this role is shared with irrigation infrastructure operators and Basin State trade approval authorities, which are local monopoly service providers in their respective regions. Transfers of titles (part of settlement services) and other registry functions are provided by irrigation infrastructure operators and Basin State water registers. A range of information services are also provided by a variety of public and private providers, such as the Bureau of Meteorology, Waterflow, the MDBA and Basin States.

The ACCC found that trade approval processes and costs can be complex and vary considerably depending on the context of individual trades. However, with some exceptions, trade approval fees are generally low and trade approval processes appear not to cause significant issues for market participants. However, the ACCC found that the current trade services framework gives rise to three major issues for market participants.

First, there is inconsistent and inadequate access to information to make trading and investment decisions:

- There are problems with the completeness, availability and consistency of water market data across states and trading zones. For example, many trades are reported as having a 'zero price' or a price that differs significantly from the prevailing market price, and the reasons for this are not recorded. Core market information such as price and 'strike date' are siloed, and there is insufficient integrity within datasets and ability to link datasets to enable effective monitoring of market activity

and to allow market participants to seamlessly access comprehensive water market data and related information.

- Existing rules and frameworks fail to provide accurate market data. For example, the Basin Plan Water Trading Rules require all traders selling water access rights to report the price agreed for the trade, but there are no mechanisms to verify the reported prices, or to enforce the requirement to report them correctly. Some trade approval authorities, particularly irrigation infrastructure operators, do not ask traders to report price, or keep records of price data.
- Gaps in rules and regulations mean that certain important market data is not reported. For example, data on the dates and types of trade (such as forward, spot or carryover parking) are held by brokers, exchange platforms and traders, and have only recently begun to be collected in New South Wales and Victoria. It is therefore not reported in historical registry trade data, and it is not clear when other Basin States will begin to collect this important information.
- Information on trade within irrigation networks in New South Wales and South Australia is not reported to Basin State registers, and some data held by trade approval authorities is generally not publicly reported, except to some extent in Victoria. These issues make it difficult to evaluate trade approval service provision and to understand how water markets and markets for trade services are developing. For example, trade approval authorities do capture data on the date trades are submitted, the number of refused trades, and the lodging party type, but such data is generally not accessible.
- There is minimal data available publicly on trade that occurs within irrigation infrastructure operators' irrigation networks. Trade involving irrigation infrastructure operators accounts for a large proportion of trade within the Basin, meaning that large segments of the markets are opaque. Greater transparency is needed on trading opportunities and prices within each irrigation network, and also about the trading activities irrigation infrastructure operators themselves undertake.
- With the exception of Victoria, State legislation does not explicitly authorise or require approval authorities or water registers to provide information services. This means that some States have been slower to respond to calls to provide more or better market information, because such services could be perceived as beyond their roles defined in legislation.
- Terminology used across the Basin continues to be inconsistent, leading to confusion about whether different water rights are comparable and what water products or trade types are available. Basin States and irrigation infrastructure operators have made insufficient progress in moving towards harmonised terminology, despite committing to the National Water Initiative (NWI) framework and Water Act, which provide definitions that could be used across the Basin.
- There is no clear compliance and monitoring role assigned to state agencies to ensure price reporting by sellers is accurate. However, some states have been working together to improve price reporting by making changes to temporary trading forms such as requiring sellers to disclose a reason for trade.

Second, market participants experience inconsistent transaction costs:

- There are inconsistencies and inefficiencies in trade approval processes in different regions. For example, trade approval times differ across states, and trade data in some zones is more up-to-date than in others. In some jurisdictions trade approvals are still processed manually using paper-based forms. This results in different fees for market participants, as automated approvals generally incur lower fees.
- Existing rules and frameworks fail to require a high standard of trade processing service delivery. While trade approval service standards do exist, they are voluntary, out-of-date, and only apply to government trade approval authorities, not to irrigation infrastructure operators (in their role as approval authorities for trade within, into and out of their irrigation networks). The result is that traders experience different service qualities and trade approval times.
- State-specific legislation results in differing water rights, and trading is set up differently in each state water management act. These underlying differences mean that types of trade, and trade approval processes can all differ across Basin States, resulting in complexity for market participants and differences in trade approval fees.

- Certain trade approval processes increase the complexity and cost of trading across Basin States. For example, an irrigator in an irrigation infrastructure operator irrigation network in New South Wales who wants to trade with another inside a South Australian irrigation infrastructure operator irrigation network must obtain the approval of four different authorities and pay four different fees.

Third, access to intervalley trading opportunities is inequitable:

- The processing of intervalley trades operates on a first-come, first-served basis, and the technological and procedural differences between Basin State trade approval authorities provide advantages to some traders over others. This has prompted a technological 'arms race' between a limited number of market participants who have the expertise and resources to use digital technologies to help ensure they are at the front of the queue and able to capture the majority of benefits from intervalley trading opportunities.

Overall, these harms contribute to market participants' lack of trust in water markets and discourages participation.

If market participants cannot access all the information they need, in a timely manner, their ability to make optimal trading decisions is hampered. Further, if trade services are provided in a way which advantages some users over others, this can form barriers to entry for some participants and, in turn, allow certain participants to capture proportionally more of the gains from trade. The ACCC acknowledges that service providers – both public and private – are already aware of many of these shortcomings, and that there have been recent and promising developments. Movement toward greater digitisation and integration, and timelier information provision is already underway. However, significant additional steps and decisions need to be taken.

The main causes of these three broad issues are outdated and disconnected information technology infrastructure for trade services, differences in underlying legislative frameworks, legislative gaps, and different approaches of private trade service providers. This leads to varying quality, timeliness and transparency of information. Each of these issues needs to be addressed; but they need to be addressed collectively, not independently.

The ACCC also considers that the existing regulatory and governance frameworks have at times inhibited the timely and effective resolution of these issues. In the past, and particularly while interzone trade was limited, there was little need for coordination, and so service provision by governments developed in a mostly localised way. Past attempts to develop a common registry system failed due to budget and technical challenges, but also to the fundamental difficulty of applying a centralised technical solution over a distributed governance framework.

Trade processes and market transparency need to improve, to help farmers and other water users make trading decisions

The ACCC considers that reform to four key elements is needed to improve trade services and market transparency:

- improve the ease of trading, reducing and harmonising transactions costs where possible
- improve the quality of water market data and related information
- improve the flow of information between current and future entities involved in Basin water markets, and water management more generally
- reduce or remove inequities in access to intervalley trade opportunities.

There is a need to establish a clear and comprehensive framework governing all entities who process trades, including brokers who provide matching services, exchange platforms, irrigation infrastructure operators and Basin State approval authorities.

Greater transparency in water markets, combined with improved and streamlined trade services, will help farmers and other water users make better trading decisions and improve participation and engagement in water markets by boosting traders' confidence and lowering costs of trading. In particular, this will:

- allow them to make more informed decisions on whether, how or what to trade
- lessen the time, cost and effort it takes to access the information they need to make trading decisions
- help them be at less of a disadvantage to parties with time and knowledge to navigate the markets, such as water investors and large agribusinesses.

The ACCC recommends several practical improvements that, in its view, should be made as soon as possible. Further, the ACCC considers digital technologies offer the opportunity to make more substantial improvements to streamline trade services, and at the same time enable increased market oversight to improve the integrity of Basin water markets, particularly in the Southern Connected Basin. Key recommended actions are:

- The Australian and Basin State governments and trade service providers to collaboratively invest in developing and implementing digital infrastructure and data standards. This will provide market participants with higher quality, more timely information, and to provide the proposed Water Markets Agency with adequate data and information to perform its proposed regulatory functions. Further, Basin States and the MDBA should work collaboratively to upgrade trade approval processes and digital systems to ensure a 'level playing-field' for traders in the southern connected Basin.
- Basin Governments and trade service providers to collaborate to deliver a public-facing central information portal to make disparate information and data accessible in one place, building on and extending current initiatives.
- Basin Governments to implement legislative change to give effect to the above recommendations. These changes will ensure that entities, particularly public trade service providers, are equipped with the mandate to fulfil their obligations. They will also help harmonisation or standardisation to be pursued where possible, and necessary obligations to be mandated to provide the necessary incentives or requirements to ensure real change actually occurs in practice.

These recommended improvements to data quality and data flows will help reduce the complexity of trade for market participants. Greater automation of trade services and system upgrades should help reduce operational costs, and therefore trade approval fees and times, over the longer term. Introducing a holistic framework under which all trade service providers have clear and consistent obligations will help build market participants' confidence in these service providers. It will also help ensure future innovations in trade services do not fragment or increase barriers to entry into trade services provision.

The ACCC considers that implementing these reforms will be a further important step in the Australian and Basin State governments pursuing the Basin water market and trading objectives set out in the Water Act.

Significant changes have occurred in the Basin since water markets were established and trade arrangements have not kept pace

The Basin States created water markets by establishing the rights, rules and arrangements to allow trade to occur, including accounting for, storing and delivering traded water. The ACCC uses the term ‘market architecture’¹⁸ to refer to this framework of laws, rules, policies and arrangements that govern where, when and what water can be traded.

Key elements of market architecture considered in this report include:

- allocation policies – these determine how Basin States allocate available water to users, as a proportion of their entitlement, in light of how much water is available and rules determining priority of allocation to different classes of user
- carryover policies – these rules and arrangements allow water allocated to an entitlement in one year to be used in a subsequent year or years, requiring its owner to use or trade the water in the year it is allocated. Carryover arrangements allow water users to manage water availability risk. Where a user cannot access enough carryover capacity, they may seek to take advantage of other users’ access to carryover by trading water between locations and classes of entitlement under ‘carryover parking’ arrangements
- geographical trade rules, including intervalley trade limits and other trade rules that regulate the movement of water between valleys and zones, and that manage the physical constraints that limit the storage and delivery of water between locations
- river operations requirements – these physical constraints, operating rules, water delivery and trade accounting arrangements govern how water is moved around the system by river operators to meet demand when and where it is needed. This includes how conveyance losses (water that is lost to seepage and evaporation as it moves through the system) are managed and accounted for
- metering and measuring use requirements – these rules and policies determine the arrangements for recording how much water users extract and how frequently meter readings and account reconciliations occur. They provide a framework for managing trade, ensuring compliance with individual entitlement limits and system limits, and limiting the opportunities for water theft.

Significant policy, investment, water use and climatic changes have occurred in the Basin since water markets were established. Water markets have continued to evolve, increasing in size, value and complexity.

The market architecture needs to be designed to ensure that limited water resources, storage and delivery capacity and trade opportunity are allocated in ways that achieve the best, most efficient, outcomes for water users and the environment. However, there are signs that this does not always occur.

As trade volumes have increased and locations of trade have changed, problems with the current arrangements have begun to emerge. In particular, interzone trade has facilitated the movement of water use further down the Murray. A greater proportion of this use is supplied by the ‘call-out’ of water from intervalley trade accounts, with resulting consequences for water delivery, river operations and associated environmental impacts. For a range of reasons, delivering water is becoming more challenging for river operators and is associated with increasing impacts on other water users and the environment.

¹⁸ Key Basin market architecture elements include the:

- legal frameworks that create property rights (tradeable water rights include water access entitlements, water allocations, water delivery rights and irrigation rights) and provide for access to water resources
- intergovernmental agreements and Basin state and Commonwealth laws and policies that establish the arrangements for the sharing of water between the States, and among water users
- Basin State, Commonwealth and Irrigation Infrastructure Operator (IIO) trading rules, that determine when and how trade can occur, in what water products, and if any special constraints or requirements apply to certain products or transactions
- a range of ancillary rules and arrangements that provide for the storage, delivery, measurement and use of, and accounting for, traded water and the operation of the river systems and their associated infrastructure.

Stakeholders raised a wide range of concerns with the functioning of the Basin market architecture. These ranged from concerns about the transparency of key rules and policies – especially concerning allocations decisions – to concerns with increasing delivery risk, and access to opportunities for trade.

The ACCC found that under current market settings:

- proxy storage markets have emerged in the form of trade for carryover ‘parking’, reflecting that carryover is tied to entitlements rather than specified as a separate storage right. Due to low levels of trade currently, these markets are operating reasonably well, but higher levels of carryover parking may impact trade limits, and could increase the magnitude of any third party impacts not effectively addressed by existing policies
- intervalley trade limits do not adequately protect third parties from impacts related to timing of use and delivery, such as delivery shortfall risk and environmental damage. A limited number of market participants are able to circumvent those limits using ‘grandfathered tags’¹⁹
- intervalley trade limits are becoming more binding – that is, the limit operates to restrict trade – at the same time, and are expected to continue this trend. When intervalley trade limits are binding, larger and better resourced participants such as agribusinesses and brokers dramatically increase their successful access at the expense of irrigators
- changing patterns of water use are making the management of water deliveries more difficult and potentially contributing to increased conveyance losses
- risks of delivery shortfall are increasing, reflecting unpriced and bundled or uncapped on-river delivery capacity
- there is a need to better protect the environment and other water users from the unintended impacts of moving water throughout the system
- current metering data is not sufficiently timely nor spatially granular to inform river operators’ decisions.

The ACCC found that the way the market architecture manages the hydrological characteristics of the storages and river systems produces a series of ‘disconnects’ between the time of trade and the actual movement of water, resulting in indirect, less efficient approaches to managing the impacts of trade. This can be seen in:

- trade rules, such as intervalley trade limits, being used as imperfect mechanisms for managing all of the impacts of intervalley water deliveries
- third party impacts of water trade, use and delivery that change the location or timing of use (such as environmental damage, delivery risks and conveyance losses) not being appropriately priced and therefore, not factored into water users’ business decisions
- river operations being increasingly challenged by changing patterns of water use occurring in part, as a result of trade (in conjunction with other non-market factors).

The ACCC concluded that, in particular, the Southern Basin’s market architecture may not allocate available storage, trade or delivery capacity efficiently. Because market architecture does not always accurately reflect the hydrological realities of the system, it does not effectively send price signals to users that reflect the limited storage and delivery capacity, or the potential third party impacts of trade, storage and delivery decisions.

Further, current settings increase risks to other water users, river operators and the environment by failing to cost externalities into the market. Market architecture that does not adequately account for the impacts on delivery of changes in the location of use is likely contributing to observed changes in water use, such as increased irrigation development in the lower Murray.

Policy settings can interact with market activity and other changes, resulting in distributional impacts, where some market participants are implicitly favoured at the expense of other water users. For example, this can occur when holders of grandfathered tags bypass intervalley trade limits, when well-

19 The term grandfathered tags refers to a small number of water access entitlements that are exempt from restrictions on the trade of water allocation within or between two regulated systems, because a ‘tag’ between the systems was established before 22 October 2010. Basin Plan Water Trading Rule 12.23(2) creates this exemption. See section 14.1.7..

resourced participants are able to monitor trade openings and capture these opportunities, in river operators' decisions to prioritise mitigating delivery risk at the risk of increasing conveyance losses, and in the combined effects of trade and declining inflows on allocations to low reliability entitlements.

Other issues with the design of current settings can lead to trade occurring beyond ecologically acceptable limits while, at other times, settings may inappropriately limit or prevent trade. For example, intervalley trade limits may allow trades that would contribute to environmentally damaging water deliveries, as has been seen in the Goulburn system in recent years. However, when limits are binding they may also prevent trades, even though trade might not actually contribute to the risks being managed by these limits.

Ultimately, these characteristics reduce the net benefits of water trade. The effective operation of the Basin's water markets is also hindered by lack of:

- transparent information on market architecture
- adequate and reliable data
- coordinated and comprehensive modelling capabilities.

Key elements of market architecture can be improved to better manage trade activity and address pressures from trade and delivery arrangements

Many market architecture problems arise from simplifying assumptions made in the design of arrangements to enable water trading, and from the characteristics of the underlying property rights. The influences of changing climatic, hydrological, market and other conditions mean that market architecture is unlikely to remain fit-for-purpose without ongoing assessment and consideration of design improvements.

The design of key elements of the market architecture can be improved to better manage trade activity, and to address pressures from trade and delivery arrangements that are now affecting the river system and water users. In practice, this involves reassessing some foundational assumptions and making changes to a number of specific rules or policies. For example, the integrity of the operation of intervalley trade limits should be improved by removing the current exemption for 'grandfathered tags' – tagged entitlement trades created before October 2010 – that enables a limited number of licence holders to circumvent the operation of intervalley trade limits. These exemptions detrimentally affect other entitlement holders and the environment.

A second potential option is to develop more 'dynamic' intervalley trade mechanisms. More timely and responsive tools to allocate access to the limited capacity to deliver water between valleys could improve the efficiency of market operation and opportunities for trade, while also better managing the effects of that trade and delivery on other water users and the environment. The Victorian Government is currently exploring such issues through its review of the Goulburn to Murray trade rule.

Another area that requires long-term reconsideration is the accounting for, and attribution of, conveyance (or transmission) losses – that is, the water that is lost while flowing through the river system. While aggregate changes in water use facilitated by water trade may be putting upward pressure on conveyance losses, the ACCC has not been able to effectively determine the magnitude of trade's role in these increases. Applying conveyance loss factors to deliveries or trades downstream is technically and administratively difficult to implement, and so governments should first work on better understanding the relationship between trade and losses, and on improving the transparency of how these impacts interact.

Further, the existing market architecture should also be improved by a range of measures, including:

- increasing the transparency of water allocations decisions and improving information to help water users understand influences on supply
- formalising and communicating plans for managing delivery shortfall risks, improving the understanding users have of those risks and actions to mitigate them
- updating guidance to more explicitly address how river operators should make trade-offs between different operational objectives

- improving how intervalley trade mechanisms manage access to trade opportunity
- continuing to improve metering and monitoring of water take, including to support capturing improved time of use data and better modelling
- enhancing hydrological modelling capabilities to better reflect irrigator behaviour, help manage water deliveries and understand the impacts of trade, including on conveyance losses.

These targeted changes will improve the functioning of markets. However, they will not guarantee enduring, effective market architecture that integrates market activity with water management and ensures the efficient operation of water storage and delivery systems. A comprehensive, forward-looking and coordinated approach is needed to avoid piecemeal, reactive changes and to achieve effective reforms.

The ACCC considers that implementing reforms to the markets' design and construction – its 'architecture' – will be a further important step in delivering on the Basin water market and trading objectives, set out in the Water Act.

Two paths: more of the same, or more comprehensive and immediate reform

The Basin's water rights markets have serious problems that need to be fixed to generate more of the benefits of water trade for farmers and other water users. The markets' rules are deficient, enforcement of them is inconsistent and limited, and the overall governance of the Basin's water trade is problematic.

The terms of reference required the ACCC to recommend options to enhance markets for tradeable water rights.

A path available to governments is to continue to maintain existing arrangements while attempting important but incremental fixes to targeted problems at the same time. The ACCC does not recommend the continuation of this approach. It would not decisively fix the markets' existing and urgent flaws, or set up the markets, their participants and their institutions to overcome new challenges.

The ACCC recommends comprehensive change to address the markets' problems, and establish the necessary arrangements to solve problems as they will inevitably arise in these complex and dynamic markets. Implementing the reforms recommended in this report will allow the full benefits and opportunities of water trading to be harnessed, and address the negative impacts of unfettered and poorly designed markets.

The ACCC does not consider it a viable option to entirely or substantially dismantle existing water markets, or to make them more restricted. While this may curb some of the poor outcomes caused by problems with the current markets, it would also mean that the Basin's farmers, other water users, and the nation would lose some of the considerable benefits of water trading.

This report contains 29 recommendations to reform Basin water markets. Many of the recommendations work together to maximise the benefits of water trading.

Implementation of the proposed recommendations will require commitment by a wide range of government and other stakeholders. The ACCC considers that a cooperative legislative scheme between Basin State and Australian Governments should be adopted to establish a framework for many of the recommended reforms. The input of stakeholders will also be important to maximise the benefits from initiatives pursued in response to this report.

The ACCC envisages these recommendations being implemented in three stages as shown in figure 5. Stage 1 focuses on recommendations to improve current trade arrangements and deliver on existing commitments as a matter of priority. Stage 2 involves creating new market focused governance, oversight and information arrangements, and would include the introduction of the proposed cooperative legislative scheme. Stage 3 contains a suite of recommendations to be delivered on by the proposed Water Markets Authority and Australian and Basin State governments to strength governance, decision making and market design.

Figure 5: Implementation pathway for the ACCC's recommendations

<p>Stage 1</p> <p>Improving current trade arrangements and existing commitments</p>	<ul style="list-style-type: none"> Require identifiers on trade forms (recommendation 4). Implement technical and procedural solutions to provide consistency for interzone trade (recommendation 5). Reshape current information portal initiatives (recommendation 6). Increase the transparency of allocations decisions and the drivers of water availability (recommendation 15). Improve efficiency in accounting for the costs of carryover (recommendation 16). Strengthen metering and monitoring (recommendation 17). Improve modelling of delivery and trade (recommendation 18). Formalise and communicate plans for managing delivery shortfalls (recommendation 19). Refine river-operations guidance to more effectively and transparently balance trade-offs (recommendation 20). Improve transparency of conveyance losses and other delivery impacts (recommendation 21). Improve intervalley trade mechanisms (recommendation 22). Assess whether the current configuration of geographical units remains fit-for-purpose (recommendation 24). Increase transparency of roles and functions of intergovernmental committees (recommendation 29).
<p>Stage 2</p> <p>Creating new market focused governance, oversight and information arrangements</p>	<ul style="list-style-type: none"> Create a Water Markets Agency (recommendation 26). Implement centralised, Basin-wide water market conduct and integrity legislation including an enforceable code of conduct for water market intermediaries; provisions that prohibit price manipulation, broaden price reporting requirements and broaden and strengthen insider trading provisions (recommendations 1-3). Implement Water Market Data Standards to provide a clear and fit-for-purpose framework for water market data and water trade services (recommendation 7). Implement mandatory trade approval service standards (recommendation 8). Implement rules and processes for water announcements (recommendation 9). Implement better rule-making process (recommendation 27).
<p>Stage 3</p> <p>Strengthening governance, decision making and market design</p>	<ul style="list-style-type: none"> Water Markets Agency to lead: <ul style="list-style-type: none"> Adopt a comprehensive Digital Messaging Protocol for the capture, storage and transfer of water market data and trade applications (recommendation 10). Implement a digital platform ('Backbone Platform') to act as a single repository for water market data and a single hub for trade approvals (recommendation 11). Implement a public-facing Water Market Information Platform which harnesses improved data collection and quality (recommendation 12). Implement a Basin-wide Water Market Education Program (recommendation 13). Develop a reform roadmap for designing and operating efficient markets now and into the future (recommendation 25). Australian/Basin State governments to lead: <ul style="list-style-type: none"> Implement lifetime traceability for water allocations (recommendation 14). Implement clear and integrated mechanisms for delivery of environmental water (recommendation 23). Obtain and have regard to advice from the Water Markets Agency (recommendation 28).

ACCC recommendations for water market reform

This section lists the ACCC's recommendations for enhancing the markets for tradeable water rights in the Murray–Darling Basin. The ACCC's recommendations work together as an integrated set, with an aim to restore confidence in water markets across the Murray–Darling Basin, and improve their operation and efficiency so that they work better for participants and the Australian economy. At the heart of the recommendations is proposed reform to the governance arrangements, to ensure markets receive the necessary focus that they deserve.

Market integrity and conduct

There is insufficient regulatory oversight, and associated enforcement and compliance activity, in relation to some practices of some market participants.

The ACCC considers that market integrity regulation for water rights trading needs to be improved to improve confidence in the integrity and fairness of water markets.

► Recommendation 1

Implement centralised, Basin-wide water market conduct and integrity legislation

New centralised Basin-wide legislation should be introduced to protect the integrity of Basin water markets by regulating conduct of market participants, to be enforced by the proposed Water Markets Agency (see recommendation 26).

The proposed new legislation should include:

- an enforceable mandatory code for intermediaries, to address the detrimental conduct and practices identified by the inquiry and ensure that intermediaries are subject to the standard safeguards that apply in similar markets
- integrity protections such as broader price reporting requirements, and conduct prohibitions on market manipulation and insider trading
- a requirement for exchange platforms and trade approval authorities to keep records of trades and to provide trade data to the Water Markets Agency through arrangements for the flow of trading data outlined in recommendations 10 and 11
- a role for the proposed Water Markets Agency to conduct surveillance, enforcement and reporting
- compulsory information gathering powers and appropriate enforcement powers for the Agency
- a requirement to issue a unique common identifier to each market participant, to enable trades to be traced and traders to be identified across regions and multiple accounts (see recommendation 4).

► **Recommendation 2**

Incorporate key obligations as part of an enforceable mandatory code for water market intermediaries

The mandatory code should apply to all parties that provide intermediary services, including irrigation infrastructure operators, and include obligations to:

- act in the best interests of a client, when providing certain services typically provided only by brokers
- provide the following information in writing to a client at the outset of each engagement:
 - the services being provided by the intermediary
 - the obligations owed to the client by the intermediary
 - the fees/commissions to be charged by the intermediary
- inform the client in a timely manner of any reasons for a trade approval authority rejecting or delaying the processing of an application
- implement a complaints-handling process, including obligations to keep records relating to complaints or resolution of complaints
- hold written authorities to submit trades for approval on behalf of clients
- hold written authorities to act as an agent on behalf of clients, when providing certain services typically provided only by brokers
- act in accordance with client instructions, when providing certain services typically provided only by brokers
- communicate all buy and sell offers to clients in relation to the proposed trade, when providing certain services typically provided only by brokers
- disclose to the client when receiving multiple fees/commissions in relation to a single trade, when providing certain services typically provided only by brokers, excluding trades matched through an exchange platform
- disclose to the client when an intermediary or a related entity has a personal interest in the trade, and that the water rights they have a personal interest in are to be transferred to/from the intermediary's or related entity's trading water account (that is, not the intermediary's broking water account which is used to hold client water rights). The intermediary must provide an opportunity for the client to get independent advice and the client must return written consent before proceeding with the trade
- disclose to the client when water rights are to be transferred to/from the intermediary's broking water account which holds client water rights
- comply with client water rights management and accounting obligations (under statutory trust accounting framework for broking water accounts which hold client water rights)
- comply with client funds management and accounting obligations (under statutory trust accounting framework for client funds)
- hold professional indemnity insurance
- keep records of client instructions, trade details (including strike date) and client details for the period of time (five years) required under Australian Tax Law
- disclose which method the intermediary is using to allocate successfully transferred volumes following an intervalley trade opening (for example, in chronological order or pro rata).

► Recommendation 3

Prohibit price manipulation, broaden price reporting and broaden and strengthen insider trading obligations

Existing price reporting obligations and insider trading prohibitions should be removed from the Basin Plan Water Trading Rules, and incorporated into the new water market conduct and integrity legislation.

The price reporting obligations should be broadened to require prices to be reported for all transactions of tradeable water rights, including irrigation rights and water delivery rights – not only water access rights. Trade approval authorities (including irrigation infrastructure operators) should be required to collect, record and transmit this information.

The insider trading prohibition should be broadened and strengthened to apply to the use of any material information prior to it being made public in order to gain an unfair advantage in the market – not only to ‘water announcements’ (for example, government announcements about allocations, carryover and trading restrictions).

The proposed new conduct and integrity legislation should include a prohibition on price manipulation.

The price reporting obligations, insider trading prohibition and market manipulation prohibition should be enforced by a single Basin-wide regulator – recommended to be the Water Markets Agency (see recommendation 26).

Implementing this recommendation will address challenges in enforcing prohibitions against misconduct that arise under current laws, and address regulatory gaps.

► Recommendation 4

Require identifiers on trade forms

Traders should be required to include a unique common identifier on trade forms. This could be their ABN, ACN, and/or the unique identifier issued to them by the centralised regulator.

The ability to identify market participants, and trace and follow transactions, is a foundational issue for protecting market integrity and maintaining market confidence. This will improve the regulator’s ability to detect misbehaviour and enforce against it.

Trade processing and water market information

Practical changes to trade processing are needed to improve the quality and flow of core market data.

► Recommendation 5

Implement technical and procedural solutions to provide consistency for interzone trade

New South Wales, Victoria, South Australia and the MDBA should work collaboratively to upgrade trade processing systems and interoperability protocols to ensure these systems provide consistency for market participants wanting to access interzone trade opportunities. In principle, this should happen as part of enhancements that move all states towards the longer-term goals outlined in recommendations 10 and 11.

This will help ensure that market participants in some states are not disadvantaged relative to participants in other states when accessing interzone trade opportunities, particularly when opportunities are limited due to trade restrictions such as the Barmah Choke trade restriction and the Goulburn and Murrumbidgee intervalley trade limits. It will also help ensure traders face more consistent and neutral incentives when deciding whether or not to use aggregator services/brokers when trading interzone.

► Recommendation 6

Reshape current information portal initiatives

Australian and Basin State governments should work collaboratively to substantially improve existing information portal initiatives to improve information availability and prepare to transition towards the proposed digital infrastructure for water markets, particularly the proposed Water Market Information Platform (see recommendation 12).

This will ensure that benefits of existing initiatives are leveraged and that water market transparency continues to improve during the transition to the proposed new legal framework and digital infrastructure for water markets.

Priority actions are:

- New South Wales to publish water access licence (WAL) and water trade data for the NSW Murray Regulated River water source in a manner that clearly identifies which zone(s) are associated with the WAL or trade (as applicable).
- South Australia to implement collection and publication of 'reason for trade' and 'strike date' data from trade application forms, in line with actions already undertaken or committed to by New South Wales and Victoria.
- The Bureau of Meteorology to incorporate into its water market information dashboard data from New South Wales, Victoria and South Australia on 'reasons for trade' and 'strike date' as soon as practicable.
- Australian government agencies to map existing and 'in development' data sharing agreements relevant to water market data or related information such as rainfall, inflows and storage levels, river flow data, water allocations, intervalley trade limits, environmental watering.
- All information portals which display price data to document and make available easily accessible metadata on how price series are calculated, including explaining any data cleaning processes undertaken prior to derivation of aggregate or average price series.

► **Recommendation 7**

Implement Water Market Data Standards to provide a clear and fit-for-purpose framework for water market data and water trade services

Australian and Basin State governments should establish mandatory Water Market Data Standards governing the collection, storage, transmission and publication of water market data and related information by trade service providers.

This will deliver a robust and consistent legal framework to bring about improved data quality and water market data flows, leading to improved transparency for water market participants and enhanced interoperability between trade service providers.

Key recommended actions are:

- Develop Water Market Data Standards to provide a consistent framework underpinning the collection, storage, transmission and publication of water market data and related information (noting that technical specifications such as for data transmission will be implemented via the proposed Digital Messaging Protocol and proposed Backbone Platform – see recommendations 10 and 11).
- Trade service providers such as brokers, exchange platforms, irrigation infrastructure operators and Basin State trade approval authorities and register operators should have clear obligations to provide data as specified in legislation and to comply with the proposed Water Market Data Standards (see recommendation 1).
- Establish a centralised Water Market Data Standards compliance and enforcement role to ensure compliance with the standards once they are established. It is recommended the Water Markets Agency (see recommendation 26) should have this role.
- The Water Market Data Standards should specify the form, and process for issuing and use, of Basin-wide common party identifiers for tradeable water rights holders, and Basin-wide single transaction identifiers to be used to uniquely identify all trades of tradeable water rights.
- Harmonise or standardise terminology in water management law, where possible, as part of changes to legal frameworks to implement the proposed Water Market Data Standards.

Development of Water Market Data Standards should be undertaken collaboratively by government, trade service providers and water user representatives (such as irrigator groups, environmental water holders and traditional owner groups), and should be based on meaningful 'user needs' consultation with water market participants.

► **Recommendation 8**

Implement mandatory trade approval service standards

Australian and Basin State governments should implement consistent mandatory service standards that apply to all trade approval authorities, including irrigation infrastructure operators.

This will help ensure that trade approvals are undertaken in a consistent and timely manner.

► Recommendation 9

Implement rules and processes for water announcements

Australian and Basin State governments should implement rules and processes for water announcements, which apply, at a minimum, to all governments or government agencies, and all trade service providers. This should build on existing relevant provisions in the Basin Plan Water Trading Rules (note that recommendation 3 proposes relocating these rules into the proposed new conduct and integrity legislation).

Agencies or organisations making water announcements should be required to provide them to the proposed Water Market Information Platform in a timely manner (see recommendation 12). The current materiality criterion applying to water announcements – that the announcement ‘can reasonably be expected, if made generally available, to have a material effect on the price or value of water access rights’²⁰ – should be retained, but broadened to apply to all tradeable water rights.

The recommended processes for making water market announcements could be integrated into the proposed centralised legislation (see recommendation 1).

This will ensure that information which could materially affect the price or value of water access rights will be accessible by all market participants from a single source, at a specified time.

► Recommendation 10

Adopt a comprehensive Digital Messaging Protocol for the capture, storage and transfer of water market data and trade applications

Australian and Basin State governments should work collaboratively with trade service providers to establish and implement a mandatory Digital Messaging Protocol for water trade and water market data, which will enable:

- enhanced interoperability between Basin State registers, by providing automated digital connections (that is, machine-to-machine connections) and the ability to establish a direct digital interface between the proposed digital platform (Backbone Platform) and irrigation infrastructure operators, private exchange platforms and Basin State trade approval authority systems and water registers
- the ability to securely transmit data and trade applications between trade service providers
- the ability to automatically execute instructions, and automate collection, cleaning and publishing of water market data.

It is recommended that the proposed Water Markets Agency (see recommendation 26) play a lead role in developing the Digital Messaging Protocol, and should be assigned the role of enforcing adoption of the protocol (once established), as required by legislation. The proposed Water Markets Agency should also be assigned the responsibility of developing appropriate governance arrangements for the Digital Messaging Protocol.

When fully implemented, the Digital Messaging Protocol should give effect to the relevant requirements of the proposed Water Market Data Standards (see recommendation 7).

The Digital Messaging Protocol should be implemented in conjunction with the proposed Backbone Platform and public-facing Water Market Information Platform (see recommendations 11 and 12).

The ACCC recommends Australian and Basin State governments consider subsidising some of the cost of private service providers’ system upgrades to assist with the transformational change needed to deliver digitised trading processes and digital infrastructure for water markets.

20 Basin Plan (2012) (Cth), s12.49(2)(c)(ii).

► **Recommendation 11**

Implement a digital platform ('Backbone Platform') to act as a single repository for water market data and a single hub for trade approvals

Australian and Basin State governments should work collaboratively with trade service providers to establish and implement a digital platform ('Backbone Platform') to underpin trade services and water market data.

It is recommended that the proposed Water Markets Agency (see recommendation 26) play a lead role in developing the Backbone Platform and operating it, or have oversight of its operation, once established. The proposed Water Markets Agency should also be assigned the responsibility of developing appropriate governance arrangements for the Backbone Platform.

Establishing the Backbone Platform will help streamline trade approvals and the collection and dissemination of water market data by providing a single hub through which water trade applications are made, and within which water market data is stored.

When fully implemented, the Backbone Platform should comprise:

- a secure digital repository for water market data and related information
- digital connections between the Backbone Platform and trade service providers, regulators, approval authorities, river operators, and the public-facing Water Market Information Platform, with purpose- or entity-specific access controls
- single portal for lodging trade applications (Southern Connected Basin)
- harmonised 'trading rules engine' for assessing trade application against trading rules (Southern Connected Basin).

The Backbone Platform should be implemented in conjunction with the proposed Digital Messaging Protocol, public-facing Water Market Information Platform and in compliance with the proposed Water Market Data Standards (see recommendations 7, 10 and 12).

When implemented together, these technologies will form an underlying digital framework and common digital 'language' and processes, upon which different trade service providers can build their own digital infrastructure.

The Backbone Platform is not intended to operate as an exchange platform or to replace the role of existing trade approval authorities, although the proposed single lodgement portal and 'trading rules engine' could assist trade approval authorities to undertake their roles in a more timely and consistent manner.

► **Recommendation 12**

Implement a public-facing Water Market Information Platform which harnesses improved data collection and quality

Australian and Basin State governments should build on centralised information platform initiatives already in place to improve the transparency of water market information. Industry and government should work collaboratively to implement a public-facing Water Market Information Platform.

This will ensure all the key information market participants need to make well-informed trading decisions is available from one location, is accurate and is up-to-date.

It is recommended that the proposed Water Markets Agency (see recommendation 26) play a lead role in developing the public-facing platform and operate it, or have oversight of its operation, once established. The proposed Water Markets Agency should also be assigned the responsibility of developing appropriate governance arrangements for the Water Market Information Platform.

At a minimum, the platform should make publicly available:

- water market data (in general, sourced via automated data feeds from the digital repository contained in the Backbone Platform)
- information on relevant government policies and decision-making (see recommendation 15 concerning improving transparency of policies and procedures)
- water announcements (see recommendation 9).

The Water Market Information Platform should be implemented in conjunction with the proposed Digital Messaging Protocol and the Backbone Platform (see recommendations 10 and 11).

► **Recommendation 13**

Implement a Basin-wide Water Market Education Program

The Australian Government should develop a Basin-wide Water Market Education Program, in collaboration with irrigation infrastructure operators, brokers, water exchange platforms, water information service providers and Basin State governments.

This will assist current and potential market participants – especially irrigators – to better understand water products and trading rules, and to engage confidently in water trading.

► **Recommendation 14**

Implement lifetime traceability for water allocations

Australian and Basin State governments should implement lifetime traceability for water allocations when implementing the proposed Digital Messaging Protocol.

This will make it possible to trace water from its original point of allocation to its eventual use. This will facilitate implementation of policies, trading rules or water management options that rely on the ability to track how water moves in detail.

The governments should implement this in consultation with water market participants, river operators and infrastructure operators.

Market architecture

These recommendations identify actions to strengthen current arrangements, and build on governments' existing commitments to improve their systems. They propose tackling urgent problems with current settings, and lay the groundwork for future improvements. A reform roadmap describes pathways and timeframes for advancing more robust, efficient and coordinated arrangements for managing trade and its impacts, and integrating market design with other water policies.

► Recommendation 15

Increase the transparency of allocations decisions and the drivers of water availability

Basin States should increase the transparency of inputs, assumptions and administrative decision making involved in determining allocation announcements by:

- publishing in detail the steps taken and factors considered by relevant authorities
- explaining calculations and how assumptions or inputs, such as conveyance losses and forfeiture rates, have varied over time
- communicating how authorities apply discretion based on their risk appetite.

Basin States should publish accessible and easy to understand guidance explaining how states will manage periods of extreme dry conditions and low water availability. The guidance could include fact sheets on the triggers for when special provisions occur and how water access will be affected – that is, how, when and on whom temporary water restrictions will be imposed.

Australian and Basin State governments should help entitlement holders better understand the changes in, and drivers of, entitlement reliability and allocations (including the role of carryover arrangements). A key part of building this knowledge of changing drivers will involve improving the transparency and understanding of how water allocated to different water access right categories is influenced by accounting for conveyance losses, carryover policies and use, and climate variability. Another element of this should include communicating how trading for carryover parking can interact with user account limits. Building knowledge in this regard should also be an element of the proposed Water Market Education Program (see recommendation 13).

This information and improved transparency will help stakeholders to interpret market information and understand the drivers of changes, likely supporting improvements to market confidence.

► Recommendation 16

Improve efficiency in accounting for the costs of carryover

New South Wales and South Australia should update carryover rules and policies to appropriately account for evaporation losses associated with storing water in a dam beyond the year in which that water was allocated, and attribute those losses to the individual.

South Australia should update its registers and trade forms to be able to identify carryover parking trades.

Once robust data on trade for carryover parking is available, Basin States or the proposed Water Markets Agency (if established in time) should assess whether demand for storage space (as measured by carryover parking trade) is such that carryover is generating externalities (such as opening or closing trade barriers) which cannot be adequately managed through carryover policy or rule design.

This is to ensure that individual users face the full costs of their decisions, including evaporation losses, and the water accounting more accurately reflects the hydrological realities of the system, to drive more efficient decisions by individuals about use of available storage capacity and water.

► Recommendation 17

Strengthen metering and monitoring

Australian and Basin State governments, and the MDBA should strengthen existing commitments to better metering and measurement of water take across the Basin through:

- continuous improvement and harmonisation of the metering standards and technology in use in the Southern Connected Basin. In particular, South Australia should commit to upgrading its metering standards to require telemetry where cost effective
- implementation of telemetry across the Southern Connected Basin, where technologically possible and cost effective
- monitoring progress on the measurement and outcomes of overland flows/flood plain harvesting. In particular, Queensland and NSW should continue efforts to more accurately measure overland flows/floodplain harvesting using new technologies; and to bring these forms of water take into the licensing framework
- Basin States, in consultation with the MDBA and the proposed Water Markets Agency should implement a consistent approach across jurisdictions and reporting agencies for the collection, storage, transmission and reporting of usage data. This should be consistent with existing Basin Compliance Compact commitments on the automation of reporting of water take, and with any relevant proposed Water Market Data Standards (see recommendation 7)
- Basin States should improve compliance and enforcement programs and invest in systems to identify and prevent water users being able to go into negative balances by extracting more water than is available in their account.

This could be achieved by extending and expanding the scope of the Basin Compliance Compact.

These measures will provide a foundation for good management of markets and water resources, increase the confidence and trust of market participants and water users generally, and support other improvements to market architecture, modelling and water information.

► Recommendation 18

Improve modelling of delivery and trade

Australian and Basin State governments should improve modelling of water use, delivery and trade across the Basin, including through improving linkages between models. Specifically, this can be achieved by working with and supporting:

- the MDBA, and relevant industry and academic bodies, to continually improve hydrological and river modelling capability and research
- the MDBA, the Australian Bureau of Agricultural and Resource Economics and Science, the Bureau of Meteorology, and relevant industry and academic bodies, to improve hydro-economic modelling²¹ capability and research.

This will help policy makers better understand and predict the impacts of water trade and associated changing patterns of usage on conveyance losses and delivery risks; improve and update water user behavioural assumptions; and strengthen the capability to forecast and incorporate trends in crop mixes and climate-change scenarios.

21 Hydro-economic modelling combines economic management concepts with an engineering level of understanding of a hydrologic system. Hydro-economic models integrate spatially distributed water resources, economic values, infra-structure, and management policies. Models predict the allocation of water between different uses across time and space taking into account various physical, economical, environmental and institutional constraints. See, for example, United Nations Food and Agriculture Organisation, 2018, *Hydro-economic modelling for basin management of the Senegal River*, <http://www.fao.org/3/CA1968EN/ca1968en.pdf>, viewed 14 February 2021.

► **Recommendation 19**

Formalise and communicate plans for managing delivery shortfalls

Basin States and the MDBA should move promptly to:

- formalise their arrangements for managing shortfall events, including how they will enforce those arrangements
- publicly release plans, or a joint plan, that clearly and with consistent messaging, describe:
 - the delivery risks faced by water users, and how these will be communicated to users in a timely fashion
 - how a shortfall would be managed by authorities, including the mechanisms and approaches that will be used to ration water availability
 - how water users can take steps to mitigate their own risks or potential impacts of shortfall events based on their location in the river system.

This will give irrigators more certainty about how water deliveries will be managed in times of high demand and potential shortfall. This will help irrigators make decisions about, for example, whether they invest in water storages on their farms.

► **Recommendation 20**

Refine river-operations guidance to more effectively and transparently balance trade-offs

River operations guidance should be refined, to more effectively and transparently balance trade-offs. Specifically, that the MDBA and Basin States, through Basin Officials Committee, should work together to:

- update key governance documents and operational guidance to clarify how important 'trade-offs' between operations, market activity, trade opportunity and the impacts on third parties and environmental risks will be managed
- better integrate consideration of impacts on and of trade and market design into operational decision-making
- establish ecological tolerances within which to operate in the Southern Connected Basin, and enshrine these in whole-of-system operational guidance for river operators
- ensure that reviews of river operations also include a section which analyses the market effects of river operations decisions and the way decisions are announced.

This is to improve guidance to river operators and policy makers on how to manage operational, environmental and market trade-offs, more effectively integrating and improving understanding of the interaction between water management and water markets and the management of connected systems in an integrated way.

► Recommendation 21

Improve transparency of conveyance losses and other delivery impacts

The MDBA and Basin States should improve the transparency of conveyance losses and other delivery impacts. Specifically, that the MDBA should commit to the active and ongoing monitoring, and communication about trends and drivers, of conveyance losses through the annual publication of the 'River Losses in the River Murray System' report, in a timely manner following the finalisation of each water year. Basin States should also consider releasing similar reports to explain the nature and drivers of conveyance losses in other rivers where concerns are present, such as the Murrumbidgee.

This will help water users and their communities better understand the relevant issues and operational considerations, and provide further evidence to water managers in considering potential avenues for revising how these losses are accounted for within the market architecture.

► Recommendation 22

Improve intervalley trade mechanisms

Basin States and the MDBA collectively and, where required, Victoria and New South Wales separately, should improve and harmonise the operation of the rules governing intervalley trade and trade through the Barmah Choke, by:

- improving the efficiency of, and equity of access to the opportunity to trade, which are currently largely 'first in, first served'
- removing the exemption in Basin Plan water trading rule 12.23 for 'grandfathered' tagged water access entitlements, because it affords a small number of market participants an inequitable exemption from restrictions on intervalley trade.
- considering if current 'rolling' intervalley trade limits can be replaced with 'dynamic limits' – to develop trade rules that better match opportunities to trade with the constraints of the physical system.

Revising intervalley trade arrangements so that trade opportunities more accurately reflect the benefits, costs and risks of water use and delivery will encourage market participants to make efficient usage, trading and investment decisions. Dynamic limits that change to increase trade opportunity at times when there are fewer impacts on the river system, such as during late winter in alignment with natural flow patterns, and to reduce trade when there are negative impacts on the river system, such as at times of peak demand in summer, will help with this. Removing exemptions that undermine effective operation of limits will also improve market operation and outcomes.

► **Recommendation 23**

Implement clear and integrated mechanisms for delivery of environmental water

Basin States, in collaboration with the MDBA and the Commonwealth and State environmental water holders, should better integrate environmental watering arrangements into trading arrangements and market design, including by:

- ensuring that trading and delivery arrangements are not contingent on the intended use of the water, including by making available arrangements currently only open to environmental water holders to consumptive water users, where possible, and ensuring neither consumptive or environmental users are given preference over the other
- committing to explicitly assess and address likely impacts on water markets, landholders or the environment of any new trading or delivery arrangements developed in future
- clearly and consistently accounting for environmental trade and delivery across Basin States
- developing a transparent policy position on how and when environmental water holders, and consumptive users, should use trade mechanisms to move water, and clearly articulating how movements of water within and outside of the trading framework affect trade opportunities, particularly for interzone trade opportunities governed by restrictions.

This will contribute to developing arrangements and tools to deliver environmental water in ways that help improve transparency and confidence, and alleviate system congestion.

► **Recommendation 24**

Assess whether the current configuration of geographical units remains fit-for-purpose

Basin States, together with the MDBA, should assess the appropriateness of the current set of, and spatial definitions of, geographical units used in water management and river operations and as the basis for trading zones.

This is to ensure that the spatial boundaries of geographical areas relied upon to manage water remain fit for purpose; assess whether new geographical units may be required; and to assess whether and how the current spatial definitions may need to be formalised and aligned across agencies.

► **Recommendation 25**

Develop a reform roadmap for designing and operating efficient markets now and into the future

The proposed Water Markets Agency should work with the Australian and Basin State governments and the MDBA to undertake a work program to progress a long-term reform roadmap that better integrates water market design with water management and aligns market architecture with the hydrological realities of the natural system.

This work program should consider how more fundamental reforms of the market architecture may drive improved market efficiency, such as through creating appropriate market based incentives and reducing generation of externalities. Informed by improved information gathering stemming from other recommendations in this report, this should include assessing the feasibility and merits of adopting new market mechanisms, pricing measures or complimentary policies within the Southern Connected Basin or across the whole Basin, as appropriate. Potential mechanisms to explore include, but are not limited to:

- applying water accounting that better aligns with the physical transfer of water, such as through ‘tagged allocation trade’
- applying congestion or time-of-use charges
- developing formal markets for rights to delivery capacity and/or water extraction (for example, ‘constraint rights’, ‘on-river delivery rights’, ‘extraction shares’)
- applying ‘loss factors’ to water trades in the Southern Connected Basin
- adopting ‘capacity sharing’ – where each water user is allocated with a share in storage capacity and a share in water inflows – in the Southern Connected Basin, including its potential to offer long-term alternatives to intervalley trade account-balance limits
- considering the potential use of ‘water banks’ to fulfil roles like coordinating particular trading opportunities, such as allocating out intervalley trade capacity, and holding and redistributing water rights as a ‘safety net’ in the markets
- developing a water market operator/smart market to operate the Southern Basin water markets and co-ordinate water delivery to users as one integrated system, matching bids for water with offers of supply, within the physical constraints of the system.

Developing the roadmap and considering longer term reform options will provide pathways and timeframes for continued improvement of markets through improved design and integration of the rules and arrangements for trade across the Basin.

Governance of the Basin water markets

There is a need to reset governance frameworks, to enable independent and clear decisions on the development of market settings. Improved governance will help to resolve many of the issues identified throughout the inquiry; as well as strengthen the system so fewer problems emerge in the future.

► Recommendation 26

Create a Water Markets Agency

The Australian and Basin State governments create an independent Basin-wide Water Markets Agency to consolidate and carry out new and existing trade-related roles and functions.

The ACCC considers the Water Markets Agency would be best established through a cooperative legislative scheme between the Australian and Basin State governments.

The key functions of the proposed Water Markets Agency would be:

- *Market regulation and surveillance functions* – ongoing monitoring of market activities and investigating allegations of potential market misconduct. This will address key regulatory gaps, such as in relation to water market intermediaries (see recommendations 1 to 3).
- *Market information functions* – provide a ‘one-stop-shop’ for water users to access market information, such as pricing and availability, water storage information, announced allocations and access to policy documents (see recommendation 12).
- *Market evaluation function* – undertaking proactive whole-of-basin market evaluation and reporting activities of trading market issues and cross-jurisdictional trade impacts. This would enable research and analysis in relation to market issues, including those set out in recommendation 25.
- *Advisory and advocacy functions* – providing expert and technical advice to the Australian and Basin State governments and advocate for the interests of water markets in broader policy discussions.

It is not proposed that any existing rule making functions be transferred to the proposed Water Markets Agency.

This will establish an organisation distinct from broader water management governance, so that there is a greater institutional focus on delivering important specific functions that support efficient markets. It would have a Basin-wide reach and a whole-of-Basin perspective.

► Recommendation 27

Implement better rule-making process

The Australian and Basin State governments should implement a consistent and transparent process for reviewing and amending water trading rules and other decisions with significant impacts on water markets.

Details about each review, including commencement of consultation, preliminary and final decisions, and any other stages in the process relevant to market participants should be published through the proposed water market announcements platform to be operated by the proposed Water Markets Agency (see recommendation 9).

This will improve transparency of decision making processes across the Basin and improve accountability and confidence in processes and outcomes.

It is not proposed that any existing rule making powers be transferred from their existing bodies.

► **Recommendation 28**

Have regard to advice from the Water Markets Agency

The Australian Government and Basin State governments should incorporate a requirement into applicable legislative frameworks to obtain and have regard to advice from the proposed Water Markets Agency before making changes to trading rules and other decisions with significant impacts on water markets.

The proposed Water Markets Agency should also be given a mandate to provide advice in relation to broader reforms not subject to the proposed requirement, where it considers it necessary to highlight potential water market impacts for decision makers.

This will ensure that policy makers understand the impact on markets of their decisions, and enable more adequate consideration of markets impacts in water policy.

► **Recommendation 29**

Increase transparency of roles and functions of intergovernmental committees

The Murray–Darling Basin Ministerial Council and the Basin Officials Committee should publish procedural documents to improve the transparency of the roles, functions and strategic priorities of its intergovernmental committees, with particular regard to how water trade matters are escalated and decisions are made.

This will deliver important information to stakeholders about how these governance arrangements work.

Glossary

ACCC	the Australian Competition and Consumer Commission
ACT	the Australian Capital Territory
allocation, water allocation	the specific volume of water allocated to a water access entitlement in a given water accounting period. The size of the allocation depends on how much water is available in the water resource in that season. Also referred to as a seasonal water assignment in Queensland
allocation trade, water allocation trade	change of ownership and/or location of a particular volume of water allocation
approval authority	in relation to the proposed trade of a tradeable water right: a person whose approval is required under State water management law for the trade to proceed
Basin Plan	a high level framework on which the Australian Government and Basin States agreed, and that sets standards for the management of the Murray–Darling Basin’s water resources in a coordinated and sustainable way in collaboration with the community. Officially known as the Basin Plan 2012
Basin Plan Water Trading Rules (BPWTR)	rules set out in Part 12 of the Basin Plan that relate to the trade of tradeable water rights. The rules commenced on 1 July 2014 and are enforced by the Murray–Darling Basin Authority
Basin States	New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory
Basin State governments	the state and territory governments of New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory
carryover arrangement	an arrangement which allows a water access right holder to retain water allocations not taken in a water accounting period for possible take in the next water accounting period
CCA	the <i>Competition and Consumer Act 2010</i> (Cth)
conveyance water	water required primarily to operate regulated rivers and utility supply networks to enable the delivery of water
delivery right, water delivery right	a right to have water delivered by an infrastructure operator. It typically represents the holder’s right of access to an irrigation network (there may also be a right to drainage), and can be terminated.
entitlement, water access entitlement	a perpetual or ongoing entitlement, by or under a law of a state, to exclusive access to a share of the water resources of a water resource plan area. Also referred to as a water share (Victoria), water access licence (New South Wales) and water allocation (Queensland)
entitlement trade, water access entitlement trade	change of ownership and/or location of a water access entitlement (including through the establishment of a tagging arrangement)
exchange platform	a water market intermediary who operates an online portal facilitating direct trading between sellers and buyers, using algorithms for automated matching, auction style listings, or ‘buy-it-now’ listings for a commission or fee or other form of remuneration or payment
gigalitre (GL)	one billion litres

grandfathered tag	a tagged entitlement which was established prior to 22 October 2010 (and see definition of 'tagged entitlement' below)
gravity-fed irrigation system	an irrigation system comprising channels and/or pipes that relies on the movement of water due to the force of gravity
infrastructure charge	charges that infrastructure operators impose for access to their water service infrastructure, and for services provided in relation to that access
infrastructure operator	<p>any person or entity that owns or operates infrastructure for one or more of the following purposes:</p> <ul style="list-style-type: none"> ■ the storage of water ■ the delivery of water ■ the drainage of water <p>for the purpose of providing a service to someone who does not own or operate the infrastructure</p>
infrastructure service	access, or a service provided in relation to access, to water service infrastructure. It includes the storage, delivery, drainage and taking of water
intervalley trade/transfer (IVT)	trade in water access rights between trading zones or valleys
irrigation infrastructure operator (IIO)	an infrastructure operator that owns or operates water service infrastructure for delivering water for the primary purpose of irrigation
irrigation network	the water service infrastructure of an irrigation infrastructure operator. In practice, an irrigation network typically constitutes a network of carriers (open channels, pipes and/or natural waterways) that convey water from a water source through customer service points to customer properties. It may be either a gravity fed network (typically using channels and/or natural waterways) or a pressurised network (using pipes)
irrigation right	a person's right against an irrigation infrastructure operator to receive water, which is not a water access right or a water delivery right
megalitre (ML)	one million litres
Murray-Darling Basin	has the meaning given in the <i>Water Act 2007</i> (Cth)
National Water Initiative	Intergovernmental Agreement on a National Water Initiative, between the Australian, state and territory governments, 2004
Northern Basin	the Northern Murray-Darling Basin is defined as incorporating the following systems: Barwon-Darling, Lachlan, Macquarie-Castlereagh, Gwydir, Namoi, New South Wales Border Rivers, Queensland Border Rivers, Moonie, Condamine-Balonne and Warrego-Paroo-Bulloo-Nebine. The Lachlan River, an intermittent tributary of the Murrumbidgee, is included in the Northern Basin
NSW	New South Wales
off-platform trade	trades negotiated via a broker or individuals without the involvement or use of an exchange platform, but lodged for approval via an exchange platform
private diverter	a person that extracts water directly from a natural watercourse (either a regulated or unregulated river)
SA	South Australia

Southern Basin	the Southern Murray–Darling Basin (Southern Basin) comprises surface-water systems incorporating the Murray River and its various tributaries across the ACT, NSW, Victoria and South Australia, as well as the groundwater systems (not including the Great Artesian Basin) underlying these surface-water systems
Southern Connected Basin	for the purpose of this report, the Southern Connected Murray–Darling Basin is defined as comprising the following trading zones: 1A Greater Goulburn, 1B Boort, 2 Broken, 3 Lower Goulburn, 4A Campaspe—Eppalock to WWC, 4C Lower Campaspe, 5A Loddon—CC/Tull to LWP, 6 VIC Murray—Dart to Barmah, 6B Lower Broken Creek, 7 VIC Murray—Barmah to SA, 10 New South Wales Murray Above Choke, 11 New South Wales Murray Below Choke, 12 SA Murray, 13 Murrumbidgee and 14 Lower Darling
tagged allocation trade	form of trade via which water that is allocated in one location (that is, catchment or trading zone) can be physically extracted (used) in another, as a result of a ‘tag’ placed on the water user’s account in the state water register. Water only moves between valley accounts when it is being delivered and remains in subject to rules of the origin catchment or trading zone (for example, for the purposes of further trade or carryover)
tagged entitlement trade	a form of trade via which the water that is allocated to an entitlement issued in one location can be physically taken in another, via the process of placing a ‘tag’ authorising the different extraction location on the entitlement in the relevant Basin State water register. When an allocation is made to the entitlement in the source zone, the tag is automatically activated and the purchaser is credited with the volume allocated and can order water for delivery in the destination zone (subject to any restrictions on ordering or delivery)
telemetry	meters that allow reading to occur remotely, with the data being sent to a centralised database for monitoring
termination	when a person terminates or surrenders the whole or part of a right of access to water service infrastructure, typically by terminating a water delivery right
termination fee	a fee that an infrastructure operator may impose when a person terminates their right of access, such as a water delivery right
trade	includes a transfer (that is, a trade that does not involve the payment of consideration; a trade between places under which ownership of the right being traded does not change; the establishment of a leasing arrangement; and the establishment of a tagged water access entitlement). Trade can include transfers of water within an irrigation network, into or out of a network, entirely outside of an irrigation network, within and between trading zones and between states
tradeable water rights	means: <ul style="list-style-type: none"> ■ water access rights (including water access entitlements, and water allocations) ■ water delivery rights or ■ irrigation rights
trading zone	zones established to simplify administration of a trade by setting out the known supply source or management arrangements and the physical realities of relevant supply systems within the zone so that trade can occur within and between zones without first having to investigate and establish the details and rules of the system in each zone

transformation	process by which an irrigator permanently transforms their entitlement to water under an irrigation right against an irrigation infrastructure operator into a water access entitlement held directly by the irrigator (or anybody other than the irrigation infrastructure operator), thereby reducing the volume (for example, the share component) of the infrastructure operator's water access entitlement
water access right	any right conferred by or under a law of a state to hold and/or take water from a water resource, including: <ul style="list-style-type: none"> ▪ stock and domestic rights ▪ riparian rights ▪ water access entitlements ▪ water allocations
water account	an account established with an approval authority used to record the account-holder's water allocation. For example, an allocation account or allocation bank account (Victoria, NSW) or water account (South Australia, Queensland). May also be referred to as a 'water holding account'
water broker	a water market intermediary who, for a commission or fee or other form of remuneration or payment, offers one or more of the following services: <ul style="list-style-type: none"> ▪ providing advice to clients regarding the trading of water rights ▪ trading tradeable water rights on behalf of another person ▪ investigating tradeable water right trading possibilities on behalf of another person ▪ preparing and submitting documents necessary for the trade of a tradeable water right on behalf of another person
water market intermediary	a person who is a water broker and/or an exchange platform
water market participants	includes those persons involved in water markets through the holding, use, leasing, trade, or regulation of tradeable water rights, and includes irrigation farmers, investors, water brokers, exchange platforms, water registries and other service providers that facilitate the trade of water, environmental water holders, urban water authorities, other infrastructure operators, indigenous users and communities, and market advisors and analysts
water market products	includes tradeable water rights, and statutory or contractual arrangements associated with tradeable water rights, including but not limited to leases, forwards and options
Water Market Rules 2009 (WMR)	rules dealing with actions or omissions of an IIO that prevent or unreasonably delay transformation arrangements or trade of the resulting water access entitlement
water service infrastructure	infrastructure for one or more of the following purposes: <ul style="list-style-type: none"> ▪ the storage of water ▪ the delivery of water ▪ the drainage of water for the purpose of providing a service to another person

watercourse	<p>a river, creek or other natural watercourse (whether modified or not) in which water is contained or flows (whether permanently or intermittently). It includes:</p> <ul style="list-style-type: none"> ■ dams or reservoirs that collect water flowing in a watercourse ■ lakes or wetlands through which water flows ■ channels into which the water of a watercourse has been diverted ■ parts of a watercourse ■ estuaries through which water flows
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01

About the inquiry

This part contains:

- a glossary of selected terms used in this report
- information about the conduct of this inquiry, including its terms of reference. Chapter 1 sets out the stakeholder engagement and information gathering activities undertaken by the ACCC for the final report.

1. Conduct of the inquiry

On 8 August 2019 the Treasurer directed the Australian Competition and Consumer Commission to conduct an inquiry into markets for tradeable water rights in the Murray–Darling Basin.

The inquiry direction stated that matters to be taken into consideration in the inquiry (the terms of reference) must include:

- a. market trends since 2012, including demand for water, changes in the location where water is used, the quantity of water traded, water availability, changes in water users and their communities, development of new trading products, and the number of participants and sectors participating in the water markets
- b. the role of carryover arrangements, and the trading of water allocations which have been carried over, on water markets
- c. the role and practices of market participants, including water brokers, water exchanges, investment funds and significant traders of water allocations and entitlements
- d. the availability to the public of information on water market activities and tradeable water right holdings
- e. the timeliness, accuracy, and completeness of public information released on water market activities and tradeable water right holdings, including true trade price reporting and the types of trade (for example, immediate purchases, forward contracts, leases)
- f. barriers to entry, expansion and exit, including transaction costs
- g. the management of constraints on the storage or delivery of water, including adjustments made to give effect to trades and intervalley transfers.

The ACCC received information from a variety of sources, including through submissions, public forums, group feedback sessions, data from state and commonwealth government agencies, compulsory information requests, voluntary information requests and meetings with a range of stakeholders.

1.1 Inquiry framework

The ACCC is required to hold an inquiry in public pursuant to s. 95R (1) of the *Competition and Consumer Act 2010* (Cth) (CCA). As the inquiry is a public process, the ACCC published written feedback from stakeholders on its website.

A number of parties made confidentiality claims over the information they provided to the ACCC. Where the ACCC considered that disclosure of information was necessary in the public interest, the ACCC consulted with the relevant parties before disclosing that information.

1.2 Submissions to the issues paper

The ACCC released an issues paper for public consultation on 17 October 2019.

The ACCC received over 130 submissions in response to the issues paper from a range of stakeholders. Submissions were received from irrigators and their representatives, commonwealth, state and local government bodies, brokers and exchanges, investors, indigenous water user representative groups, environmental groups and members of regional communities.

All public submissions are available on the ACCC's website.²²

²² ACCC, *Murray-Darling Basin water markets inquiry*, 2021, <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry>.

1.3 Public forums

In November 2019, the ACCC held 10 public forums across the Basin. The forums focused on hearing the views of those engaged in, or affected by, markets for tradeable water rights in the Basin.

Table 1.1: Public forums held across Basin

Location	Date
Mildura, Victoria	7 November 2019
Renmark, South Australia	8 November 2019
Griffith, New South Wales	11 November 2019
Deniliquin, New South Wales	12 November 2019
Kerang, Victoria	12 November 2019
Shepparton, Victoria	13 November 2019
Dubbo, New South Wales	18 November 2019
St George, Queensland	20 November 2019
Narrabri, New South Wales	21 November 2019
Murray Bridge, South Australia	29 November 2019

The forums were attended by ACCC Commissioners and staff. The ACCC heard a range of views from the approximately 800 market participants and interested parties in attendance. The summaries of these forums are available on the ACCC website. The ACCC thanks all attendees for their time and contributions.

The ACCC also held site visits and over 100 meetings during the inquiry, including with irrigators and their representatives, irrigation infrastructure operators (IIOs), government agencies, brokers and intermediaries, and investors.

The ACCC also hosted group feedback sessions in late October 2020 to hear feedback on the interim report. A summary of the issues raised during these sessions was also published on its website.

1.4 Compulsory information requests

The ACCC used its compulsory information gathering powers under part VIIA of the CCA to obtain information and documents. The ACCC issued over 50 notices under s. 95ZK of the CCA to investors, brokers and intermediaries and large water users.

These notices enabled the ACCC to examine a wide range of information and documents that have not been available to past examinations of water markets. This included reviewing internal strategy documents, communications, contracts and data. Notice recipients claimed confidentiality over the majority of material submitted.

The ACCC conducted two private hearings of representatives of a large investor to examine its investment and trading strategy and trading activities.

1.5 Voluntary information requests

The ACCC also issued voluntary information requests to a number of Australian and Basin State government agencies, in order to analyse the substantial volumes of data that exists relating to water markets. This enabled the ACCC to conduct an in-depth examination of trade data to inform the analysis contained in the final report.

The ACCC also issued 11 voluntary information requests and one compulsory notice to IIOs to obtain information and data.

The ACCC acknowledges the cooperation by Australian and Basin State government agencies, IIOs and other market participants in responding to information requests.

1.6 Data collection and analysis

The ACCC obtained most of the data analysed in this report through the compulsory and voluntary information requests described above. The ACCC's analysis of Basin water markets has relied on the accuracy of the information and data supplied.

The ACCC acknowledges that much of this data has been generated from processes and systems that focus on service delivery and physical water management, rather than facilitating markets for tradeable water rights. This creates very different datasets from one entity to the next, even when providing similar types of data.

The ACCC is confident in its analysis and findings despite the limitations in the data. The ACCC's analysis and findings should be interpreted in the context of these limitations. These are discussed in chapters 6, 10, 13 and 15 of this report, and are more generally explored in appendix G.

1.7 Reports

The ACCC engaged researchers at the Centre for Global Food and Resources at the University of Adelaide and the Health Research Institute at the University of Canberra to analyse data collected in surveys undertaken across the Basin between 1998 and 2018. The ACCC incorporated relevant data and analysis from these reports in the ACCC's final report.

The ACCC also engaged Frontier Economics to assist with its market architecture and governance analysis. Frontier Economics worked with the ACCC, the MDBA and the Southern Basin States, and drew on data and information collected and supplied by the ACCC, to undertake independent analysis. The ACCC has drawn on the Frontier Economics report in preparing this report, and credited Frontier Economics where appropriate. The ACCC will publish the Frontier Economics report on the ACCC website along with this report.

1.8 Interim report, submissions and final report

The ACCC released an interim report on 30 July 2020. The closing date for submissions was extended to 30 October 2020.

The ACCC received over 91 submissions in response to the interim report from a similarly diverse range of stakeholders as those that made submissions to the issues paper. The final report builds on our analysis undertaken throughout the inquiry. The final report was provided to the Treasurer on 26 February 2021.

02

Market trends

This part comprises three chapters which provide an overview of Basin water markets and introduce key concepts and issues which are explored in greater detail in other parts of this report.

Chapter 2 briefly describes the purpose, function and governance of Basin water markets, and the kinds of rights that are traded.

Chapter 3 provides an overview of recent trends in water markets, for the period 2012-13 to the present. It then examines key supply and demand drivers, and considers some implications of trends and drivers for water market outcomes.

Chapter 4 describes the different types of traders who participate in Basin water markets, and discusses traders' 'water ownership and trading strategies'. It then considers potential barriers to more effective water market engagement, with a particular focus on irrigators as the largest group of water users, and traditional owner groups, who face unique issues in accessing water and water markets.

2. Water market basics

Key Points

The Basin is not characterised by just one market for just one product called ‘water’. There is a set of interrelated markets, involving many types of tradeable water rights and geographic areas, that support the trade of:

- rights to access or receive water (water access rights and irrigation rights)
- rights to delivery capacity or to have water delivered through certain specified infrastructure (water delivery rights).

Key reasons for having water markets are:

- Water is scarce. Its most valuable use will change over time as commodity prices and other supply and demand drivers change. Trading in water markets helps people access water where it is valued most; to put it to its most productive use.
- Markets and trading give individual people and businesses more choice in, and more responsibility for, their tradeable water rights.

Markets for tradeable water rights in the Murray–Darling Basin involve many participants and facilitators, variously under private, co-operative and government control. Key participants include:

- irrigation infrastructure operators
- irrigators
- infrastructure operators, such as the Murray–Darling Basin Authority, Goulburn–Murray Water and WaterNSW, who operate key storages, rivers and delivery infrastructure
- investors, being parties that hold water assets to make money out of trading or holding them
- intermediaries, such as brokers.

The dominant determinant of total supply across the Basin is rainfall, followed by the Murray–Darling Basin Plan. Rules and policies, such as trading zones and Basin State water regulations, also strongly shape how much water is available, where and when. River flow considerations and state borders have led to the development of a complex set of location-based trading rules, particularly rules governing trade between trading zones, and into and out of irrigation networks.

This chapter explains how and why water is traded in the Murray–Darling Basin (the Basin) and gives a broad overview of who is trading, what and where.

2.1 Introduction to the Murray–Darling Basin

The Basin extends across southern Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia (the Basin States). The water rights traded in the Basin largely relate to the water flowing in the catchments of the Basin’s rivers, such as the Murray, the Goulburn, the Murrumbidgee and the Darling. Basin water users may also use and trade groundwater, from aquifers, and use water that falls or flows directly onto their properties.²³

The Basin is broadly split into two large regions: the Southern Basin and the Northern Basin (figure 2.1).

²³ Where use of water that falls or flows directly onto a property involves intercepting water that would otherwise flow, directly or indirectly, into a watercourse, lake, wetland, aquifer, dam or reservoir that is a Basin water resource, it is referred to as an ‘interception activity’. See *Water Act (2007)* (Cth), s.4. This form of water use may or may not occur under a water access right; this is governed differently across Basin States.

Figure 2.1: Map of Northern Murray–Darling Basin and Southern Murray–Darling Basin



Source: Murray–Darling Basin Authority.²⁴

24 MDBA 2018, <https://www.mdba.gov.au/discover-basin/landscape/geography>, viewed 25 June 2020.

2.1.1 Southern Murray–Darling Basin

The Southern Murray–Darling Basin (Southern Basin) comprises surface-water systems – rivers, lakes and wetlands – incorporating the Murray River and its various tributaries across the ACT, NSW, Victoria and South Australia, as well as the groundwater systems (not including the Great Artesian Basin) underlying these surface-water systems.²⁵

The Southern Basin accounts for a large proportion of Australia’s irrigated agricultural production, which includes significant areas of broadacre cropping in southern New South Wales (including annual crops such as rice, cotton and pasture), dairy farming and horticulture in northern Victoria, and horticulture in South Australia. The Southern Basin also contains many significant communities and internationally-recognised environmental sites.

The Southern Basin also accounts for a large volume of Australia’s ‘water access entitlements’ (entitlements) on issue. Over 95% of the nominal volume of entitlements on issue in the Southern Basin are within regulated surface water systems. A ‘regulated system’ is one where the water flow is managed through artificial structures such as large dams and weirs. This means that water management authorities can, to a degree, manage the amounts and timing of water flowing down the river and also store it. Many sections of the largest rivers in the Southern Basin are ‘regulated’. For example, the River Murray is regulated by Hume and Dartmouth Dams and other water infrastructure such as locks and weirs. Smaller water courses are often ‘unregulated’, which means they do not have the infrastructure to regulate the flow of water.

There is a high degree of ‘hydrological connectivity’ between many of the regulated surface water systems in the Southern Basin. In general terms, this means the water sources are connected and water originating from one can be diverted or extracted from the other, within certain limits. This has meant that the Southern Basin has become Australia’s most significant water market, accounting for between 80 and 90% of all water rights trading activity across Australia.²⁶ Further, it is regarded by many as the most sophisticated water market in the world.²⁷ For this report, these connected regulated surface water systems are defined as the Southern Connected Murray–Darling Basin (Southern Connected Basin) and include the New South Wales systems of New South Wales Murray, Murrumbidgee and Lower Darling systems; the Victorian systems of Goulburn, Victorian Murray, Ovens and Loddon; and the South Australian River Murray system.²⁸

Groundwater and unregulated surface water are also important water resources for producers, consumers, communities and the environment in the Southern Basin. For groundwater, key water systems in the Southern Basin include Murray Alluvium and Murrumbidgee Alluvium in New South Wales and Goulburn–Murray in Victoria.

25 Groundwater is the water that sits beneath the earth’s surface. It is stored in fractured rocks, porous rocks and soils called aquifers or groundwater systems. Groundwater can be connected to surface water, which includes the water in our rivers and wetlands. Unlike surface water, groundwater resources can take longer to recharge – or refill with water – when water is taken. This may be weeks, months, years or even hundreds of years in some systems. Source: Murray–Darling Basin Authority (MDBA) 2019, <https://www.mdba.gov.au/basin-plan-roll-out/groundwater>, viewed 11 June 2020.

26 Bureau of Meteorology, *Australian Water Markets Report 2017–18: Southern Murray–Darling Basin section*, BOM, Melbourne, 2019, p. 5.

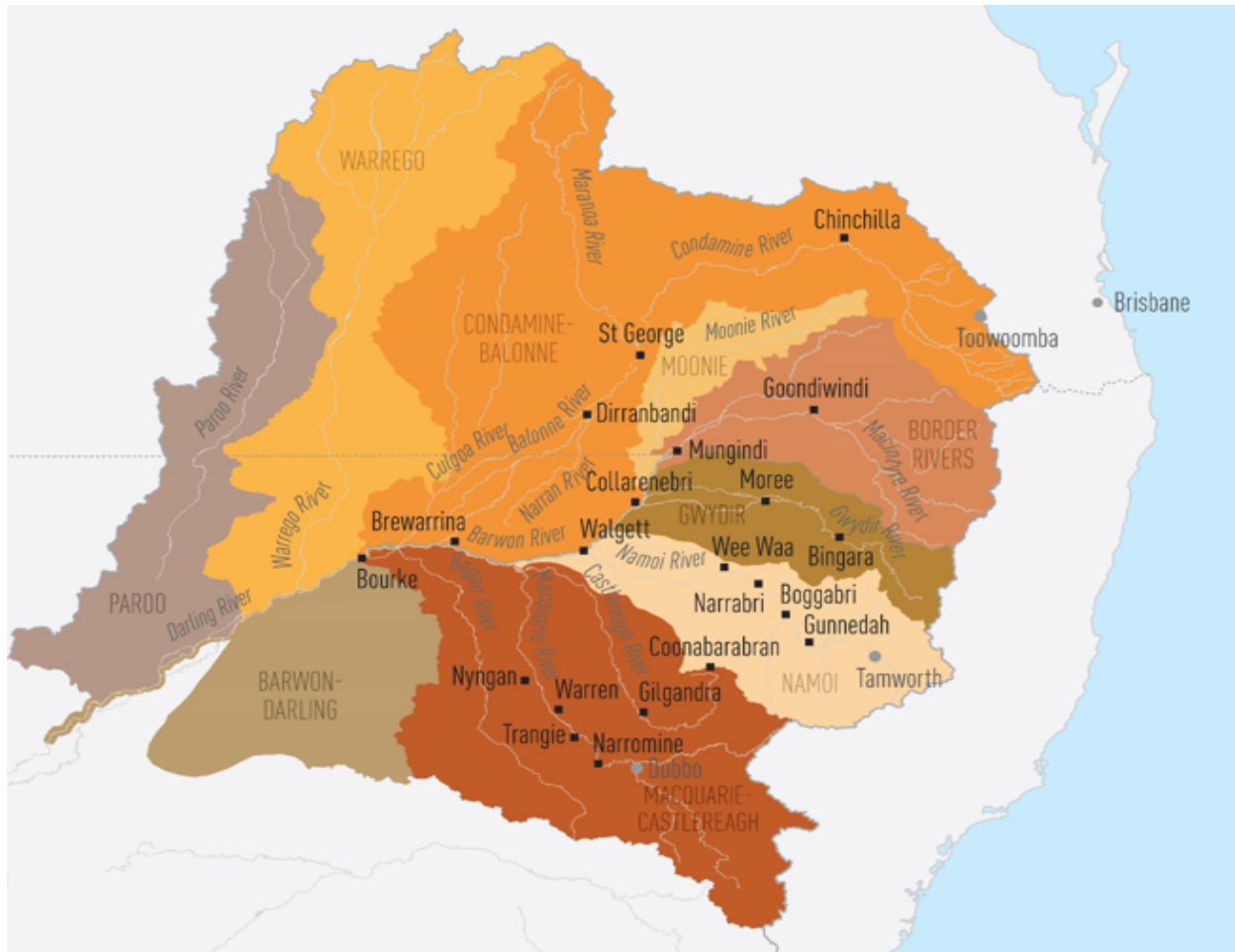
27 Australian Bureau of Agricultural and Resource Economics and Sciences, *Australian Water Markets Report 2016–17*, ABARES, Canberra, 2018, p. 16.

28 For the purpose of this report, the ACCC defines the Southern Connected Murray–Darling Basin as comprising the following trading zones: 1A Greater Goulburn, 1B Boort, 2 Broken, 3 Lower Goulburn, 4A Campaspe – Eppalock to WWC, 4C Lower Campaspe, 5A Loddon – CC/Tull to LWP, 6 VIC Murray – Dart to Barmah, 6B Lower Broken Creek, 7 VIC Murray–Barmah to SA, 10 New South Wales Murray Above Choke, 11 New South Wales Murray Below Choke, 12 SA Murray, 13 Murrumbidgee and 14 Lower Darling.

2.1.2 Northern Murray–Darling Basin

The Northern Murray–Darling Basin (Northern Basin) comprises the catchment of the Barwon–Darling River system and its tributaries upstream of Menindee Lakes (figure 2.2). This is primarily a range of systems along tributaries of the Darling River.²⁹

Figure 2.2: Map of Northern Murray–Darling Basin



Source: Murray–Darling Basin Authority.³⁰

The Northern Basin includes over half of the Basin's total area. It is more arid and flat than the Southern Basin, and rainfall and resulting stream flows are more variable compared to the south. Northern Basin rainfall is summer dominant (more rain falls in the summer) compared to winter dominant in the Southern Basin. These features of the Northern Basin have meant that the surface water resources have been developed and managed differently to the Southern Basin. The proportion of flows regulated by dams is much lower and a significant proportion of irrigation production relies on diverting unregulated flows directly into large, privately constructed, off-stream storages.³¹

29 For the purpose of this report, the ACCC defines the Northern Murray Darling Basin as incorporating the following systems: Barwon–Darling, Lachlan, Macquarie–Castlereagh, Gwydir, Namoi, New South Wales Border Rivers, Queensland Border Rivers, Moonie, Condamine–Balonne and Warrego–Paroo–Bulloo–Nebine. The Lachlan River, an intermittent tributary of the Murrumbidgee, is included in the Northern Basin.

Source: ABARES, 'Northern Murray–Darling Basin chapter', *Australian Water Markets Report 2015–16*, 2017, p. 1 at <https://www.agriculture.gov.au/abares/research-topics/water#australian-water-markets-reports>, viewed 25 June 2020.

30 Murray–Darling Basin Authority, *Northern Basin Review Report*, 2016.

31 Murray–Darling Basin Authority, *Constraints Management Strategy 2013 to 2024*, 2013, p. 13.

In general, water markets are less developed for the Northern Basin compared to the Southern Basin. This has been attributed to a range of factors, including that, compared with the Southern Basin, the Northern Basin:

- has fewer regulated systems, with less hydrological connectivity – that is, water from one system cannot be diverted or extracted from the other easily or at all
- has more variation in water supply
- has irrigators that rely more on groundwater
- has irrigators that use more on-farm storages
- has fewer irrigators
- historically has been monitored less strictly for extractions
- has greater ‘homogeneity’ among water users – that is, less differences in demand, which is a key driver of potential gains from trade.³²

2.2 Water sources and uses in the Murray-Darling Basin

The starting point for and dominant determinant of how much surface water can be supplied is the amount of precipitation – rain and snow – that is received in catchments. How much of that water is available in a particular storage or river reach at any one time is then shaped by:

- hydrology – the amount and timing of flows and physical limits on them
- climatic conditions, such as evaporation rates
- human decisions on water management.

By agreement, Basin State governments have capped the total amount of water that can be extracted in the Basin. This is designed to ensure that the total amount users can extract is sustainable in the long-term. The exact level of the cap has changed over time. Basin States introduced the first cap on diversions in 1995. The Basin Plan 2012 (the Basin Plan) introduced a new water accounting and compliance framework based on ‘sustainable diversion limits’, which came into force on 1 July 2019.

The water held in storages and flowing down the rivers broadly falls into one of several different use classes. Much of the water is allocated, through the entitlement framework, to ‘consumptive uses’, to be consumed by people for drinking and other domestic use (‘critical human needs’); watering cattle, sheep and other stock; and in business activities that use water intensively, including mining and irrigated agriculture. The single sector that uses the most water in the Basin is irrigated agriculture, which includes growing crops such as cotton and rice, horticulture (including nuts, fruit and vegetables) and dairy (see chapter 3).

In addition to consumptive uses, water resources are also allocated to sustaining the natural environment. Minimum flows for the environment have been a part of the water management framework for a long time. However, since at least the late 1990s, governments have recognised that those minimum flows were insufficient to maintain the Basin’s water systems on a sustainable footing. As part of a process of resetting the balance between consumptive and environmental water uses, governments established statutory bodies referred to as environmental water holders (see section 2.10), and acquired entitlements from consumptive users for these environmental water holders to use to achieve environmental outcomes. This process has reallocated significant volumes from consumptive water to environmental water. Other non-consumptive uses also exist; for example, many cultural or recreational uses of water.

32 S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, p. 46.

2.3 Types of tradeable water rights

To best understand markets for tradeable water rights in the Basin, it helps to understand that the Basin area is not characterised by just one market for just one product called ‘water’. There is a set of interrelated markets, split across product types and geographic areas, which support the trade of rights to *access* or *receive* water; and rights to delivery capacity or to have water delivered through certain specified infrastructure. Not all rights to water are tradeable. The key types of tradeable water rights are:

- water access rights, including entitlements and allocations
- water delivery rights (delivery rights)
- irrigation rights.

Different Basin States use different terminology for tradeable water rights. This report uses the generic terms for tradeable water rights as defined in the Commonwealth *Water Act 2007* (Water Act), such as ‘water access entitlements’, or a shorthand term for these, such as ‘entitlements’.

Another key concept to understand is ‘carryover’, which involves holding or ‘carrying over’ water allocated in one period, for use in a subsequent period (see box 2.1).

Box 2.1: Timing mechanisms–carryover and continuous accounting

Historically, water accounting operated on a simple annual basis, under which users forfeited any water not used or traded by the end of the water year back into the general pool of water in storage, and therefore available to be re-allocated in the following water year. Under this system, users had incentive to use or trade all their water in the current water year, because they could never be certain how much water they would be allocated in the following year. This was one driver of inefficient water use.

In recognition of this incentive encouraging inefficient water use, and to help water users to plan, governments have developed several mechanisms to allow water users to retain at least some of the water allocated to them during one water accounting period, for use during a subsequent period. These mechanisms give individual entitlement holders tools to better manage their access to water over time, allowing farmers to save their unused water from wet years for later use in dry years. These mechanisms differ between states, river systems and irrigation infrastructure operators (IIOs), and are affected by how allocations are made by states and the license type.

- **Carryover** is a mechanism used in systems that have kept the annual approach to water accounting. Instead of re-setting account balances to zero at the start of the new water year (as happened under historical approaches), carryover allows water users to keep at least some (if not all) of their water in their water accounts at the end of the year, for use or trade in the next water year. Carryover was initially introduced by states as a temporary measure during the Millennium Drought (1996 to 2010³³). Its aim was to help farmers deal with the impacts of the drought, allow farmers to smooth out their consumption of water and reduce the ‘use-it-or-lose-it’ approach. All states kept carryover following the end of the Millennium Drought. Carryover can be particularly beneficial to water users where there are limited opportunities for on-farm storage (as is the case in much of the Southern Basin) or to trade water.
- **Continuous accounting** adopts a different approach. It effectively removes the artificial construct of the annual water accounting period, and simply allocates water resources as inflows occur. There is no re-setting of account balances to zero at the start of a water year, and so there is no need for an additional ‘carryover’ mechanism, since account balances in a sense automatically carry over.³⁴ Annual accounting may still be used for reporting on aggregate allocation, trade and use, and still may be a relevant concept in terms of setting the maximum amount of water any person is eligible to receive or use³⁵, but the key difference is that the end of the water year (usually 30 June) does not have a significant impact on water users’ account balances.

Carryover and continuous accounting mechanisms have important implications for trade, as they allow water users to move water use or trade in time as well as geographically. The contribution of these mechanisms to water market trends is discussed further in chapter 3. Carryover policy is discussed in more detail in part 5.

33 Bureau of Meteorology 2015, www.bom.gov.au/climate/updates/articles/a010-southern-rainfall-decline.html, viewed 11 June 2020.

34 C Ribbons, *Water availability in New South Wales Murray–Darling Basin regulated rivers*, 2009, New South Wales Department of Water and Energy.

35 A person may be allocated water as inflows occur, but there may still be a cap on their overall use in a given accounting period. For example: ‘A continuous accounting system operates for the New South Wales Border Rivers allowing general security users to accrue water in their accounts up to 100% of entitlement (264,411 ML). The maximum usage (including trade out) in any year is 1.0 ML per unit share (264,411 ML).’ C Ribbons, *Water availability in New South Wales Murray–Darling Basin regulated rivers*, 2009, New South Wales Department of Water and Energy, p. 7.

2.3.1 Water access rights

A **water access right** is a generic term referring to a statutory right to take (use) or hold water.³⁶

Historically, water access rights were tied to land. This meant that ownership of the water right only changed when ownership of the land changed; and use of that water right was bound to one specific location. Increasingly in the Basin, many forms of water access rights have been separated or ‘unbundled’ from the land.³⁷ A right holder can continue to use their water access right on their land; but can also trade it away, for use in another place, permanently or temporarily. The right holder can also sell their unbundled water access right to another person, without also selling their land.³⁸ There are however some significant exceptions, where the rights holder cannot trade away the right. These include what are called ‘riparian’ (essentially riverside) rights and rights for watering stock.

The two key categories of water access rights are entitlements and allocations:

- An **entitlement** is a perpetual or ongoing statutory right to a share of a water resource.³⁹ It is often called a ‘permanent’ right; and so is one kind of right traded in ‘permanent markets’ (also referred to as ‘permanent trade’). Entitlements are often specified as a volume amount per year, typically in megalitres (ML) or number of shares of the water resource.
- An **allocation** is a specific volume of water allocated to an entitlement in a given water accounting period, usually a water year.⁴⁰ It is sometimes called a ‘temporary’ right, and so is one type of right traded in ‘temporary markets’ (also referred to as ‘temporary trade’). Allocation policies differ across water systems and states, and are discussed further below.

There are different classes of entitlement, often relating to ‘reliability’ or ‘security’, which each Basin State assigns different names (Table 2.1). Given water is scarce and the amount available varies greatly from time to time, classes of rights holders are often ranked in terms of who will be supplied ‘first’ and who receives lower priority, and how much of their nominal full entitlement they are likely to receive. Entitlement classes can be distinguished in terms of their historic reliability, which is a parameter indicating the likelihood that an entitlement will receive 100% of its ‘face value’ by the end of the water year.⁴¹

36 See *Water Act 2007* (Cth), s. 4.

37 For more information, see, for example, ACCC, *Water Trading Rules – Final Advice*, 2010, p. 43 at <https://www.accc.gov.au/regulated-infrastructure/water/water-trading-rules-advice-development/final-advice>, viewed 11 June 2020.

38 The water rights holder could also sell the land and keep the water rights.

39 See *Water Act 2007* (Cth), s. 4: ‘water access entitlement means a perpetual or ongoing entitlement, by or under a law of a State, to exclusive access to a share of the water resources of a water resource plan area.’

40 See *Water Act 2007* (Cth), s. 4: ‘water allocation means the specific volume of water allocated to water access entitlements in a given water accounting period.’

41 Note that the timing of announced allocations, while an important factor for water users, does not factor into reliability calculations. Therefore, historic reliability only partially characterises the ‘yield’ of different entitlement classes.

Table 2.1: Key entitlement classes in regulated surface water systems

State	Class	Explanation of right	System
NSW	High security	Holder will generally receive its full water allocation before general security entitlements receive an allocation. NSW high security entitlements are generally not eligible to access carryover.	Belubula, Gwydir, Lachlan, Lower Darling, Macquarie–Cudgegong, Murrumbidgee, Namoi, NSW Border Rivers, NSW Murray, Peel
	General security	A lower priority to receive allocation. Once system commitments have been met, the available water asset is then available for distribution to the access licence categories in order of priority; general security entitlements have a lower priority than high security and conveyance entitlements. NSW general security entitlements are generally eligible to access carryover; rules vary across systems.	Belubula, Gwydir, Lachlan, Lower Darling, Macquarie–Cudgegong, Murrumbidgee, Namoi, NSW Border Riversb, NSW Murray, Peel
	Supplementary	Supplementary flow events are announced periodically during the season when high flow events occur, with the period of extraction and volume of water to be extracted determined based on the rules as set out in the relevant water sharing plans.	Belubula, Gwydir, Lower Darling, Macquarie–Cudgegong, Murrumbidgeec, Namoi, NSW Border Rivers, NSW Murray
	Conveyance	Water needed to operate off-river water infrastructure such as irrigation networks. Some NSW irrigation infrastructure operators (IIOs) (discussed in box 2.2), but not all, hold such entitlements. NSW conveyance entitlements are generally eligible to access carryover; rules vary across systems.	Lachlan, Murrumbidgeed, NSW Murray
Vic	High reliability	Holder will generally receive its full water allocation before Low reliability entitlement holders receive an allocation. Victorian high reliability entitlements generally have access to carryover, with carryover in excess of 100% of entitlement volume subject to spillable water account rules, although rules vary across systems.	Broken, Bullarook, Campaspe, Goulburn, Loddon, Victoria Murray, Ovens and King
	Low reliability	A lower priority to receive allocation. Victorian low reliability entitlements generally have access to carryover, with carryover in excess of 100% of entitlement volume subject to spillable water account rules, although rules vary across systems.	Broken, Bullarook, Campaspe, Goulburn, Loddon, Victoria Murray
	Spill reliability	Available to customers while the storages in these systems are spilling.	Ovens and King

State	Class	Explanation of right	System
Qld	High priority	Chinchilla Weir Water Supply Scheme (WSS) and Upper Condamine WSS: Announced allocations for High Priority water allocations are calculated and announced on the first day of each water year. St George WSS: continuous sharing rules apply (which operates as an alternative to carryover), but High priority is prioritised over medium priority.	Chinchilla Weir WSS, St George WSS, Upper Condamine WSS ^a , Border Rivers WSS

Source: Adapted from water products information available on MDBA website.

Notes: This table summarises the main categories of entitlements on issues but is not an exhaustive list. WSS = Water Supply Scheme.

a Upper Condamine WSS has High Priority Class A and High Priority Class B.

b New South Wales Border Rivers has General Security A and General Security B.

c Murrumbidgee has Supplementary and Supplementary (Lowbidgee).

d Murrumbidgee has Conveyance, Coleambally Irrigation Conveyance and Murrumbidgee irrigation Conveyance. Further information on how carryover eligibility varies by entitlement class and water system is available in section 15.2 in chapter 15.

2.3.2 Basin State governments allocate water

The Basin States, the Murray–Darling Basin Authority and the Border Rivers Commission jointly manage the Basin's rivers. The Murray–Darling Basin Authority (MDBA) operates the River Murray on behalf of New South Wales, Victoria and South Australia (the MDBA's roles are explained in more detail in section 2.11). Under the Murray–Darling Basin Agreement, the MDBA determines the amount of water available for each state. It is then up to the states to determine how that water is allocated to individual entitlement holders, and the MDBA is not involved in these decisions or processes. The Border Rivers Commission plays a somewhat similar role in the Queensland–New South Wales border region, operating and maintaining jointly “owned” water infrastructure and implementing agreed water sharing arrangements in that region, on behalf of the New South Wales and Queensland governments.⁴²

Allocations and entitlements in regulated systems

Water allocation decisions are made by the manager of a water resource and in line with the relevant jurisdiction's allocation rules and policies. In making allocation decisions, resource managers take into account a range of factors such as precipitation (rainfall) and snow melt and the resulting inflows into the system, expected future inflows, storage levels, operational commitments such as water needed to cover expected losses, and the volume of different classes of entitlement on issue and the priority order of those entitlements.

Most regulated systems in the Basin operate on an ‘announced allocation’ system, where allocations are made against entitlements on a periodic and incremental basis, up to a nominal volume which depends on total water availability. The resource manager announces a starting or ‘opening’ allocation, and then may increase or ‘improve’ it over the course of the water year, as additional inflows are received into storages. This is particularly common with lower reliability rights such as general security entitlements in NSW; some high reliability rights may be allocated 100% of their volume in the ‘opening’ announcement for the water year, particularly in years of relatively higher water availability. For example, for an entitlement of 100 ML, an ‘opening’ announced allocation of 30% would mean that 30 ML of allocation would be available for use (or trade). Later in the water year, as water availability improves, a further 20% of allocation may be announced. This would mean that in total 50 ML would have been allocated against the 100 ML entitlement. If absolutely necessary, the resource manager can also decrease announced allocations, although this only occurs under severe water shortage circumstances as it has significant implications for water users. For historical data on allocation announcements, see section 3.2.1.

Water users then are able to order or take the water allocated against their entitlement, placing obligations on infrastructure operators to provide access to it.

42 Border Rivers Commission website, <http://www.brc.gov.au/>, viewed 2 February 2020.

Water sharing and entitlements in unregulated systems

In an unregulated system, water users are not allocated a specific volume at a point in time, and do not order any water against their water access right. Instead, right holders may extract water under specified flow conditions or events, in accordance with the maximum volume, and any other conditions, specified in their entitlement. Entitlements in unregulated systems (and regulated systems with continuous accounting rules) can specify maximum volumes that can be taken either in one year or in relation to an average annual volume over a period of several years.

2.3.3 Irrigation rights

Water users located within irrigation networks in New South Wales and South Australia commonly hold ongoing rights to receive water from their off-river water infrastructure provider, known as an irrigation infrastructure operator (IIOs). These non-statutory rights are known as 'irrigation rights', and are often called 'permanent' rights to indicate their ongoing nature. Trade of these rights is often referred to as 'permanent trade'. The specific volume of water a person can access in a given period under a permanent right is sometimes called a 'temporary' irrigation right. An IIO's approval is required to trade an irrigation right.

Where irrigation rights are specified, the IIO holds entitlements to fulfil obligations to customers who hold irrigation rights. Consequently, IIOs are significant holders of water access rights (entitlements and allocations) in the Basin, particularly in New South Wales and South Australia.⁴³

Irrigation right holders within an irrigation network are able to 'transform' their (permanent) irrigation rights into statutory entitlements. When transformation occurs, the volume of the entitlements held by the IIO itself is reduced via a subdivision of the IIOs entitlement, or a permanent trade from the IIO's entitlement. Correspondingly, a new entitlement (or increase in volume to a pre-existing entitlement) is issued, either to the transforming irrigator or another person if the transformation happens as part of a trade. The holder of the entitlement resulting from transformation can trade the entitlement or the water allocated to it outside the area and membership of the irrigation network, without needing IIO approval.

2.3.4 Water delivery rights

A water delivery right is a right to have water delivered by an Infrastructure Operator. It may take the form of a statutory right or be an express or implied contractual agreement that allocates a share of an infrastructure network's delivery capacity to the holder. Having these rights on issue helps allocate and manage infrastructure capacity.

2.4 Temporary trade: water allocation and temporary irrigation rights

When water allocation was first introduced as a concept, it was, in a sense, a 'temporary' right, in that holders of entitlements had to use (or, when available, trade) the volume of water allocated to their entitlements within the water year; any remainder was forfeited back into the general pool of water for reallocation in the following year. Therefore, markets for allocation are often referred to as 'temporary markets'.

However, since the introduction of 'carryover' and 'continuous-accounting' rules (see section 2.3), allocation can be banked for use or trade in a future period, subject to the rules. Therefore, allocations continue to be 'temporary' in the sense that allocations credited to a user's account are drawn down as a person uses or sells water, but no longer necessarily expire at the end of the water year.

The issuing or crediting of new allocations is still linked with entitlements, as entitlements are the mechanism used to determine what proportion or volume of water to credit to water accounts.

⁴³ See section 4.1.3 in chapter 4.

Once allocations have been issued, they can usually be traded and held independently of entitlements. Generally, a person does not need to hold an entitlement in order to purchase and use an allocation, and a person who does hold an entitlement can independently sell any allocation they have been issued.⁴⁴ An entitlement holder can trade away this allocation, while retaining their entitlement long term. Such transactions are therefore often called ‘temporary trades’ and are the most common type of trade in the Basin (see chapter 3).

Likewise, trade of specific volumes of water within IIOs is also known as ‘temporary trade’. Temporary trade of irrigation rights functions much the same as allocation trade outside of IIOs (see box 2.2).

Box 2.2: What is the difference between an allocation trade and temporary trade of irrigation right?

The key differences are:

- For temporary irrigation right trades wholly within an IIO’s irrigation network, the IIO itself is the trade approval authority, and the Basin State authorities are not involved in approving or recording the trade.
- Where a person located within an IIO’s irrigation network wants to undertake a temporary trade with a person located outside the network, two transactions occur in tandem. For the case of an internally located seller:
 - Within the irrigation network, the seller relinquishes some of their temporary irrigation right to the IIO.
 - Outside the irrigation network, the IIO’s undertakes an allocation trade from its allocation account (or licence, if in New South Wales) to the account (or licence) of the externally-located buyer.

This process is reversed for an external seller-internal buyer.

There are several different ways allocations (and temporary irrigation rights) can be traded:

- **Ownership transfer:** changing the ownership of the whole or part of an allocation or temporary irrigation right from one owner to another. In this case the seller’s water account will be debited, and the buyer’s account credited, to reflect the trade. In some systems, a transmission loss factor may be applied to the trade (such that the buyer’s credited volume differs from the seller’s debited volume), but in most cases the amount sold equals the amount purchased.
- **Intra-zone/intra-valley trade:** this kind of trade changes the location at which allocation/temporary irrigation right may be taken, *within* a given trading zone or ‘valley’.
- **Inter-zone/inter-valley trade/transfer (IVT):** changing the trading zone in which allocation can be used and carried over. This kind of trade occurs via the Basin State debiting the seller’s account in the origin trading zone, and crediting the buyer’s account in the destination trading zone. It effectively results in allocation issued in one zone being cancelled and re-issued in another zone. This kind of trade is subject to inter-valley trading rules (discussed in section 2.6).
- **Tagged allocation trade:** This kind of trade means that the water that is allocated in one location (for example, a catchment or trading zone) can be physically extracted (used) in another, as a result of a ‘tag’ placed on the water user’s account in the Basin State water register. This is different to regular inter-zone allocation trade because the allocation is still linked to the origin zone – for example, it is

44 However, in New South Wales, a person must hold a New South Wales Water Access Licence (WAL) in order to hold a water allocation. In this case, the WAL performs the role of forming the basis of a water account. This WAL does not need to have any entitlement volume associated with it; users are able to hold ‘zero-share WALs’ which do not receive any allocation when available water determinations are made (because the holder is entitled to a ‘zero share’ of available water resources), but which enable the holder to purchase and use water allocations.

assessed against origin zone rules for carryover or further trade. This type of trade is currently only available in Victoria and the NSW-Queensland Border Rivers.⁴⁵

- **Forward contracts:** for allocations: a contractual agreement to trade allocation in the future.
- **'Carryover parking':** an agreement or contract to conduct paired allocation trades at the end of one water year and the start of the next water year, to take advantage of differential access to carryover (see box 2.1 for an explanation of carryover)
- **Options contracts for allocations:** a contractual agreement to provide an option to purchase allocation at a future time, when specified conditions are met.

A given trade may combine elements of these different trade types. For example, a trade between one irrigator located in New South Wales with another in Victoria involves both a change of ownership and an inter-zone change of location. Also, forward contracts, carryover parking and options contracts are private agreements between parties, and to give effect to them one or more of the methods above will need to be used (i.e. ownership transfer, intra- or inter-zone trade, etc.).

2.5 Permanent trade: entitlements and permanent irrigation rights

Entitlement trades, also known as 'permanent trades', are transactions which change the ownership and/or *location* of entitlements and permanent irrigation rights⁴⁶.

Traditionally, water users traded entitlements in a simple sale transaction to change the ownership of the right; for example, as part of the process of changing the ownership of an irrigated farm. However, now that entitlements have been unbundled from land, there is a variety of options for trading entitlements and permanent irrigation rights:

- **Entitlement ownership transfer:** changing the ownership of the whole or part of a permanent right from own owner to another.
- **Tagged entitlement trade:** This kind of trade means that the water that is allocated to an entitlement issued in one location can be physically taken in another, via the process of placing a 'tag' authorising the different extraction location on the entitlement in the relevant Basin State water register. When an allocation announcement is made to the entitlement in the source zone, the tag is automatically activated and the purchaser is credited with the volume allocated and can order water for delivery in the destination zone (unless restrictions apply⁴⁷).
- **Multi-year entitlement leases:** a statutory lease or contractual agreement to give the lessee the right to use, trade, or carryover a whole or part of allocations made in respect of a particular entitlement for the term of the lease.

2.6 Overview of location based trading rules

Physical parameters and legal frameworks shape the locations and boundaries of trade. When water access rights are traded, it is important to consider two locational aspects of the right:

- First, the 'source' of the water. This is generally defined in geographic terms with respect to water catchment areas and state borders. For example, the Murray catchment is divided up into New

45 Department of Environment, Land, Water and Planning (Victoria) n.d., <https://waterregister.vic.gov.au/water-trading/trading-rules>, viewed 11 June 2020; Queensland Government, n.d. Interstate water market, <https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/interstate>, and NSW Department of Industry, 2018), NSW Border Rivers Surface Water Resource Plan, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0012/206103/nsw-border-rivers-surface-water-resource-plan.pdf, p. 62, viewed 2 December 2020.

46 Entitlement trades include where right holders trade only a portion of their entitlement, such as in a share component trade in New South Wales, and also leases of entitlements and permanent irrigation rights

47 Basin Plan Water Trading Rule 12.23 provides that if a restriction is in place on allocation trade between two locations, that restriction must also be applied to delivery of water available under a tagged water access entitlement, except if the limited exemptions set out in that rule apply. See section 14.1.7 in chapter 14 and section 16.3.2 in chapter 16 for further discussion of tagging arrangements.

South Wales Murray, Victorian Murray and South Australia Murray, as this catchment crosses state boundaries; whereas the Goulburn constitutes one single catchment, wholly within Victoria.

- Second, the ‘destination’ or ‘delivery’ location. This is where water available under the right is able to be extracted for use. When thinking about the delivery location aspect, it is important to keep in mind the physical ability to deliver water, which may need to take into account natural or operational constraints – for example, the physical size of the delivery channel or watercourse and environmental constraints.

There are at least two levels to think about when considering trade. At one level (often called the ‘retail’ level), there are right holders, such as irrigators and other water users; on another level (often called the ‘bulk’ or ‘wholesale’ level), there are the parties that have the role of providing the water to which the right holder is entitled: the infrastructure operators, who administer the water contained in their storages and operate the rivers and man-made infrastructure through which water is delivered.

Trading rules are needed to govern where and when changes to the source and/or delivery locations are allowed, taking into account potential impacts of these changes on third parties, including the environment. While it might be straightforward to change arrangements to give effect to a single trade, facilitating inter-zone trade in aggregate can entail complex considerations at the bulk level to make sure all users’ demands can be met with minimal impacts on other water users and the environment (see box 2.4).

Box 2.3: Example of how allocation trade changes infrastructure operator obligations at the wholesale level

John is an irrigator located within Goulburn-Murray Water’s (GMW) irrigation network in the Goulburn system in Victoria. John sells some of his allocation to Sarah, who is a ‘private diverter’ (that is, not within an IIO) located on the New South Wales River Murray. Before the trade, GMW has the obligation to supply John using water in the Goulburn System. After the trade, WaterNSW, in conjunction with the Murray-Darling Basin Authority (MDBA) (who operates the River Murray on behalf of New South Wales, South Australia and Victoria), has the obligation to supply Sarah at her property on the River Murray. GMW, MDBA and WaterNSW need to work together to transfer this supply obligation and ensure Sarah can use, or further trade, her new allocation when she wishes, which could be a long time after the actual trade has occurred.

When irrigation rights are traded purely within an IIO’s network, the obligations at the wholesale level remain the same as before, because water is still delivered from wholesale storages to the IIO’s extraction point. However, for this kind of trade, there is another intermediate level to consider – the obligations against the IIO itself. The extraction point may change from one location inside the network to another, and while this occurs on a much smaller scale than is possible for allocation trade, there may still be important differences in how the IIO needs to manage its network to continue to honour its obligations to its customers after the trade has occurred.

2.6.1 Borders and trading zones

As discussed in section 2.1, the Basin can be considered as two quite different and only loosely connected systems:

- the **Northern Basin** has both regulated and unregulated systems, and in general regulated systems are not hydrologically connected to each other;
- the **Southern Basin** has largely ‘regulated’ systems, with a good degree of hydrological connectivity between different regulated systems (although connectivity changes at different times).

The Darling River connects the Northern and Southern Basin, although it is ephemeral in many parts.

Authorities have defined trading zones throughout the Basin. Their boundaries are shaped by a mix of jurisdictional boundaries, such as state borders, and physical/hydrological considerations – largely that users in the zone will be drawing from the same source point, such as a particular storage or water course. Authorities place more restrictions on trade between zones than on trade within zones.

Trading zones are often defined as areas within which trade can freely occur. Authorities impose rules to ensure that there is enough water to meet the calls made on the water source, which in theory could come at any time in a year, and to take account of the impacts of trade on other water users and the environment.

Trading zone definitions could match the borders of a water source or catchment, but could also be a subset of the catchment, if there are delivery constraints that need to be taken into account. One key example is that the Victorian Murray and New South Wales Murray water sources are each divided up into zones above and below the significant natural constraint of the Barmah Choke (see below for more detail on the Barmah Choke trade restriction).

Trading zones in the Southern Basin

In the Southern Connected Basin, 15 trading zones have been defined (figure 2.3).

Figure 2.3: Inter-state trading zones, Southern Connected Murray–Darling Basin



Source: Murray–Darling Basin Authority.⁴⁸

Although the Murray is one river, it is split into 5 different zones. First, it is split down the middle for trading purposes all the way along the NSW–Victorian border. This NSW–Victorian section is further split into zones above and below the Barmah Choke, making two zones for the Victorian Murray (zones 6 and 7), and two for the NSW Murray (zones 10 and 11). When the Murray reaches the border with South Australia, it enters a new trading zone (zone 12).

Trade between zones in the Southern Connected Basin is possible, but is subject to inter-zone trading rules (sometimes also referred to as ‘inter-valley trading rules’ or ‘interstate trading rules’).

The four major allocation trade restrictions in the Southern Connected Basin are:

- Murrumbidgee inter-valley trade limit

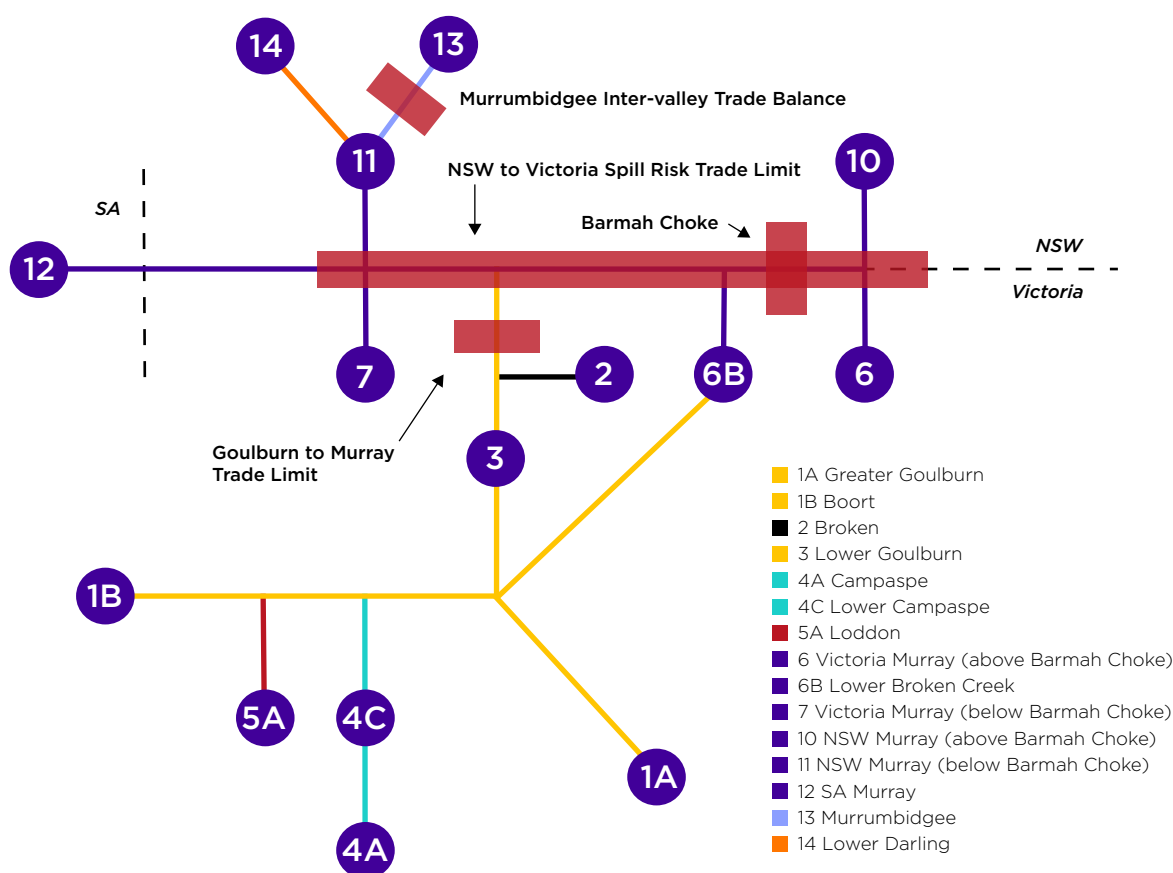
⁴⁸ Murray–Darling Basin Authority 2017, <https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade>, viewed 11 June 2020.

- Goulburn to Murray trade limit
- New South Wales to Victoria spill risk trade limit
- Barmah Choke trade restriction, which is used to manage the most well-known hydrological constraint in the Southern Basin: the Barmah Choke, where the Murray River runs through the Barmah-Millewa Forest, upstream of Echuca in Victoria.

Figure 2.4 provides a stylised representation of these trade limits, and also uses different colours to show each regulated system. Note that some systems (for example, the Murrumbidgee) are comprised of just one trading zone, whereas other systems (for example, the Goulburn and Murray) are comprised of several.

Chapter 3 and part 5 discuss the operation of inter-zone trading limits in more detail.

Figure 2.4: Southern Connected Basin trading zones and trade restrictions



Source: ACCC analysis based on information from Basin States.

Notes: In legend, yellow indicates trading zones in the Goulburn system; teal indicates zones in the Campaspe system; red indicates zones in the Loddon system; purple indicates zones in the Murray system; light purple indicates the Murrumbidgee system and orange indicates the Lower Darling system.

Trading zones in the Northern Basin

In the Northern Basin, there are only a few places where the level of hydrological connectivity is sufficient to allow trades between different zones. The main areas where this is permitted is in the Border Rivers catchment (figure 2.5). Trade mechanisms in the Northern Basin are unique in several different ways.

In Queensland, all regulated systems (water supply schemes) and unregulated (water management areas) areas have zones established.⁴⁹ Owing to the type of water supply and objectives associated with managing third-party impacts and environmental objectives, temporary and permanent trading

⁴⁹ Queensland uses “supplemented” and “unsupplemented” to refer to regulated and unregulated systems, respectively.

within and between zones in a regulated water supply scheme is generally more flexible than for unregulated areas.

In the Macintyre Brook Water Supply Scheme (Queensland), when a water allocation is traded from one zone to another zone, a factor is applied to determine the water available at the new location.⁵⁰ The factor effectively takes into account the estimated differences in delivery losses (e.g. evaporation, seepage or overbank flows) that occurs between the major headworks infrastructure and the destination zone (i.e. where a water allocation is traded to a zone further upstream, the delivery losses are less and therefore the volume of water available increases accordingly, and the reverse applies when water is traded downstream). In most other regulated systems, transmission or 'conveyance' losses are shared among all water users, not just those involved in a trade, so a buyer is credited with exactly the same volume of water that is debited from the seller and no account is taken of delivery losses (this is commonly referred to as 'socialisation' of losses).⁵¹

In the case of trade across state borders in the NSW-Qld Border Rivers, allocation trade does not operate via cancelling allocation in one state and re-issuing it in the other state ('exchange rate allocation trading'). Rather, the framework for interstate trading is based on the entitlement continuing to be authorised in the state of origin, managed in accordance with the water sharing rules in the state of origin and delivered by the infrastructure operator in the state of origin. The process for dealing with an application for interstate trade is essentially seeking confirmation from the state of destination that the nominated works are authorised and equipped with an approved meter and they have no objections to the trade.⁵² This model is commonly known as the 'state of origin' or 'tagged allocation trade' approach.

This interstate trading approach is facilitated by several key elements. First, NSW and Queensland water management law provide for the infrastructure operator in the state of origin to deliver water under a state of origin water entitlement to approved works (e.g. pump) in the state of destination. The ACCC understands this functionality is not available in the Southern Basin; that is, in the River Murray, water in a Victorian water account is not able to be delivered for extraction by works in NSW, and vice versa.

Second, NSW and Queensland have an agreement regarding the interstate trading framework and a requirement to establish procedures and protocols to give it effect. Because the Border Rivers water supply scheme (Qld) and equivalent in NSW is managed under continuous accounting, the states administer the water accounting through a holding account arrangement (which effectively uses the air space in the headwork storage). On approval of an interstate trade, the approved volume is credited to the holding account and debited according to water orders. From the NSW perspective, use of the NSW works to extract that delivery is authorised even if that user holds no account in NSW, because NSW recognises that Queensland has provided the authorisation for that water to be taken (as specified in the 'seasonal water assignment notice' issued by Queensland to give effect to the trade).

50 In Queensland's terminology, this type of trade is referred to as a seasonal assignment of unused annual resource cap. See Department of Natural Resources, Mines and Energy, February 2019, Macintyre Brook Water Supply Scheme Operations Manual, chapter 4, https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0007/1434787/macintyre-brook-operations-manual.pdf, viewed 18 February 2021.

51 In the Macintyre Brook water supply scheme, water sharing rules include what is referred to as a 'storage factor' which applies a different (and increasing) percentage loss to zones further from the headworks storage. This approach also applies to temporary and permanent trades between zones. In contrast, in the Border Rivers water supply scheme, the water sharing rules do not include a 'storage factor'; water may be traded temporarily or permanently from zone to zone on a one-for-one megalitre basis. According to Queensland department staff, these approaches were discussed with entitlement holders prior to introducing the rules and there was general agreement that some potential change in performance (following the original granting of a water access entitlement) would be offset by having greater trading flexibility.

52 Queensland Government, n.d. Interstate water market, <https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/interstate>, and NSW Department of Industry, 2018), NSW Border Rivers Surface Water Resource Plan, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0012/206103/nsw-border-rivers-surface-water-resource-plan.pdf, p. 62, viewed 2 December 2020. Note that, unlike for some other forms of tagged trading, under this approach there is no 'tagging' on the Queensland water register of an interstate entitlement or water available under an entitlement.

Figure 2.5: Inter-state trading zones, Northern Murray–Darling Basin



Source: Murray–Darling Basin Authority.⁵³

Water trading does not usually result in movement of water at the time of trade

It is important to recognise that entitlements and allocations do not ordinarily specify that the water user must draw down any particular portion of the water on any set days or in any set seasons of the year; and rights are generally not traded with any stipulation about when, by date or season, the buyer must access the water available under that right. For instance, a party that has bought an allocation is free to seek to draw it down over that year as it wishes, or in subsequent years, subject only to carryover rules.

One important implication of this is that when parties trade water access rights, water is not physically moved from the location of the first party to the location of the second. After the trade, the water infrastructure operator has an obligation to deliver the water to a different location, when the new owner later requests delivery of that water. This is important because rules governing trade between zones or valleys are generally specified with a view to ensuring the future obligations to supply water users at different locations don't change 'too much'. Part 5 considers these issues in more detail.

⁵³ Murray–Darling Basin Authority 2017, <https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade>, viewed 11 June 2020.

2.7 Overview of trading rules supporting market integrity and fair trading

Water markets are also subject to certain rules which are designed to promote 'fair trading' or a 'level playing field' for traders, and to help ensure there is sufficient information available for traders to make their decisions.

The Basin Plan Water Trading Rules provide a basic framework that is consistent across Basin States (see box 2.4). State legislation also contain provisions designed to help ensure water markets operate efficiently and effectively.

Box 2.4: Overview of the Basin Plan Water Trading Rules

The Basin Plan Water Trading Rules, which are set out in chapter 12 of the Basin Plan 2012, are intended to provide greater clarity and consistency for water markets across the whole of the Basin. They set out a consistent framework for water trading across the states, without duplicating existing rules.

These trading rules apply to the Commonwealth, the Basin States, IIOs and individual market participants. The rules address three broad aspects of market operation:

- reducing restrictions on trade
- improving transparency and access to information
- maintaining market integrity and confidence.

These trading rules provide that all water market participants have the right to trade free of certain restrictions. Providing these rights helps ensure that all people can participate in Basin water markets subject to a common set of rules.

These rules also contain certain non-discrimination provisions, to help ensure all traders can access the benefits of trade. For example, the rules provide that a person may trade a water access right (allocation or entitlement) free of any restriction which relates to:

- the person being, or not being, a member of a particular class of persons (section 12.07)
- the purpose for which the water relating to that right has been, or will be, used (with limited exceptions) (section 12.08)

The rules also require that:

- people who sell or dispose of water access rights declare their sale price
- approval authorities must notify the parties involved in a trade when a trade is restricted or refused, and must provide reasons for their decisions. They must also disclose any legal, commercial, or equitable interest they have in a trade to all parties when processing trades of water access rights
- the Australian and Basin State governments have to make water announcements generally available. Water announcements include announcements on allocations, carryover (including changes to carryover arrangements), trading restrictions and trading strategies
- persons or organisations refrain from trading activities when they are aware of a water announcement that has not been made generally available (often referred to as the 'insider-trading rules')

- Basin States provide the MDBA with information about the characteristics of water access rights on issue in their State, and the trading rules in their State. The MDBA must then publish this information. The MDBA is discussed more in section 2.11.

The MDBA is responsible for enforcing the Basin Plan Water Trading Rules⁵⁴, while the ACCC has a role to provide advice to the MDBA on the rules.⁵⁵

Different aspects of these kinds of rules are discussed further in this report. For example:

- rules governing the behaviour of water market intermediaries are considered in chapter 8.
- rules relating to data and information collection and transmission, including rules designed to support pricing transparency are discussed in part 4.

Stakeholder concerns about the existing rules are considered further in parts 3, 4 and 5.

2.8 Who participates in water markets?

The markets for tradeable water rights involve many people – directly as participants and indirectly as facilitators – who can be private, co-operative or government-controlled entities.

Irrigators are the most significant participant group in Basin water markets, accounting for the majority of the volume of water rights traded commercially, and the largest number of trades. Irrigators can be located within an off-river irrigation network, or may be a “private diverter”, holding their own water access right to extract (or ‘divert’) water directly from a natural watercourse. Irrigators range in size from small family farms to large scale corporate agribusinesses.

Irrigation infrastructure operators (often called IIOs) are major holders of water entitlements on issue. In New South Wales and South Australia, IIOs hold entitlements (sometimes referred to as ‘bulk licences’) on behalf of customers in their networks and issue irrigation rights which entitle customers to receive water from the IIO. In contrast, in Victoria, entitlements are specified at both the ‘wholesale’ or ‘bulk’ and ‘retail’ levels: Victorian IIOs hold ‘bulk entitlements’ and their customers hold retail-level entitlements (generally ‘water shares’, the main type of retail-level entitlement in Victoria).

Since water has been ‘unbundled’ or separated from land, individuals can also participate in water markets without necessarily intending to use the water themselves.

There are also water market intermediaries and other trade service providers involved in facilitating trade. These include:

- brokers, such as Ruralco Water, Wilks Water and Elders
- exchange platforms, such as Waterexchange, H2OX and Waterpool Trading
- water information service providers, such as Waterflow, the Australian Government Bureau of Meteorology and the Australian Bureau of Agricultural and Resource Economics and Sciences, and
- state-owned trade approval authorities, such as WaterNSW, SunWater (Queensland) and Lower Murray Water (Victoria).

Government entities have roles in managing river operations, setting trading rules, approving and registering trades; and managing compliance with Basin-wide requirements under the Murray–Darling Basin Agreement and the Basin Plan. These include adherence to the cap on the amount of water extracted from the Murray–Darling Basin: the Sustainable Diversion Limit, noted in section 2.2.

Chapter 3 contains more detail on issues such as the amounts of water used in particular agriculture sectors, irrigation networks and water for the environment.

54 Murray–Darling Basin Authority 2016, <https://www.mdba.gov.au/publications/policies-guidelines/guidelines-water-trading-rules>, viewed 25 June 2020.

55 ACCC 2010, <https://www.accc.gov.au/regulated-infrastructure/water/water-trading-rules-advice-development>, viewed 25 June 2020.

Chapter 4 provides an introduction to the different groups who participate in water trading, and analyses water ownership and trading activity in the Southern Connected Basin.

2.9 How does trading occur in practice?

Water trade processes can be complex and involve many participants.

Sellers and buyers need to find and transact with each other:

- They often conduct their trades through brokers and over exchanges, as discussed in detail further below.
- They can trade directly with each other, without such intermediaries – although authorities retain a role in registering, or approving and registering the trade.
- Traders of rights relating to IIOs' networks, such as irrigation rights, are more likely to trade within the network, but can also trade externally. As noted earlier in section 2.3.3, irrigation right holders can also 'transform' their permanent irrigation rights into statutory entitlements.

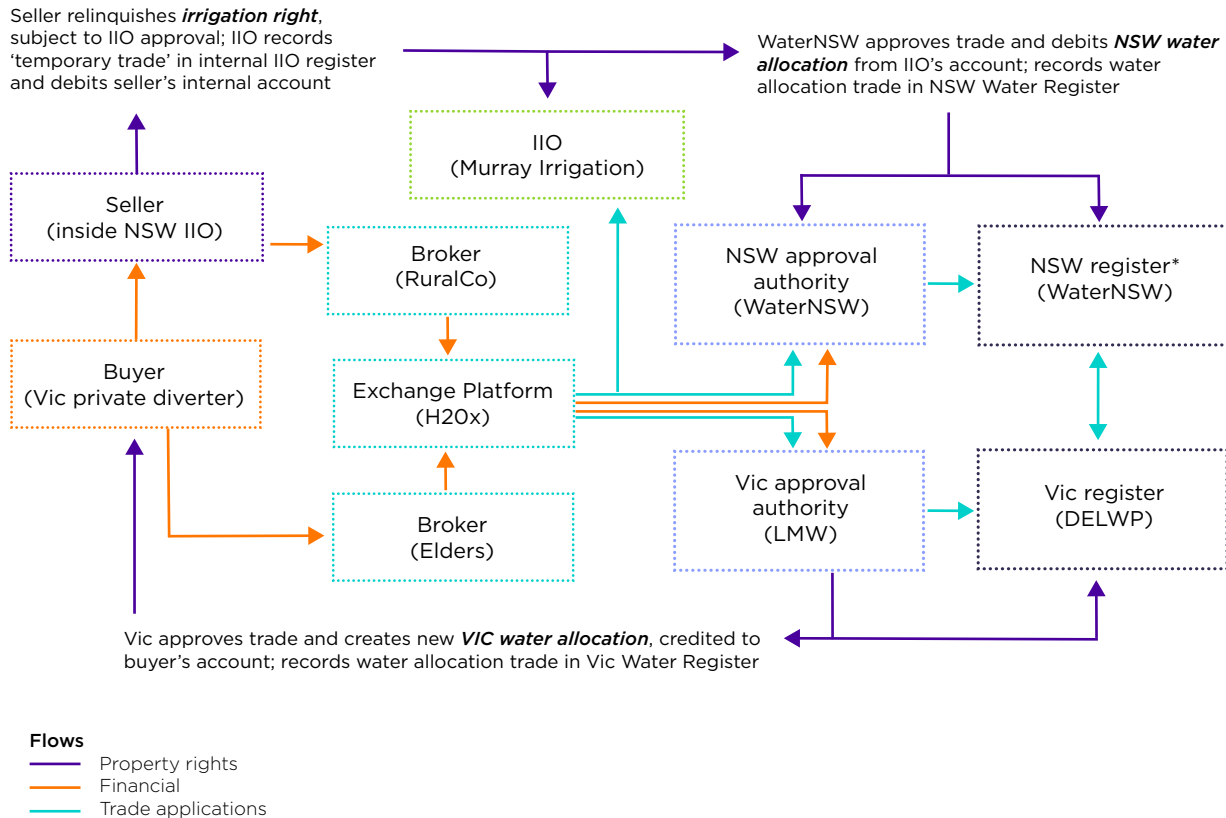
The sellers and buyers also need to settle on a price. To inform their expectations, they may rely on information from such sources as brokers, online information services such as Waterflow, and their own experience and records.

As in all markets and trade, it is more difficult to settle on an 'efficient price' if there is a lack of good information or one party has better information than the other. Chapter 11 provides more detail on the different information sources traders draw on to make water trading decisions.

Once two parties to a trade have reached agreement, details of the transaction are then lodged on trade forms with state-owned approval or registration authorities, such as WaterNSW, SunWater or Goulburn–Murray Water. There are various separate registers used to record water rights ownership and trades. For example, Victoria's register is maintained by its Department of Environment, Land, Water and Planning and records both permanent and temporary water rights ownership and trades. In contrast, in New South Wales, permanent water entitlement ownership and trades are recorded on the New South Wales Water Access Licence Register by the NSW Land and Registry Services, and allocation ownership and trades are recorded by WaterNSW on the allocation assignments register. Figure 2.6 provides an example for how a trade is executed.

As a rule of thumb, authorities approve allocation trades more quickly than entitlement trades. Chapter 10 provides more detail on trade approval times.

Figure 2.6: An example of how a trade is executed



Source: ACCC analysis.

2.10 Water for the environment

Allocation arrangements throughout the Basin have long included provision for some basic environmental flows. These provisions are written into water sharing arrangements, and therefore are often referred to as 'rules-based environmental water'.

However, over time, scientific consensus emerged that rules-based environmental water was insufficient to maintain the ecosystems and environmental assets of the Basin, and that consumptive water rights had been over-allocated – that is, consumptive water use in the Basin was not sustainable. Basin State governments have been working together with water users to address this imbalance. Key milestones in this process have been the 1995 Cap on Diversions, the *Water Act 2007* and the Basin Plan 2012. In particular, the Water Act and the Basin Plan together establish the role and functions of the Commonwealth Environmental Water Holder (CEWH), and set caps on the amount of water that can be allocated within the consumptive pool that are consistent with long-term sustainability assessments.⁵⁶ The CEWH's role is to manage the portfolio of water rights acquired by the Commonwealth government for environmental purposes, in a way that maximises environmental outcomes. There are also other state-based environmental water holders, such as the Victorian Environmental Water Holder, and also non-government environmental water holders such as the Nature Conservancy.

⁵⁶ For further detail on the operation of the Basin Plan, see <https://www.mdba.gov.au/basin-plan/plan-murray-darling-basin>, viewed 11 June 2020; and the Productivity Commission's most recent review of Basin Plan implementation: <https://www.pc.gov.au/inquiries/completed/basin-plan>, viewed 11 June 2020.

While this inquiry does not extend to examining the effectiveness of water buy backs for environmental purposes⁵⁷, it does consider the key impacts of environmental water holders on the markets for tradeable water rights. These impacts are complex, and are examined in more detail in chapter 3.

2.11 Basin management responsibilities

The Murray–Darling Basin is a complex and dynamic environment that crosses multiple state and territory boundaries, and requires state and Australian government agencies to cooperate in its management.

The arrangements for the institutions, and the ‘governance’ or oversight, involved in water resources and water trade in the Basin are themselves complex. They differ across different catchments and they reflect complex governance and funding arrangements set out in such laws and agreements as the Basin Plan and the Murray–Darling Basin Agreement. A brief overview of Basin management responsibilities is provided below. Institutional and governance arrangements are outlined in table 2.2, and discussed further in chapter 17.⁵⁸

57 Interested readers are directed to section 3.5.3 of S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, which provides some relevant references, and to the work of the Socio-Economic Impacts Panel (<https://www.basin-socio-economic.com.au/>, viewed 11 June 2020).

58 The Australian Senate has convened a Select Committee on the Multi-jurisdictional management and execution of the Murray Darling Basin Plan. Its issues paper contains more detail on arrangements. See issues paper chapter 1: https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Management_and_Execution_of_the_Murray_Darling_Basin_Plan/MurrayDarlingBasinPlan/Interim_Report/section?id=committees%2freportsen%2f024341%2f27789, viewed 11 June 2020.

Table 2.2: Key institutions in the Murray–Darling Basin governance framework

Institution	Key roles and responsibilities
Basin State agencies	<ul style="list-style-type: none"> Basin States have historically had primary responsibility for managing the water resources in their States. Basin States enter into intergovernmental agreements to co-operatively manage Basin water resources and enhance consistency between States. Basin State agencies grant water licences/entitlements under their legislation and annually allocate water to entitlement holders. Each Basin State determines annual allocations for each river catchment in its state in line with water resource plans, which must be accredited under the Basin Plan. Basin States create the majority of rules governing water trade in the Basin, including intra-zone, inter-zone (or ‘inter-valley’) and interstate trading rules. These rules must be consistent with the Basin Plan. Basin States are responsible for approving trades and for compliance with and enforcement of state-based water management frameworks. Basin States administer their own water ownership registers.
Murray–Darling Basin Ministerial Council	<ul style="list-style-type: none"> Ministerial Council approves infrastructure works on the River Murray (shared water resources), makes decisions on allocation of shared resources and on policy issues of common interest to Basin States and the Australian Government. Ministerial Council consists of one minister from each government (the Australian Government and the Basin States).
Murray–Darling Basin Authority (MDBA)	<ul style="list-style-type: none"> MDBA has responsibilities under the Murray–Darling Basin Agreement to manage the shared resources of the River Murray. It manages the storage and delivery of water in the River Murray system on behalf of the Basin governments. MDBA (in communication with Basin States) adjusts state water shares when water is traded between states (see also box 2.5). The MDBA also implements and enforces the Basin Plan. This includes helping the Australian Government Minister responsible for water with the accreditation of Basin State water resource plans and assessing the consistency of Basin State trading rules with the Basin Plan.
Interim Inspector General of Murray–Darling Basin Water Resources (IIG)	<ul style="list-style-type: none"> The IIG’s role is to provide independent oversight and assessment of the Australian Government and Basin State agencies responsible for implementing the Basin Plan. This includes assessing the performance of the MDBA and Basin States in carrying out their compliance functions under the Water Act and Basin Plan. In performing the role, the IIG must undertake investigations and community consultation and to refer instances of alleged non-compliance to appropriate enforcement agencies. The IIG reports directly to the Commonwealth Minister and the Basin Ministerial Council.⁵⁹ The IIG is intended to be replaced by the Inspector-General of Water Compliance (IG). As at December 2020, legislation to create the IG is currently under development.⁶⁰
Commonwealth Environmental Water Holder (CEWH)	<ul style="list-style-type: none"> CEWH’s role is to manage the large portfolio of held environmental water (entitlements with annual allocations) that have been acquired through the Australian Government’s investment in water-saving infrastructure and strategic water purchasing throughout the irrigation districts of the Basin. CEWH works with environmental water holders in each of the Basin States to co-ordinate and deliver environmental watering activities.
Bureau of Meteorology (BOM)	<ul style="list-style-type: none"> BOM has responsibility under the <i>Water Act 2007</i> for compiling and disseminating comprehensive water information across Australia. BOM also provides a range of other information, analysis and forecasts that assist water users to make effective decisions.

59 The Australian Government appointed Mick Keelty AO as Interim Inspector-General of Murray–Darling Basin Water Resources (IIG) from 1 October 2019, for 12 months or until a statutory appointment is made, pending new Commonwealth legislation to create the Inspector-General of Water Compliance. Mr Keelty’s tenure as IIG ended in September 2020.

60 Interim Inspector-General of Water Compliance, <https://www.igwc.gov.au/>, viewed 5 February 2021.

Institution	Key roles and responsibilities
Australian Competition and Consumer Commission (ACCC)	<ul style="list-style-type: none"> ▪ Enforcing rules relating to transformation of irrigation rights, regulated charges levied by infrastructure operators, and termination fee rules, and providing advice to the Australian government on these rules⁶¹ ▪ Advising the MDBA on the development of the Basin Plan water trading rules ▪ Enforcing the Australian Consumer Law (ACL) over water market participants, including brokers, exchange platforms and IIOs
Australian Securities and Investments Commission (ASIC)	<ul style="list-style-type: none"> ▪ ASIC has some jurisdiction to regulate certain aspects of tradeable water rights. Chapter 7 discusses this in more detail.

As discussed in section 2.6, some water catchments within the Basin cross state boundaries. In these cases, Basin States' shares of shared water resources are determined under the Murray–Darling Basin Agreement (for the Southern Basin) and the Border Rivers Agreement (for the Northern Basin). The MDBA has responsibilities in administering these agreements. Box 2.5 summarises the Commonwealth, state and intergovernmental instruments that have developed for managing the Basin.

Box 2.5: Commonwealth, state and intergovernmental instruments

The water rights frameworks and resource management arrangements that underpin Basin water markets have historically been state-based. However, the need to coordinate policy and management arrangements for shared Basin resources has necessitated the Basin States entering into intergovernmental agreements that refer limited legislative powers to the Commonwealth to enable legislate the *Water Act* (2007) (Cth).

Building on earlier versions of the Agreement to reflect changes arising from the Water Act, Basin governments adopted the Murray–Darling Basin Agreement 2008⁶² to promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water and other natural resources of the Murray–Darling Basin.

The Agreement establishes the Murray–Darling Basin Ministerial Council to consider and determine outcomes and objectives on major policy issues of common interest to the Basin governments. It also establishes the Basin Officials Committee to oversee high level decision-making in relation to river operations, including setting MDBA objectives and outcomes.

The Basin Officials Committee, in turn, is advised by several technical working groups. These include the River Murray Operations Committee, the Southern Connected Basin Environmental Watering Committee, the Water Liaison Working Group and the Trade Working Group.

See figure 2.7 for a diagram outlining the river operation decision making bodies in the Murray Darling Basin.

River operations

The operation of the Basin is split into two regions: the Northern Basin and the Southern Connected Basin.

In the Southern Connected Basin, the MDBA works in cooperation with the Basin governments to run the River Murray. Inter-valley and interstate trade are the subject of joint management and oversight through arrangements set out in Schedule D of the Murray–Darling Basin Agreement.

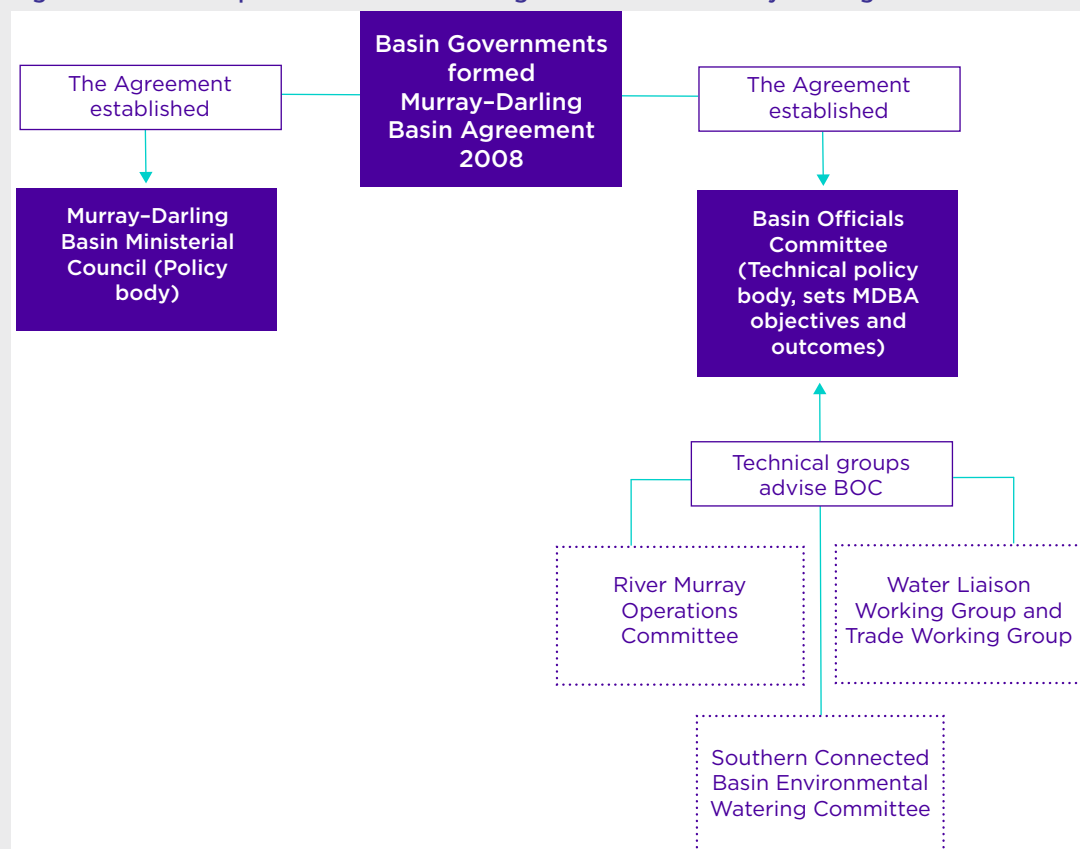
61 ACCC n.d., www.accc.gov.au/regulated-infrastructure/water/accc-role-in-water, viewed 11 June 2020.

62 Now Schedule 1 in the *Water Act 2007* (Cth).

As the river operator in the Southern Connected Basin, the MDBA maintains the IVT accounts and coordinates trade of water entitlements and allocations between states and valleys.

In the Northern Basin, interstate trade between Queensland and New South Wales is managed under agreements between the two states.⁶³ The bulk water operations are managed via the New South Wales–Queensland Border Rivers Intergovernmental Agreement 2008⁶⁴ and by the Border Rivers Commission.⁶⁵ Trade between New South Wales and Queensland is managed by the states via their water sharing plans.

Figure 2.7: River operation decision-making bodies for the Murray–Darling Basin



Source: ACCC analysis based on Murray–Darling Basin Authority.⁶⁶

- ⁶³ New South Wales and Queensland entered into the Border Rivers Agreement in [1946]. The agreement was ratified in New South Wales by the New South Wales–Queensland Border Rivers Act 1947 and in Queensland by the New South Wales–Queensland Border Rivers Act 1946 (MDBA 2017: <https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade>, viewed 11 June 2020).
- ⁶⁴ At https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0006/105963/intergovernment-agreement.pdf, viewed 25 June 2020.
- ⁶⁵ Border Rivers Commission 2020, <http://www.brc.gov.au/>, viewed 11 June 2020.
- ⁶⁶ Murray–Darling Basin Authority, Murray–Darling Basin Ministerial Council and Murray–Darling Basin Authority Service Level Agreement, 2014 at <https://www.mdba.gov.au/sites/default/files/pubs/Service%20Level%20Agreement.pdf>, viewed 23 June 2020.

2.12 Why is there water trading in the Murray-Darling Basin?⁶⁷

The buying and selling of water rights in the Murray-Darling Basin has been enabled for certain key reasons:

- Water is scarce; and where it is demanded or valued most changes over time. The ability to trade water helps people access water where it is wanted most – to put it to its most productive use. With water trade, irrigators produce more of the things valued most and the Australian economy benefits:
 - Irrigators are the single largest group of water users in the Basin. Water markets allow many irrigators to top up their water needs, expand production, develop new business models or free up capital to invest elsewhere in their businesses (for example, by leasing water temporarily at less cost than owning it permanently).
 - To give some concrete examples, markets for water rights can i) help some businesses emerge or expand, such as vegetable or nut growers buying water entitlements to chase new domestic and export market opportunities; ii) help others stay stable over the longer term, such as grape growers buying water allocations to keep their long-held vines alive in drought; or iii) help a farmer transition into different forms of agricultural production, by selling water rights to free up capital to invest in new production systems.
- Markets and trading give individual people and businesses more choice in, and more responsibility for, what happens to the Basin's scarce water. With trade, individual people and businesses work out what they want and need, and then deal directly with each other in the marketplace. Without water markets, processes for changing ownership of water rights and where water can be used would be more cumbersome. In the alternatives:
 - private interests might still trade water assets, but if, for example, water is tied to land, people's choices and actions would be more restricted and costly
 - if government decisions and processes solely and centrally determined all the detail of water use and movement, people would be confined just to dealing with and lobbying government to fulfil their needs.
- In the context of the droughts that beset the Murray-Darling Basin, trading and markets can be used as tools to make the best use of the scarce natural resource of water. When individuals trade in markets, especially markets characterised by healthy competition, experience indicates that they tend to deal with each other more efficiently and effectively than alternative systems. That is:
 - more needs and parties are satisfied and there is less waste and loss
 - there is greater pressure to drive down costs of using and transferring water between parties
 - there is innovation – new ways of doing things.

This is summed up in the first objective listed for water markets in the Water Act, which is:

to facilitate the operation of efficient water markets and the opportunities for trading, within and between Basin States⁶⁸

It is also reflected in the purposes of the Basin Plan, which include to provide for:

water to reach its most productive use through the development of an efficient water trading regime across the Murray-Darling Basin.⁶⁹

⁶⁷ Content in this section draws on material from National Water Commission, *Water Markets in Australia: A Short History*, 2011, p. 6, at apo.org.au/node/27438, viewed 11 June 2020.

⁶⁸ *Water Act 2007* (Cth), s. 3, Clause 3 Basin water market and trading objectives.

⁶⁹ *Water Act 2007* (Cth), s. 23.

Box 2.6: The economics, in simple terms, of ‘efficient water markets and opportunities for trading’

The Basin water markets stem from the basic idea of managing a scarce resource through the use of a ‘cap-and-trade’ system in which:

- the cap represents the total pool of the resource available, consistent with sustainable levels of extraction
- individual users are given entitlements to a share of the total pool
- entitlement rights and the quantity of water allocated to an entitlement each season (an allocation) are tradeable, so that ownership, control and use can change over time
- the price is determined in the market by the value placed on water by many buyers and sellers.

The objective of the cap-and-trade water market approach is to facilitate the economically efficient allocation of water while improving environmental sustainability by limiting extraction of the resource. Once the cap on total consumptive water use is established, water trading is a mechanism intended to ensure that limited water resources are put to their most valuable ‘uses’ (including non-consumptive uses such as environmental watering). The idea is that water markets will promote economic efficiency by enabling water resources to be reallocated to those who value them most highly in both the long and the short terms:

- Seasonal water trading (sometimes called ‘temporary trade’) enables the water available in any given season to be reallocated across crops, locations, irrigators and other water users in response to seasonal conditions (the concept of allocative efficiency). This is particularly valuable where different users have different water demands. For example, given enough warning, rice growers can choose to reduce the areas they sow during times of low water availability. However, other farmers, such as those growing perennial horticultural crops (such as fruit trees), need water every year. Trading provides the opportunity to move water between users with different water demands.
- Water trading can facilitate investment and structural adjustment in response to changing conditions. For example, in a capped system in which no new entitlements are available, trade enables new water users, such as a new ‘greenfield’ irrigation developments, to establish and develop. The corollary is that water markets provide a mechanism for existing users to retire or move on. As a result, markets enable dynamic changes in the size and composition of water-using industries over time. This is particularly useful in a market-oriented economy such as Australia’s, in which farmers face fluctuating global market forces for the commodities they produce.
- Water trading can also promote productive efficiency. The price signal for water in the market provides an incentive for users to make efficient use of all inputs and invest in improving the efficiency of their on-farm water use.

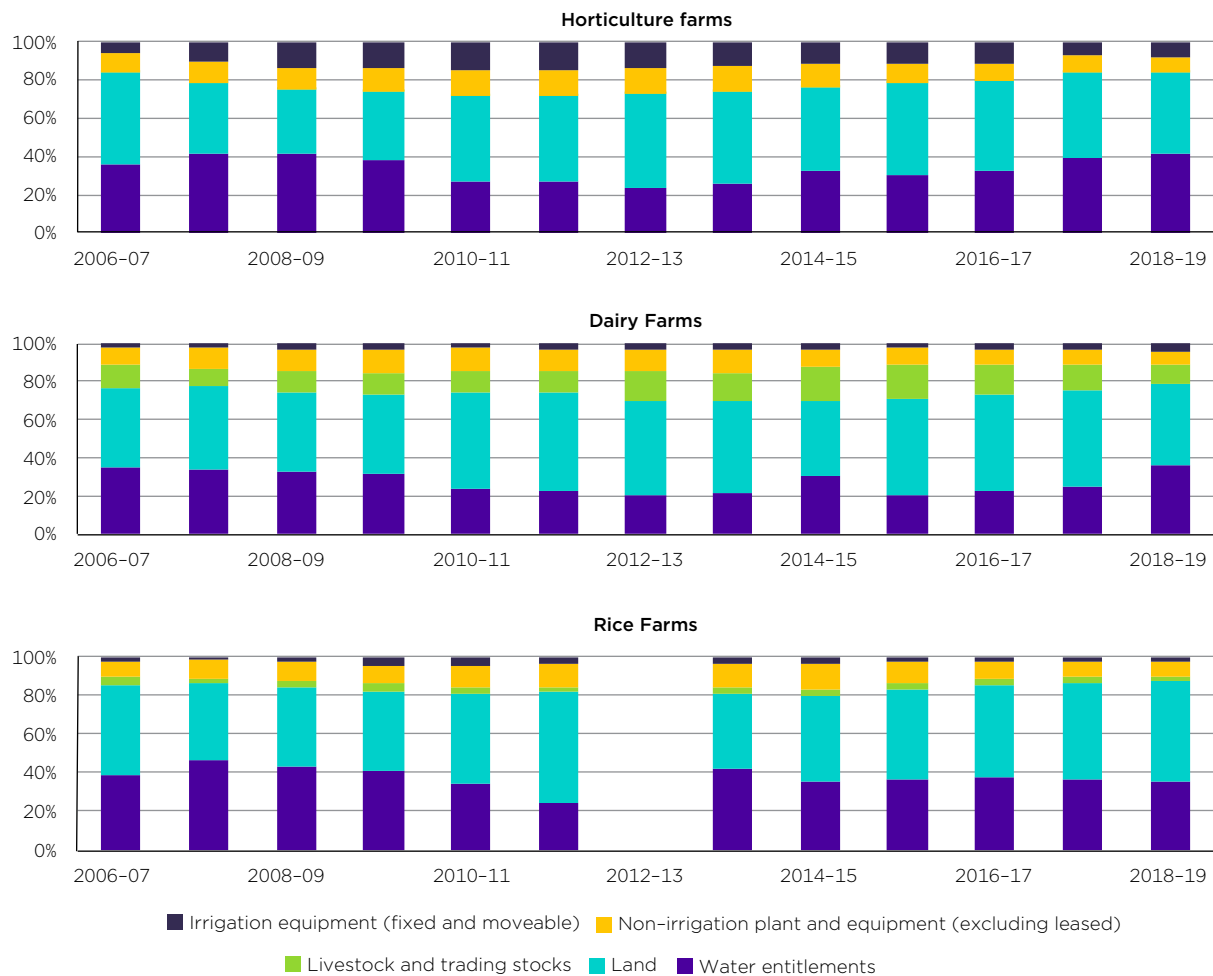
In short, markets allow water users, rather than governments, to make these complex short-term and long-term decisions about who should use water for what. Market prices provide a signal for users to consider the opportunity costs of their water-use decisions and make decisions in their own best interests. However, for the decisions of individuals to be consistent with the broader public interest, water markets must operate within the physical and hydrological realities of surface water and groundwater systems. Therefore, to be efficient, water trading needs to be governed by rules that reflect those realities.

As illustrated above, water trading is an opportunity not just for buyers but also for sellers, who can earn an income from their water rights when they are more valuable to someone else. Markets provide the opportunity for one party that wants and needs water to find another party that is prepared to trade its water, at a price they both accept. Both sides are seeking an outcome that benefits and profits them. To repeat the example used in box 2.6, growers of annual crops, such as rice and cotton, can earn an income by trading on their water assets in years when prices for those crops are low and water is expensive.

Water rights are now significant assets for many farmers:

- The value of water entitlements on issue across Australia in 2019–20 has been estimated to be \$26.3 billion.⁷⁰ In recent years the average turnover of Basin water rights markets has been about \$1.8 billion (includes both temporary and permanent trade).⁷¹
- On average for the Southern Basin, water entitlements comprise around 41% of capital assets for horticulture farms, 36% for dairy farms, and 35% for rice farms, as at 2018–19 (figure 2.8). Importantly, for some farms, the value of entitlements held is equal to or even more than the value of land assets.

Figure 2.8: Average proportion of capital assets by asset class, by farm type



Source: ABARES irrigation survey.

Notes: Average per farm. For horticulture: average of three regions (Goulburn, Murray and Murrumbidgee); for rice: average of two regions (Murray and Murrumbidgee); for dairy: average of two regions (Murray and Goulburn-Broken). Data for rice not available for 2012–13.

70 Aither, Water markets report, 2019–20 and 2020–21 outlook, see <https://www.aither.com.au/wp-content/uploads/2020/08/2020-Aither-Water-Markets-Report.pdf>, viewed 14 January 2021.

71 ACCC analysis based on BOM and ABS data. Average annual total real value of trade, 2012–13 to 2019–20, in \$2019–20.

2.12.1 There are many reasons why different parties decide to trade in water

Water markets allow various parties to pursue a range of activities and execute a range of strategies and plans. Table 2.3 gives some examples. Chapter 4 provides more detail and data on the different types of traders, including discussion of traders' 'Water Ownership and Trading Strategies'.

Table 2.3: Examples of reasons for participating in water markets

Tradeable water right	Reason for trade	Type of trade
Water access entitlement and permanent irrigation right	Adjust permanent water holdings	Buy or sell water access entitlement or permanent irrigation rights
	Source additional water access entitlement or permanent irrigation right for defined period of time	Lease (as lessee) a water access entitlement or permanent irrigation right
	Permanently change the location at which water can be accessed	Tag a water access entitlement
	Provide an income stream for water access entitlements held	Lease (as lessor) a water access entitlement or permanent irrigation right
Water allocation and temporary irrigation right	Adjust current water holdings	Buy or sell water allocation or temporary irrigation rights ('spot market' trades)
	Access carryover capacity	Carryover parking
	Access water at a future point while limiting exposure to future price movements	Forward trade water allocation or temporary irrigation right
	Change location at which currently available water may be accessed	Change of location trade (for example, inter-valley or inter-zone trade)
	Provide an income stream from water allocations sold	Sell water allocations; enter into forward contracts
Water delivery right	Permanently adjust share of network capacity (and liability to pay fixed network charges)	Buy or sell water delivery rights

Source: ACCC analysis.

2.13 Elements of effective water markets

As discussed in section 2.12, the overall objective in creating water markets is to set up a mechanism to allocate a scarce and limited resource (water) to generate maximum public benefit.

Policymakers and economists have long recognised that markets are much better mechanisms to allocate resources in ways that maximise benefits and are responsive to changing circumstances than are governments. The extended negative legacy of government water allocation decisions in Australia and internationally over many decades provides a sharp reminder of the limitations of government allocation decisions, especially for a resource such as water.

Water markets involve a product which has unique characteristics, specifically its supply is dependent on seasonal conditions and is unresponsive to demand, and there are physical constraints which limit its storage and transportability. It also has value for non-economic purposes such as maintenance of the environment, and is essential for human and animal needs. Consequently, developing an efficient and well-functioning water market needs careful market design. This is particularly so in the Southern Basin, as it involves thousands of irrigators sourcing water from multiple waterways and storages spanning three states.

An efficient and well-functioning market is one:

- which results in prices that most closely reflect all available information (that is, there are no 'externalities' – which is where prices do not incorporate or reflect all the costs and benefits of the activity)
- which results in products being allocated to their most economically-valuable use (that is, allocation is efficient, including taking into account dynamic considerations⁷²)
- in which transaction costs are efficient⁷³
- which enables participants to readily access relevant and comprehensive market information.

Markets can take many different forms, ranging from the simple open-cry auction markets typically used to buy and sell real estate, to more complex electronic exchanges used to buy and sell financial derivatives or equities, or spectrum allocation auctions. However, there are several common elements that are fundamental to most markets, and which in combination contribute to their efficient and effective operation.⁷⁴ Table 2.4 provides a description of these common elements of efficient markets and how they apply in water markets, and shows which chapters of this report address which element(s).

72 The concept of efficient allocation of resources among competing uses entails several concepts of efficiency. In relation to water resources, these concepts can be considered as follows:

- Allocative efficiency: water resource short-term decision making reflecting seasonal conditions is most often achieved through water allocation trade.
- Productive efficiency: water price changes offer incentives for the efficient use of water resources as either an investment or input for productive outcomes.
- Dynamic efficiency: water resource structural or long-term decision making reflecting new investment opportunities, regulatory shifts in access arrangements or personal strategic choices is achieved through water entitlement trade.

Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, p. 18.

73 This principle is sometimes phrased as 'transactions costs are minimised'. However, transactions costs are not necessarily a 'dead-weight loss' which reduce gains from trade; transactions costs may constitute necessary investment in services and systems for facilitating trades. Therefore, maximising gains from trade does not necessarily equate to minimising transactions costs. Therefore, we use the concept of 'efficient transactions costs', which refers to the level of transactions costs which maximise gains from trade.

74 The ACCC has commissioned a literature view which summarises existing assessments of water markets and describes the objectives and principles of effective water markets in more detail. See in particular chapter 4 of this report and S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020.

Table 2.4: Common elements of effective water markets, and where they are addressed in this report

Category	Market element	How does this element apply in water markets?	Relevant chapters/parts
Enabling Institutions	Supply	Volume of water available to be traded. In a cap-and-trade market, this also encompasses the robust definition of the cap and specifying resource shares in perpetuity.	chapter 3
	Product description	Details of water 'product' characteristics, including security level, risk level, legal protection.	chapter 2
	Ownership registry	Record of legal ownership of water entitlements and allocations, including records of changes in ownership, on state-based registers established under water management legislation. Settlement (see below) for some trades does not take place until registration.	part 4
	Trading rules	Rules that determine when and how trade can occur, in what water products, and special constraints applicable to certain products or transactions.	part 5
Facilitating gains from trade	Exchange	Forum(s) in which buyers and sellers are able to make and accept price offers to exchange ownership of water entitlements and allocations.	part 4
	Clearance	Ensuring buyer and seller honour contract obligations; and assessing and approving trade applications.	part 4
	Settlement	Facilitating the actual transfer of payment from buyers to sellers, and transfer of title from sellers to buyers and updating water accounts to reflect approved transactions.	part 4
	Delivery	Process of physically supplying a volume of water which an owner of a water entitlement/allocation/right is legally entitled to receive.	part 5
	Market information	Collation and dissemination of information detailing key market data such as the price of water trades that have occurred, and the description of the water product that has been transacted. Ensure the quality of data and information is appropriate for users' needs.	part 4
Effective monitoring, enforcement and evaluation	Market monitoring	Market monitoring involves both actively examining the behaviour of market participants (including service providers such as intermediaries and trade approval authorities) and compiling and monitoring data detailing the prices, volumes and nature of products that are traded.	parts 3 and 4
	Compliance and enforcement	Compliance and enforcement are critical in terms of market integrity and confidence. Compliance and enforcement actions apply for many of the elements listed above (for example enforcement of total supply cap; enforcement of rules governing permissible trade restrictions; enforcement of rules governing trader behaviour; compliance with rules or standards for trade processing and information flows).	parts 3 and 5
	Market evaluation	Evaluating the outcomes arising from markets in order to assess whether markets are performing well or could be improved. This includes reviewing existing transactions costs to see whether they can be reduced, scanning for unanticipated externalities, and developing new market products in response to traders' demands.	parts 5 and 6

Source: ACCC analysis, adapted from S Wheeler and others.⁷⁵

⁷⁵ S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, p. 7.

3. Trends and drivers in water markets

Key Points

Trends in water markets since 2012–13: volumes and values

- The total value of **water allocation** trade in Murray–Darling Basin water markets since 2012–13 is estimated at \$2.73 billion in 2019–20 constant terms (accounting for inflation), and the value of **entitlement** trade over the same period is estimated at \$12.7 billion.
- While the volume of water allocation trade strongly depends on total water availability, the data indicates that volumes traded relative to the total water allocated to entitlement holders is growing. This indicates water markets are developing, and more water users are making use of them, over time.
- Water allocation prices were much more volatile, and generally higher, in 2018–19 and 2019–20, than in previous years. For the 2020–21 year to December, allocation prices were much lower, reflecting drought-breaking rains in much of the Basin, although 2020–21 water allocations currently remain low for some entitlement types.
- Due to expanding demand in downstream regions and other factors, inter-valley trade restrictions are becoming more binding over time, and so their impact on market outcomes is increasing.
- Significant proportions of trading activity takes place within off-river irrigation networks, such as the private irrigation infrastructure operators in New South Wales and South Australia.

Drivers of water market trends since 2012–13

- Key trends likely to have significantly driven demand for water for irrigation and irrigator participation in water markets have been:
 - substantial expansion of the almond industry in the Southern Basin: increased irrigated areas, volume applied and production of almonds, which have been concentrated on the Murray River below the Barmah Choke
 - continued significant role of irrigated cotton, rice and other broadacre annual cropping in New South Wales, and increased irrigated pasture production in Victoria
 - increased irrigated area and volume of water applied for cotton in the Murrumbidgee, although a decrease irrigated area and volume of water applied in the Lower Darling.
- Government environmental water holders (EWHs) have become significant owners of water access entitlements in the Southern Basin. Acquisition of water access entitlement by EWHs have decreased the consumptive pool, reducing the supply of water access entitlements and water allocations available in water markets. The impact this has on trade is complex: while demand for water may have increased from some irrigators who sold their entitlements to the Commonwealth but continued irrigating, some have exited irrigated farming altogether, reducing water demand. EWHs are also significant traders of water allocations, although the majority of trades are transfers between different EWHs at zero price to facilitate environmental watering.
- New entrants into water markets such as institutional investors now account for significant proportions of water allocation trade in the Southern Basin.
- Substantial increased in water allocation prices during 2018–19 and 2019–20, combined with the entry of new market participants such as institutional investors, are key drivers of stakeholder concerns about market integrity and the conduct of ‘non-user’ market participants.
- From 2012–13 to 2018–19, ACCC estimates indicate trade between own accounts (where buyer and seller are the same entity) represented at least 10% of total allocation trades in the Southern Connected Basin (by number), and 12% by volume. This indicates significant volumes of recorded trades are a consequence of the Southern Connected Basin consisting of a series of interconnected but distinct systems, rather than a single system. ‘Carryover parking’ trades, which allow users to manage their water portfolios through time and across zones, likely add to this volume of trade that is related-party trade.

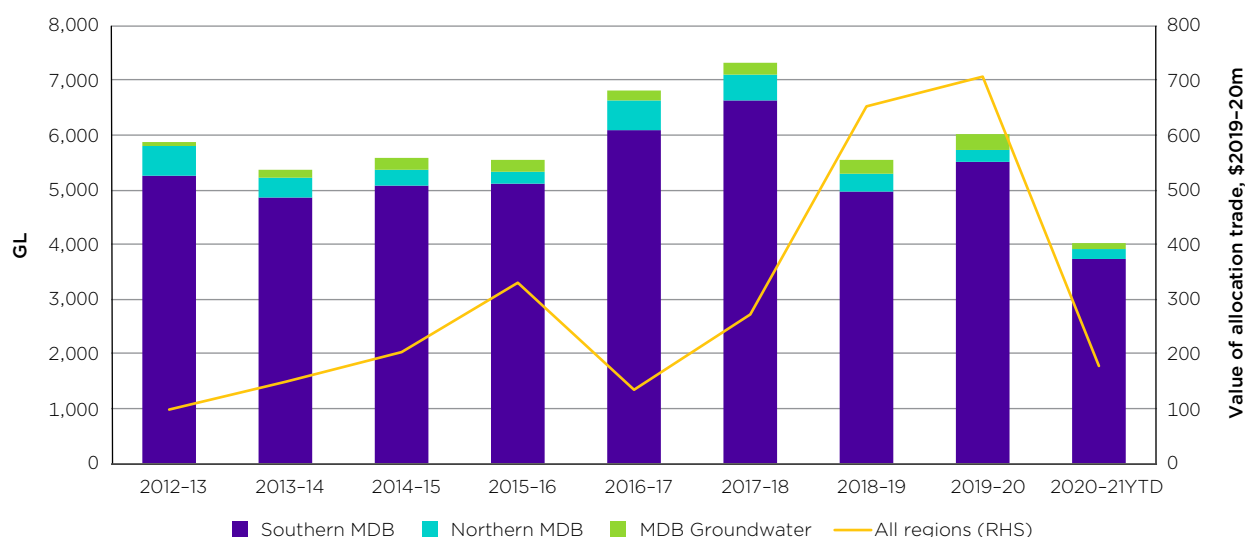
This chapter summarises key trends in Murray–Darling Basin water markets since 2012 and considers the drivers which interact to produce these trends. It then draws out some key implications of current trends and changes in underlying drivers over time, with an emphasis on considering whether these underlying drivers are putting pressure on current market structures which may negatively impact on efficient market functioning.

3.1 Trends in water markets since 2012

3.1.1 Water allocation markets and temporary trade of irrigation rights

Since 1 July 2012, 47,305 GL of water allocation has been traded in Southern Basin surface water systems, with an additional 3,099 GL traded in Northern Basin surface water systems, and 1,676 GL traded in Basin groundwater systems (figure 3.1).⁷⁶ The total value of this trade is estimated at \$2.73 billion in 2019–20 constant terms (accounting for inflation).⁷⁷ As this figure shows, over this period, the most significant years in terms of value of trade were 2018–19 and 2019–20, in which high prices and relatively high trade volumes (compared to historical volumes traded) combined to produce a total value of \$651 million and \$708 million, respectively (in \$2019–20). For the 2020–21 year to 30 December, the total value of allocation trade was \$177 million.

Figure 3.1: Allocation trade volumes and total value (\$2019–20 million), 2012–13 to 2020–21



Source: ACCC analysis based on BOM and ABS data.

Note: YTD = year to date (2020–21 year to 31 December 2020).

Over this period, the volume of allocation traded in the Southern Basin has been increasing relative to the volume allocated annually to entitlement holders. This reflects several factors:

- More irrigators are using temporary trading as part of their farm business strategy: in 2000, only around 10% of irrigators in the Southern Basin had ever participated in temporary trade, but participation has risen sharply and by 2015, around 78% of irrigators had conducted at least one water allocation trade.⁷⁸
- The introduction of carryover has resulted in significant volumes being held over from one year to the next, some of which is then traded.

⁷⁶ ACCC analysis based on Bureau of Meteorology data. Data includes all allocation trades in the Murray–Darling Basin drainage division, from 1 July 2012 to 31 December 2020.

⁷⁷ ACCC analysis based on Bureau of Meteorology and Australian Bureau of Statistics, Cat. No. 6401. Total value of temporary trade, Northern and Southern Basin and MDB groundwater, 2012–13 to 2020–21 year to 30 December, valued in \$2019–20 dollars.

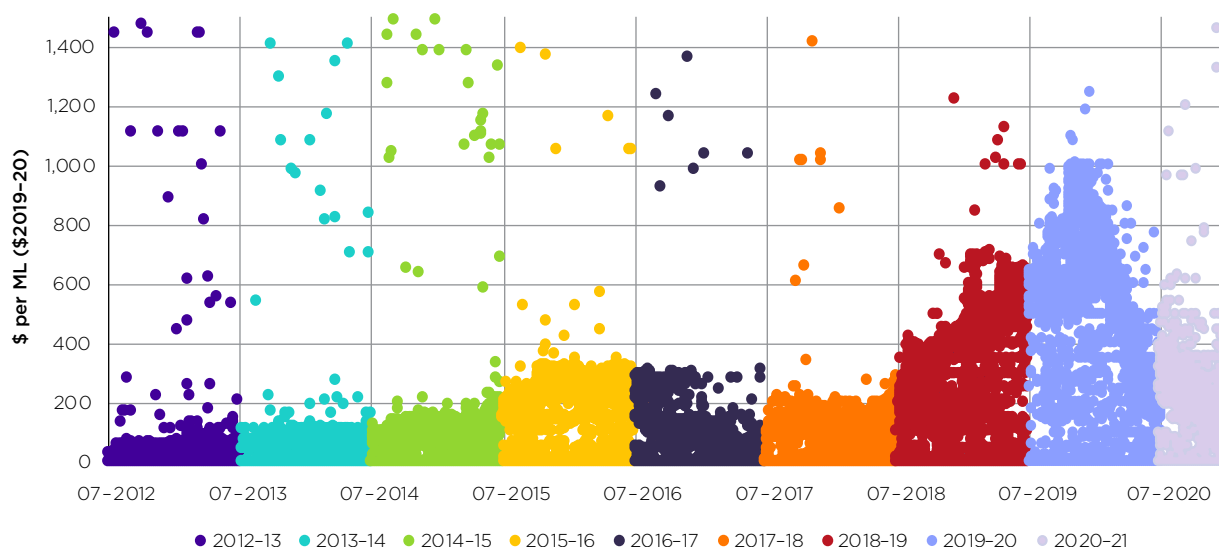
⁷⁸ J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray–Darling Basin*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, p. 35. See also chapter 4 and appendix A for a detailed analysis of irrigator participation in water markets.

- There has been an increase in consumptive water users moving water allocated in one trading zone to another zone for further trade or use (extraction).⁷⁹
- Environmental water holders (EWH) have acquired a substantial portfolio of water access entitlements, and regularly move water allocation accruing to these entitlements between valleys and between EWH as part of environmental watering strategies.

Water allocation price movements

Over the period 2012-13 to 2019-20, water allocation prices have fluctuated significantly. 2018-19 and prices increased dramatically during the first half of 2019-20 as drought conditions returned to the Basin, before falling again as rains in much of the Basin increased water availability (figure 3.2). Water allocation prices on any given day show a wide range of variation; there is no single price for water allocation.

Figure 3.2: Allocation prices for Southern Connected Basin, 2012-13 to 2020-21



Source: ACCC analysis based on Bureau of Meteorology data and Australian Bureau of Statistics, Cat. No. 6401. 2020-21 year to 31 December 2020.

Notes: Zero dollar trades included. Trades with real price >\$1,500/ML (\$2019-20) excluded.

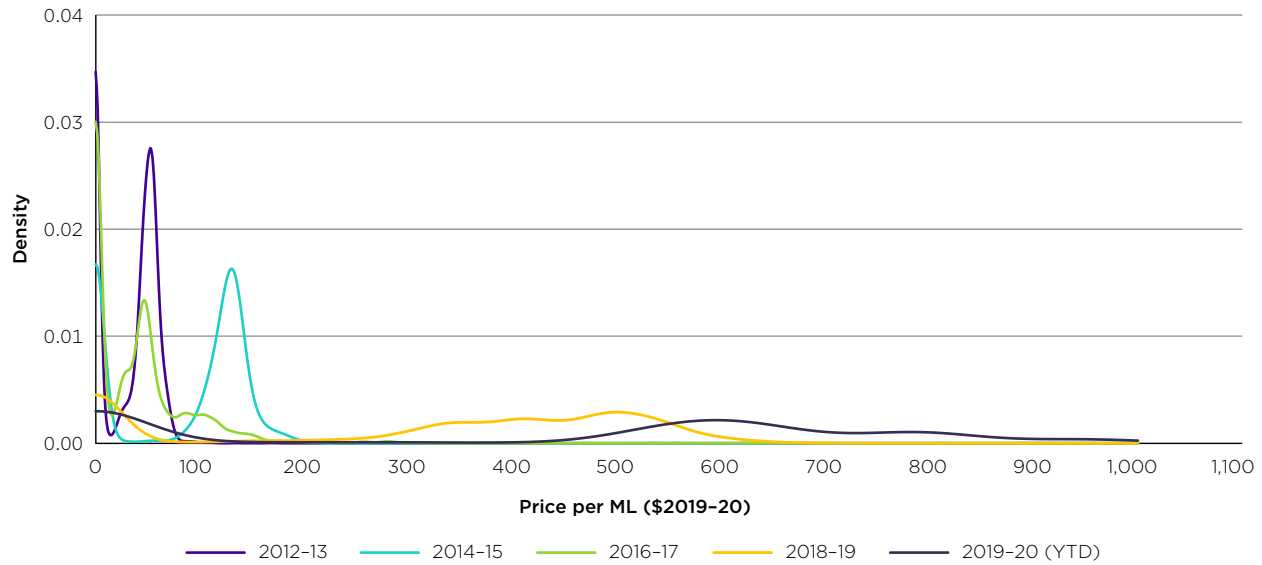
Water allocation prices have been particularly volatile in 2018-19 and 2019-20. Figure 3.3 below shows the relative spread of prices for each water year, in constant \$2018-19 per ML. In a wet year such as 2016-17, prices are dominated by zero dollar trades conducted by environmental water holders and other parties seeking to transfer water between their own accounts, or to related parties – for example, the Commonwealth Environmental Water Holder (CEWH) transfers a significant proportion of its water allocation to the Victorian Environmental Water Holder (VEWH) for delivery, in part because the VEWH holds bulk entitlements with different and more flexible delivery arrangements (see also section 4.3.1).⁸⁰ In contrast, in a dry year such as 2018-19, the majority of trade is undertaken by non-EWH traders, and prices fluctuate significantly and reflect the tightened supply due to low water availability, versus the increased demand from irrigators.⁸¹

⁷⁹ ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request.

⁸⁰ For example, the VEWH's 'access to return flows is enabled through rules in its environmental entitlements. Reuse of return flows is also available to the CEWH and MDBA when the VEWH delivers water on their behalf.' See VEWH Annual Report 2017-18, https://www.vewh.vic.gov.au/__data/assets/pdf_file/0006/506373/VEWH-Annual-Report-2017-18_web.pdf, viewed 22 June 2020, p. 20.

⁸¹ ABARES, *Snapshot of Australian water markets*, <https://www.agriculture.gov.au/abares/publications/insights/snapshot-of-australian-water-markets#water-market-prices-are-driven-by-supply-and-demand>, viewed 22 June 2020.

Figure 3.3: Density of price per ML, by water year, Southern Connected Basin



Source: ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request.

Notes: A density plot shows the distribution of trade prices. Higher densities mean more trades at that price. YTD = 2019-20 year to 30 November 2019.

Inter-valley trade restrictions within the Southern Connected Basin cause water allocation prices to differ between zones. Figure 3.4 shows how average prices for the main trading zones in the Southern Connected Basin converge and diverge over time. Section 3.3 considers how restrictions on inter-valley trade contribute to price divergence between zones when trade limits are closed (that is, when inter-zone trade is not permitted).

Figure 3.4: Average prices, by selected trading zones, and average for Southern Connected Basin



Source: ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request, Waterflow data and Australian Bureau of Statistics, Cat. No. 6401.

Notes: Basin State voluntary information request data used up until 31 October 2019 (solid lines); Waterflow data thereafter (dashed lines). Daily zone and Southern Connected Basin (all zones) price series derived using ABARES GAM methodology. Excludes zero dollar trades.

Temporary trade involving IIOs

IIOs in New South Wales and South Australia are significant holders of water access entitlement, particularly in the Southern Basin (see further discussion under section 3.1.2 below). In these states, IIOs typically hold water access entitlements on behalf of their customers, and the customers hold irrigation rights and are allocated water ('temporary irrigation right') by their IIO. When an IIO customer who holds irrigation rights wishes to trade with a person situated outside the IIO's network, the IIO undertakes a water allocation trade on their customer's behalf, and reduces or increases the customer's internal temporary irrigation right to reflect the trade. Because of these arrangements, IIOs often appear as trading parties in Basin State registry data. In 2018–19, IIOs accounted for 8% of water allocation volumes purchased, and also 8% of water allocation sold in the Southern Connected Basin; this is lower than in earlier years, when IIOs typically accounted for around 12–17% of the volume of trade (as sellers), and 8–10% (as buyers).

Trade of temporary irrigation right *within* these IIO networks can also be significant. In 2018–19, 621 GL of temporary irrigation right was traded within New South Wales and South Australia IIOs in the Southern Connected Basin, in around 9,500 transactions.⁸² This trade is not captured in Basin State water registers, as IIOs are the approval authorities for these trades.

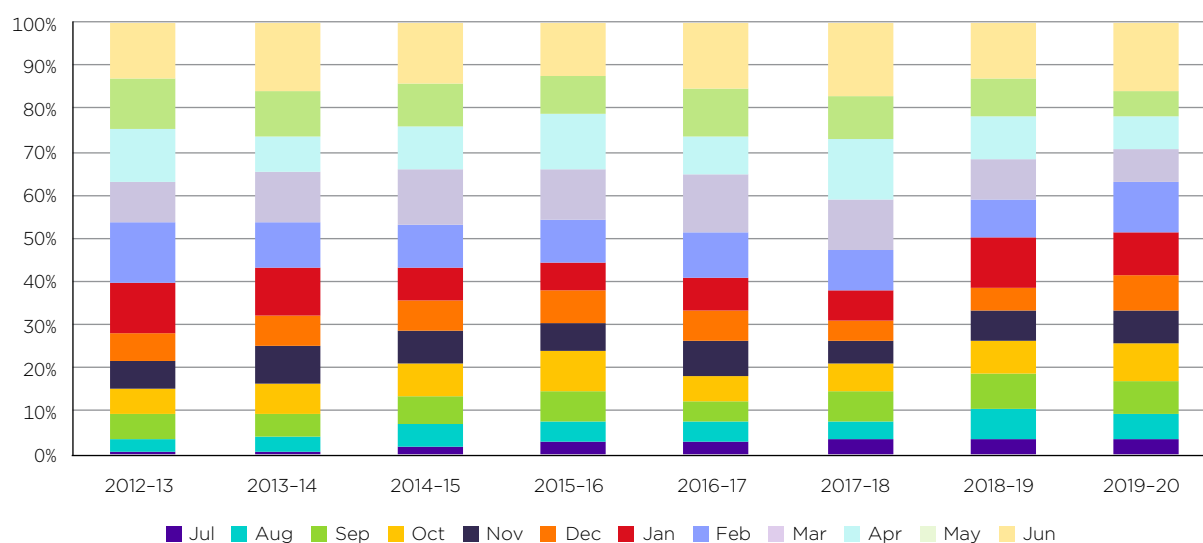
Allocation trade activity varies throughout the water year

Trading activity varies throughout the water year (figure 3.5). Over the period 2012–13 to 2019–20, on average, around 2% of trades (by number) occur in July – typically this is because the irrigation season has not started, and allocations may not yet have been announced, even for higher security rights.⁸³ As the year progresses, trading activity increases, particularly over the summer months and into autumn, as the irrigation season progresses.

82 Temporary trade volumes within IIOs covers the following IIOs: Barossa Infrastructure, Buddah Lake, Coleambally, Central Irrigation Trust, Eagle Creek Pumping Syndicate, Hay Private Irrigation District, Jemalong, Marthaguy, Murrumbidgee Irrigation, Murray Irrigation, Moira, Narromine Irrigation Board of Management, Renmark Irrigation Trust, Tenandra, Trangie-Nevertire Irrigation Scheme, West Cororgan, Western Murray Irrigation. Temporary trade numbers covers the following IIOs: Coleambally, Central Irrigation Trust, Murrumbidgee Irrigation, Murray Irrigation, Renmark Irrigation Trust, West Cororgan and Western Murray Irrigation. Sources: ACCC analysis based on ACCC annual Water Monitoring Report IIO Requests for Information and IIO responses to voluntary information request.

83 For example, Murray Irrigation Limited's (MIL) 2019–20 Seasonal operating plan states that (subject to certain conditions, MIL will commence refilling of its supply channels through its bulk supply offtakes on 24 July 2019, with the intention to commence delivering water on 15 August 2019. See Murray Irrigation, Season Operating Plan 2019/2020, <https://www.murrayirrigation.com.au/wp-content/uploads/resource/2019/12/SOP-2019-20-final.pdf>, viewed 22 June 2020. Likewise, GMW's gravity-fed irrigation season typically commences on 15 August. See GMW, Customer Service Charter, November 2007, https://www.g-mwater.com.au/downloads/gmw/Customer_Service_Charter_2007.pdf, viewed 22 June 2020.

Figure 3.5: Proportion of allocation trades by month and year, Southern Connected Basin, 2012-13 to 2019-20



Source: ACCC analysis based on Bureau of Meteorology data.

Notes: Month determined by date trade application was approved. Includes all approved trades, including zero-dollar trades.

Trading to access carryover

Carryover changes the dynamic of when water is available in accounts for use or trade. Users who have carried over water from the previous year will have allocation available in their accounts even before new allocations are announced for entitlement holders, at the start of a water accounting year. Carryover and trade also interact, as many users trade water after the irrigation season has finished (e.g. in June), to maximise use of carryover on their own entitlement, and potentially rent access to carryover on others' entitlements via carryover 'parking' trade.

Figure 3.5 above shows that June has accounted for a significant proportion of trading activity throughout the period 2012-13 to 2019-20. Trades approved in June 2017, 2018 and 2019 each constituted more than 15% of the total number of trades for the respective water year. One reason for this significant volume of late-season trade is that users move water between their own accounts to take full advantage of their own access to carryover, and also undertake 'carryover parking trades' with other users, to take temporary advantage of others' unused carryover eligibility.

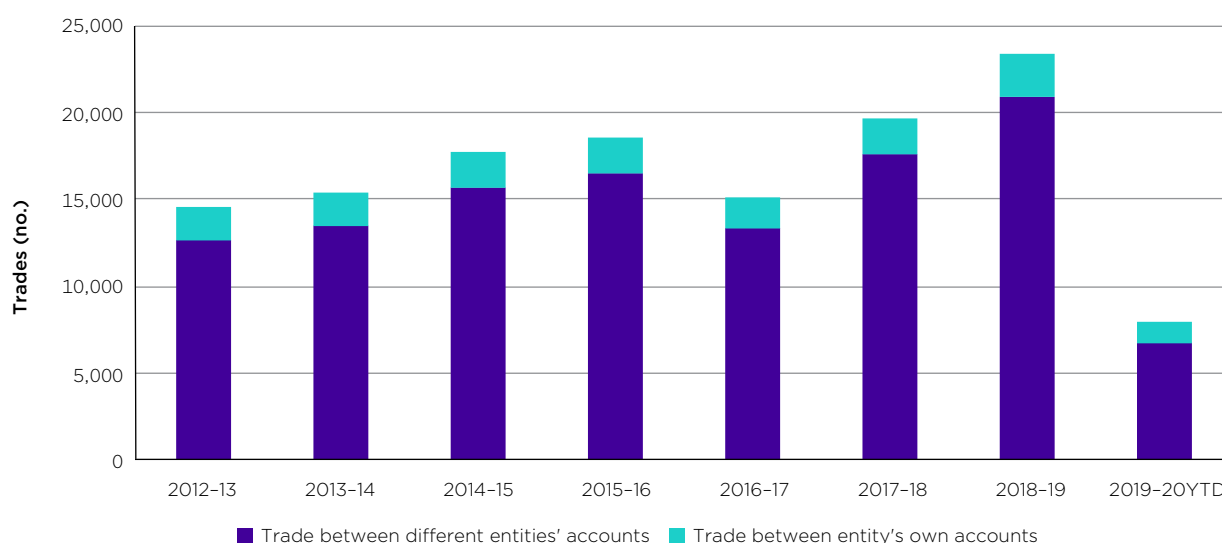
While it is difficult to precisely identify trades as carryover parking trades in historical data, ACCC analysis has identified 630 trades, totalling 166 GL, over the period 2012-13 to 2018-19 that are highly likely to have been carryover parking trades.⁸⁴ This accounts for only 0.5% of trade in this period (in terms of both number and volume of trade), but likely underestimates the magnitude of this type of trade. As detailed in Chapter 11, Basin States have recently introduced changes to data captured via allocation trade applications that should allow improved identification of carryover parking trades in future.

⁸⁴ See box 15.2 in chapter 15 for ACCC methodology to identify carryover parking trade.

Trading between entity's own accounts

Over the period 2012-13 to 2019-20, ACCC estimates indicate that trade between own accounts represented about 12% of total allocation trades (by number), and 16% by volume (figure 3.6).⁸⁵ This is important because it highlights that significant volumes of trade are due to the fact that the Southern Connected Basin is made up of a series of interconnected but distinct systems. A user may not hold a single account for all of their trading and water use activity, but rather may hold different accounts in different states and zones, and may in some cases even hold multiple accounts in the same zone. ACCC analysis also shows that trade between users' own accounts is much more focussed on end-of-year trade (particularly in June) than trade in general, indicating that users may be adjusting their holdings between their accounts to maximise carryover opportunities and minimise end-of-year forfeitures. This kind of reorganising of allocation volumes between an entity's own accounts may not be captured by stricter definitions of 'carryover parking trade', but may be undertaken for similar reasons.

Figure 3.6: Number of allocation trades between own accounts and between different entities' accounts, Southern Connected Basin



Source: ACCC analysis based on New South Wales, South Australia and Victoria responses to voluntary information request.

Notes: 2019-20YTD = 2019-20 year to 30 November 2019. Trade between entity's own accounts represents trade within a 'cluster', as determined using clustering algorithm analysis. This methodology takes into account where the same entities appear in different Basin State datasets, and where multiple entities jointly hold allocation accounts or water access entitlements. See box A.1, Appendix A for further detail.

⁸⁵ ACCC analysis based on New South Wales, South Australia and Victoria responses to voluntary information request. Note that individual users, particularly those who trade in multiple jurisdictions, may be identified by several similar names in registry trade data. For example, an individual might be identified in different datasets as 'John B. Smith', 'J Smith' and 'John Smith'. Also, many accounts have joint owners, which may also be represented differently in different datasets. For example, Farm ABC and ABC Trading Company may in reality be related parties who hold water access entitlements and/or allocation accounts in common. These phenomena make precise identification of trading activity between an individual entity's own accounts problematic. The ACCC has used an iterative clustering algorithm approach for this analysis; this methodology is summarised in box A.1, Appendix A.

3.1.2 Water entitlement markets

Permanent trade

The total value of permanent trade in the Basin since 2012–13 is estimated at \$12.7 billion in 2019–20 constant terms (accounting for inflation). The total value traded each year fluctuates with changing prices and volumes traded, but averages around \$1.5 billion per year.⁸⁶

Over the period 2011–12 to 2015–16, the single largest reason for permanent trade was the acquisition of permanent rights by the federal government for environmental use.⁸⁷ After 2015–16, acquisition by government for environmental use has declined, and trades between different classes of consumptive users – particularly different irrigated sectors – has become more significant. Changes in the relative economic returns from different agricultural commodities also drives entitlement trade. For example, high returns for almonds and cotton, combined with low interest rates, has driven expansion and entitlement acquisition in these industries.⁸⁸ In addition, in some valleys, there has been significant acquisition of permanent water rights by non-users, who seek to hold permanent water rights as long-term investment assets, and who provide a range of services to water users, such as entitlement sale-and-lease-back arrangements and forward allocation contracts. On the seller side, entitlement markets have allowed sellers to free up capital and rationalise or restructure businesses. Chapter 4 provides greater detail on water market participation by different categories of traders, and appendix A provides detail on entitlement holdings and trades for irrigators, including data showing the importance of entitlements as part of farm business assets.

As with any asset, entitlement prices change over time, driven by a range of factors, including: changing profitability of productive activities using water (for example, irrigated agriculture), actual and perceived long term changes in water availability, changes in the volume of entitlements on issue, changing interest rates, changes in agricultural land values and policy impacts such as the entry of the government environmental water holders into water market and the introduction of carryover, costs of holding entitlements (for example, fees and charges) and changes in the operation of water markets themselves.⁸⁹ There are also indirect links to year-to-year variability in rainfall, as market participants factor in this variability into their assessments of likely changes in long-term entitlement yields. Entitlement prices are also linked to allocation market prices, as the sale of water allocations provides a return to entitlement holders.⁹⁰

Industry has developed an index of entitlement values in the Southern Basin, which is used to track changes in the estimated value of entitlements over time. Over the past six years to 2019–20, this index has observed a 7% compound annual growth rate, indicating strong growth in entitlement values.⁹¹ In the 2018–19 water year, the index rose sharply (24% increase compared to the previous year), and gained in all months except March 2019.⁹² In 2019–20, the index rose by 6% overall; rising in the first part of the year but then declining over February to June 2020.⁹³ The current value for major entitlement types on issue in the Southern Basin is estimated at \$26.3 billion, with approximately \$6.8 billion held by the Australian Government for environmental purposes.⁹⁴

86 ACCC analysis based on Bureau of Meteorology and Australian Bureau of Statistics, Cat. No. 6401. Calculation of annual average value of trade includes 2012–13 to 2019–20 water years. Entitlement trade statistics include permanent irrigation right trade reported to the Bureau of Meteorology by IIOs. Value reported in \$2019–20 terms.

87 See chapter 4 for detailed analysis of trader categories.

88 Aither, *Review of water trading: the impact of IPART's regulatory framework on water trading markets*, final report prepared for IPART, August 2018, see <https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-review-of-water-trading-2018/legislative-requirements-review-of-water-trading-2018/consultant-report-aither-review-of-water-trading-2018-final-report.pdf>, viewed 22 June 2020, p. 16.

89 Australian Bureau of Statistics, see <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4655.0Feature%20Article12016>, viewed 22 June 2020.

90 Aither, *Water markets report, 2017–18 review and 2018–19 outlook*, see <https://www.aither.com.au/wp-content/uploads/2019/03/Aither-Water-markets-report-2017-18-3.pdf>, viewed 22 June 2020.

91 Aither, *Water markets report, 2019–20 and 2020–21 outlook*, see <https://www.aither.com.au/wp-content/uploads/2020/08/2020-Aither-Water-Markets-Report.pdf>, viewed 14 January 2021.

92 Aither, *Water markets report, 2018–19 and 2019–20 outlook*, see https://www.aither.com.au/water-markets-report-2018-19/#report_section_5, viewed 22 June 2020.

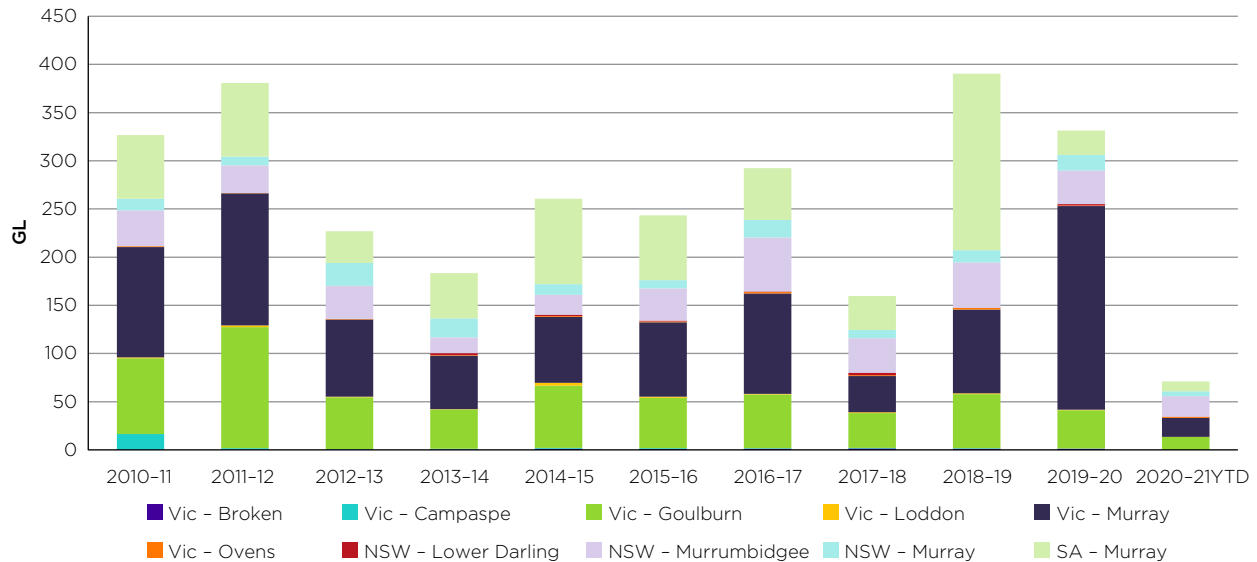
93 Aither, *Water markets report, 2019–20 and 2020–21 outlook*, see <https://www.aither.com.au/wp-content/uploads/2020/08/2020-Aither-Water-Markets-Report.pdf>, viewed 14 January 2021.

94 *ibid.*

Permanent trade in the Southern Connected Basin

As for allocation trade, permanent trade⁹⁵ is concentrated in the Southern Connected Basin. 2,866 GL of high security/high reliability right has been traded and 3,233 GL of general security and supplementary (New South Wales) and low and spill reliability (Victoria) right over the period 2011-12 to 2020-21 (figure 3.7 and figure 3.8).

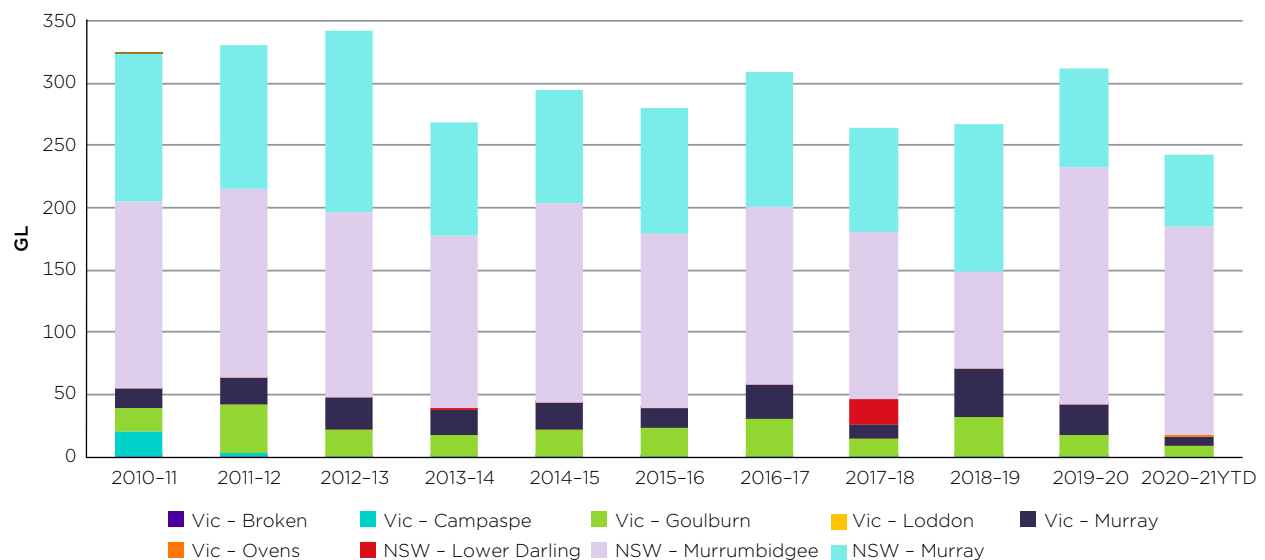
Figure 3.7: Permanent trade by water resource, regulated systems, Southern Basin, high reliability/high security



Source: ACCC analysis based on Bureau of Meteorology data.

Notes: YTD = year to date (2020-21 year to 31 December 2020). Includes the following: South Australia River Murray: Class 3a, 3b, 4, 7, 8, 9 entitlements and permanent irrigation right trade; New South Wales Regulated River High Security Water Access Licences and permanent irrigation right trade for New South Wales Lower Darling, Murray and Murrumbidgee; Victoria High Reliability Water Share trade for Broken, Campaspe, Ovens, Goulburn and Loddon systems. Nominal volumes (i.e. not adjusted for long-term average annual yield).

Figure 3.8: Permanent trade by water resource, regulated systems, Southern Basin, low and spill reliability, general security



Source: ACCC analysis based on Bureau of Meteorology data.

Notes: YTD = year to date (2020-21 year to 31 December 2020). Includes the following: New South Wales Regulated River General Security and Supplementary Water Access Licences and permanent irrigation right trade for New South Wales Lower Darling, Murray and Murrumbidgee; Victoria Low and Spill Reliability Water Share trade for Broken, Campaspe, Ovens, Goulburn and Loddon systems. Nominal volumes (i.e. not adjusted for long-term average annual yield).

Permanent trade of irrigation rights within New South Wales and South Australian IIOs

IIOs in New South Wales and South Australia continue to be among the largest holders of water access entitlement within the consumptive pool for the Southern Connected Basin. In 2018–19, IIOs held 72%, 22% and 25% of high security water access entitlement (WAE) on issue in Murrumbidgee, New South Wales Murray and South Australian Murray, respectively, and 50% and 67% of general security WAE on issue in Murrumbidgee and New South Wales Murray.⁹⁶ However, over time, the volume of water access entitlement held by IIOs is changing, for several reasons. First, there has been an ongoing movement of irrigated agriculture to areas outside established IIO networks – that is, irrigators are increasingly **private diverters** rather than **irrigation network customers**. Second, some irrigators located within IIO networks have **transformed** their permanent irrigation rights into separately-held water access entitlements. These customers may still have their water delivered within an IIO network, but prefer to hold the water access entitlement themselves rather than hold a permanent irrigation right against an IIO.

Given that IIOs hold such a significant portion of water access entitlement, trade of permanent irrigation right *within* these IIO networks can be significant. In 2018–19, 100 GL of permanent irrigation right (nominal volume) was traded within New South Wales and South Australian IIOs in the Southern Connected Basin.⁹⁷ This trade is not captured in Basin State water registers, as IIOs are the approval authorities for these trades. While current data sources do not distinguish between the reliability types of permanent irrigation right trade, what is known is that in New South Wales, the majority of IIOs' entitlements are General Security, while in South Australia the majority of IIO entitlements are Class 3. Using the total trade volumes for these entitlement classes as a guide, internal permanent irrigation right trade within South Australian IIOs is about 15% of the volume of entitlement trade in South Australian River Murray Class 3 entitlements (3.3 GL traded). For New South Wales, internal irrigation right trade within IIOs is far greater than permanent trade of water access entitlements; for Murrumbidgee IIOs, internal permanent trade volumes totalled 41 GL, 1.7 times higher than trade volumes for Murrumbidgee General Security water access entitlements. In New South Wales Murray, internal permanent trade volumes totalled 56 GL, 1.8 times higher than trade volumes for New South Wales Murray General Security water access entitlements.⁹⁸

Another notable trend is the increasing market participation of investors such as superannuation funds. Analysis undertaken by the ACCC (presented in chapter 4) shows that institutional investors in particular now account for a significant proportion of allocation trade in the Southern Connected Basin, in terms of both the number and volume of trades.

The ACCC has heard a range of significant concerns expressed by some stakeholders about market participation by investors and non-landholders or non-water users more generally, particularly in relation to purchase of water allocations by institutional investors.⁹⁹ For this reason, chapter 4 considers trading activity and entitlement ownership by this participant group in significant detail. However, despite concerns about the impact of investors on water prices, the ACCC's analysis (see below) indicates that water allocation price movements are strongly driven by relative scarcity of water allocation. This finding aligns with previous studies, such as ABARES (2019) and Aither (2020).¹⁰⁰

96 Source: ACCC analysis based on data sourced from Irrigation Infrastructure Operator voluntary and compulsory information requests, IIO Requests for Information (RFI) for the ACCC's annual Water Monitoring Report and the New South Wales Water Register <https://waterregister.watnsw.com.au/water-register-frame>, viewed 30 November 2019.

97 Internal permanent trade volumes sourced from ACCC annual Water Monitoring Report IIO Requests for Information (RFI). This data source does not distinguish internal permanent trades by security type. Permanent trade within IIOs covers the following IIOs: Barossa Infrastructure, Buddah Lake, Coleambally, Central Irrigation Trust, Eagle Creek Pumping Syndicate, Hay Private Irrigation District, Jemalong, Marthaguy, Murrumbidgee Irrigation, Murray Irrigation, Moira, Narromine Irrigation Board of Management, Renmark Irrigation Trust, Tenandra, Trangie-Nevertire Irrigation Scheme.

98 Sources: IIO internal irrigation right trade volumes: ACCC analysis based on data sourced from Irrigation Infrastructure Operator voluntary and compulsory information requests, IIO Requests for Information (RFI) for the ACCC's annual Water Monitoring Report; New South Wales General Security entitlement trade volumes: New South Wales Water Register.

99 Chapter 5 summarises stakeholder concerns about large investors.

100 ABARES, 2019, *ABARES Insights: Snapshot of Australian Water Markets*, Issue 2, 2019, https://www.agriculture.gov.au/sites/default/files/abares/documents/SnapshotOfAustralianWaterMarkets_v1.0.0.pdf, viewed 5 February 2020; Aither, 2020, *Southern Murray-Darling Basin water market: Recent and future trends and drivers*, Final report prepared for the Department of Environment, Land, Water and Planning, p. 1.

3.2 Drivers of water markets trends since 2012

3.2.1 Water supply

Key factors affecting water supply in the Basin are:

- seasonal conditions
- water storage capacity
- inflows into storages and volumes held in storage
- allocations
- carryover
- trade restrictions.

These drivers are discussed in turn below.

Seasonal conditions

Seasonal conditions influence the availability of water supply available to irrigators and environmental water holders. Multiple factors combine to determine seasonal conditions, but a major factor is the volume of rainfall. This is because rainfall is a major component for the inflows into water storages, which is particularly essential for the regulated surface water in the Southern Basin.

While increased rainfall affects water supply to entitlement holders, it also affects the water market demand from irrigators, environmental water holders and other users. In the case of increased on-farm rainfall, irrigators may have sufficient water for crop growth and not need to enter the water market to purchase allocation water. In some cases, this may result in irrigators seeking to *sell* water allocations.

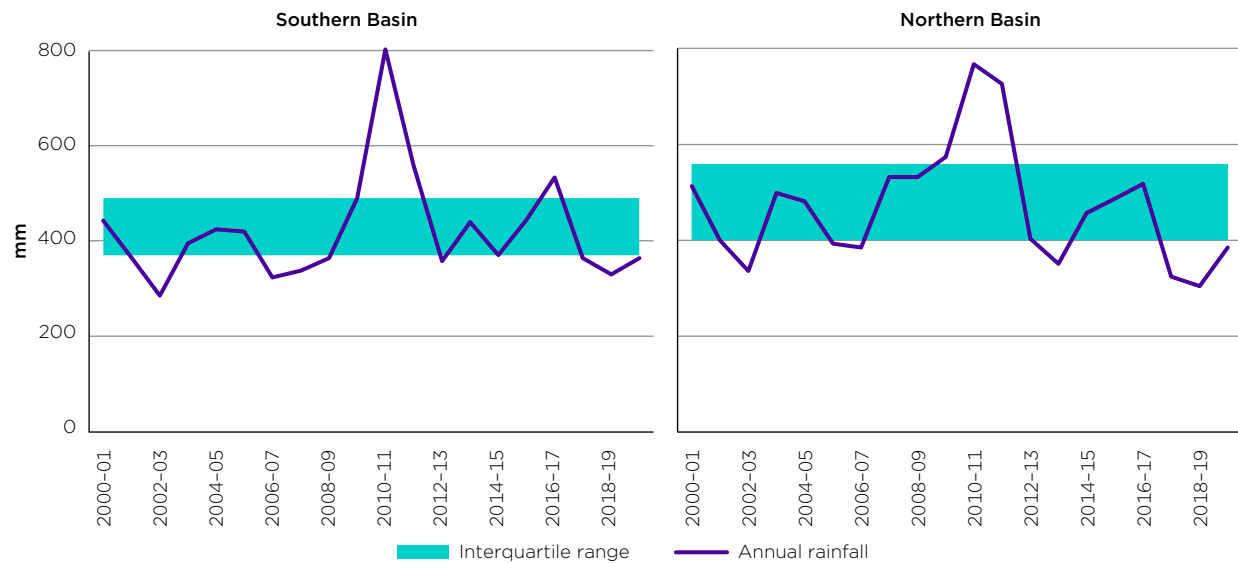
Rainfall in the Basin has varied each year, which has had a significant impact on water supply and water markets. It is important to remember that between 1997 and 2009, Australia and the Basin experienced a significant and prolonged drought. This came to be known as the Millennium Drought and had a detrimental impact on irrigators, communities and the environment across the Basin. The Millennium Drought ended with high and widespread rainfall during 2010–11.

In 2010–11, the Southern Basin received on average almost 800 mm (figure 3.9). To put this in context, between 1900–01 and 2019–20, the interquartile range of average annual rainfall for the Southern Basin was between 366 mm and 486 mm.¹⁰¹ As shown in the figure below, rainfall has fluctuated since 2011–12 but has been closer to or within the interquartile range (more in keeping with historical records), until 2017–18 and 2018–19, where there were two years in succession of low rainfall, with 2018–19 receiving the lowest average rainfall since the Millennium Drought in both Northern and Southern Basins. While there were good rainfalls in some areas in late summer and autumn 2020, total rainfall for the whole 2019–20 was still low relative to historical averages.

Rainfall in the Northern Basin is more variable than in the south, as indicated by the wider interquartile range for the Northern Basin shown in figure 3.9. Similar to the Southern Basin, drought-breaking rainfall in the north reached 763 mm in 2010–11 (area-weighted average terms), significantly higher than any other year during this period.

¹⁰¹ The interquartile range is a measure of spread and indicates that 50% of the observed values are within the specified range. In this context, 50% of average annual rainfall observed in the Southern Basin was between 366 mm and 486 mm.

Figure 3.9: Area averaged rainfall in the Southern and Northern Basin, 2000-01 to 2019-20



Source: Bureau of Meteorology.

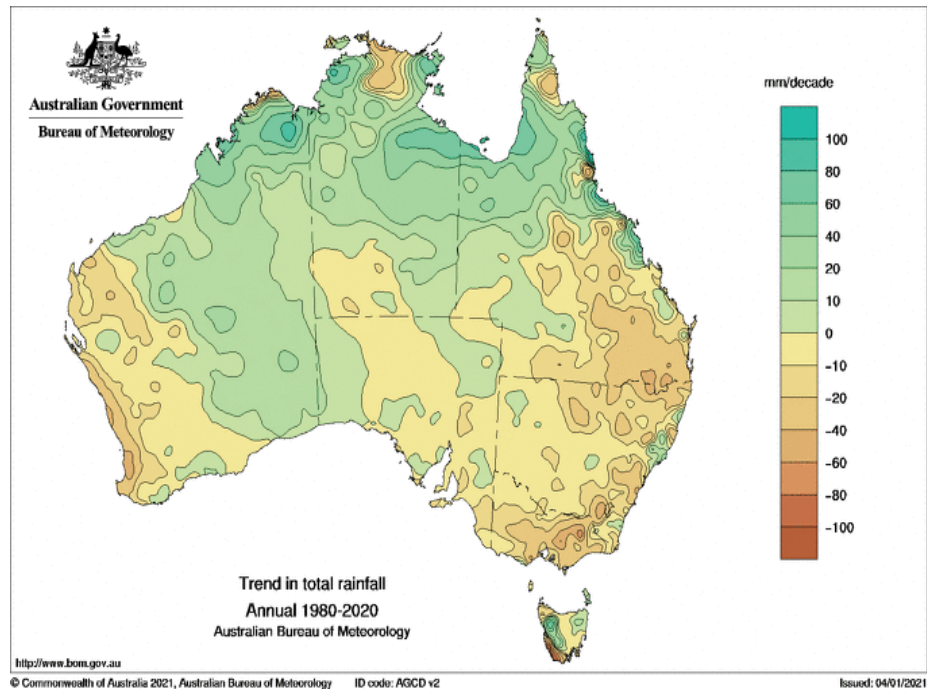
Note: The interquartile range is a measure of spread and indicates that 50% of the observed values are within the specified range.

While average annual rainfall is useful in understanding broad seasonal conditions, the seasonality of rainfall is of greater importance. Broadly speaking, rainfall in the Southern Basin during the winter months is higher than during the summer months, while the opposite is true in the Northern Basin. It is also important to note that the growing periods and associated water needs of different crops vary. For example, summer annual crops such as cotton are planted between October and November, and are harvested between April and June. These crops need either water from rainfall or water allocations throughout this period. In contrast, winter cereal crops such as wheat are planted between March and June, and harvested between October and December, and require either rainfall or irrigation water during this period.

With the ending of the Millennium Drought in 2010-11, average monthly rainfall was in excess of respective interquartile ranges between August 2010 and March 2011 for the Southern Basin, and between July 2010 and December 2010 for the Northern Basin. This compares to the first half of 2019-20, widely recognised as a dry period when average monthly rainfall was lower than the respective interquartile for all months apart from November 2019, for both the northern and Southern Basin. In particular, average monthly rainfall in December 2019 was just 6 mm (for both the north and the south), as compared to the December interquartile range of 17-49mm for the south, and 34-76mm for the north.

Climate data from the Bureau of Meteorology indicates that annual rainfall has been declining since 1980, with decreases of 20-40mm per decade for much of the Basin (figure 3.10). These drier conditions significantly reduce water supply for irrigators, environmental water holders and other users. If this continues, this is likely to have major flow-on effects for water markets in the Basin.

Figure 3.10: Trend in annual rainfall, 1980–2020



Source: Bureau of Meteorology.

Inflows and storage volumes

The volume of inflows into key storages is important determinant of allocations to water access entitlement holders in regulated systems, and subsequently water allocation prices. This is particularly true in the Southern Basin, which relies on large upstream storages (particularly Dartmouth, Hume, Eildon and Burrinjuck dams) to capture and retain inflows for use throughout the year. Water storages in the Southern Basin typically have a pattern of increasing volumes in storage over winter months and then decreasing volumes in storage over the spring to autumn months. Total capacity of public storages has increased only slightly in recent years (see box 3.1), and while other supply augmentation initiatives have been introduced, they have not yet become an ongoing feature of the water resource landscape, and so inflows into existing public storages remains the key driver of total resource availability.

Southern Basin

In 2010–11 there was substantial rainfall across the Southern Basin resulting in the end of the Millennium Drought. Water storage volumes in the Southern Basin over this year increased substantially from 33% to 84% of maximum capacity.¹⁰² Between 2010–11 and 2015–16, water held in storages in the Southern Basin broadly decreased and reached a low of 29% of capacity in May 2016. During 2016–17, water storage volumes increased following increased rainfall to a high of 86% in November 2016 following substantial rainfall between July and September. Between 2016–17 and 2019–20, water volumes in storages in the Southern Basin again declined. Importantly, water storages reached a low of 33% of capacity in May 2019, which was a similar level to that experienced before the ending of the Millennium Drought in 2010–11.

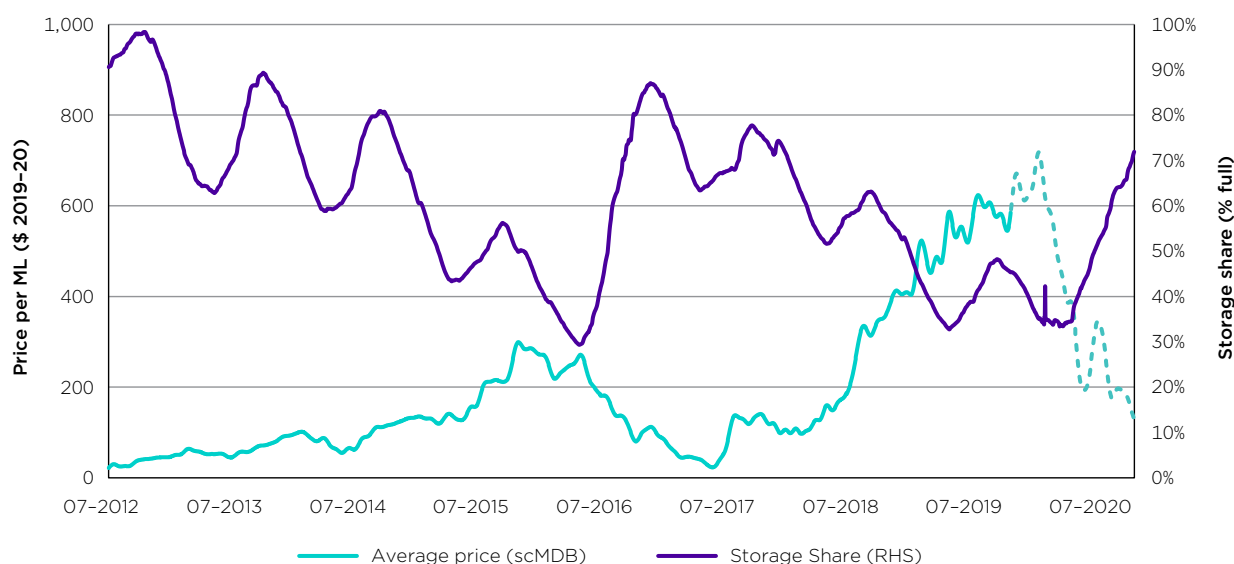
¹⁰² Bureau of Meteorology.

These fluctuations in storage levels have been a key driver of temporary water market prices. Figure 3.11 shows the relationship between total storage percentages and average prices (in real terms) in the Southern Connected Basin, for the period 1 July 2012 to 22 May 2020. In general, higher storage levels correspond to lower prices. However, in 2018–19, prices remained high even during periods when storage levels were recovering relative to their lowest point, reflecting that:

- absolute storage levels still remained low relative to past years
- poor seasonal outlooks throughout autumn 2019¹⁰³ for the 2019 winter/spring rainfall drove concerns about insufficient opening allocations for the 2019–20 water year (these outlooks were realised in storages peaking at only 48% full in September 2019, substantially lower than in any other year since the Millennium drought)
- increased demand for water for permanent plantings (discussed further in section 3.2.2 below).

Prices in 2019–20 remained high relative to historical levels, until late summer 2020, when widespread rain and favourable seasonal outlooks¹⁰⁴ resulted in significant price declines. As at 30 October 2020, the average price for water allocation in the Southern Connected Basin had declined in real terms to \$128 per ML; at this date, water storages were 72% full.

Figure 3.11: Storage levels and average water allocation prices, Southern Connected Basin, 2012–13 to 2020–21



Source: ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request, Waterflow data, Bureau of Meteorology (for storage data) and Australian Bureau of Statistics, Cat. No. 6401.

Notes: For price series: Basin State voluntary information request data used up until 31 October 2019 (solid line); Waterflow data thereafter (dashed line). Daily Southern Connected Basin (all zones) price series derived using ABARES GAM methodology. Excludes zero dollar trades.

103 See, for example, Bureau of Meteorology (BOM), Climate outlook for May to July, April 2019, <http://www.bom.gov.au/climate/ahead/outlooks/archive/20190411-outlook.shtml>; viewed 22 June 2020; BOM, Climate outlook for June to August, May 2019, <http://www.bom.gov.au/climate/ahead/outlooks/archive/20190516-outlook.shtml>, viewed 22 June 2020.

104 See for example, BOM, Climate outlook for April to July, March 2020 <http://www.bom.gov.au/climate/ahead/outlooks/archive/20200305-outlook.shtml>, viewed 22 June 2020; BOM, Climate outlook for May to August, April 2020, <http://www.bom.gov.au/climate/ahead/outlooks/archive/20200409-outlook.shtml>, viewed 22 June 2020.

Northern Basin

The Northern Basin also received drought-breaking rains in 2010–11, with storage inflows increasing to 100% in the Border Rivers, Macquarie and Condamine–Balonne catchments. Refilling of storages in the Gwydir and Namoi occurred somewhat later, with storage levels reaching approximately 99% of capacity in February 2012 for Gwydir, and 94% in September 2012 for Namoi.¹⁰⁵ However, storage levels declined again in northern systems over the period 2012–13 to 2015–16, and again in 2017–18 through to first half of 2019–20. Storage levels were below 20% of capacity in Namoi and Gwydir for much of 2014–15, 2015–16 and 2018–19. In November 2019, the Bureau of Meteorology released a Special Climate Update detailing the drought conditions across the Basin, observing that:

‘Records [i.e. record lows] have been set for the 34 and 22 months ending in October 2019 for the Border Rivers, Moonie, Gwydir, Namoi–Peel, Castlereagh, Macquarie–Bogan, Paroo and Lower Darling catchments, with records also set at the 22-month timescale in the Condamine–Culgoa and Lower Murray catchments’

‘...Runoff in the major storage catchments in the Gwydir (Lake Copeton), Namoi (Split Rock and Keepit Reservoir) and Macquarie (Lake Burrendong) valleys in particular have been well below average for the last two years.’¹⁰⁶

While drought conditions have eased somewhat for some parts of the Basin with good autumn rainfall in 2020, as at 18 May 2020 storages in the Macquarie system remain only 22.5% full, 14.7% in Lachlan, 12.7% in Gwydir and only 10% full in the Namoi.¹⁰⁷

105 Bureau of Meteorology storage data.

106 Bureau of Meteorology, Special Climate Statement 70 – drought conditions in Australia and impact on water resources in the Murray–Darling Basin, 2 November 2019, pp. 6, 17, <http://www.bom.gov.au/climate/current/statements/scs70.pdf>.

107 <http://www.bom.gov.au/water/dashboards/#/water-storages/summary/>, viewed 19 May 2020.

Box 3.1: Water supply augmentation initiatives

Many of the Basin's key water storages were built decades ago, and total storage capacity in public storages such as large dams and weirs has remained relatively static for some time.¹⁰⁸ As climatic shifts are reducing inflows into existing storages¹⁰⁹ and demand for water continues to grow, governments and other stakeholders are examining a range of options for augmenting water supplies. Investing in storage upgrades ('dam building') is one well-understood method of augmenting supply and one that is regularly raised by stakeholders, but which no longer presents an easy solution because of the absence of suitable sites for new dams, changing rainfall patterns and the need to comply with the Sustainable Diversion Limits within Basin catchments. There is an array of other supply augmentation methods, although most are quite limited. These include use of desalinated sea water or saline groundwater to augment freshwater supplies, managed aquifer recharge¹¹⁰, recycled water, 'produced' water from mining and fracking operations, and investing in reducing evaporation.

Key recent government initiatives to augment Basin water supplies include:

- use of the Adelaide desalination plant under the Commonwealth 'Water for Fodder' program¹¹¹,
- storage upgrades such increasing the height of Chaffey Dam¹¹² and upgrading the Walgett and Wilcannia town water supply weirs¹¹³
- the establishment of the National Grid Authority whose mandate is to 'work in partnership with state and territory governments to identify, plan and invest in water infrastructure projects across the country'.¹¹⁴

The Queensland Government has also convened a panel to 'investigate the viability of a modern Bradfield-like scheme', which could entail 'projects to divert flows from the Wet Tropics to the Burdekin, across the Great Dividing Range to Queensland's western regions', for irrigation, hydroelectricity generation and other purposes. Until this investigation into its viability is complete, it is not possible to comment on the potential implications for the Basin.¹¹⁵

Private participants have also invested in storage capacity – for example, irrigators are investing in on-farm storage capacity, sometimes on their own, and sometimes as part of government-funded infrastructure upgrade programs. On-farm storage does not necessarily result in increased water take, as all users still need to comply with their water licence and dam licence conditions. On-farm storage helps irrigators manage water risk, particularly for farms downstream of significant capacity constraints, and may also be used for specific activities such as harvesting overland flows or short-term storage of water available under supplementary flow conditions.

108 Bureau of Meteorology storage data.

109 Interim Inspector-General of Murray-Darling Basin Water Resources 2020, Impact of lower inflows on state shares under the Murray-Darling Basin Agreement, Canberra. CC BY 4.0, p. 7.

110 Managed aquifer recharge (MAR) is the intentional draining or discharging of water directly or indirectly into a well (aquifer) for subsequent recovery or environmental benefit. See Government of South Australia, Managed Aquifer Recharge, <https://www.environment.sa.gov.au/topics/water/resources/stormwater/managed-aquifer-recharge>, viewed 11 June 2020.

111 Department of Agriculture, Water and the Environment, Water for Fodder, <https://www.agriculture.gov.au/water/mdb/programs/basin-wide/water-for-fodder>, viewed 11 June 2020.

112 WaterNSW, Chaffey Dam, <https://www.watarnsw.com.au/supply/visit/chaffey-dam#:~:text=Later%20improvements,from%2062%2C000%20to%20100%2C500%20megalitres>, viewed 10 June 2020.

113 New South Wales Government, Community drought consultation fact sheet, INT19/26982, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0005/217544/Community-drought-meetings-What-we-heard-Feb-2019.pdf, viewed 10 June 2020.

114 National Water Grid Authority, <https://www.nationalwatergrid.gov.au/>, viewed 10 June 2020.

115 Queensland Government, n.d., Bradfield regional assessment and development panel, <https://www.dnrme.qld.gov.au/land-water/initiatives/bradfield-regional-assessment-development-panel>, viewed 10 December 2020.

It is important to recognise that different infrastructure investments affect the total available resource and resource availability at the local level differently. For example, supply of water into the system from desalination plants constitutes an increase in total available resource, whereas building a new dam or augmenting an existing storage within the Basin may increase the volumes able to be captured and stored at a particular point or improve the ability to harvest overland flows, but may also reduce the amount of water available elsewhere in the system.¹¹⁶ Thus, supply augmentation does not necessarily directly result in additional allocations to entitlement holders, and compliance with total resource caps – Sustainable Diversion Limits – still needs to occur.

Supply augmentation initiatives impact water markets in a variety of ways. Most directly, where they translate into new water allocations, the relative increase in supply can be expected to decrease prices, all other things being equal. Augmentation may also make water resources less variable from year to year, and therefore enable a different mix of water use than before. The net impacts of these dynamic changes depend on how this changes the location and timing of supply and demand for water.

Indirectly, supply augmentation also affects water market outcomes by impacting on the costs faced by water users. For example, if a dam upgrade results in higher infrastructure charges being paid by water users in the relevant catchment, this may decrease the price they are willing to pay for water purchased in water markets.

Finally, some augmentation initiatives have come with specific, intentional price impacts. The key example is the ‘Water for Fodder’ initiative, which sold water in 50ML parcels to eligible participants at the set price of \$100 per ML, at a time when temporary water market prices were between \$600-\$800 per ML. The program entails substituting water produced by the Adelaide desalination plant for River Murray water, and allocation trade is the mechanism used to deliver water into the accounts of eligible participants.¹¹⁷

To date, 40GL of water allocation has been traded to 800 eligible participants; a further 60GL was potentially to have been made available in Round 2 of the program, but after a review of Round 1, the government decided not to proceed with Round 2.¹¹⁸ As shown in figure 3.4 above, average prices in South Australia Murray zone 12 dropped considerably in January 2020, down to a low of \$82 per ML as these trades were approved. Prices in zone 12 have since recovered to be in line with other zones, although due to good autumn rains remain considerably below peaks observed in 2019. Some ‘Water for Fodder’ trades were also ‘back traded’ from South Australian Murray to upstream zones, which created an estimated 13.2 GL of downstream opportunity through the Barmah Choke and 14 GL of downstream opportunity from Goulburn to Murray from January 2019.¹¹⁹ These opportunities have since been captured by a variety of water market participants who may have no direct involvement in the program. This example shows how supply augmentation initiatives can produce direct and indirect price and quantity effects in water markets.

116 For example, ‘In areas where many farm dams have been constructed, impacts on downstream flows can be significant. Annually, farm dams can reduce the flow from Victorian catchments by typically up to 5%, although in some cases, annual flow reductions of over 30% have been estimated.’ Victorian Guidelines for meeting flow requirements for licensable farm dams, p. 6.

117 Project Agreement to produce water from the Adelaide Desalination Plant to support the Water for Fodder Program, <https://www.agriculture.gov.au/sites/default/files/documents/water-for-fodder-sa-project-agreement.pdf>, viewed 11 June 2020.

118 Department of Agriculture, Water and the Environment, Water for Fodder, <https://www.agriculture.gov.au/water/mdb/programs/basin-wide/water-for-fodder>, viewed 17 February 2020.

119 ACCC analysis based on Water for Fodder program data, available from Department of Agriculture, Water and the Environment, Water for Fodder, <https://www.agriculture.gov.au/water/mdb/programs/basin-wide/water-for-fodder>, viewed 11 June 2020.

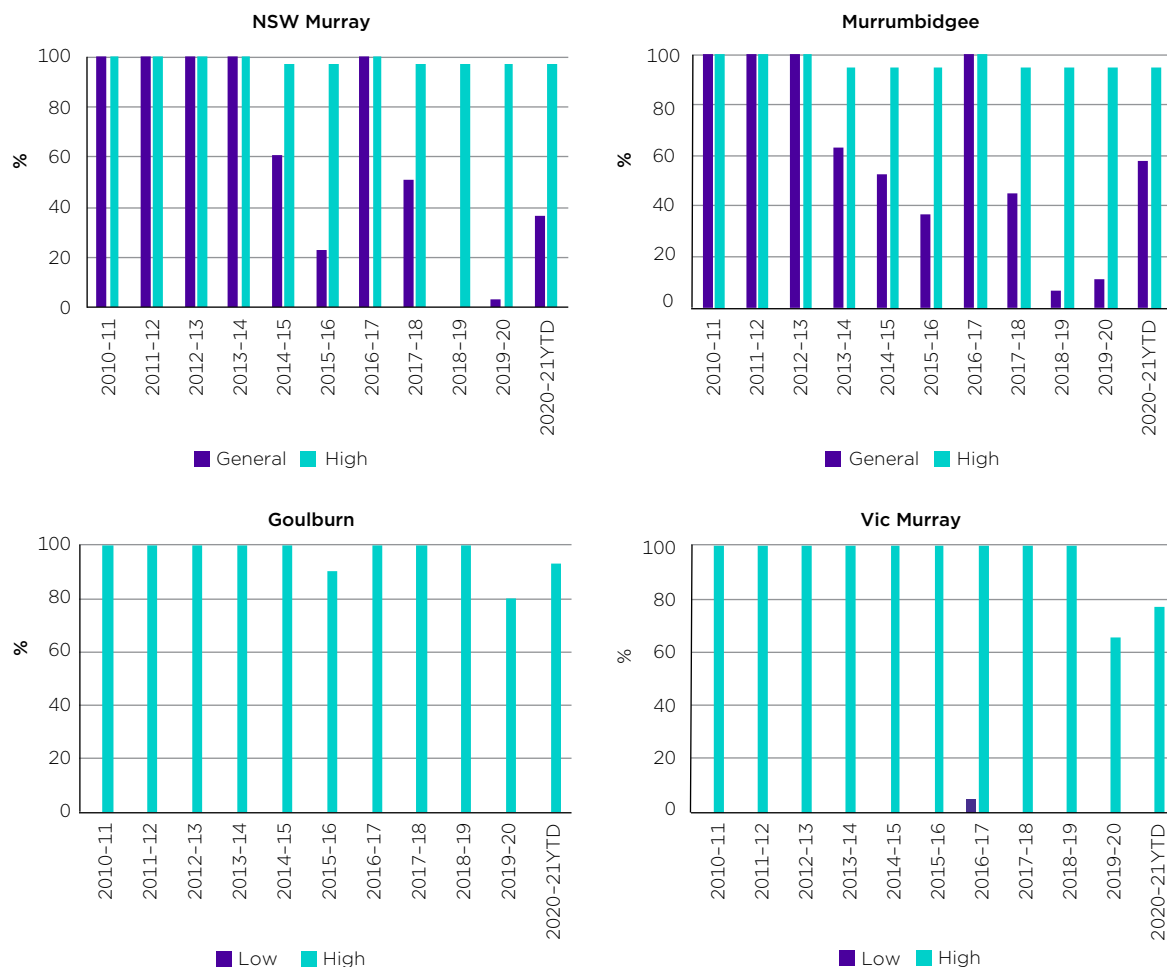
Allocations to entitlement holders

As discussed in chapter 2, most regulated systems in the Basin operate on an announced allocation system, where water allocations are announced for holders of water access entitlements on a periodic basis and up to a nominal volume. For example, for a water access entitlement of 100 ML, an announced allocation of 30% would mean that 30 ML of water allocation would be available for use.

A variety of information is used by resource managers when making allocation decisions. As noted in chapter 2, many jurisdictions have more than one class of water access entitlement. For example, water access entitlement classes in New South Wales include General Security, High Security, and Supplementary. Generally, available water is allocated first to higher reliability entitlements and then to lower reliability entitlements. As a result, higher reliability entitlements tend to receive higher allocation volumes (as a percentage of the total volume of the right) on average.

Between 2010-11 and 2019-20, higher reliability entitlements in the Southern Basin received 100% allocations by the end of the year for most years, with 2019-20 being a notable exception for Victoria (figure 3.12). In comparison, allocations to lower reliability entitlements differed between New South Wales and Victoria. For Victoria, allocations to Low Reliability water access entitlements have typically been 0% for this whole period. For New South Wales, allocations to General Security entitlements have fluctuated considerably. For example, in 2015-16, allocations to New South Wales Murray General Security (GS) entitlements were 23% of maximum allocation, then rebounded to 100% in 2016-17, a higher water availability year. With return of drought conditions to the Basin, NSW GS received 0% for 2018-19 and only 3% for 2019-20. For the 2020-21 year to November 5, allocations to NSW Murray general security totalled 36%.

Figure 3.12: End of year announced allocations for selected water systems and reliabilities in the Southern Basin, 2010-11 to 2020-21

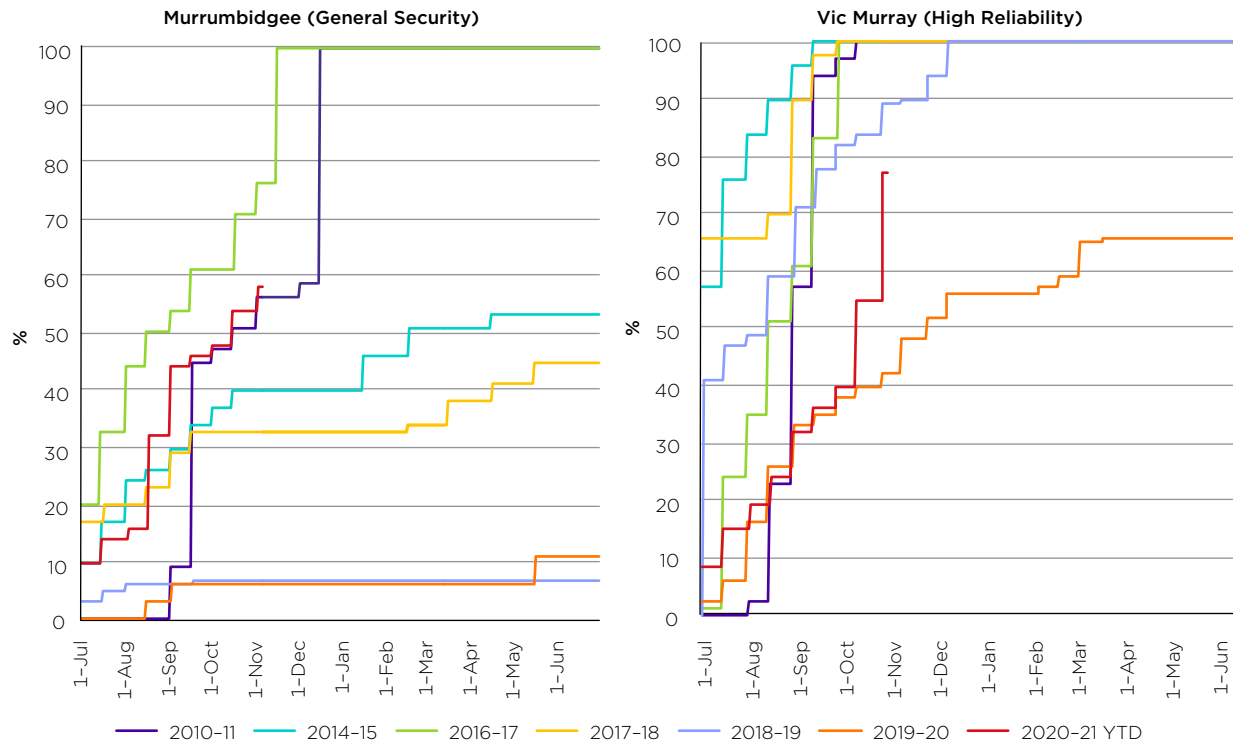


Source: WaterFlow.

Notes: 2020-21YTD = 2020-21 year to 5 November 2020.

Allocation announcements are made throughout the year (figure 3.13) in response to changing circumstances as the year progresses. For example, Murrumbidgee General Security allocations during 2016–17 were low initially but increased following rainfalls in September 2016 and increases in water storage levels. For 2018–19 and 2019–20, Murrumbidgee General Security final allocations for the year were only 7 and 11%, respectively, while allocations for High Reliability entitlements in Vic Murray reached 100% in both years. For the first half of the 2020–21 water year, General Security allocations in Murrumbidgee had reached 58% by 4 November, a marked improvement on recent years.

Figure 3.13: Progressive allocation announcements for Murrumbidgee General Security and Victoria Murray High Reliability for selected years

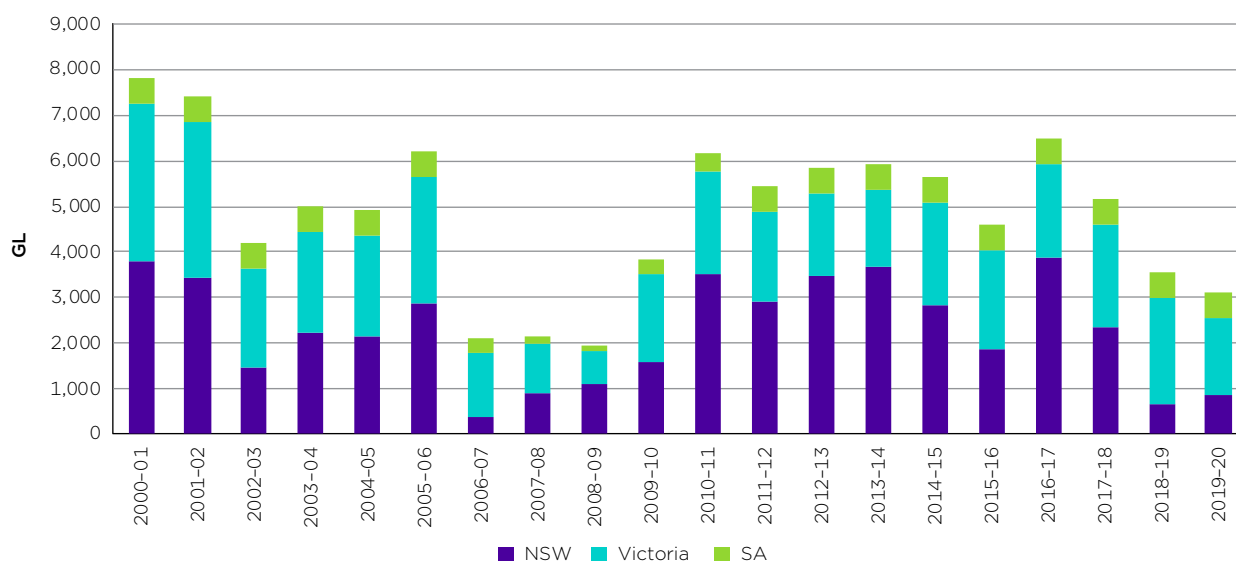


Source: WaterFlow.

Notes: 2020-21YTD = 2020-21 year to 5 November 2020.

As expected, the volume of water from announced allocations in the Southern Basin since 2010–11 has fluctuated in line with water availability (figure 3.14). It is worth noting that the total volume of water allocations are correlated with the volume of allocations from New South Wales. For example, between 2016–17 and 2018–19, the total volume of allocations almost halved from 6,491 GL to 3,291 GL. Over this period, the volume allocated to New South Wales entitlement holders decreased 3,194 GL, while Victoria increased 278 GL and South Australia remained unchanged.

Figure 3.14: Allocation volumes in Southern Basin, by state, 2000-01 to 2019-20



Source: ABARES data.

Notes: Allocation includes uncontrolled flows and has within year forfeits removed.

This is interesting from the perspective that New South Wales and Victoria equally share inflows into two of the largest water storages in Southern Basin, Hume Dam and Dartmouth Dam. Volumes in these water storages are therefore critical for the resource managers in determining available allocation.

In addition, it is worth noting the role the General Security allocations have in affecting the total volume of allocation water available in the Southern Basin. As an example, if New South Wales Murrumbidgee General Security allocations were 10% higher in 2018-19, then the total volume of allocations in the Southern Basin would have increased 190 GL or over 5%. This would have had a significant impact on water allocation prices but also would have affected other objectives of the resource manager.

Carryover

Carryover is a mechanism used in water systems which operate on an annual accounting basis. It allows unused water allocations to be transferred from one water year to the next. The specifics of the carryover policies vary by water system and are set out in individual water resources plans (see chapter 15, which discusses carryover policies in detail). Since its introduction, and particularly since 2007-08, there have been significant change in carryover policies. In particular:

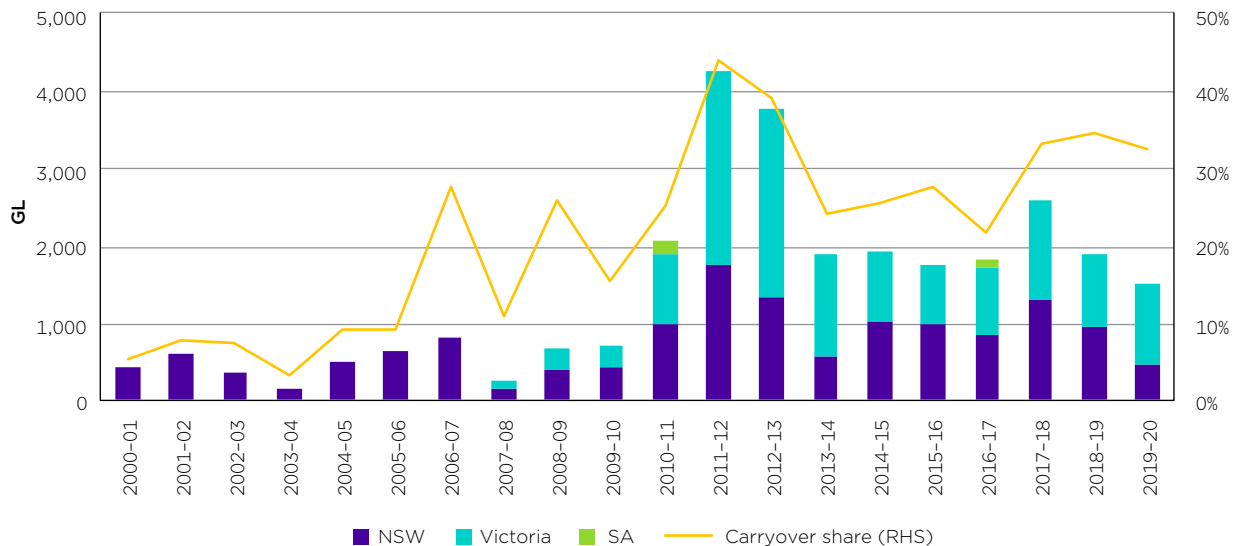
- 2007-08: South Australia and Victoria introduce temporary carryover arrangements
- 2008-09: Victorian annual carryover limit increased from 30% to 50% of nominal entitlement volumes
- 2009-10: Murrumbidgee annual carryover limit increased from 15% to 30% of nominal entitlement volumes
- 2010-11: Victoria introduces permanent carryover arrangement in the form of spillable water accounts, with no limit on annual carryover volumes
- 2012-13: South Australia adopts a permanent carryover arrangement
- 2013-14: Victoria applies a 100% limit on annual carryover volumes.¹²⁰

Since 2000-01, the volume of carryover in the Southern Basin increased from 433 GL to a high of 4,293 GL in 2011-12 and then decreased to 1,506 GL in 2019-20 (figure 3.15). Following Victoria allowing carryover, its usage by Victoria water access entitlement holders has been substantial, accounting for 2,524 GL of carryover or 59% of the volume carried over in the Southern Basin in 2011-12. Following changes to Victoria's carryover policies, New South Wales and Victoria carried over roughly the same volumes between 2016-17 and 2018-19. In 2019-20, volumes carried over

¹²⁰ ABARES, *Murray-Darling Basin water markets: Trends and drivers 2002-03 to 2018-19*, Canberra, February 2020, p. 11.

against NSW general security entitlements fell, reflecting continued low allocations to general security entitlements in NSW Murray and Murrumbidgee, and relatively low levels of trade into general security accounts to be carried over.

Figure 3.15: Carryover volumes and share of water available in the Southern Basin by state, 2000-01 to 2019-20

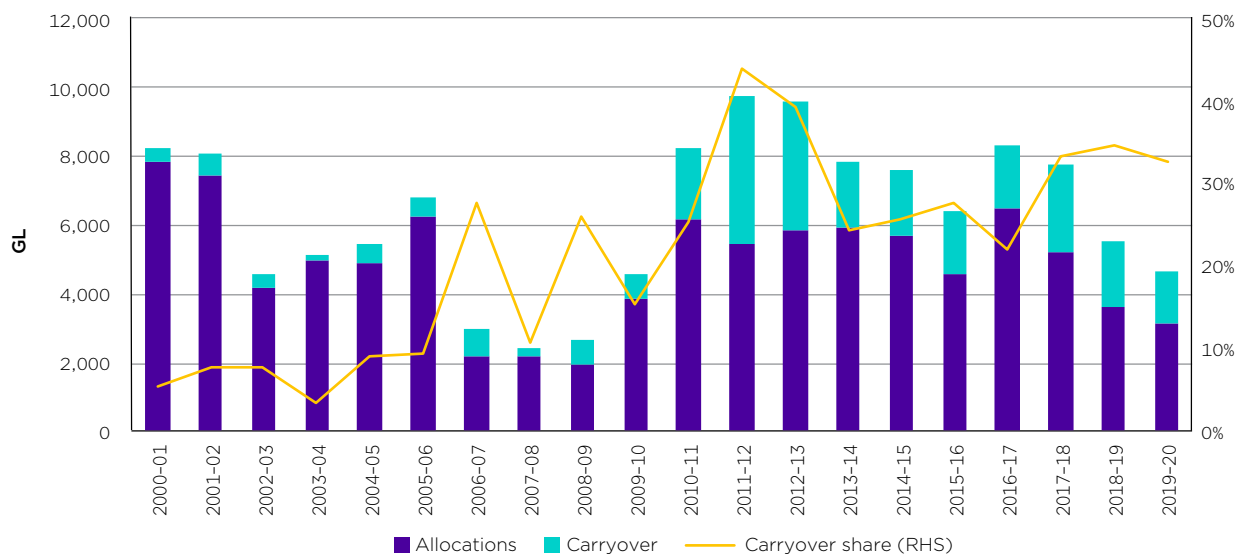


Source: ABARES data.

Notes: Carryover share of water available calculated as current year carryover as proportion of carryover from previous year plus current year allocation.

Together, allocations to water access entitlements and carryover from the previous year combine to determine the total volume of water available within a year in the Southern Basin (figure 3.16). The relative share of allocations and carryover varies from year to year. Over the long term the share of carryover has increased from around 5% in 2000-01 to 38% in 2019-20. In 2018-19, the share of total water availability sourced from carryover from the previous year rose to 42%, as water availability from new allocations fell to a low of 3,574 GL, but water users retained allocations from previous years.

Figure 3.16: Water availability from allocations and carryover for Southern Basin, 2000-01 to 2019-20



Source: ABARES data.

Note: Carryover share of water available calculated as current year carryover as proportion of carryover from previous year plus current year allocation. Allocation includes uncontrolled flows and has within year forfeits removed.

With increased volumes of water held by environmental water holders (EWHs), the proportion of allocation and carryover held by EWHs has increased. Between 2010–11 and 2018–19, ABARES estimates that the share of environmental allocations in total water supply has increased from 11% to almost 19%.¹²¹

Restrictions placed on the trade of water access entitlements and water allocations affect where water can be moved using trading mechanisms. These restrictions affect both supply and demand in different zones, and causes prices in different zones to diverge. Broadly, unless water systems are connected, water access entitlement and water allocation trade is restricted to within an individual water system. In Southern Connected Basin, water allocation trade is permitted both within and between the zones making up this system, but inter-zone trade is subject to a number of additional restrictions. The four major water allocation trade restrictions operating in the Southern Connected Basin are:

- Murrumbidgee inter-valley trade limit
- Goulburn to Murray trade limit
- New South Wales to Victoria spill risk trade limit
- Barmah Choke trade limit.

Data on the operation of these trade limits is presented below, together with a brief discussion of their impacts on prices. Trade restrictions are discussed in more detail in section 14.1 in chapter 14.

The **Murrumbidgee inter-valley trade limit** is implemented by the New South Wales Government. It reflects the net balance of surface water allocations traded or tagged traded out of the Murrumbidgee. Trade is permissible within the bounds of a lower limit of 0 GL and an upper limit of 100 GL. If the balance reaches 0 GL, trade into the Murrumbidgee is closed and cannot open until the balance reaches 15 GL. If the balance reaches 100 GL, trade out of the Murrumbidgee is closed and cannot open until the balance reaches 85 GL.¹²² The reason for these ‘shoulder’ operational limits (i.e. trade opening again after 15GL of trade opportunity has accumulated) is to prevent trade openings and closures in rapid succession; although in recent times, this has proved insufficient, and openings for trade out of Murrumbidgee often close within a matter of hours.¹²³

Since 2011–12, the Murrumbidgee inter-valley trade balance has switched regularly between being opened and closed (figure 3.17). During 2016–17, there were regular closures of the Murrumbidgee inter-valley trade, and there were also long periods of closure in 2018–19.

The **Goulburn-to-Murray trade limit** is operated by the Victorian Government. It does not allow trade from the Goulburn, Campaspe, Broken and Loddon systems to the Victorian Murray, New South Wales Murray and South Australian Murray if more than 200 GL of water is owed to the Murray at any one time. If the 200 GL is exceeded, trade **out** of the Goulburn system is closed and cannot open again until the Goulburn IVT account balance falls below 200 GL (generally as a result of trade from the Murray back into the Goulburn system).¹²⁴

Since 2012–13, there have been extended periods when the Goulburn-to-Murray trade limit was closed (figure 3.17). The longest period where trade was open was between October 2014 and October 2016. In contrast, more recently, trade has been closed more often than not. Importantly, trade has been closed for almost the entirety of 2019–20. It is worth noting that on 5 March 2020, the Victorian Government commenced a public consultation on proposed changes to the Goulburn-to-Murray trade limit.¹²⁵

121 ABARES, 2020, *Murray–Darling Basin water markets Trends and drivers 2002–03 to 2018–19*, https://daff.ent.sirsidynix.net.au/client/en_AU/search/asset/1029942/0, accessed 15 February 2021. Note: ABARES defines ‘environmental allocations’ as ‘water allocations against entitlements owned by the Commonwealth Environmental Water Holder (from purchases and on-farm infrastructure)’. Therefore, these estimates understate the share of total water supply held by environmental water holders (EWH), as allocations made to entitlements held by other EWHs (e.g. VEWH) are omitted, and these estimates do not account for carryover by EWHs.

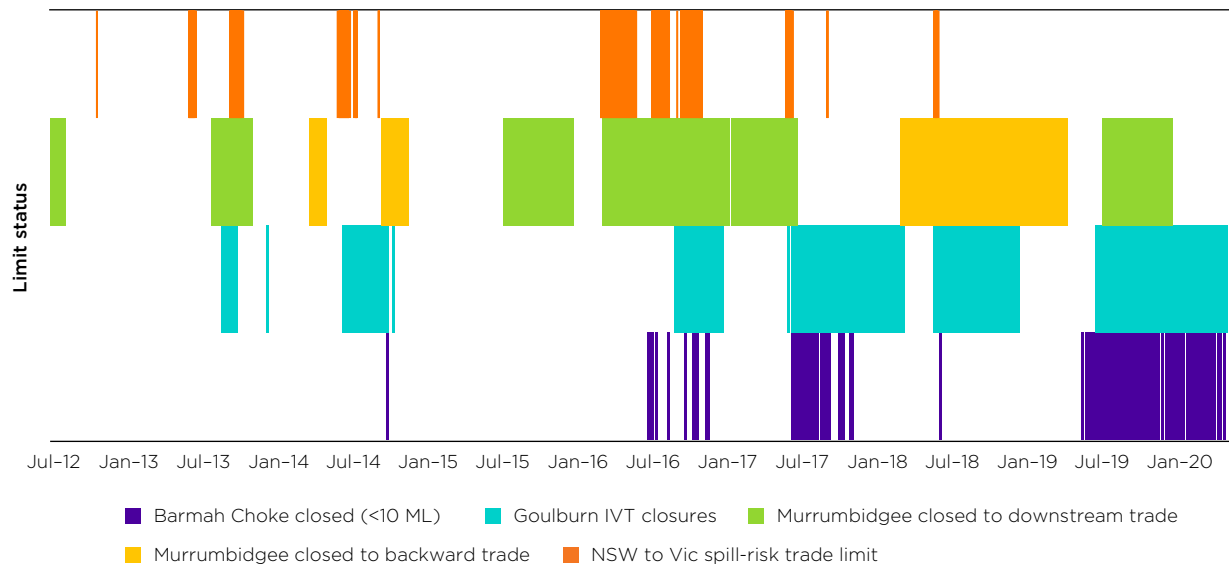
122 WaterNSW, Murrumbidgee IVT Account Status, <https://www.watarnsw.com.au/customer-service/ordering-trading-and-pricing/trading/murrumbidgee#stay>, viewed 19 June 2020.

123 NSW Government, Murrumbidgee Inter-Valley Trade Account (IVT) Fact Sheet, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0018/209412/murrumbidgee-ivt-fact-sheet.pdf, viewed 28 January 2021.

124 Victorian Water Register, Understanding the Goulburn to Murray trade limit, 17 September 2017, <https://waterregister.vic.gov.au/about/news/171-understanding-the-goulburn-to-murray-trade-limit>, viewed 22 June 2020.

125 Engage Victoria, Department of Environment, Land, Water and Planning (Vic), Goulburn to Murray trade rule review, <https://engage.vic.gov.au/goulburn-murray-trade-rule-review>, viewed 22 June 2020.

Figure 3.17: Inter-valley trade limits, Southern Connected Basin, 2012-13 to 2019-20



Source: ACCC analysis based on MDBA, NSW Government and Victorian Government responses to voluntary information request.

Notes: Figure shows instances where a particular trade limit was binding (i.e. inter-zone trade was closed in that particular direction). Where there is no data point for a particular date, closures are extrapolated from previous datapoint. Barmah Choke 'closure' is when account balance is less than 1 ML. Sensitivity analysis was run to compare impact of different 'closure' assumptions, with only small impact for all assumptions tested up to 100 ML. Murrumbidgee closures from 31/07/2012 are calculated from IVT account balance data. For 2019-20 water year, daily data for this account did not accurately capture IVT closures, so these were manually corrected. Other such discrepancies may exist for previous water years. For NSW to Vic spill-risk trade limit: data available from 20 November 2012 to 3 November 2020. NSW introduced new procedures for processing inter-valley trades through the Murrumbidgee IVT account on 9 February 2016. This rule change introduced the 'shoulder' mechanism so that after becoming binding, trade does not open again until the account balance drops below 85 GL (for restrictions on trade into the Murray) and above 15 GL (for restrictions from trade into the Murrumbidgee).

The **New South Wales-to-Victoria spill risk trade limit** is implemented by the Victorian Government. It limits allocation trade from New South Wales to Victoria to the lesser of a net annual volume of 200 GL or a volume that keeps the risk of spill in Victoria's share the Murray system below 50%.¹²⁶

Since 2012-11, the New South Wales-to-Victoria spill risk trade limit mostly did not apply (see figure 3.17 above). However, during late 2015-16 and early 2016-17, there were significant periods when the trade limit applied and so allocation trade from New South Wales to Victoria was not allowed.

The **Barmah Choke trade limit** is implemented by the MDBA and reflects a physical constraint on the Murray River running through the Barmah-Millewa Forest. The Barmah Choke restricts the flow of the Murray River to 7000 ML per day.¹²⁷

Broadly, the trade limit ensures that water allocation trade downstream through the Barmah Choke can only occur when there is sufficient matching trade upstream. Each 1 July the Barmah Choke trade balance is reset. A positive balance indicates the volume of water allocation that can be traded from upstream to downstream. A Barmah Choke balance less than 0.1 GL indicates there is no opportunity to trade downstream, and trade downstream can only occur again following water allocation trade from downstream to upstream.

Since 2014-15, the Barmah Choke trade balance has varied between a low of -18 GL at the start of July 2018 to a high of 199 GL in November 2015. During 2015-16, the Barmah Choke trade balance was over 150 GL for a majority of the year. This indicates that for this period there was an ability for over 150 GL of water allocation to be traded from upstream to downstream. More recently during 2019-20, the Barmah Choke trade balance has been generally 0 GL with small periods when water allocation trade

¹²⁶ Victorian Water Register, Understanding the New South Wales to Victoria trade limit, 21 March 2016, <https://waterregister.vic.gov.au/about/news/195-understanding-the-nsw-to-victoria-trade-limit>, viewed 22 June 2020.

¹²⁷ MDBA, Barmah Choke trade balance and restriction, <https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade/barmah-choke-trade-balance>, viewed 22 June 2020.

downstream could occur. It is important to note that the Barmah Choke trade limit in its current form has been operating since 28 October 2014. Prior to 28 October 2014, there were less restrictions on water allocation trade across the Barmah Choke.¹²⁸

3.2.2 Water demand

There are many types of users of water in the Basin, each with different incentives. Chapter 4 of this report provides a detailed examination of how these different consumers participate in water markets. For the purpose of this chapter, two major uses of water in the Southern Basin are for irrigated agriculture and achieving environmental objectives by environmental water holders.

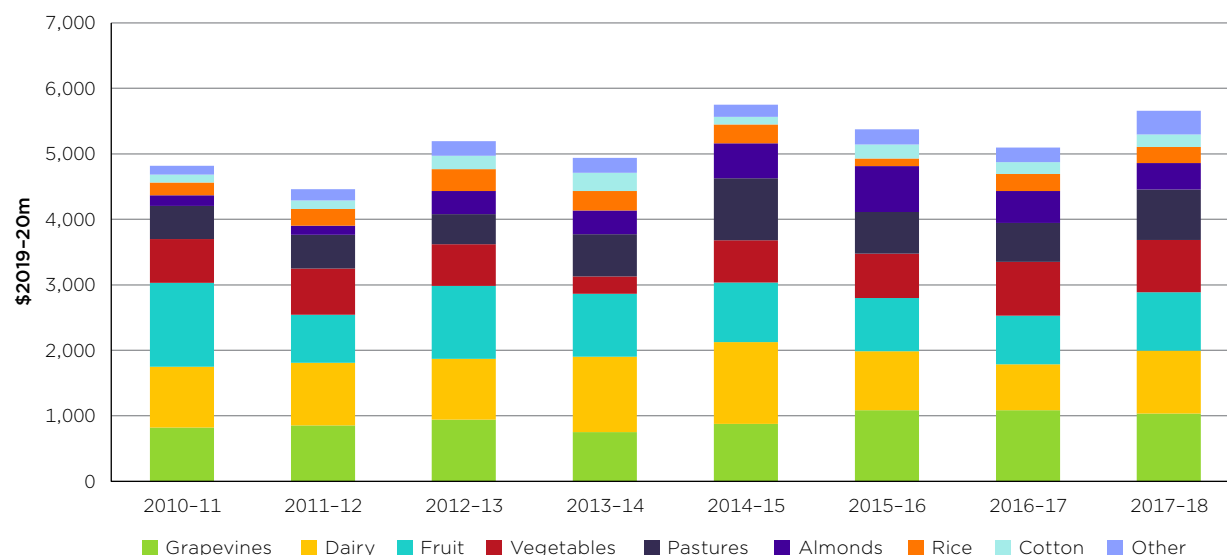
Water users obtain water from a range of sources. For irrigated agriculture, this can include on-farm rainfall, announced allocations for holders of water access entitlements – which could be surface water or groundwater – and purchasing water in water allocation markets. There is a degree of substitutability between different sources of water, such that higher than expected rainfall may reduce the need to use announced allocations or to purchase water in water allocation markets. This means that water demanded by end users is not the same as demand *in water markets*. Also some demand in water market comes from participants who are not in themselves water users. For example, investors who may purchase water allocation at one point in time in order to fulfil a forward contract at a later point in time. This section considers some of the main drivers of demand in water markets.

Irrigated agriculture

Across the Southern Basin, producers of many agricultural commodities require irrigation water to operate their businesses. In 2017–18, total Gross Value of Irrigated Agricultural Production (GVIAP) in the Southern Basin was over \$5.7 billion (figure 3.18), with the most valuable commodities produced being grapes (\$1,037 million), dairy (\$964 million), fruit (\$895 million), vegetables (\$804 million) and pastures (\$771 million).

In the Northern Basin, irrigated agricultural production is dominated by cotton, although other irrigated commodities produced include vegetables and irrigated pasture. In 2017–18, the total GVIAP in the Northern Basin was around \$1.6 billion in real terms (figure 3.19).

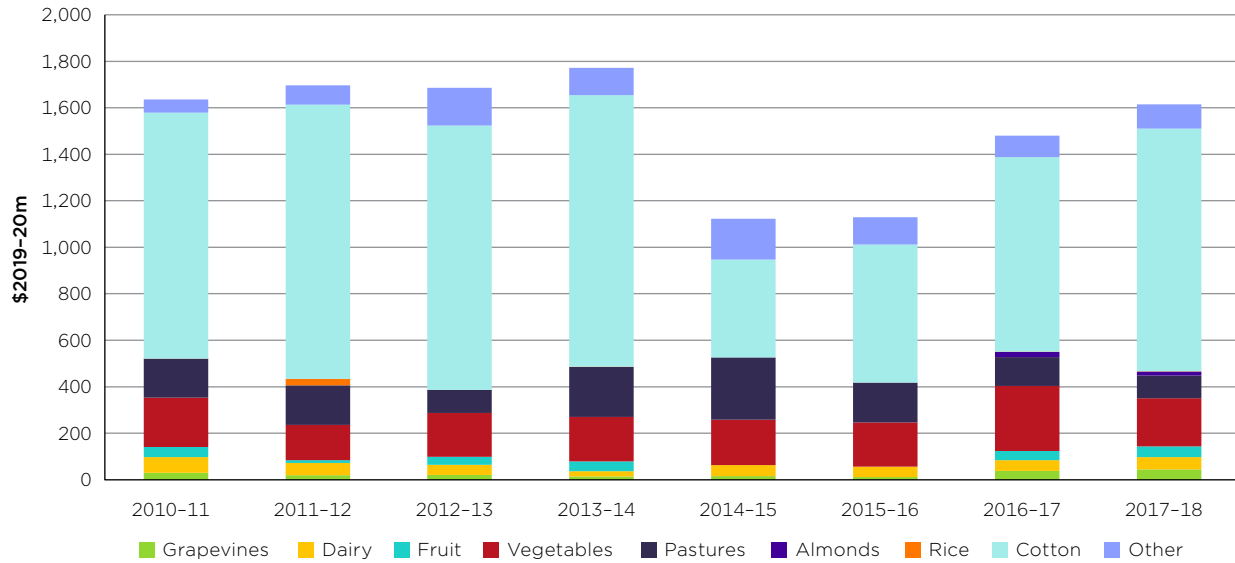
Figure 3.18: Gross value of irrigated production for Southern Basin, by commodity



Source: ABARES, MDB water market dataset – demand.

¹²⁸ Source: MDBA response to voluntary information request.

Figure 3.19: Gross value of irrigated production for Northern Basin, by commodity



Source: ABARES, MDB water market dataset – demand.

Since 2010-11, the GVIAP in the Southern Basin increased on average 2.3% per year in real terms. However, there has not been a uniform increase, with GVIAP decreasing in some years. For example, GVIAP for the Southern Basin decreased in 2015-16 by 6.5% and again in 2016-17 by 5.2%. Importantly, almond GVIAP increased on average 13.9% per year from \$164 million in 2010-11 to \$407 million 2017-18, with GVIAP peaking in \$702 million in 2015-16. This overall growth in GVIAP has occurred in the context of a significant reduction in the consumptive pool, as recovery of water for the environment has removed up to 30% of the total volume of entitlement on issue in some catchments (see discussion on environmental water holders below).

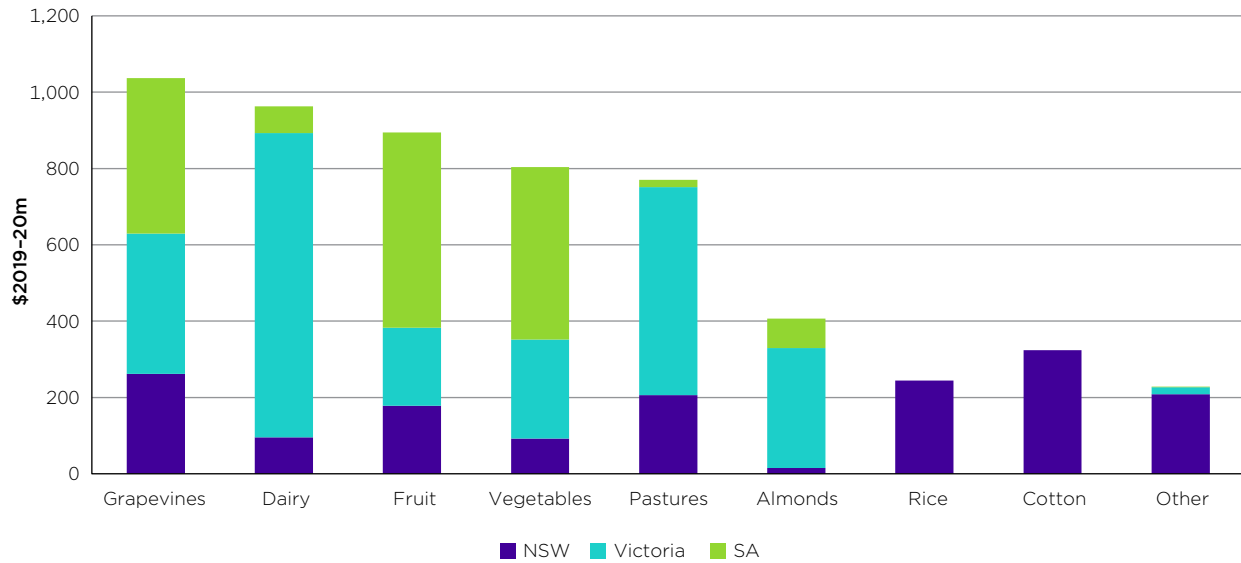
The location of irrigated production differs for each commodity type (figure 3.20). For the Southern Basin in 2017-18:

- dairy production is primarily located in northern Victoria, mostly in the Goulburn-Broken water system
- fruit and vegetable production is primarily located in South Australia
- almond production is mostly in Victoria (but has also been increasing elsewhere) and is concentrated in the Victorian Murray below the Barmah Choke
- rice and cotton production is primarily located in New South Wales.

For the Northern Basin:

- cotton dominates irrigated production for the whole region, and is mostly grown in northern New South Wales
- vegetables and pastures are also important commodities, with vegetables being particularly important in the Queensland Border Rivers.

Figure 3.20: Gross value of irrigated production in the Southern Basin, by state and commodity 2017-18



Source: ABARES, MDB water market dataset – demand.

Between 2010-11 and 2017-18, there have been significant changes in the location of irrigated production across the Southern Basin:

- almond production increased in Victoria, South Australia and New South Wales by \$205 million, \$29 million and \$7 million respectively
- fruit production in Victoria decreased by \$656 million while it increased in South Australia by \$258 million
- pasture production in South Australia decreased by \$19 million while it increased in Victoria by \$208 million.

These changes in GVIAP reflect the changes in the volumes applied and area irrigate by horticultural and broadacre industries in the Southern Basin (figure 3.21 and figure 3.22).

Figure 3.21: Volume applied and area irrigated for selected horticultural industries in the Southern Basin



Source: ABARES data.

Figure 3.22: Volume applied and application rate for selected broadacre industries in the Southern Basin



Source: ABARES data.

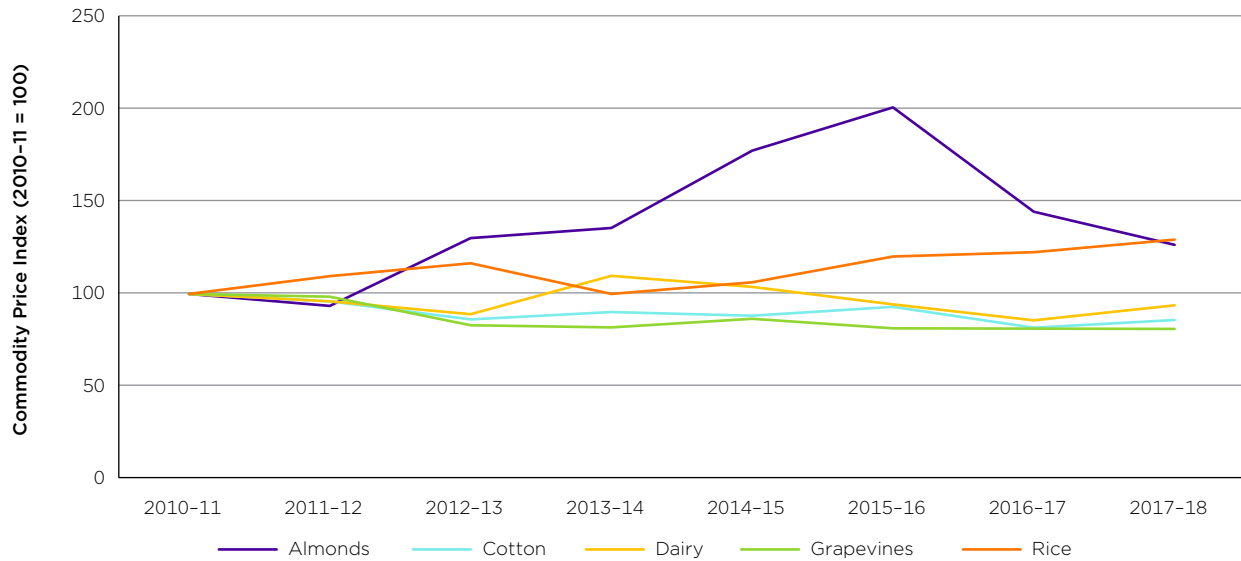
For the Southern Basin, between 2010-11 and 2018-19, the area of almonds under irrigation and the volume of water applied to them increased by almost 25,000 hectares (an 89% increase over the period as a whole) and 302 GL (an 157% increase over the period). This growth has been concentrated in the Victoria Murray below Barmah Choke, New South Wales Murray below Barmah Choke and South Australian Murray. By comparison, the area of irrigation and volume of water applied to rice peaked in 2012-13 at 113,000 hectares and 1,434 GL and reached a low in 2018-19 of 6,558 hectares and 67 GL, with these changes occurring in the New South Wales Murray below Barmah Choke, New South Wales Murray above Barmah Choke and Murrumbidgee zones. Over the same period, the area of irrigated cotton and volume of irrigation water applied to that crop increased by 23,000 hectares and 255 GL, with most of this increase occurring in the Murrumbidgee in contrast to reductions which occurred in the Lower Darling.

Changes in input and output prices and other factors faced by irrigators affect the profitability of irrigation activities, demand for water and the participation of irrigators in water markets. Over the long run, changes in expectations of the profitability of irrigation activities drive changes in investment patterns and shifts in irrigated land and water use.

Prices for major irrigated commodities in the Southern Basin have varied considerably since 2010-11 (figure 3.23). In real terms:

- almond prices have increased by around 27% between 2010-11 and 2017-18 overall, doubling between 2010-11 and 2015-16, before decreasing by 37% to 2017-18
- rice prices have increased by almost 30% between 2010-11 and 2017-18
- cotton prices have decreased by over 14% between 2010-11 and 2017-18.

Figure 3.23: Selected annual commodity prices indexes



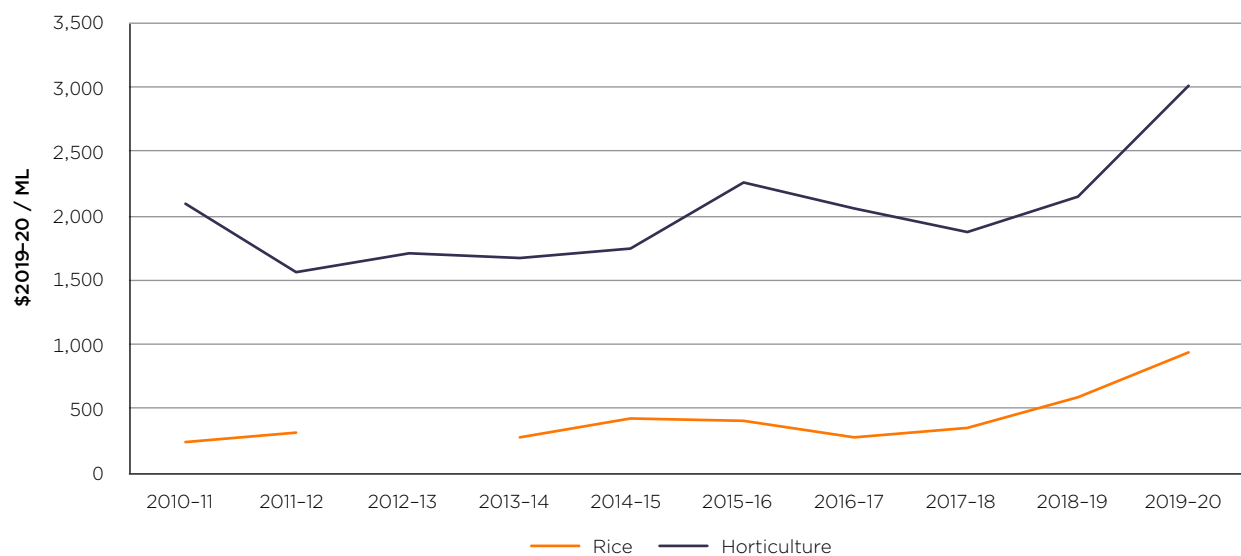
Source: ABARES, MDB water market dataset – demand.

Notes: 2010-11 = 1. Index based on prices in real terms (\$2019-20). Note that while 2017-18 is the most recent year for which this dataset is available, there have been further changes in commodity prices since 2017-18.

In the Southern Basin, ABARES farm survey results show that the horticulture industry achieved a substantially higher real gross unit return per megalitre of water applied compared to rice (figure 3.24). Between 2010-11 and 2019-20, real gross unit returns for the horticulture industry (encompassing pome fruit, citrus, stone fruit, grapes and other tree crops) averaged \$2,013 per ML applied. Over the same period, the rice industry averaged \$425 per ML applied.

While these differences are significant and may lead to the conclusion that more water will or should be diverted from rice production to horticulture, it is important to recognise that horticultural production requires a reliable volume of water to be available every year, whereas farmers producing an annual crop such as rice can make annual decisions about how much crop to plant, based on rainfall and irrigated water availability. Annual crops are therefore much more suited to locations or irrigation water entitlements with lower annual reliability.

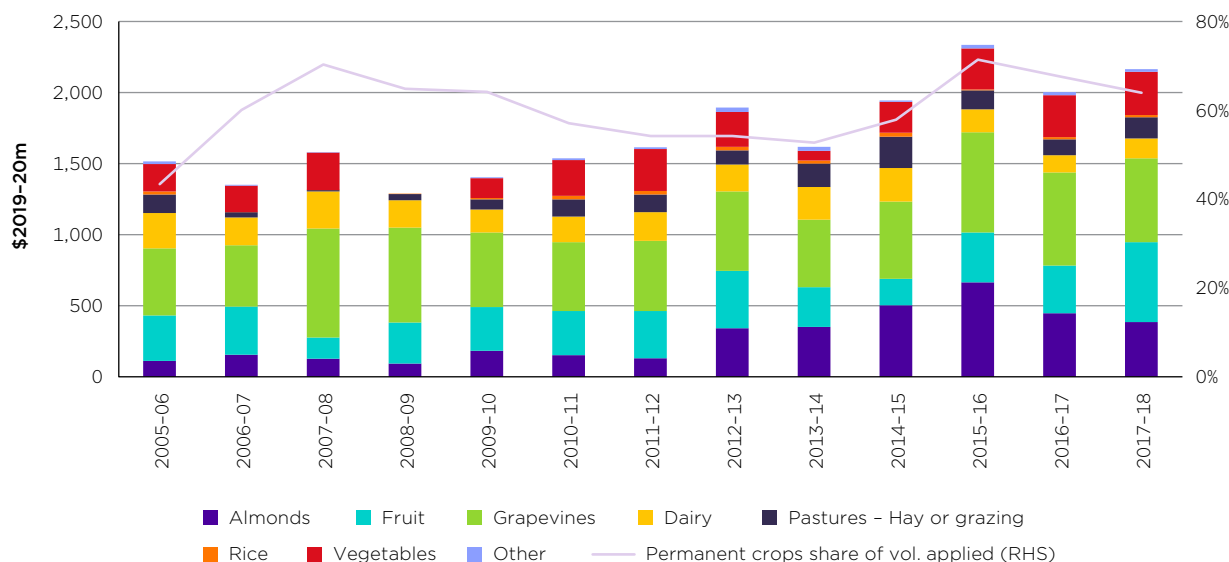
Figure 3.24: Gross unit return to horticulture and rice crops, average per farm



Source: ABARES irrigation farm surveys. Note: 2012-13 data not available for rice.

In the Murray regions downstream of the Barmah Choke, for some time agricultural production has been dominated by permanent plantings, both in terms of the value of production, and in volumes of water applied. Within this segment, almond and fruit production have grown, and are replacing grapevine production to some degree (figure 3.25). Permanent plantings (almonds, grapevines and fruit trees) are quite dominant in this region, accounting for 64% of water volumes applied in 2017–18.

Figure 3.25: Gross value of irrigated agricultural production by commodity in River Murray regions downstream of Barmah Choke



Source: ABARES, MDB water market dataset – demand.

Notes: Permanent crops share of volume applied is shown on the right axis, and comprises Almonds, Fruit and Grapevines. Includes New South Wales Murray downstream of Barmah Choke; Victoria Murray downstream of Barmah Choke, and South Australian Murray. 2017–18 latest year available. Gross value of irrigated agricultural production in \$2019–20 million.

Stakeholders have raised concerns about the resilience of the agriculture sector in these regions as production is dependent on a few high value permanent crops.¹²⁹ Several issues have been raised. These include:

- There is concern there will not be sufficient reliable water to sustain permanent plantings and agriculture more generally through a prolonged drought, or under an increasingly dry or variable climate due to climate change.¹³⁰
- Many of the permanent plantings are new, and so the historical data underestimates their share of water demand. Questions arise about the implications of growth in permanent plantings, and their demand for water as these crops mature, especially for growers of other commodities who may be less able to compete for water in scarce periods.¹³¹

129 For example, Almond Board of Australia, Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, pp. 3–4, 6–7. Leeton Shire Council submitted that ‘Diversity of crop type has been the strength of the MIA for over one hundred years and has increased our resilience. Without that diversity our established industries that have built up over many decades will be threatened, impacting local jobs, our local economy and our local community. Further losses in agricultural diversity also poses a serious threat to national food security and will drive up food prices for Australians.’ Leeton Shire Council Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, p. 2.

130 For example, the National Irrigators Council (NIC) submitted that ‘The current severe drought is the key factor in high prices, and clearly over coming years the predicted reductions in run off, as a result of climate change, will have real negative impacts on irrigation water availability.’ NIC Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, p. 9.

131 For example, NSW Farmers, Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, p. 6. SunRice Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, p. 15. Almond Board of Australia, Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, pp. 3–4. The Australian Dairy Industry Council Inc. (ADIC) submitted that ‘that the current regulations in the water market should be re-examined to account for increased risks due to significant changes in land use and crop types and subsequent water demand below the Barmah Choke, with focus on consideration of third-party impacts, especially reliability of entitlements’. ADIC Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, p. 2.

- Some irrigators are more vulnerable to low water availability as they own low or no volumes of permanent entitlements and rely on temporary water markets to source the water they need each year. This is particularly concerning in relation to permanent plantings.¹³²

Resolving these issues involves making a range of assumptions about commodity prices and water availability in the future. The ACCC has not undertaken its own scenario modelling to assess these questions, but there are several recent efforts undertaken by others to assess the implications of these changes for water markets and agricultural sectors. In particular, ABARES modelled a range of scenarios to assist the work for the Socio-Economic panel in 2019–20. While there are acknowledged limitations of this work¹³³, the key projections arising from this study include:

- 'Growth in water demand in the lower Murray due to maturing almond trees (particularly in New South Wales and South Australian Murray), leads to greater pressure for inter-regional water trade, more frequently binding trade limits and large differences in prices between regions. Particularly in dry years, trade limits lead to significantly higher prices in the Murray below Barmah region (between \$955/ML and \$1,075/ML) compared to the Murrumbidgee (between \$665/ML and \$712/ML).'
- 'While water supply (including both surface water and other sources such as groundwater) is sufficient to meet estimated demand from horticultural plantings (fruits, nuts and grapevines) in all scenarios, in practice there remains some risk of supply shortfalls within each water year, particularly if future conditions are drier than modelled or trade constraints are tightened. Horticultural plantings are estimated to use around 1,276 GL on average each year in the 'future scenarios'.
- GVIAP is also projected to decrease for some agricultural commodities (chiefly dairy and rice) but increase for almond, although the modelling does not account for commodity or input price shifts as prices are fixed to observed values in 2018–19.¹³⁴

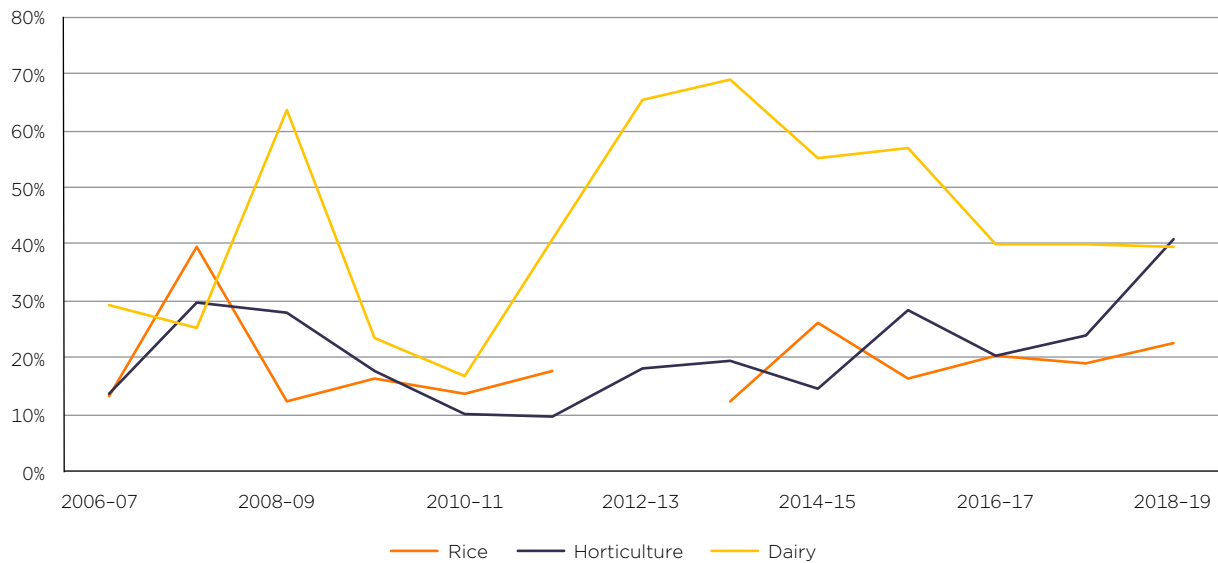
ABARES survey data also shows that dairy farmers are most reliant on temporary water markets to source the water they use. Figure 3.26 shows that in 2018–19, the average dairy farm purchased 41% of volumes of water used. Similarly, horticulture farms' temporary water purchase amounted to 39% of use in 2018–19, but this was significantly higher than in previous years. In contrast, temporary purchases by rice farms averaged 23%, fairly consistent with previous years.

132 For example, NSW Farmers submitted that 'Supply and reliability issues experienced by upstream farmers because of the current drought are being exacerbated because many of the new permanent plantings in the recently expanded irrigation areas do not have high security water entitlements and rely upon general security and temporary water entitlements'. NSW Farmers, Submission to the Murray–Darling Basin Water Markets inquiry issues paper, March 2020, p. 6. This issue is also considered further in chapter 4.

133 ABARES notes that there are several key caveats to their scenario results: 'Firstly, the climate sequence used (2006 to 2019) is particularly dry in the context of the longer historical record and may differ from average future climate conditions. Secondly, these scenarios are based on current farms using current capital and technology, and do not allow for long-term adaptation (innovation/technological change) or structural adjustment (changes in capital investment). Commodity prices are also fixed to observed values in 2018–19. Prices higher or lower than assumed will alter the demand for water from farms producing that commodity, and hence their overall water use and production.' ABARES, *Future scenarios for the southern Murray–Darling Basin: Report to the Independent Assessment of Social and Economic Conditions in the Basin*, <https://www.agriculture.gov.au/abares/research-topics/water/future-scenarios-smdb-independent-assessment-social-economic-conditions>, viewed 22 June 2020.

134 *ibid.*

Figure 3.26: Reliance on temporary markets: Volume of temporary purchases as proportion of water use, average per farm, Southern Basin



Source: ABARES irrigation farm surveys.

Notes: Horticulture: average of 3 regions (Goulburn, Murray, Murrumbidgee); Rice: average of 2 regions (Murray and Murrumbidgee), no data for 2012-13; Dairy: average of 2 regions (Murray and Goulburn).

Key findings on irrigated agriculture water demand factors

Putting all of the above together, the ACCC's view is that key trends in the irrigated agriculture sector of the Basin which are likely to have significantly affected demand for water for irrigation (and irrigator participation in water markets) have been:

- a substantial expansion of the almond industry: increased irrigated areas, volume of water applied and production of almonds, which have been concentrated on the Murray River below the Barmah Choke
- increased pasture production in Victoria: used in dairy and other livestock industries, although average area of irrigated pasture per farm declined in 2018-19, reflecting drought conditions in that year
- a continued significant role of cotton, rice and other broadacre annual cropping in New South Wales
- increased irrigated area and volume of water applied for cotton production in the Murrumbidgee, while there has been a decrease in irrigated area and volume of water applied for cotton production in the Lower Darling.

Environmental water holders

The Australian and state governments have progressively recovered water for the environment and become significant owners of water access entitlements in the Basin. As such, they have an important impact on water demand. The government environmental water holders (EWH) include:

- Commonwealth Environmental Water Holder (CEWH)
- Victorian Environmental Water Holder (VEWH)
- New South Wales Office of Environment and Heritage (OEH)
- South Australian Minister for Environment and Water
- Murray Darling Basin Authority (MDBA).

It is important to note that recovery of water for the environment began in the 2000s, prior to the implementation of the *Basin Plan 2012* (Cth). Programs for recovering water for the environment have included:

- Water for Rivers
- Living Murray Initiative
- various New South Wales, Victoria and South Australian Government initiatives.¹³⁵

Associated with the *Basin Plan 2012* (Cth), Australian Government programs aimed at recovering water for the environment have included:

- Sustainable Rural Water Use and Infrastructure Program, comprising:
 - irrigation infrastructure projects
 - water purchase mechanisms (also known as the Restoring the Balance program)
 - supply measures
- Private Irrigation Infrastructure Program for New South Wales
- Private Irrigation Infrastructure Program for South Australia
- On-Farm Irrigation Efficiency Program
- Commonwealth On-Farm Further Irrigation Efficiency Program.¹³⁶

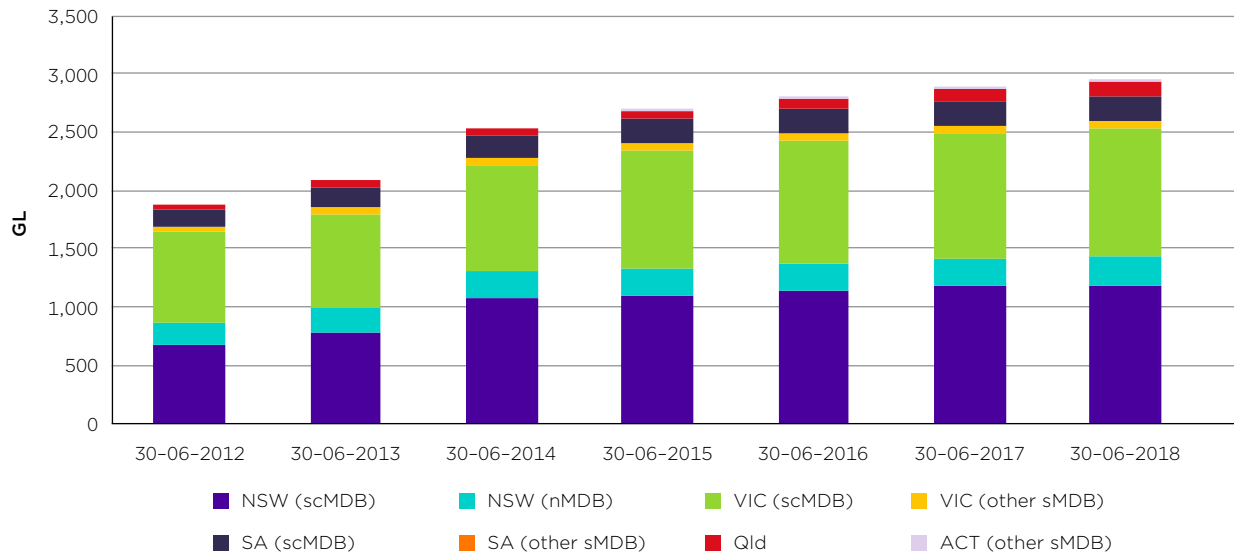
In addition, there have been several programs and initiatives by state governments which have recovered water for the environment.

As at 30 June 2018, 2,938 GL of water had been recovered for the environment and held by government environmental water holders across the Basin (figure 3.27). Between 30 June 2012 and 30 June 2018, the total volume of water access entitlement held increased by 1,057 GL, with Queensland, New South Wales, Australian Capital Territory, Victorian and South Australia water systems accounting for 89GL, 580GL, 324GL, 60GL and 5GL, respectively, of this increase.

¹³⁵ MDBA, *Transition period water take report 2017–18: Report on Cap compliance and transitional SDL accounting*, Canberra, July 2019, p. 148.

¹³⁶ Department of Agriculture, Water and the Environment, Water programs across the Murray–Darling Basin, <https://www.agriculture.gov.au/water/mdb/programs/basin-wide>, viewed 17 June 2020.

Figure 3.27: Water access entitlement volumes (GL) held by EWHs, by state and Basin region

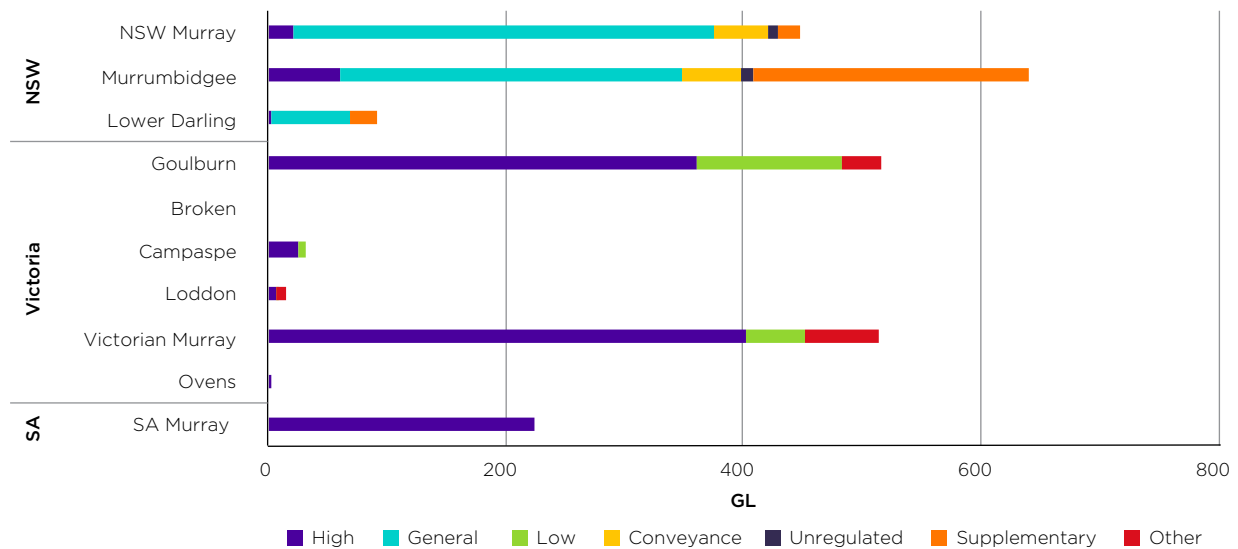


Source: MDBA, Transitional SDL water take reports (multiple years).

Notes: Volumes are expressed in Long Term Average Annual Yield (box 3.2) terms. New South Wales updated their LTDLE factors ('Cap factors' - see box 3.2) in 2018; the volumes for New South Wales as at 30 June 2018 incorporate these updated factors. nMDB = Northern Basin, scMDB = Southern Connected Basin, sMDB = Southern Basin.

Within the Southern Basin, the Murrumbidgee, New South Wales Murray, Victoria Murray, Goulburn and South Australian Murray water systems accounted for a substantial share of water access entitlements held by EWH on 30 June 2018 (figure 3.28). In addition, almost half of water access entitlements held by EWH in the Southern Basin are higher reliability (in Long Term Average Annual Yield (LTAAY terms; see box 3.2).

Figure 3.28: Volume of water access entitlements (GL) held by EWHs in the Southern Basin, by reliability, 30 June 2018



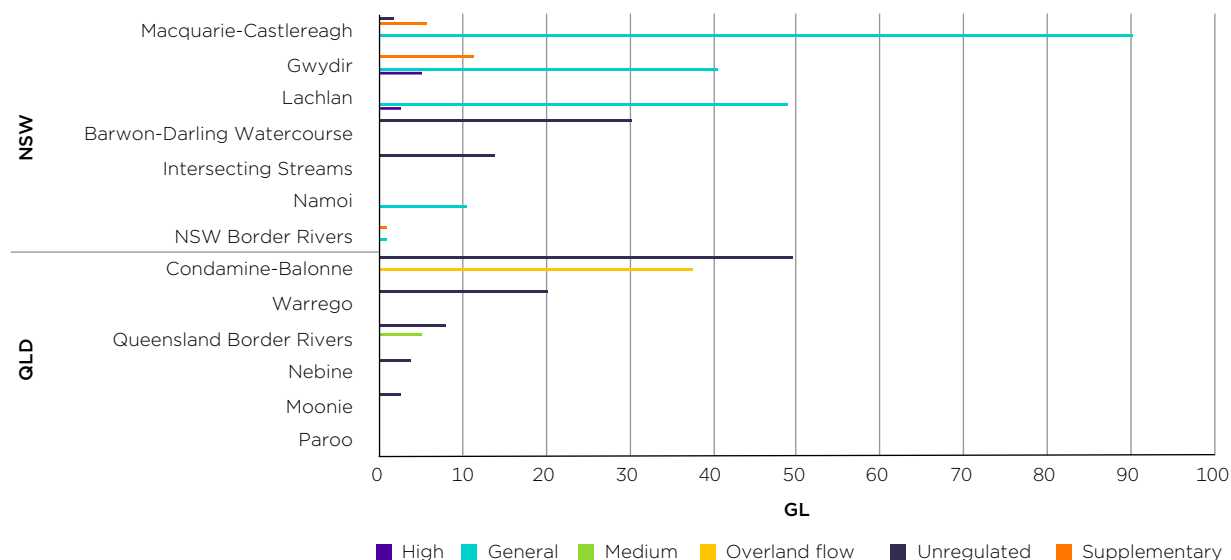
Source: MDBA, Transitional SDL water take reports (multiple years).

Notes: Volumes are expressed in Long Term Average Annual Yield (LTAAY) terms. High reliability includes High Security water access entitlements in New South Wales, High Reliability water access entitlements in Victoria, all water access entitlements in South Australia.

A small volume of water access entitlements are held by EWH in the Southern Basin but are not part of the connected systems (not shown in figure 3.28). As at 30 June 2018, this accounted for around 66 ML (LTAAY terms) or over 2.6% of the total volume of water access entitlements held in the Southern Basin.

In the Northern Basin, the majority of environmental water holdings as at 30 June 2018 were held in the New South Wales catchments of Macquarie-Castlereagh, Gwydir and Lachlan, mostly in the form of general security entitlements, and the Queensland catchment of Condamine-Balonne, as unregulated (unsupplemented¹³⁷) entitlements (figure 3.29).

Figure 3.29: Volume of water access entitlements (GL) held by EWHs in the Northern Basin, by reliability, 30 June 2018



Source: MDBA, Transitional SDL water take reports (multiple years).

Notes: Volumes are expressed in Long Term Average Annual Yield (LTAAY) terms. High reliability includes High Security water access entitlements in New South Wales, High Reliability water access entitlements in Victoria, all water access entitlements in South Australia.

Box 3.2: Water access entitlement units: nominal versus Long-Term Average Annual Yield

The 'nominal' or 'face value' of a water access entitlement is usually specified as a specific volumetric amount, usually denominated in megalitres. Water allocated to, and used by, the various classes of entitlement across the Basin varies according to the irrigation crops and practices in each valley, local climate, and water management rules. Long Term Diversion Limit Equivalence (LTDLE) factors provide a conversion between the size of a water entitlement and the long-term average use of that entitlement over the reference period used to develop the Basin Plan (1895–2009). LTDLE factors are specific for an entitlement class within each valley for which water resource plans are being prepared under the Basin Plan. In order to be able to compare across entitlement types in a consistent or 'like-for-like' way, the nominal or face value of an entitlement needs to be converted into a unit that takes into account differences in reliability. This unit is called 'Long-term average annual yield', and is calculated by multiplying the nominal or face value of an entitlement by its corresponding LTDLE factor, also known as a 'Cap factor'.

Source: Adapted from Brewsher and Simpson (2019) *Independent Review of the Victorian Method and Planning Assumptions for Long Term Diversion Limit Equivalence (LTDLE) Factors in the Murray-Darling Basin*.

137 'Unsupplemented' is Queensland terminology and corresponds to 'unregulated' in the *Water Act 2007* (Cth) terminology.

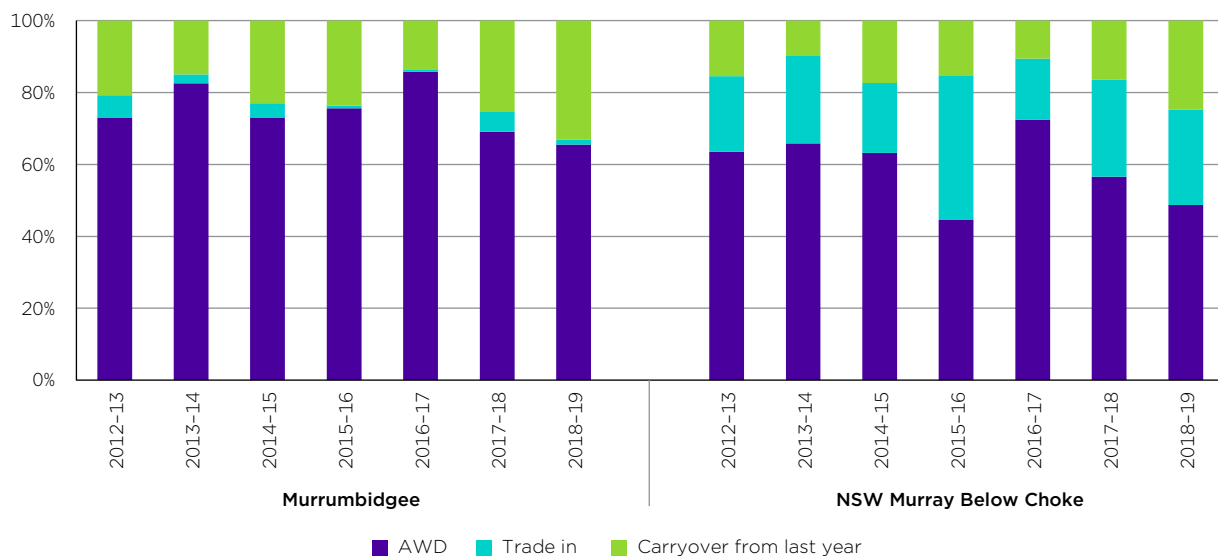
3.3 Implications of trends and drivers for market outcomes

3.3.1 Carryover and trade interact to allow concentration of water use in particular places, at particular times, for particular uses

In the past, water users were not able to carry over water allocations across multiple years, and opportunities to relocate water use across zones (or even outside of IIO networks) were limited. As trade restrictions have been removed and carryover and other policies have allowed water users to individually plan their water use across multiple seasons more directly, the relationship between water *allocations* in a given zone and season and water *use* has become less direct. However, this has occurred more in some zones than others.

The figures below compare water accounting data for New South Wales Murray Below Choke (zone 11) and Murrumbidgee (zone 13). Figure 3.30 shows proportions of account *credits*, comprising water allocated to entitlement holders via Available Water Determinations (AWD), carryover from the previous year, and trade *into* the zone. Figure 3.31 shows proportions of account *debits*, comprising water account usage (excluding uncontrolled flow usage), trade *into* the zone, forfeits and carryover into the following year.

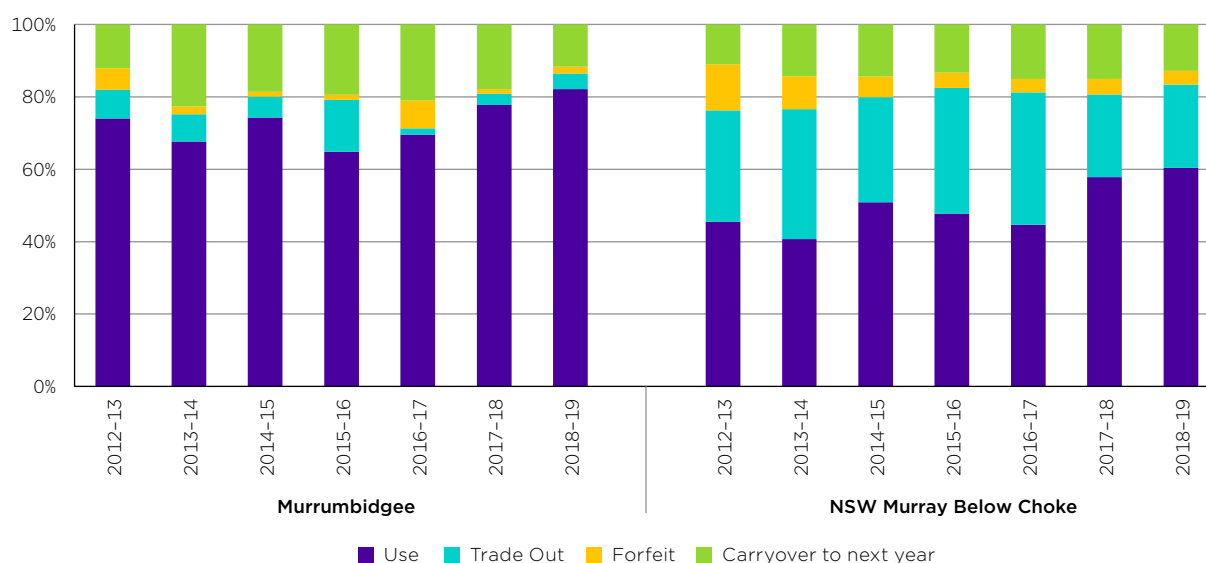
Figure 3.30: Proportion of water account credits by type, Murrumbidgee and New South Wales Murray below Barmah Choke



Source: ACCC analysis based on NSW General Purpose Water Accounting Reports and NSW Government response to voluntary information request.

Notes: AWD = Proportion of water account credits sourced from Available Water Determinations (AWD) in the current water year. Excludes uncontrolled flow usage for all accounts, and all supplementary Water Access Licence accounts.

Figure 3.31: Proportion of water account debits by type, Murrumbidgee and New South Wales Murray below Barmah Choke



Source: ACCC analysis based on NSW General Purpose Water Accounting Reports and NSW Government response to voluntary information request.

Notes: Excludes uncontrolled flow usage for all accounts, and all supplementary Water Access Licence accounts.¹³⁸

Comparison of these figures shows that:

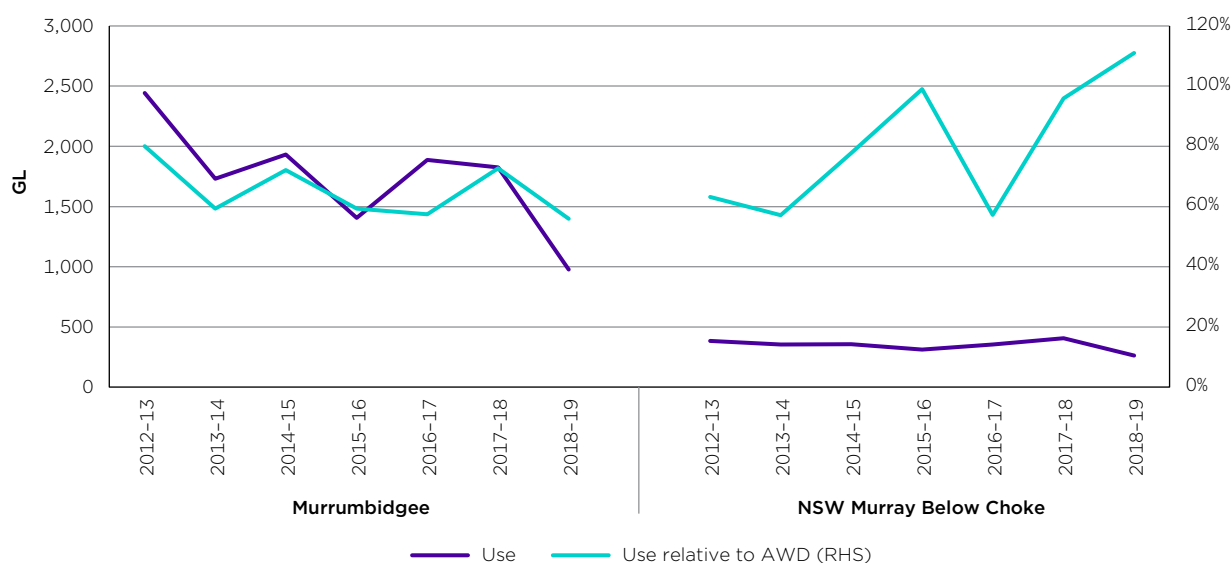
- In zone 13 (Murrumbidgee), Available Water Determinations remain the primary source of credits to users' accounts, accounting for over 80% of credits in each water year since 2012-13. This contrasts with zone 11 (NSW Murray below Barmah Choke), where allocations to entitlement holders represent a much smaller, and on average declining share of account credits. In 2018-19, allocations to entitlements accounted for only 52% of account credits, with users relying roughly equally on carrying over water in zone 11 and trading in water from outside this zone to source water.¹³⁹ In fact, New South Wales Murray general security (GS) entitlement holders received zero allocations in 2018-19, which means users who held only GS entitlements had no alternative but to use carryover or trade to source water if they wished to use water in that water year.
- In zone 11 (NSW Murray below Barmah Choke), usage within a given water year accounts for at most 50% of account debits in most years, meaning that considerable volumes each year are traded out to other zones. In contrast, water use generally accounts for around 70% of debits account in zone 13 (Murrumbidgee).

Figure 3.32 shows that actual volumes used in Murrumbidgee have fluctuated markedly over time, while volumes used in New South Wales Murray below choke have remained relatively steady despite significantly lower allocations. However, in both zones, usage relative to allocations to entitlement holders has increased significantly in recent years, even exceeding 100% in 2018-19. Thus, despite New South Wales Murray GS water entitlements receiving no allocation and Murrumbidgee GS allocations only reaching 11% in 2018-19, water users were still able to use a mix of carryover and trade to source water.

¹³⁸ Note: Figures 3.31 and 3.32 have been updated since the interim report to exclude Supplementary Water Access Licence accounts, based on feedback from stakeholders who noted that including forfeiture of Supplementary water gives a misleading impression, since Supplementary water does not operate on the same announced allocation system as other licence types, and forfeiture of Supplementary water does not result in water returned to the consumptive pool for reallocation in the following year.

¹³⁹ Note that trade into zone 11 includes carryover parking trades *from* other zones.

Figure 3.32: Volume of water used (GL) and usage as a proportion of volumes allocated, Murrumbidgee and New South Wales Murray below Barmah Choke



Source: ACCC analysis based on NSW General Purpose Water Accounting Reports and NSW Government response to voluntary information request.

Notes: Excludes uncontrolled flow usage for all accounts, and all supplementary Water Access Licence accounts.¹⁴⁰

The ACCC has selected these two regions to illustrate how volumes allocated, used, traded and carried over can vary significantly between different zones.

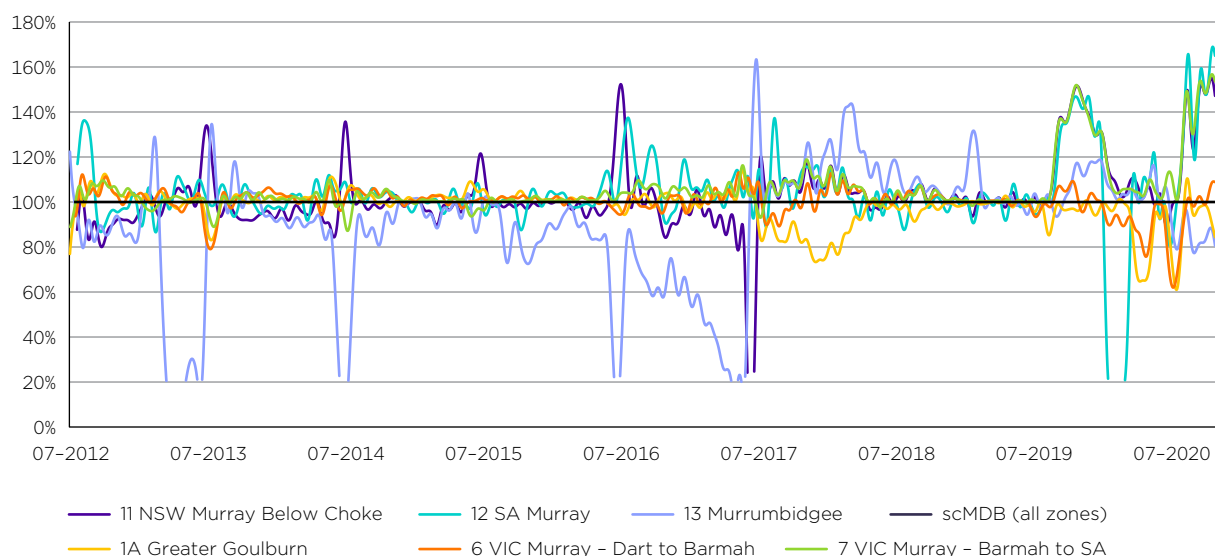
The key point to emerge from the analysis to date is that carryover and trade interact to allow concentration of water use in particular places (zones), at particular times, for particular uses. On the one hand, this is a sign of the market working – water is clearly moving from the place (zone) and time (water year) where it is initially allocated, for use in other places and times. On the other hand, given that many rules, policies and operating procedures were developed before carryover policies were introduced, and before inter-zone trade grew to be the substantial element of market activity that it is today, it becomes more important to ensure market settings are optimised such that users incorporate both the costs and benefits of carryover and trade mechanisms into their decision-making.

3.3.2 Greater use of markets means that trading is pushing up against the limits of the system more often

Overall, the ACCC's analysis to date shows that inter-valley trade restrictions are becoming more binding (restrictive) over time. Figure 3.33 shows the impacts of binding inter-valley trade limits on average prices in key zones. Where the price series are close to 100%, this means that the average price in that zone is very close to the average price prevailing across the Southern Connected Basin as a whole. Significant divergences away from the 100% line mean that prices in a particular zone are significantly higher or lower than the average price. The figure shows that earlier in the period, price differentials were mainly observed at the end of the water year – this in part can be explained by different states having had different timings for closing trading at the end of the water year (which all states historically have done, at least briefly, to allow for end-of-year accounting processes). However, in more recent years prices have diverged more often *within* the water year, particularly during 2016-17, 2017-18 and for much of 2019-20, when many trade restrictions were binding for significant periods of time (refer to figure 3.17 above). In particular, Greater Goulburn (zone 1a) and Murrumbidgee (zone 13) have seen prolonged periods of significant divergences from Southern Connected Basin average prices in recent years, and prices for zones below the Barmah Choke (zones 7, 11 and 12) show have been significantly above the average across all zones for much of 2020.

¹⁴⁰ Note: Figure 3.33 has been updated since the interim report to exclude Supplementary Water Access Licence accounts, based on feedback from stakeholders who noted that including forfeiture of Supplementary water gives a misleading impression, since Supplementary water does not operate on the same announced allocation system as other licence types.

Figure 3.33 Average daily price differentials, selected zones compared to average for Southern Connected Basin



Source: ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request and Waterflow data.

Notes: Daily zone and Southern Connected Basin (all zones) price series derived using ABARES GAM methodology.¹⁴¹ Excludes zero dollar trades Price differentials of <0.2 and >1.8 are excluded. This figure shows price differentials for each zone as a percentage of the Southern Connected Basin (all zones) average price. For example, on 4 November 2017, average prices in zone 1A Greater Goulburn were 83% of the Southern Connected Basin (all zone average price). Data covers the period 5 July 2012 to 30 October 2020.

While the overall objective of water markets is not to achieve a single price across the whole Southern Connected Basin, sustained pricing differentials between zones, combined with data on the volume of inter-zone trades that are refused, indicate that there is more demand for inter-valley trade than is able to be met under current inter-valley trade arrangements. This gives rise to the question of whether current settings governing inter-valley trade are optimised. This includes several questions:

- Could there be scope to allow more inter-valley trade, while still appropriately limiting the potential for negative impacts on other water users and the environment?
- Are there costs to inter-valley trade which are not reflected in current prices? If such costs were factored into prices, would demand for inter-valley trade correspondingly reduce (other things being equal)?

These considerations are examined in further detail in part 5 of this report.

¹⁴¹ ABARES, Measuring water market prices: statistical methods for interpreting water trade data, 2019. Available at <https://www.agriculture.gov.au/sites/default/files/abares/documents/research-topics/water/measuring-water-market-prices.pdf>, viewed 10 March 2020.

4. Buyers and sellers: who trades, what and why

Key points

Water ownership

ACCC analysis of the available data indicates that:

- Entitlement ownership by different participant groups varies widely across Victorian zones, with ownership by agricultural consumptive users (irrigators and agribusiness groups) typically lowest in zones where there are higher levels of ownership by environmental water holders (EWHs) and institutional investors.
- Irrigation infrastructure operators (IIOs) own the vast majority of entitlements in NSW Southern Basin zones. Most water users in these zones do not hold their own entitlement, and instead hold non-statutory irrigation rights against an IIO. This emphasises the important role IIOs have in approving irrigation right trade within, into and out of their irrigation networks.
- Agricultural consumptive users (irrigators and South Australian IIOs) and EWHs hold the vast majority of tradeable entitlements in the South Australian Murray, while institutional investor ownership is relatively minor.
- First Nation and Traditional Owner groups own a very small proportion (less than 0.1%) of entitlements across the Southern Basin.

Allocation trade by participant group

When considering total allocation trade data for the Southern Connected Basin (*including* zero dollar trades), environmental water holders typically trade the largest proportion of allocation volumes in a given year, mostly as a small number of non-commercial (zero dollar) trades. These trades are generally transfers between different environmental accounts, conducted for operational reasons. While Irrigators make the majority of the number of allocation trades each year in the Southern Basin, this accounts for a minority of the volumes traded.

ACCC analysis of Basin State allocation trade data for the Southern Connected Basin *excluding zero dollar trades – as a proxy for ‘commercial’ or ‘arms-length’ trade* – indicates that:

- Irrigators are the largest single trading group in allocation markets by number and volume of trade in the Southern Basin, although their share of total allocation trade has declined somewhat over the last eight years as other participant groups enter water allocation markets.
- Institutional investors' activity in Southern Connected Basin allocation markets has increased significantly in the last four years.
- Retired irrigators account for a small but not insignificant proportion of allocations **sold** in the Southern Connected Basin each year.
- Agribusinesses account for a significant share of the number and volume of allocations **purchased** in the Southern Connected Basin each year.
- Environmental water holders trade a relatively small proportion of allocation volumes in the Southern Connected Basin in a given year.
- First Nation and Traditional Owner groups typically make almost no allocation purchases in the Southern Connected Basin in a given year, but consistently account for a very small volume of allocation sales each year.
- Water market participation by different groups differs substantially across zones.

The ACCC also drew on irrigator surveys to better understand irrigator engagement with water markets. The most recently available survey data indicates that:

- While half or more of irrigators in the Southern Basin report having used allocation and entitlement markets at least once, approximately 25% have never traded an allocation and 50% have never traded a water entitlement.
- Less than 7% of irrigators across the Basin use entitlement leases to source water for their farms, and an even smaller proportion of irrigators use newer water products such as carry over parking or forward contracts.

Evidence on participation in water markets

Irrigator survey data provides evidence on irrigator trading experiences and attitudes towards water markets:

- While many irrigators have engaged in allocation and, to a lesser extent, entitlement trade, large proportions of irrigators report having limited or no engagement with water markets; 25% have never traded an allocation, and 50% have never traded an entitlement. To date, there is also limited uptake of leases and newer water products such as carry over parking and forward contracts, although trade of these products is growing.
- A significant number of irrigators, particularly those involved in dairy, appear to have adopted water ownership and trading strategies that rely principally on sourcing water in allocation spot markets to manage their water supply risks.
- Some irrigators express a lack confidence in various aspects of water markets and water policy and some evidence indicates that this lack of confidence may impact irrigators' use of water trading. On average, irrigators appear to be becoming increasingly negative about the idea of water trading over time.
- Large proportions of irrigators have expressed opposition to non-farm entities (investors) being allowed to buy water (up to 85%), and retired irrigators being allowed to retain and trade their permanent water rights (up to 48%).
- While most irrigators express positive views on the ease of making temporary and permanent trades, being able to access the information needed to trade, feeling confident in trading water, and in the security of their permanent water rights, a minority express opposing views on each of these issues.
- A third or less of irrigators express confidence in the fairness of water markets, water market rules, and the equal treatment of government owned water entitlements.
- Few First Nation and Traditional Owner groups use water markets. As a participant group, they own a very small proportion of the permanent water rights on issue and account for a very small proportion of water trade.

The ACCC anticipates that recommendations presented in Parts III to VI of this report will help address irrigator concerns about water markets identified in this Chapter, and deliver markets that they can participate in more effectively.

This chapter describes the different groups that participate in water markets, the relative size of their water ownership and trading behaviours, and identifies possible barriers some groups may face in more effectively engaging in water markets. The chapter provides an evidence base on the water ownership and trading behaviours used by different participant groups, and considers what barriers may be preventing certain participant groups from better using water markets to meet their water needs.

4.1 Who are the key participant groups in water markets?

There is increasing diversity in who owns, buys and sells water in the Basin. This section identifies key groups of water market participants, and discusses how they are using Basin water markets and why.

Water market participant groups that are referred to throughout the rest of this report are summarised in table 4.1.

Table 4.1: Water market participants

Party	Role	Examples
irrigators and agribusiness	<p>The group that uses the most water in the Basin. Production ranges from broadacre cropping, such as rice, through dairy, to horticulture, such as nuts, fruits and vegetables. Irrigators are buyers of water but also significant holders and sellers of water access rights.</p> <p>For the purposes of this report, 'irrigators' are distinguished from 'agribusiness'. Agribusinesses are also irrigators, but are large corporate entities, often operating in multiple locations, and have been identified as a separate category in part due to stakeholder feedback which raised concern about large agribusinesses as distinct from irrigators more generally.</p>	Ranging from family farms to large agribusinesses such as Webster/PSP Investments ¹⁴²
irrigation infrastructure operators (IIOs)	<p>Own and operate infrastructure for the main purpose of servicing the water needs of their irrigators.</p> <p>These may also be called off-river infrastructure providers, as they manage assets situated off the rivers such as irrigation networks consisting of channels, pipes and pumps.</p> <p>IIOs are often holders, for their members but in their own right, of significant water access rights, as explained in section 2.3.</p>	<p>Murray Irrigation Limited</p> <p>Renmark Irrigation Trust</p> <p>Goulburn-Murray Water</p> <p>Mallawa Irrigation</p>
infrastructure operator	<p>State-owned entities that own and operate the largest facilities for storing and delivering water.</p> <p>These may also be called on-river infrastructure providers, as they manage assets situated on the rivers such as large dams and weirs.</p>	<p>WaterNSW</p> <p>Goulburn-Murray Water</p> <p>Lower Murray Water</p> <p>Sunwater</p>
investors	<p>Parties holding, trading and/or managing water assets for the purpose of financial gain that is unrelated to productive use.</p> <p>Investors as a broad group includes large 'institutional investors', and 'non-institutional' investors such as retired irrigators who have retained their permanent water rights, including through a self-managed superannuation fund</p>	<p>Argyle Group</p> <p>Aware Water</p> <p>Duxton Water Ltd</p> <p>Kilter Rural</p>
water market intermediaries	Brokers and exchange platforms	H2Ox, Waterexchange, Waterfind, Wilks Water
environmental water holders	Hold and deliver water to achieve environmental outcomes.	<p>Commonwealth Environmental Water Holder (CEWH)</p> <p>Victorian Environmental Water Holder (VEWH)</p> <p>NSW Office of Environment and Heritage (OEH)</p>

¹⁴² Webster n.d., www.websterltd.com.au, viewed 11 June 2020.

First Nation and Traditional Owner groups	Need water for cultural and economic needs.	Many nations, including the Barkandji, Gomeroi, Kamilaroi, Wiradjuri and Yorta Yorta. Includes Land Councils, Indigenous Corporations and other traditional owner groups
Urban, industrial and recreational users	Need water for critical human needs, urban, industrial and recreational uses.	Basin towns and cities; Mining, electricity generators, transport, heavy industry, fishers, boating groups, racecourses, golf courses, etc.
Other non-water users	Other non-water users, which includes other participants not included in the above categories that buy and sell water but do not use water for a consumptive purpose	

Participants in each of these groups have been active at different levels in Murray–Darling Basin water markets in recent years. Participants within a particular group typically share similar reasons for owning and trading water, as well as a range of personal, business and/or locational characteristics. A short description of each participant group is provided below.

Note, however, that in reality, these groups are not necessarily mutually exclusive: some individual water market participants may meet the definition of more than one participant group – for example, some irrigators also undertake environmental watering activities on their farm, and so may share characteristics with the ‘environmental water holder’ group. However, our analysis allocates water right owners and traders to one group only, and uses these categories to examine the range of ways in which different stakeholders use water markets.

4.1.1 Irrigators

Irrigators are the most numerous and diverse group of Basin water market participants. In 2017–18 (the latest year for which ABS data is available), it is estimated there were just under 10,000 agricultural businesses irrigating land across the Basin.¹⁴³

Irrigators predominantly own and use water to produce agricultural products. As a group, they are one of the largest owners of permanent water rights, and one of the biggest participants in entitlement and allocation markets (section 4.2). Historically, the typical irrigator has owned sufficient permanent water rights to meet their on-farm water needs and traded temporary water to ‘top up’ water supplies in drier years or sell ‘surplus’ water in wetter years or when not irrigating. However, in recent years, with ongoing reforms to water ownership and trading rules and changes in external market trends and drivers (particularly agricultural input and output markets), the irrigation sector has been undergoing significant structural adjustment and irrigator strategies associated with owning, using and trading water have become increasingly diversified (section 4.2).

Appendix A to this chapter provides a detailed description of how irrigators are engaging with water markets across the Basin.¹⁴⁴

4.1.2 Agribusinesses

Agribusinesses are larger agricultural corporations that engage in irrigated farming. As a group, agribusinesses hold large volumes of entitlements and engage extensively with water markets to undertake a mixture of operations in the Southern and Northern Basin.

Chapter 7 discusses the strategies and trading activities of agribusinesses in more detail.

¹⁴³ ACCC estimates based on ABS 4618.0 – *Water Use on Australian Farms*, 2017–18.

¹⁴⁴ The appendix includes a snapshot of irrigator numbers across the Basin, the type and level of irrigator engagement with different types of water markets, including water allocation and entitlement markets, leases and newer water products such as carry over parking and forward contracts, and summarises the available data on irrigators’ attitudes to water trading and water markets.

4.1.3 Irrigation Infrastructure Operators

An irrigation infrastructure operator (IIO) owns and/or operates water service infrastructure primarily for the purpose of delivering water to irrigated farms. While the majority of the volume of water delivered typically goes to irrigated farms, many IIO customers also use small quantities of water (a few ML) for stock and domestic use.

There are 21 medium to large IIOs in the Basin, and a number of smaller IIOs such as New South Wales private irrigation trusts and districts.¹⁴⁵ IIOs in New South Wales and South Australia are among the largest holders of water access entitlements within the consumptive pool for the Southern Connected Basin. In 2018–19, IIOs held 72%, 22% and 25% of high security water access entitlements (WAEs) on issue in Murrumbidgee, New South Wales Murray and South Australian Murray, respectively, and 50% and 67% of general security WAE on issue in Murrumbidgee and New South Wales Murray (section 4.2).¹⁴⁶ These permanent water rights were typically granted to the IIOs by state governments when they were corporatized.

IIOs participate in the trade of permanent and temporary water into and out of their irrigation networks, typically at the request of irrigators within the irrigation district. IIOs also act as trade approval authorities for trades within their networks. Some IIOs also operate exchanges or offer brokerage services to help their customers to trade. Chapter 3 includes more information on IIOs.

4.1.4 Investors, including institutional investors and retired irrigators

Investors refers to parties holding, trading and/or managing water assets for the purpose of future financial gain that is unrelated to its use as an input in agricultural, industrial or other production. Over the last ten years, there has been increased participation by investors (section 4.2) in water markets in the Basin (particularly Victoria and southern New South Wales). In particular, 'unbundling' reforms and removal of ownership restrictions based on purpose of water use have allowed parties who do not directly use water to buy permanent water rights in the Basin.¹⁴⁷

There are various types of investors currently operating in Basin water markets, including:

- **Institutional investors**¹⁴⁸, which include investment fund managers (corporate superannuation and other fund types), and small investors, either individuals or small firms. Some institutional investors own a water entitlement portfolio and sell water products such as leases, forward contracts, carryover parking and spot allocation sales to irrigators. Others focus on buying and selling water on the spot allocation market.
- **Non-Institutional investors**, predominantly retired irrigators who also may be owners of self-managed superannuation funds who retain ownership of their permanent water rights and supply water products to water markets.

Chapters 5 and 6 discuss issues related to investors in more detail.

4.1.5 Water market intermediaries

A water broker, for the purposes of this inquiry, is a water market intermediary who, for a commission or fee or other form of remuneration or payment, offers one or more of the following services:¹⁴⁹

- trading tradeable water rights on behalf of another person

145 ACCC, *Water Monitoring Report 2017–18*, Monitoring approach and assumptions, https://www.accc.gov.au/system/files/ACCC%20Water%20Monitoring%20Report%202017%E2%80%9318%20Monitoring%20Approach%20and%20Assumptions_Final.pdf, pp. 2–4. Viewed 22 June 2020.

146 ACCC based on South Australia and Victoria response to voluntary information request and New South Wales Water Register data.

147 Productivity Commission, *National Water Reform*, Report no. 87, Canberra, 2017.

148 The category of institutional investors include the four large investors and four small investors examined in chapter 5.

149 Other organisations which also act as water market intermediaries include exchanges and online trading platforms. While brokers investigate trading options for their clients, water exchanges operate as a trading platform matching buyers and sellers through an automated process or bulletin board. Water exchanges may also offer similar services to brokers such as organising and submitting the necessary paperwork to the relevant trade approval authority. In some cases, an entity may offer both brokering and exchange services (see chapters 8 and 9).

- investigating tradeable water right trading possibilities on behalf of another person
- preparing and submitting documents necessary for the trade of a tradeable water right on behalf of another person.

The ACCC has identified approximately 80 broker firms that operate in the Basin with some firms having multiple employees and/or contractors engaged in brokering. Available data indicates that the use of intermediaries across the Southern Basin is widespread.¹⁵⁰ Brokers can also own and trade water in their own right.

Chapter 8 address water broker roles, practices and conduct in detail.

4.1.6 Environmental water holders

A range of government and non-government environmental water holders (EWHs) have been active in permanent and temporary water markets in recent years, with government EWHs being the dominant participants in this group. As noted in chapter 3, the key government EWHs include the:

- Commonwealth Environmental Water Holder (CEWH)
- Victorian Environmental Water Holder (VEWH)
- New South Wales Department of Planning, Industry and Environment
- South Australian Minister for Environment and Water
- Murray–Darling Basin Authority (MDBA).

Governments have been accumulating large portfolios of permanent water rights over recent years through various means, including direct purchases of entitlements from irrigators and various infrastructure programmes. However, they are currently not active buyers of entitlements in Basin water markets.

EWHs typically transfer water allocated to their permanent rights to environmentally significant locations across the Basin to generate environmental benefits. These transfers of water are typically registered on state water registers as zero dollar water allocation trades. Under certain circumstances, EWHs also engage in commercial trade by buying or selling water on allocation markets. These trades, undertaken at prevailing market prices, are also recorded on state water registers.

Section 4.2 includes data on EWH water ownership and allocation trade.

4.1.7 First Nations and Traditional Owner groups

There are more than 40 First Nations in the Basin.¹⁵¹ First Nations and Traditional Owners (Traditional Owner groups), which primarily consist of Land Councils, Indigenous Corporations and other traditional owner organisations, use water in the Basin to generate a range of cultural, environmental and economic benefits.¹⁵² However, they have submitted to the ACCC that Traditional Owner groups own few permanent water rights and are largely absent from water markets.¹⁵³

Section 4.2 includes data on Traditional Owner groups' water ownership and water trading behaviours and section 4.3 discusses possible barriers to this participant group more effectively engaging with water markets.

4.1.8 Urban, Industrial and Recreation users

This participant group includes other consumptive water users not included in the above categories, and includes other government (non-EWH) participants, mining companies, power stations, commercial recreational users such as golf courses, and urban, rural and regional water authorities.

¹⁵⁰ See chapters 8 and 9.

¹⁵¹ MDBA, Cultural flows, <https://www.mdba.gov.au/discover-basin/water/cultural-flows>, viewed 22 June 2020.

¹⁵² Murray Lower Darling Rivers Aboriginal Nations, Submission to Murray–Darling Basin water inquiry issues paper, February 2020.

¹⁵³ *ibid.*

Within this category, regional water authorities and town councils are the most active traders and hold the largest volume of entitlement.

4.1.9 Other non-water users (non-traders)

This participant group is a residual category and includes those non-water users not allocated to any category above. This category could include, for example, persons who hold 'sleeper' water rights, to which water is allocated each year but not used or traded.

4.2 Water ownership of participant groups

Currently, there is no consolidated Basin-wide data that shows the type and volume of permanent water rights owned by the key participant groups described in section 4.1. The ACCC has undertaken an analysis of water trade, ownership and accounts data provided by the Basin States to construct a dataset on water ownership by each participant group in the different water sources which comprise the Southern Connected Basin (box A.1 in Appendix A provides an overview of the ACCC's methodology). The following sections present the key results of this analysis; further detail is provided in Appendix A.

4.2.1 Water ownership by participant groups in Victorian MDB water sources

Figure 4.1 shows the volume of high and low reliability water shares in the different Victorian MDB water sources owned by the different participant groups identified in section 4.1.

The ACCC estimates that *irrigators* generally own 40–70% of the high reliability water shares in each of the Victorian MDB water sources. Across the different sources, irrigators own the lowest proportions of high reliability entitlements in Campaspe (38%), Vic Murray (42%), Goulbourn (48%) and Loddon (65%) water sources and the highest proportion in Bullarook (70%). Irrigators also own an estimated two thirds or more of the low reliability water entitlements in each water source, apart from Campaspe where they are estimated to hold 21%.

Agribusinesses are estimated to own relatively small volumes of Victorian high and low reliability entitlements, except for Vic Murray, where agribusinesses are estimated to own 11% of high reliability entitlements.

The *brokers and exchange platforms* group holds negligible volumes of entitlement in Victoria.

Infrastructure operators own approximately 20% of high reliability entitlements in Campaspe and 11% in Broken, but smaller proportions in Vic Murray and Goulburn (2% and 4%, respectively).¹⁵⁴

The *Environmental Water Holder (EWH)* group, which primarily includes government-owned environmental water holders, holds significant proportions of the high reliability water entitlements in Goulburn (31%), Vic Murray (30%), Campaspe (28%) and Loddon (18%), with a smaller proportion owned in Broken (4%). Environmental water holders also own significant proportions of low reliability entitlements in Murray and Campaspe (13% each) and Loddon (7%).

ACCC estimates indicate *Institutional Investors* own significant proportions of high reliability water entitlements in Vic Murray (8%) and Goulburn (6%), and similar proportions of low reliability entitlements in these water sources (10% and 6%, respectively).¹⁵⁵

The *Non-Institutional Investor* group, which predominately includes retired irrigators who have retained ownership of permanent water rights, own small to moderate proportions of the high and low reliability entitlements in Victorian water sources generally, being 5–6% Broken, and 3% or less of either type of water entitlement in the other Victorian water sources.

¹⁵⁴ This estimate is based on high and low reliability water share ownership only. It is important to note that Victorian Water Corporations such as Goulburn–Murray Water and Lower Murray Water (which are 'infrastructure operators') also hold significant bulk entitlements, which they use to provide water to water share owners within their areas of operations.

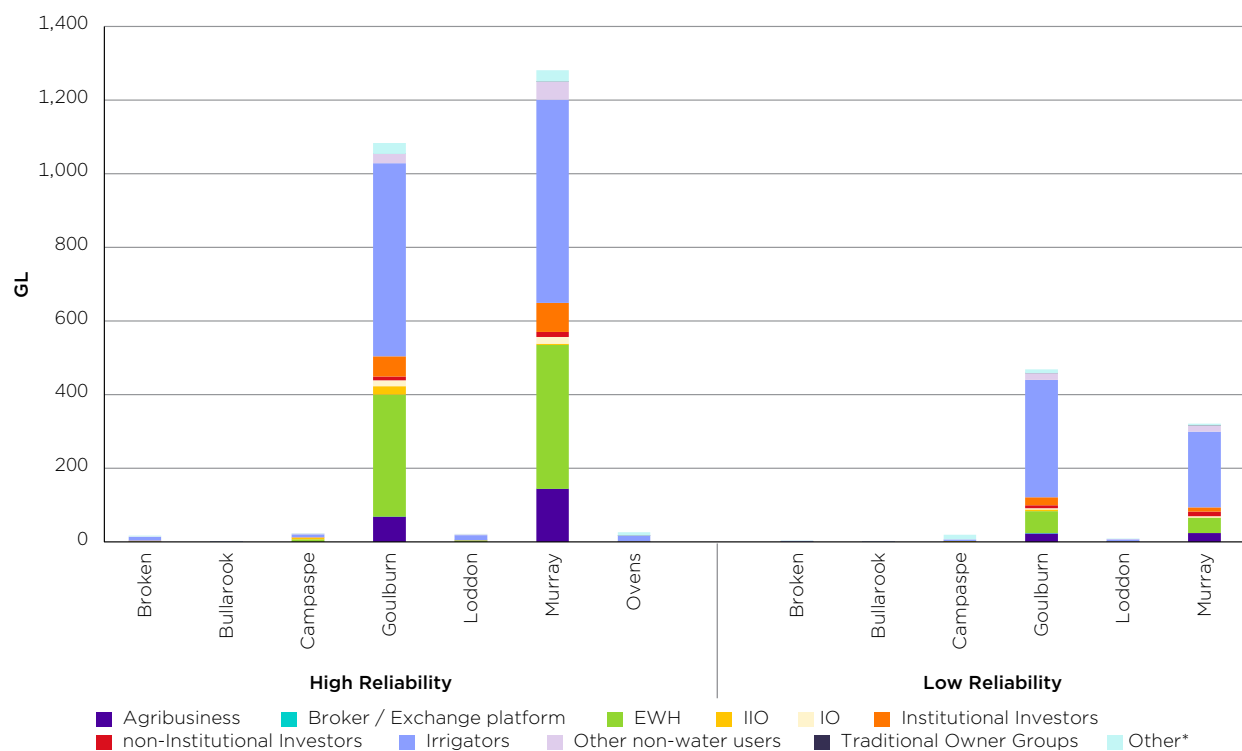
¹⁵⁵ See additional analysis in chapter 5, which analyses entitlement volumes for four large institutional investors.

The *Other Non-Water Users* group, which includes non-water users other than those already identified in another group, holds small proportions of high and low reliability water entitlements in the smaller Victorian MDB water sources. Of high reliability entitlements, this includes Loddon (11%), Broken (8%), and Campaspe (6%). Of low reliability water entitlements, this includes Loddon (10%) and Broken (9%). Given the small size of these water sources in terms of volume of entitlement on issue, overall this group owns only a small proportion of entitlements on issue in the Victorian Murray-Darling Basin.

Traditional Owners groups own a very small proportion of the high reliability entitlements in Goulburn and Vic Murray (less than 1% in each), and an equally low proportion of the low reliability entitlements in these sources.

Overall, this analysis finds that, as at November 2019, water ownership by different participant groups varies widely across Victorian water sources. Water ownership by agricultural consumptive users (that is, irrigators and agribusiness) is typically lowest in sources where there are higher levels of ownership by EWHs and institutional investors. Traditional Owners groups own a very small proportion of Victorian entitlements.

Figure 4.1: Victorian high and low reliability water share ownership, by participant type, 30 November 2019



Source: ACCC analysis based on Victoria Government response to voluntary information request.

Notes: Other* = Government (non-EWH), Industrial, Recreation, Urban.

4.2.2 Water ownership in NSW Murray and Murrumbidgee by participant group

Figure 4.2 shows the volume of NSW Water Access Licence (WAL) ownership by WAL class in Murrumbidgee (zone 13), NSW Murray upstream of Barmah Choke (zone 10) and NSW Murray downstream of Barmah Choke (zone 11).¹⁵⁶

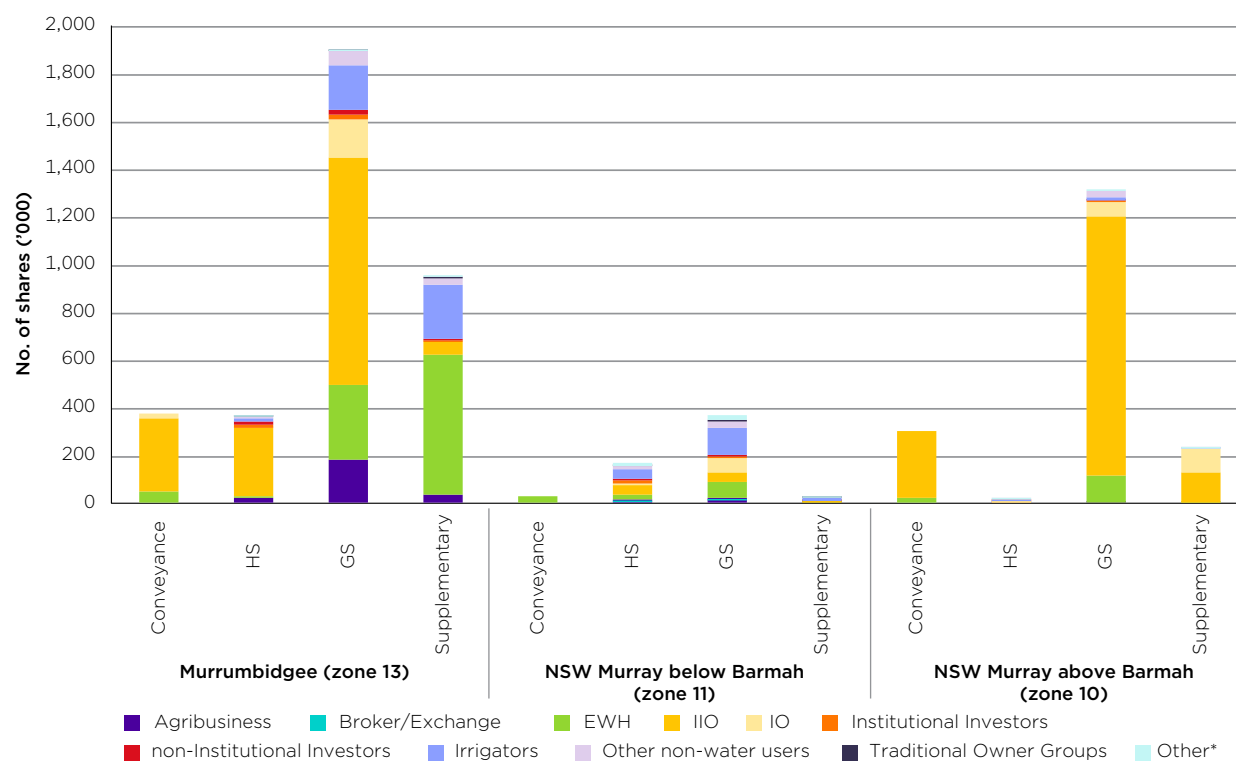
¹⁵⁶ The ACCC partitioned the NSW Murray Water Source into zones 10 and 11 using data provided by NSW LRS and WaterNSW on the water management zones to which the WALs are linked. This information is currently not publicly available.

This figure shows that the volume of water entitlement in the NSW Southern Basin held directly by irrigators is very small and that the vast majority of entitlement in all reliability classes except Supplementary is held by NSW IIOs. The ACCC estimates that IIOs hold 79% of high security and 50% of general security WAL volumes in Murrumbidgee; 83% of general security in zone 10 (NSW Murray upstream of Barmah Choke), and 80% and 93%, respectively, of conveyance WAL volumes in zones 13 and 10. This emphasises that most water users hold their permanent rights in the form of non-statutory rights, held against IIOs, as do non-users such as investors.

The second largest category of holder is *Environmental Water Holders (EWHs)*, who hold more entitlement in Murrumbidgee than in NSW Murray zones. For example, EWHs are estimated to hold 310 GL of general security WALs in zone 13, compared 65 GL in zone 11 and 111 GL in zone 10. EWHs also hold an estimated 584 GL of supplementary WALs in zone 13.

This data also shows the split of NSW Murray entitlement held above and below the Barmah Choke (trading zones 10 and 11, respectively). 75% of NSW Murray General Security entitlement is held above the Barmah Choke. This has significant implications for trade, as downstream movement of water allocated to zone 10 entitlements is constrained by the Barmah Choke trade restriction. However, this zone-based presentation of entitlement volumes is not readily available from public data sources, making it difficult for market participants to gauge volumes of water allocation available in zones 10 and 11.¹⁵⁷

Figure 4.2: NSW water access licence ownership, by participant type, selected zones, July 2020



Source: ACCC analysis based on Victoria Government response to voluntary information request.

Notes: HS = High Security; GS = General Security Includes the following WAL categories: High Security; General Security, Conveyance, Murrumbidgee Irrigation Conveyance, Coleambally Irrigation Cooperative Limited Conveyance, Supplementary, Supplementary (Lowbidgee), where these licences are denominated in number of shares. Excludes a small volume of entitlement denominated in ML rather than number of shares. Other* = Government (non-EWH), Industrial, Recreation, Urban.

157 This contrasts with Victoria, which publishes data on entitlement held and trade statistics by zone, enabling market participants to readily distinguish between rights held and traded in Vic Murray zones 6 and 7. See Victorian Water Register, n.d. Entitlement Statistics, <https://waterregister.vic.gov.au/water-entitlements/entitlement-statistics>, viewed 22 January 2021.

4.2.3 Water ownership in the South Australian Murray by participant groups

The South Australian Murray has a range of different entitlement classes, several of which are defined by the purpose for which water available under the entitlement may be used. Figure 4.3 shows the volume of South Australian River Murray entitlement ownership by class and participant group.

Class 3 (Irrigation, Recreation and Environment) is the largest class in terms of volume of entitlement on issue, and accounts for 74% of the total entitlement on issue in the South Australian Murray water source. Figure 4.3 shows that an estimated 35% of Class 3 entitlements are held by EWHs, 25% by South Australian IIOs (whose entitlements are mostly used for irrigation), and a further 20% by the *Irrigator* group (mostly private diverters). *Non-institutional investor* ownership of South Australian Murray entitlements is relatively minor (around 4% of Class 3 water rights). *Irrigators* also own an estimated 44% of Class 1, 41% of Class 5 and 84% of Class 8 entitlements, although the total volume of entitlement on issue in these classes is much smaller than for Class 3. In addition to holding some Class 3 entitlements, EWHs also hold the majority of Class 9 (wetland) entitlements.

Classes 2 and 6 are both reserved for urban water use: as figure 4.3 reflects, Class 2 and 6 entitlements are held exclusively by the South Australian Water Corporation (allocated to the residual “Other” group, which includes *Urban, Industrial and Recreation users*), but Class 6 entitlements are not tradeable.¹⁵⁸

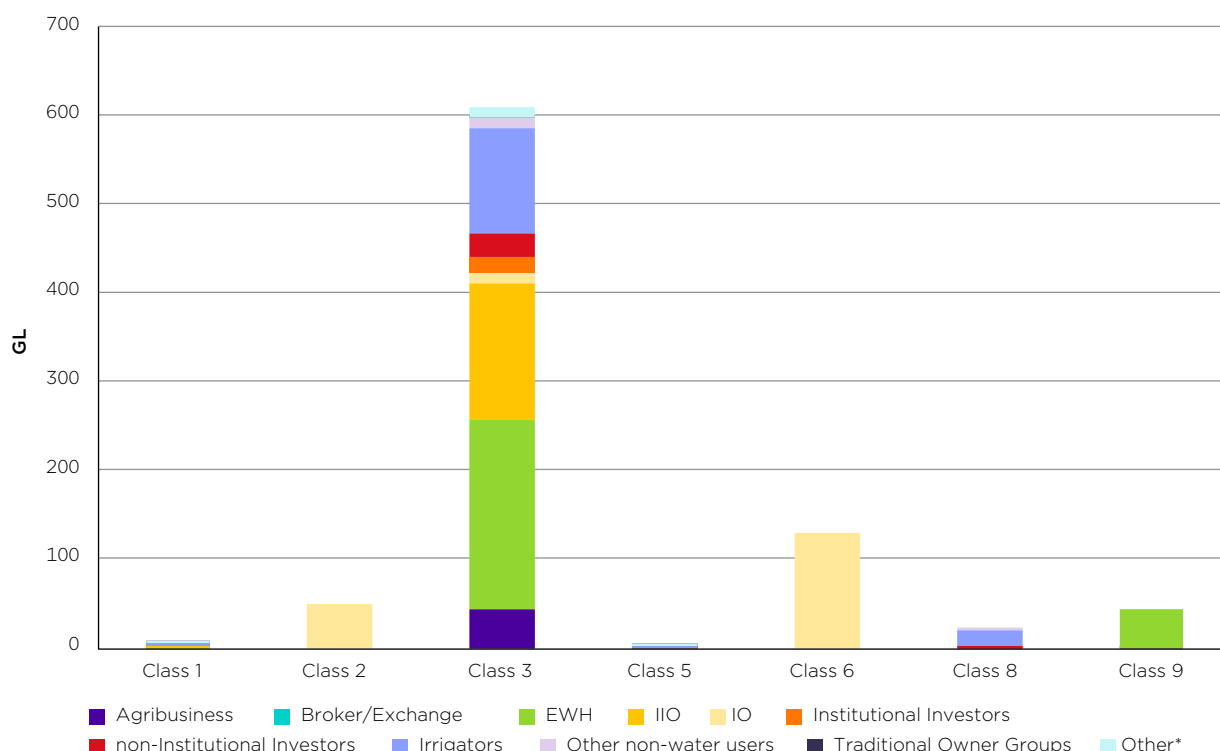
Class 5 (industrial and industrial dairy) is the only category where a significant proportion of the entitlement class is held by the *Other-non-water user* group. However, given Class 5 represents in total only 1% of the total volume of South Australian Murray entitlement on issue, this means that in reality this class holds only a very small volume of entitlement.

Traditional Owners Groups are not visible in figure 4.3, as the ACCC’s analysis indicates that this group holds only 31ML of Class 1 entitlement, 503ML of Class 3 and 305ML of Class 5 (together comprising around 0.1% of South Australian Murray entitlements on issue).

Overall, this analysis shows that, as at November 2019, agricultural consumptive water users (such as irrigators and South Australian IIOs) and EWH users hold the vast majority of tradeable entitlements in the South Australian Murray, while institutional investor ownership is relatively minor. As with Victorian entitlements, *Traditional Owners* groups own a very small proportion of permanent water rights in South Australia.

158 Department for Environment and Water (South Australia), Tradeable water entitlements in the South Australian River Murray, <https://www.environment.sa.gov.au/topics/river-murray/water-markets-and-trade/tradeable-water-entitlements-river-murray>, viewed 22 June 2020.

Figure 4.3: South Australian River Murray regulated surface Water Access Entitlement ownership, by WAE class and participant type, 30 November 2019



Source: ACCC analysis based on South Australian Government response to voluntary information request.

Notes: Other* = Government (non-EWH), Industrial, Recreation, Urban. Entitlement Classes are as follows: Class 1: Stock, domestic and stock and domestic purposes; Class 2: Urban water use – country towns; Class 3: Irrigation, Recreation and Environment; Class 5: Industrial and industrial dairy; Class 6: Metropolitan Adelaide Consumptive Pool; Class 8: All purpose; Class 9: Wetlands. Other* = Government (non-EWH), Industrial, Recreation, Urban.

4.3 Allocation trade by participant groups

Currently, there is also no consolidated Basin-wide data that shows the type and volume of trading of different water products (such as entitlements, allocations, leases, carry-over parking and forward contracts) by the participant groups described in section 4.1. As with water ownership data, the ACCC has undertaken an analysis of water trade data from state registers to estimate allocation trading by each participant group in the Southern Connected Basin from 2012–13 to the 2019–20 year to date. Box A.1 in Appendix A provides an overview of the ACCC’s methodology.

This section presents this analysis and discusses the key trends observed in the Southern Connected Basin, by trading zone and over time. Note that this analysis excludes temporary trade of irrigation right within IIO networks, as this data is not available from State registers.¹⁵⁹

4.3.1 Water allocation trade in the Southern Connected Basin, by participant groups, including zero dollar trades

State water register trade data records allocation trades that result from commercial water trades undertaken between two parties at the prevailing market price, as well as movements in water allocation between trading zones (whether or not an ownership change has also occurred – such trades are sometimes referred to as ‘transfers’ by water market participants). These movements of water,

¹⁵⁹ The ACCC did seek trade data from large IIOs in the Basin, and attempted to join this to Basin State registry data. However, due to data quality issues outlined in Part IV and Appendix G, the ACCC was unable to join these different datasets with a high degree of accuracy or completeness. For this reason, IIO trade registry data is not included in the analysis presented in this section.

which are typically recorded in the state registers as 'zero dollar trades', occur for various reasons, including to account for:

- the transfer of environmental water between EWH accounts
- the delivery of water previously contracted under a lease or other water product
- the transfer of water between accounts owned by the same person
- the movement of water allocation through a series of water accounts, in order to give effect to an underlying contract between two parties (for example, where a contract between buyer and seller takes effect via the trade of water allocation from the seller to an intermediary, and then from the intermediary to the buyer – in such cases one of these trades may be reported as zero dollar with the intention of avoiding 'double counting').¹⁶⁰

Consequently, raw allocation 'trade' data (including commercial trades and zero dollar trades) is indicative of all allocation water trades made in a given year by different groups for whatever reason. Issues concerning the difficulties of distinguishing between different types of trade are discussed further in chapter 8 and chapter 11.

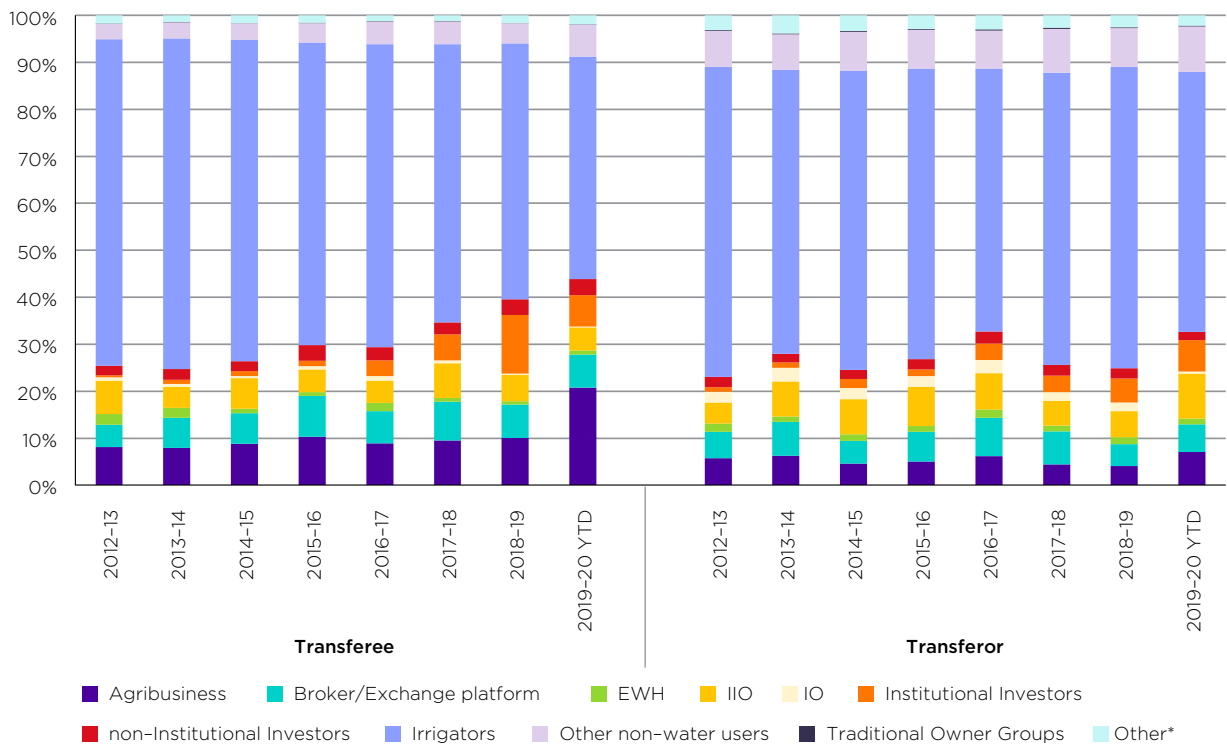
The analysis below first presents the raw allocation trade data *inclusive* of zero dollar trades that reflects transfers of water allocations (that is, trades resulting from commercial transactions and other water movements). It then presents allocation trade data *exclusive* of zero dollar trades, which provides a better proxy for commercial allocation trades undertaken at prevailing market prices.

Figure 4.4 shows the proportion of the total *number* of allocation trades undertaken each water year in the Southern Connected Basin, from 2012-13 to 2019-20, by each participant group, including zero dollar trades. The left-hand side of the chart shows the trader classification from the perspective of the 'transferee' or 'buyer', while the right-hand side shows the classification from the perspective of the 'transferor' or 'seller'. For a trade which does not involve a change of ownership (for example, an inter-zone movement of water allocation between one person's own accounts), the trader classification for the 'transferor' and 'transferee' is the same.

Figure 4.5 shows the proportion of the total *volume* of allocation trades in a given year in the Southern Connected Basin, from 2012-13 to 2019-20 by key participant groups. As for figure 4.4, this figure includes zero dollar trades.

160 Zero dollar trades can also be commercial trades made at prevailing market prices but then inaccurately recorded on state registers at zero dollar for various reasons.

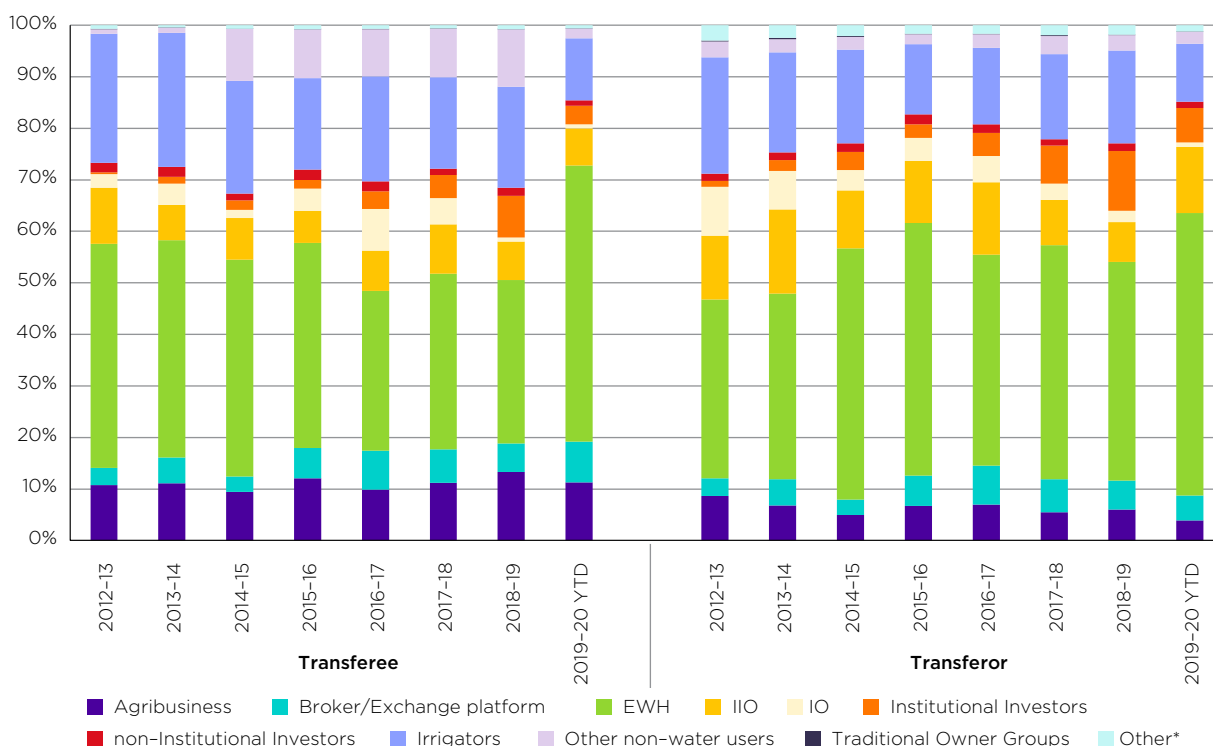
Figure 4.4: Proportion of total number of allocation trades (transferee and transferor), by key participant groups, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and NSW Governments responses to voluntary information request.

Notes: Other = Government (non-EWH), Industrial, Recreation, Urban. . The 'Transferee' side of the chart presents trader classification for the buyer or 'transferee' side of the transaction. The 'Transferor' side of the chart presents trader classification for the seller or 'transferor' side of the transaction. Includes zero dollar trades.

Figure 4.5: Proportion of total volume of allocation trades (transferee and transferor), by key participant groups, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and NSW Governments responses to voluntary information request.

Notes: Other = Government (non-EWH), Industrial, Recreation, Urban. The 'Transferee' side of the chart presents trader classification for the buyer or 'transferee' side of the transaction. The 'Transferor' side of the chart presents trader classification for the seller or 'transferor' side of the transaction. Includes zero dollar trades.

ACCC analysis indicates that irrigators are responsible for the largest proportion of the number of allocation trades each year in the Southern Connected Basin (figure 4.4). However, these trades account for a much smaller proportion of the volume (ML) traded each year (figure 4.5). In 2018-19, for example, irrigators were the transferees/buyers for 55% of allocation trades and were the transferors/sellers for 64% of trades. However, these transactions accounted for only 20% of the total volume of water allocations transferred (from the transferee perspective), or 18% of volumes (from the transferor perspective). This indicates that, on average, irrigators tend to engage in a relatively high number of smaller volume allocation trades.

The Environmental Water Holder (EWH) group, which includes government and non-government environmental water holders, undertakes only a very small proportion of the number of allocation trades each year in the Southern Connected Basin (figure 4.4). These trades include non-commercial movements of environmental water that has accrued to WAEs held by EWHs as well as commercial trades made by EWHs. However, EWHs account for the largest proportion of *volumes* traded in a given year by any participant group (figure 4.5). In 2018-19, for example, the EWH group made up just 1% of the total number of transferees/buyers and 1% of the total number of transferors/sellers. However, these trades accounted for 32% of the volume of trades (from the transferee perspective) and 42% of volumes traded (from the transferor perspective). This indicates that EWHs take part in a relatively small number of higher volume transfers.

Overall, this analysis indicates that, while irrigators account for the largest proportion of the total number of allocation trades each year in the Southern Connected Basin, they account for a much smaller proportion of volumes traded. In contrast, EWHs account for the largest proportion of volumes traded in any given year, but the majority of this volume is traded in a small number of non-commercial transactions between EWH accounts (that is, zero dollar trades).

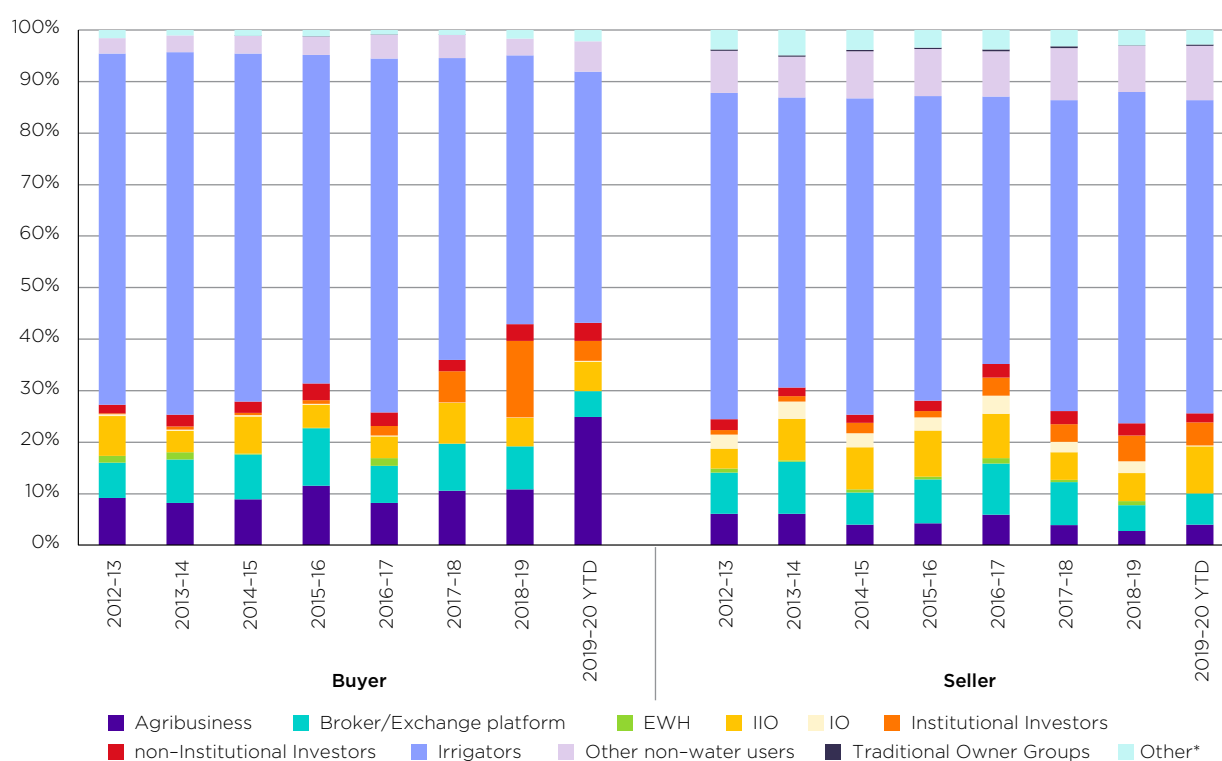
To obtain a more accurate picture of 'commercial' allocation trades made by different participant groups, we turn to figure 4.6 and figure 4.7, which report adjusted state register allocation trade data by excluding non-commercial, zero dollar trades.

4.3.2 Commercial allocation trade in the Southern Connected Basin by participant groups (excluding zero dollar 'trades')

Figure 4.6 shows the proportion of the total number of 'commercial' allocation trades (excluding zero dollar trades) in a given year, by key participant groups in the Southern Connected Basin from 2012-13 to 2019-20. Figure 4.7 shows the proportion of total volume of these trades in a given year, by key participant groups in the Southern Connected Basin from 2012-13 to 2019-20, also excluding zero dollar trades.

As noted above, although imperfect, allocation trade data from state registers that excludes zero dollar trades is a better indicator of the number and the volume of commercial allocation trades, and the resultant price information is also expected to be more reflective of commercial outcomes. For simplicity, and to distinguish this analysis from the analysis above which included zero dollar trades, this section refers to 'buyers' and 'sellers' rather than 'transferees' and 'transferors'. This analysis also uses the term 'commercial allocation trades' to reference the set of trades which have a non-zero price. It is important to recognise that this is an imperfect measure, because some trades which are actually commercial in nature may have been incorrectly reported as a zero dollar trade, or vice-versa. Issues with price reporting are discussed in chapter 11 of this report.

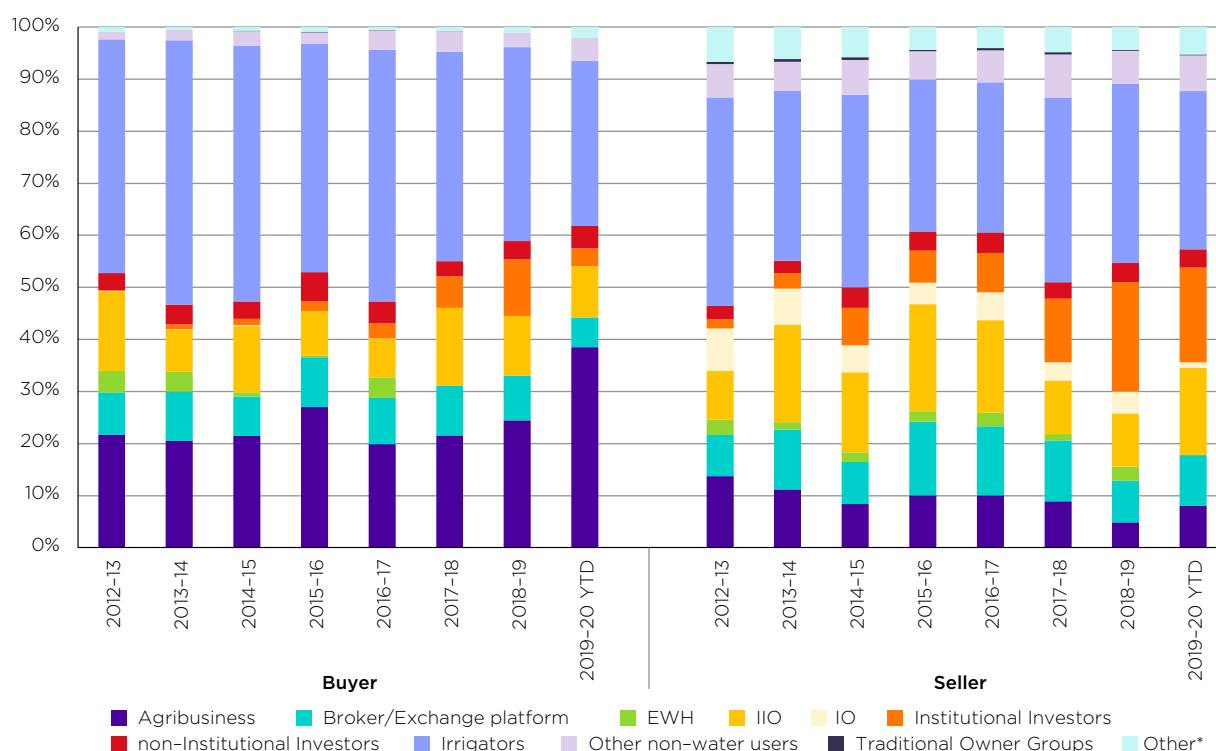
Figure 4.6: Proportion of total number of allocation trades (buy and sell) by key participant groups, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and NSW Governments responses to voluntary information request.

Notes: Other = Government (non-EWH), Industrial, Recreation, Urban. Excludes zero dollar trades.

Figure 4.7: Proportion of volume of allocation trades (buy and sell) by key participant groups, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and NSW Governments responses to voluntary information request.

Notes: Other = Government (non-EWH), Industrial, Recreation, Urban. Excludes zero dollar trades.

ACCC analysis indicates that irrigators are the largest single group trading in allocation markets in the Southern Connected Basin. Irrigators are estimated to have purchased outright a total of 4339GL of water allocations over the period 2012-13 to 2018-19, and sold an estimated 3298GL. Note, however, that this is an underestimate of the total volume of temporary purchases by irrigators, because the majority of volumes bought and sold by NSW and SA IIOs are traded on behalf of their irrigator customers. Irrigators made up the majority of the allocation 'commercial' trades in each year over this period (figure 4.6). They were also the largest single group of allocation buyers and sellers by volume in any given year in the Southern Connected Basin (figure 4.7). In 2018-19, for example, irrigators made an estimated 52% of all 'commercial' allocation purchases and 64% of all 'commercial' allocation sales in the Southern Connected Basin. These trades accounted for 37% of allocation volumes bought commercially that year, and 34% of allocation volumes sold.

However, the estimated proportion of commercial allocation trade undertaken by irrigators has been declining over the last eight years:

- Between 2012-13 and 2018-19, the proportion of the number of allocation purchases made by the irrigators decreased from 68% of total trades to 52%.¹⁶¹
- Over the same period, the proportion of allocation volumes purchased by irrigators decreased from 45% of total volumes to 37%, while the proportion of volumes sold decreased from 40% to 34% annually.

¹⁶¹ The proportion of the number of allocation sales made by irrigators does not exhibit a similar downward trend, fluctuating between 55% and 65% a year between 2012-13 and 2018-19.

The presence of *Institutional Investors* in Southern Connected Basin allocations markets has increased significantly in recent years. As a group, they typically sell more water than they buy in any given year:

- In terms of numbers of trades, it is estimated institutional investor purchases increased from less than 1% of all purchases in 2012-13 to 15% in 2018-19. Institutional Investor sales increased from 1% in 2012-13 to 5% in 2018-19.
- In terms of volumes traded, institutional investor trade activity has also increased over the period. In 2012-13, institutional investors are estimated to have bought less than 1% of total allocation volumes and sold 2%. By 2018-19, this increased to 11% and 21%, respectively.

Retired irrigators (as proxied by the Non-Institutional Investors group), who have exited irrigated farming but retain ownership of permanent water rights, are theorised to participate in water markets predominately by selling water allocations made against their entitlements. While the data presented does not allow analysis of the employment status of traders (for example, to assess whether a trader is in fact a retired irrigator), the *non-Institutional Investor* group, comprised of superannuation funds that are not identified as *Institutional Investors*¹⁶², is used as a proxy for retired irrigators. ACCC analysis indicates that this group sells a greater volume of water allocations than it buys, accounting for 3 to 6% of volumes purchased, and 2 to 4% of volumes sold.

Agribusinesses are estimated to have accounted for a significant share of commercial allocation purchases over the last eight years but a much smaller proportion of sales. Agribusinesses typically buy more water by volume in a given year than they sell, and the total annual volume of water allocation purchased by this group appears to be increasing over time:

- Between 2012-13 and 2018-19, agribusinesses made between 8% and 12% of the number of commercial allocation purchases in a year, and approximately 3 to 6% of commercial sales in the Southern Connected Basin.
- By volume over the same period, agribusinesses accounted for between 20% and 27% of all allocations purchased commercially in any given year, and between 5% and 14% of all allocations sold commercially.

The 'Other' group, which includes non-EWH government, recreation, industrial and urban participants, is a significant seller in Southern Connected Basin allocations markets. Participants in this group typically buy little water in a given year but consistently sell large volumes of allocations each year, although their share of the allocation sales has been gradually decreasing over time:

- Between 2012-13 and 2018-19, this group made less than 2% of the number of commercial allocation purchases in a given year, but between 3% and 5% of all sales in the market in a year.
- By volume over the same period, this group generally bought less than 1% of water allocation in any given year but sold between 4% and 7% of allocation volumes.

Brokers and exchange platforms participate in water markets both as service providers and, at times, as trading principals. Our estimates show that as a group, brokers and exchange platforms have accounted for a significant but variable share of allocation buy and sell trade over the last eight years (as trading principals). On average, brokers and exchange platforms sell a higher proportion of allocation water in a given year than they buy:

- Between 2012-13 and 2018-19, brokers and exchange platforms' share of the number of commercial allocation purchases and sales in a given year fluctuated between 5% and 11% of all trades.
- Over the same period, brokers and exchange platforms' share of allocation volumes bought commercially in a given year fluctuated between 8% and 10%, while their share of allocation volumes sold commercially fluctuated between 8% and 13%.

Irrigation Infrastructure Operators (IIOs) have also accounted for a significant but variable share of allocation buy and sell trade over the last eight years, selling an estimated 1,390 GL in the period 2012-13 to 2018-19, and purchasing an estimated 1,095 GL:

¹⁶² Such traders predominantly appear in the data as a family superannuation fund – e.g. a trader name such as 'John and Mary Smith Superannuation Fund'.

- IIOs consistently made up an estimated 4% to 9% of the number of annual purchases and sales in any given year over the 2012-13 and 2018-19 period, and between 7% and 21% of the volume of allocations bought and sold in any given year.
- The majority of allocation trades by IIOs are performed on behalf of their customers; see section 3.1.1 for further detail.

Environmental water holders, which primarily constitutes government EWHs, engage in irregular and relatively small *commercial* trades in the Southern Connected Basin:

- Between 2012-13 and 2018-19, the EWH group made between 0 and 2% of the total number of allocation purchases and sales in any given year.
- Over the same period, EWHs purchased between 0 and 4% of allocation volumes, and more regularly sold between 1% and 3% of allocation water traded in a given year.

Traditional Owner groups have made almost no allocation purchases over the 2012-13 to 2018-19 period in the Southern Connected Basin, but have consistently made a very small number of allocation sales each year; the total volumes sold accounted for less than 1% in any year.

The *Other Non-Water User* group, which includes non-water using participants not included in other categories, consistently accounted for a significant share of allocation buy and sell trade over the last eight years. As a group, they typically sell more water than they buy in a given year, selling an estimated 624GL over the period 2012-13 to 2018-10, and purchasing an estimated 265GL.

- Between 2012-13 and 2018-19, this group made up 3 to 5% of the number of allocation purchases in any given year, and 8 to 10% of all annual sales in the Southern Connected Basin.
- By volume over the same period, this group accounted for between 2% and 3% of allocation volumes purchased in a given year, and between 6% and 8% allocation volumes sold on the market in any given year.

Overall, this analysis of overall participation in water allocation markets in the Southern Connected Basin indicates that:

- Irrigators are the largest single trading group in allocation markets in the Southern Connected Basin. However, their proportion of total allocation trade has been declining over the last eight years.
- The presence of institutional investors in Southern Connected Basin allocations markets as either buyers or sellers was significant and has increased substantially in the last four years.
- Retired irrigators account for a small but not insignificant proportion of allocations sold in the Southern Connected Basin each year.
- Agribusinesses have been buying a significant and increasing share of allocation volumes over the last eight years in the Southern Connected Basin.
- IIOs and IOs account for a significant and variable share of allocation buy and sell trade in the Southern Connected Basin.
- Environmental water holders, including government environmental water owners, make irregular and relatively small commercial allocation trades in the Southern Connected Basin.
- Traditional Owner groups made almost no allocation purchases over the 2012-13 and 2018-19 period, but consistently make a very small number of allocation sales each year.

4.3.3 Commercial allocation trade by participant groups across Southern Connected Basin trading zones

While irrigators are typically the largest single trading group in allocation markets in the Southern Connected Basin, the size of their market share varies significantly across trading zones. Of the larger trading zones in the Southern Connected Basin in terms of water allocated or volumes traded¹⁶³, irrigators typically have the largest allocation market share in zones 6 and 1A. In zone 6, for example, in 2018–19 irrigators are estimate to have bought 75% and sold 58% of commercial allocation volumes traded, while in zone 1A, they bought 43% and sold 49% of commercial allocation volumes traded that year.

Of the larger trading zones, irrigators typically have their smallest allocation market share in zones 10 and 13, where New South Wales IIOs have large market shares. In zone 10, in 2018–19 irrigators bought only 1% and sold 10% of commercial allocation volumes traded, while in zone 13, they bought 23% and sold 10% of allocation volumes traded that year.

Over recent years, irrigators' share of allocation trade has declined most in the trading zones that have seen the largest growth in institutional investor trade, particularly in zones 11, 13 and 7. In zone 7, for example, irrigators' share of allocation volumes bought and sold has decreased from 42% and 47% respectively in 2012–13, to 29% and 30% in 2018–19.

While *Institutional Investors* have some level of market share in most trading zones of the Southern Connected Basin, of the larger trading zones their highest market shares of allocation trade by volume have been in zones 7, 11 and 1A in recent years. Institutional investors are typically least active in zone 10, where they bought and sold less than 1% of allocation volumes in this zone in 2018–19. As noted above, institutional investors' share of allocation buy and sell trade by volume has increased most in zones that have experienced the largest decrease in irrigator allocation trade.

Retired irrigators (proxied by the *Non-Institutional Investor* group) predominantly sell water allocations in any given year. In the larger trading zones, they typically have their highest allocation market share in zones 7 and 12. In 2018–19, for example, this group is estimated to have sold 5% of commercial allocation volumes in zone 7 and 4% of allocations volumes in zone 12.

Irrigation Infrastructure Operators (IIOs) as a group have their highest allocation market shares in the larger zones of 10, 11, 12 and 13, with their highest share in zone 10. In 2018–19, for example, this group bought 98% and sold 73% of water allocations volumes traded commercially in that zone.

Brokers and exchange platforms buy and sell significant proportions of water allocation volumes in all of the larger trading zones of the Southern Connected Basin, except for zones 10 and 12, and their market shares can fluctuate significantly across water years. Brokers appear to have a significantly stronger presence in New South Wales trading zones compared to Victorian and South Australian zones. For the period 2012–13 to 2018–20 (year to 30 November 2019), Brokers accounted for over 17% of allocation volumes sold (excluding zero dollar transactions) in New South Wales trading zones, and 13% of allocations purchased, compared to 7% of both purchases and sales in South Australian and Victorian zones. Chapter 9 considers the relationships between broker participation as market principals and the underlying Basin State water access entitlement frameworks and trading processes in more detail.

The *Agribusiness* group, which typically buys significant volumes of water allocation, has a higher market share in the larger trading zones of 7, 12, 13 and 11. In 2018–19, Agribusinesses purchased 34%, 28%, 19% and 14% respectively of commercial allocation volumes in these zones.

163 Larger zones in terms of water allocated or volumes traded include zones 10, 11, 12, 13, 1A, 6 and 7.

The *Environmental Water Holders* (EWH) group, which irregularly buys and sells allocations on spot markets, has made the largest purchases of water allocations (as a proportion of zone volumes) in recent years in the larger trading zones of:

- Zone 12 in 2012-13 and 2013-14, where EWHs purchased 12% and 10% of allocation volumes in the zone in those years
- Zone 11 in 2014-15, where they purchased 7% of allocation volumes in the zone that year
- Zone 13 in 2016-17, where they purchased 6% of allocation volumes in the zone that year.

The *EWH* group's largest sales have occurred in zone 1 in 2015-16, 2016-17 and 2018-19, where EWHs sold 8%, 6% and 6%, respectively of commercial allocations volumes sold in that zone in those years.

As noted above, *Traditional Owner* groups, while trading allocations in very small numbers, typically sell more water than they buy. Traditional Owner groups have been most active in zone 14, irregularly selling a significant proportion of the total volume of allocations sold in this zone in a given year. In the larger trading zones of 11, 12 and 3, Traditional Owner groups have sold smaller proportions of water (typically between 0% and 3% of total volumes sold in the zone in a given year).

The Other group (comprising *Urban, Industrial, non-environmental water holder government entities and Recreation*), which typically sell significant volumes of water allocations each year, has its highest allocation market shares in the larger zones of 1A and 6.

Overall, this analysis indicates that participation by different groups in water allocation markets in the Southern Connected Basin varies substantially across zones:

- Irrigators typically account for the largest allocation market share in zones 6 and 1A.
- Institutional investors account for the largest allocation market share in zones 7, 11 and 1A.
- Irrigators' share of allocation trade has declined most in trading zones that have seen the largest growth in institutional investor trade, particularly in zones 11, 13, 1A and 7.
- Retired irrigators typically have their largest allocation market share as sellers in zones 7 and 12.
- Agribusinesses are most active as buyers in zones 7, 12, 13 and 11.
- EWHs, over the last eight years, have made irregular but significant commercial allocation purchases in zones 11, 12 and 13 and commercial sales in zone 1.
- Traditional Owner groups have been most active as sellers in zone 14.

4.4 Water ownership and trading strategies used by participant groups

Sections 4.2 and 4.3 above each summarise data on water ownership and allocation trade by different participant groups in the Southern Basin. However, a participant's decisions on what permanent water rights to own and what type of water trade to engage do not occur in isolation. Water trading is typically undertaken as part of a wider *water ownership and trading strategy* that is designed to ensure a participant can reliably secure enough water to achieve their water use needs, whether commercial, environmental or cultural.

A water ownership and trading strategy (or 'water strategy') can be defined as the integrated approach to water ownership (including water entitlements, shares etc.) and water trading (including of entitlements, allocations, leases, carry over parking and forward contracts) a market participant uses to secure the water they need. An irrigator's water strategy, for example, may be to secure the water they typically need for a growing season by holding one or two types of water entitlements within their catchment to supply most of their water needs, and to only buy temporary water when needed to supplement what they receive from their permanent water rights. An investor's strategy, alternatively, may be to hold a diverse portfolio of water entitlements across a number of catchments or zones to ensure they can reliably meet the water supply obligations of their contracted customers.

To better understand the relationship between the ownership of permanent water rights and water trading behaviours, the ACCC has developed a framework detailed in table 4.2 below that describes the most common water strategies used by different types of participant groups in the Basin.¹⁶⁴ The ACCC has used this framework along with available data on water ownership and trading to analyse water strategies used by different market participants. This analysis provides new evidence on which water strategies are currently in use and by who, how frequently they are used, and the reasons why a participant chooses a particular strategy (that is, the strategy drivers).

¹⁶⁴ Recent research has considered possible frameworks for describing in an integrated way how different water market participants own and trade water. Seidl et al 2020, for example, analysed water market participants' reasons for owning and trading water, the type of permanent water rights they owned and the water trading they engaged in. The participant groups studied included irrigators, agribusinesses ('agri-corporates'), investors ('financial investors', 'entrepreneurs' and 'speculators') and EWHs. Seidl et al identified various 'water user types' that corresponded to different levels of sophistication in terms of: the type of permanent water rights owned (ranging from owning no permanent water, to a limited portfolio of one or two entitlement types in one zone, to a diversified portfolio of entitlements of differing levels of reliability in more than one zone), and the type of water trading they used (ranging from no trade at all, to allocation and/or entitlement only trade, to increasingly frequent and sophisticated trade using leases carryover parking and multi-year forwards).

Table 4.2: Key water ownership and trading strategies identified by the ACCC

Market participant type	Water ownership & trading strategies	Aim of strategy	How common is the strategy?
Traditional non-trading irrigator, agri-business and EWHs	Owns limited portfolio of entitlements ¹⁶⁵ , no allocation or entitlement trade, may use carry over	Owns all the water they use, uses carryover but does not trade to meet water needs	In 2018, around 66% of irrigators used only water allocated to entitlements they owned. ¹⁶⁶
Traditional trading irrigator or agri-business	Owns limited portfolio of entitlements, trades allocations only, may use carry over	Mostly owns the water they use, buys allocations to supplement water supply, or sells surplus water to earn income	In 2018, 26% of irrigators used water from their own entitlements and supplemented this with water purchased on the temporary market. ¹⁶⁷
Diversified trading irrigator or agri-business	Owns diverse portfolio of entitlements ¹⁶⁸ , trades allocations, may use carry over	Mostly owns the water they use, buys allocations to supplement water supply, or sells surplus water to earn income	
Diversified trading irrigator or agri-business, using new water products	Owns diverse portfolio of entitlements, trades entitlements and allocations, uses leases or a newer water product, may use carry over	Owns some of the water they use, trades entitlements to diversify supply risk, secures temporary water through allocations, leases or other water products	
No portfolio trading irrigator or agri-business	Owns no entitlements, trades allocations leases and other water products, may use carry over	Owns none of the water they need, sources water through allocation trade, leases and newer water products	In 2018, only 3% of irrigators used no water from their own entitlements and relied solely on water either purchased on the temporary market or from a leased entitlement. ¹⁶⁹
Traditional investor or agribusiness	Owns diverse portfolio of entitlements, trades allocations and entitlements, uses carry over	Mostly owns the water they need, but also buys allocations to supplement supply to meet obligations to market for long-term leases and forward contracts	
Diversified investor	Owns diverse portfolio of entitlements, trades allocations and entitlements, uses carry over	Mostly owns the water they need, but also buys allocations to supplement supply to meet obligations to market for long-term leases and forward contracts, also trades allocations for profit	

165 Holds entitlement in one valley of at most two classes (e.g. high and low reliability) sufficient for supplying, or exceeding, their own on-farm water needs in a year with average water availability.

166 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, p. 24.

167 *ibid.*

168 Holds at least two entitlements of different security and/or across different catchments, at most two classes (e.g. high and low reliability) sufficient for supplying, or exceeding, their own on-farm water needs in a year with average water availability.

169 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, p. 24.

4.5 Barriers to more effective water market engagement

There are many factors that feed into a decision to use or not to use a given water product, and non-use of a particular product or not using water markets at all are not, by themselves, evidence of a problem or barrier to trade.

Submissions to this inquiry have highlighted the significant benefits that water markets are providing to irrigators and other water users across the Basin.¹⁷⁰ Data indicates that most irrigators have used allocation markets, and to a lesser extent entitlement markets at some level, and that the proportion of irrigators trading in these markets has been increasing over time.¹⁷¹ However, evidence available to this inquiry and summarised below also shows that certain groups of participants, in particular some irrigators and Traditional Owner groups, rarely or never engage in allocation or entitlement trade. The evidence also indicates that only a small proportion of irrigators as a whole use other types of water products such as leases, and an even smaller proportion use carryover parking or forward contracts.

This section summarises the available evidence on the level of irrigator and Traditional Owner group engagement with each type of water market product (including for allocations, entitlements, leases, carryover parking and forward contracts), and the possible barriers that may prevent use of these water products barriers.¹⁷²

4.5.1 Irrigator engagement with water markets

Submissions to this inquiry have stated that while many irrigators are using and benefiting from water trading¹⁷³, some irrigators are experiencing difficulties in effectively engaging with water markets and are suffering negative impacts as a result.¹⁷⁴

Many factors can drive an irrigator's decision whether to engage or not engage with a particular water market. Key categories of these drivers include:

- market-based drivers: including current and future trends or changes in commodity prices, demand for agricultural products, seasonal weather or longer term climate conditions etc. that can impact water use and water availability (demand and supply) and so drive a decision to buy and sell a water product at a given time
- institutional and infrastructure drivers: including trading and operational rules and physical constraints that can impact if, when and how an irrigator can buy or sell water

170 Almond Board Australia, Submission to Murray-Darling Basin water inquiry issues paper, March 2020; AWBA, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Aware Water Group, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Citrus Australia, Submission to the Murray-Darling Basin Water Markets inquiry issues paper, January 2020; Commonwealth Department of Agriculture, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; H20X, Submission to Murray-Darling Basin water inquiry issues paper, February 2020; Kilter Rural, Submission to Murray-Darling Basin water inquiry issues paper, March 2020; Tom Martin, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

171 Appendix A, figure A.2.

172 Effective engagement with a water market typically requires that a buyer or seller has ready access to enough market information on the price and characteristics of the water products being traded to allow them to make an informed trading choice that best match their individual water use needs.

173 Almond Board Australia, Submission to Murray-Darling Basin water inquiry issues paper, March 2020; AWBA, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Aware Water Group, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Citrus Australia, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Commonwealth Department of Agriculture, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; H20X, Submission to Murray-Darling Basin water inquiry issues paper, February 2020; Kilter Rural, Submission to Murray-Darling Basin water inquiry issues paper, March 2020; Tom Martin, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

174 AJ and MH Spiers, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Australian Grape and Wine Incorporated, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Central Irrigation Trust, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Citrus Australia, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Commonwealth Department of Agriculture, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; NSW Farmers' Association, Submission to Murray-Darling Basin water inquiry issues paper, February 2020; Select Harvest, Submission to Murray-Darling Basin water inquiry issues paper, April 2020; SunRice, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

- government policy drivers: including policies governing access to carryover and interventions such as water buybacks or irrigation infrastructure subsidies that can alter the incentives for an irrigator to engage in certain types of water ownership and trade
- an irrigator's individual circumstances and characteristics: including the characteristics of the irrigator's business (that is, their farm type, size, location, profitability, debt levels, access to capital etc.), the types of risks they face and their attitudes to managing risk, their access to and use of government programmes, and characteristics of the irrigator themselves, which can include:
 - their ability to collect, process and use market related information (for example, do they have the experience, skills and knowledge to trade, the time and money to commit to the information and transaction costs of trading, or access to a water market intermediary to advise or act of their behalf?)
 - their future plans (do they intend to expand, adjust or exit their business?)
 - their attitudes to and confidence in water markets and trading (do they have confidence in water markets and the security of their water rights, or are they uncertain or expect the rules to change?).

The ACCC has focussed on irrigator participation in water markets as irrigators are the largest group of water market participants. In comparison to other participant groups (such as EWHs, institutional investors, agribusinesses, IIOs and WMIs) irrigators, particularly smaller, family owned farmers, may be more susceptible to certain barriers that limit their ability to effectively engage with different kinds of water markets. This may result in these irrigators producing less, earning lower profits, being more likely to go out of business and less likely to make structural adjustments as market conditions change.

To better understand the potential magnitude and scope of any barriers to trade that irrigators may be experiencing, the ACCC, with the help of two external consultants (box 4.1), has undertaken analysis of how many irrigators are using and not using each type of water product, the individual circumstances and characteristics of irrigators who trade and don't trade these products, and their attitudes to trading and water markets. Appendix A summarises key results and findings of this analysis. The consultants' reports are available on the inquiry webpage.

Box 4.1: Water inquiry consultancies on irrigator engagement with water markets

The ACCC commissioned two consultants to perform and report on analysis of data collected in surveys of Basin irrigators undertaken between 1998 and 2018. The aim of the work was to gain a clearer and more representative understanding of irrigators' water ownership and trading behaviours, and their attitudes to water trading and water markets.

The Centre for Global Food and Resources at the University of Adelaide has conducted various surveys of irrigators across the Basin from 1998 to 2015. These surveys, amongst other things, asked irrigators about their water ownership, water trading and farm management behaviours, and included a number of attitudinal questions.

The Health Research Institute at the University of Canberra undertakes an annual survey – the Regional Wellbeing Survey – of people in Australian regional areas. The 2015 and 2016 surveys, amongst other things, asked Basin irrigators about their water use, water ownership, water trading and farm management behaviours. They also asked irrigators to indicate to what degree they agreed or disagreed with various statements related to the process of trading water, their confidence in water markets and water market rules, and the security of their permanent water rights.

The ACCC has incorporated relevant data and analysis from the consultants' reports into this report. The full consultant reports are available from the ACCC's website (<https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/accc-commissioned-research>).

This section draws on the available evidence on irrigators' use of water markets, including from submissions, the academic literature and our consultants' reports, to identify key issues related to irrigator engagement and non-engagement with water markets.

Issue 1: Some irrigators appear to have limited engagement with water markets, particularly leases and newer water products

Submissions to the inquiry have highlighted that some irrigators, particularly smaller, family owned operators, find it difficult to effectively engage with water markets and these submissions identify some causes of the difficulties.¹⁷⁵

Central Irrigation Trust noted the complexity of the information needed to forecast water availability and market conditions:¹⁷⁶

'...water is very complex, some of which is caused by history and the resulting development of irrigation across the Murray Darling Basin; some of which results from the jurisdictional control over water; and some which results from the delivery of that water through a complex hydrological system of rivers, creeks, dams, lakes and streams. Compounding this complexity is the variable nature of the key ingredient rainfall and runoff. It is not hard to see that there are very few people that have sufficient information or understanding to be considered informed on the water resource and markets.'

NSW Farmers highlighted the lack of availability of key types of information:¹⁷⁷

'NSW Farmers believes improvements in the transparency of water trade are urgently required. Readily available information including price, location and volume, provide market participants with the information required to make informed decisions. Without transparency and improved functional capacity, trust in the water market and wider water reforms is being eroded, and the ability of the water market to deliver the social, economic and environmental objectives of the Murray-Darling Basin Plan is greatly diminished.'

Australian Grape and Wine Incorporated emphasised the limitations smaller irrigators face relative to larger operators when trying to access and analyse market information:¹⁷⁸

'...there is a large range across wine grape growers' ability and capacity to engage with the water market which leads to problems associated with information asymmetry. Some vineyard owners and operators are large wine companies, or corporate style winegrowing entities with dedicated technical staff with the capacity and resources to engage with the water markets on a continuous basis. Other growers are small family or sole - trader entities, and engagement with the complex rules and regulations that are associated with the water markets is daunting for them.'

Select Harvest noted that the combination of a lack of readily available data and differences in market participant resources puts smaller players at a commercial disadvantage when trading:¹⁷⁹

'A lack of consolidated, accurate, comprehensive and timely data on water rights trading activity gives a significant informational advantage to large, well-resourced and connected Sophisticated Investors and large scale irrigators (like Select Harvests) over smaller market participants.'

175 AJ and MH Spiers, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Australian Grape and Wine Incorporated, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Central Irrigation Trust, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Citrus Australia, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; Commonwealth Department of Agriculture, Submission to Murray-Darling Basin water inquiry issues paper, January 2020; NSW Farmers' Association, Submission to Murray-Darling Basin water inquiry issues paper, February 2020; Select Harvest, Submission to Murray-Darling Basin water inquiry issues paper, April 2020; SunRice, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

176 Central Irrigation Trust, Submission to Murray-Darling Basin water inquiry issues paper, January 2020.

177 NSW Farmers' Association, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

178 Australian Grape and Wine Incorporated, Submission to Murray-Darling Basin water inquiry issues paper, January 2020.

179 Select Harvest, Submission to Murray-Darling Basin water inquiry issues paper, April 2020.

Finally, AJ and MH Spiers stated that while new and useful water products are becoming available in water markets, some irrigators had not considered them or could not afford to use them: ¹⁸⁰

‘The number of products available to irrigators (long term and short term leases) has given irrigators who sold their permanent water shares some years ago, a greater amount of flexibility and security going forward. I do not think the majority of irrigators have explored these options OR if they have they may not be able to afford to purchase water at the current prices in 2019.’

Irrigator engagement with allocation markets

Available data indicates that as of 2016 approximately 75% of irrigators in the Southern Basin reported having traded (bought or sold) an **allocation** at least once, and that irrigator use of allocation trade measured in this way has been increasing over time.¹⁸¹ However, it also shows that in 2016 a quarter of irrigators (approximately 25%) reported having never traded (bought or sold) an allocation, and only a small proportion of irrigators (less than 15%) report having both bought and sold an allocation over a five year period prior to 2016.¹⁸² Appendix A includes more detailed data on irrigator engagement with allocation markets.

This data indicates that while the majority of irrigators report having used allocation markets at least once, a significant minority are not engaging with allocation markets at all, and a larger proportion of irrigators only trade allocations infrequently.

An irrigator’s use of allocation trade, as noted above, will vary depending on a range of market-based, institutional, government policy and individual drivers, amongst others. To better understand the extent to which the observed non-engagement with allocation trade by some irrigators was an informed choice or evidence of some barrier to trade, the ACCC commissioned analysis of irrigator engagement with water markets (box 4.1) and compared the individual characteristics of irrigators engaging and not-engaging in allocation trade, including the characteristics of an irrigator’s business, the irrigators themselves and their attitudes to water trade and water policy generally (appendix A).

Initial analysis of individual irrigator characteristics (summarised below) found a number of significant differences between irrigators who traded water allocations in a given year and irrigators that did not trade allocations in the same year.¹⁸³

In terms of business characteristics, water allocation traders in the Southern Basin, on average, were found to have higher net farm incomes (on average 15% higher) than non-traders. This difference may be because allocation traders earned additional income from selling their allocations while non-traders did not. Alternatively, it may suggest some positive association between higher access to capital or cash flow and the likelihood of an irrigator engaging in allocation trade.

Allocation trade also varies significantly with the type of farm commodity production. In 2018, 38% of grain growing irrigators and 40% of dairy irrigators did not engage in any type of trading in the water market. In comparison, in the same year, the percentage of fruit/nut growing irrigators and wine grape growing irrigators that did not engage in any trade in the water market was 67%.¹⁸⁴

Allocation traders were also found to have carried over a higher volume of water than non-traders (on average 72% more water in the year of trading). These differences may suggest that traders usually managed a larger water volume than non-traders, which offers them greater flexibility to trade water allocations.

180 AJ and MH Spiers, Submission to Murray–Darling Basin water inquiry issues paper, January 2020.

181 Appendix A, figure A.2.

182 Appendix A, figure A.3.

183 The comparison was for allocation trade in 2015 across the Southern Basin. We note that these differences are indicative of statistically significant associations (between a characteristics and trade behaviour) rather than causation and may or may not be associated to a driver of trading or not trading. The full analysis can be found in S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, table 6.5, and pp.118–119.

184 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray–Darling Basin*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, Table 13, p. 40.

There were a range of significant differences in the personal characteristics of irrigators who traded and did not trade allocations. Allocation traders compared with non-traders:

- were three years younger (traders were on average aged 57.5 years compared to 60.5 for non-traders)
- had four years less farming experience (traders had on average 35.3 years of experience compared to non-traders who had on average 39.6 years)
- had higher post-secondary education attainment (traders were more likely to have gone to TAFE or University than non-traders).

These differences may suggest that irrigators who were younger, had worked in the industry for less time, and had a higher level of educational attainment found it easier to navigate the information and administrative requirements to engage in allocation trade.

Allocation traders were also found to be more likely to have a whole farm plan, and to be planning for climate change. These differences may indicate that irrigators who are willing or able to engage in a higher level of forward looking farm management practices are also more willing or able to navigate the information and process requirements to engage in allocation trade.

There were also a range of significant differences in the attitudes of irrigators who traded and did not trade allocations:

- Allocation traders on average reported a more positive attitude to water trading.¹⁸⁵ They also had a more positive attitude to investors.¹⁸⁶ These differences may suggest that irrigators who were more open to the idea of trading water in principle were more willing to use water trading in practice.
- Allocation traders expressed less 'traditional' attitudes to farming than non-traders.¹⁸⁷ They also had a more positive attitude to environmental water recovery.¹⁸⁸ These attitudinal differences may suggest that irrigators who hold more traditional attitudes to farming may be less willing to use allocation trade as a farm management tool.
- Allocation traders were significantly more likely to find it easy to trade both temporary water and entitlements, to feel confident to use water trading, and to feel able to access information, than those who did not trade allocation.¹⁸⁹

Attitudes relating to the fairness of the water trade market, the stability of water market rules, and whether entitlements held by the government were subject to the same rules and charges as other water market participants, did not differ between irrigators who traded allocation and irrigators that did not.¹⁹⁰

These findings suggest that irrigators' propensity to trade is associated with finding it easy to trade, confidence in being able to use water trading, and confidence in being able to access information about water trading. The propensity of an irrigator to trade is less associated with views about the fairness or stability of the water market.

The University of Canberra's Regional Wellbeing Survey indicates that in 2016, 11.8% of irrigators fell into a class of irrigators that lacked confidence in both their own ability to access information about water trade and the settings of water trading systems (Class 1). In the same year, 20.1% of irrigators fell into a class of irrigators that had moderate confidence in being able to trade, and some confidence that the water trade systems are fair for all water market users, however felt the water market is somewhat unfair and were only slightly confident in their ability to access information about the market and trade

185 Allocation traders agreed more than non-traders with statements 'I believe water trading has been a good thing for farming'.

186 Allocation traders agreed more than non-traders with the statements 'Retired irrigators no longer farming should be allowed to retain and trade water' and 'Corporate non-farm entities should be allowed to invest in water'.

187 Allocation traders agreed less than non-traders with the statements 'Farming is the only occupation I want to do' and 'I could never imagine living anywhere other than this area'.

188 Allocation traders agreed less that 'The Commonwealth Environmental Water Holder belongs in the agriculture not the environment department' and 'I believe the Basin Plan should be suspended'.

189 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, p. 47.

190 *ibid.*

water (Class 2). Class 1 irrigators were significantly less likely to trade allocation than Basin irrigators as a whole.¹⁹¹

Irrigator engagement with entitlement markets

Available data indicates that as of 2016 approximately 50% of irrigators in the Southern Basin reported having traded (bought or sold) an **entitlement** at least once, and that irrigator use of entitlement trade measured in this way has been increasing over time.¹⁹² However, it also shows that in 2016 around half of all irrigators (approximately 50%) reported having never traded (bought or sold) an entitlement. In addition, only a small proportion of irrigators (less than 10%) reported having both bought and sold an entitlement over the five year period prior to 2016.¹⁹³ Appendix A includes more detailed data on irrigator engagement with entitlement markets.

This indicates that while around half of irrigators report having used entitlement markets at least once, 50% of irrigators in the Southern Basin have never bought or sold water entitlement.

An irrigator's use of entitlement trade, as noted above, will vary depending on a range of market-based, institutional, government policy and individual drivers. To better understand the extent to which the observed non-engagement with entitlement trade by some irrigators was the result of an informed choice or some barrier to trade, the ACCC commissioned analysis of irrigator engagement with water markets (box 4.1) and compared the individual characteristics of irrigators engaging and not-engaging in entitlement trade, including the characteristics of an irrigator's business, the irrigators themselves and their attitudes to water trade and water policy generally (appendix A). Initial analysis of individual irrigator characteristics summarised below, found a number of significant differences between irrigators who traded water entitlements in a given year and irrigators who did not trade entitlements in the same year.¹⁹⁴

In terms of farm characteristics, water entitlement traders in the Southern Basin, on average:

- held greater volumes of entitlements (high security entitlements, low security entitlement in Victoria and general security entitlements in New South Wales)
- irrigated a significantly larger area of land than non-traders (on average 78% more)
- carried over more water into the season they traded in.

These difference are suggestive of a number of possible causal relationships between farm characteristics and engaging in entitlement trade, particularly entitlement sales, including:

- Irrigators holding greater volumes of entitlements can more easily sell some to raise funds while maintaining farming operations compared to farms with smaller entitlement holdings.
- Irrigators with more land may have greater flexibility to move to non-irrigated land uses than irrigators with smaller farms and so can more easily sell some of their permanent water rights.
- Irrigators who use larger volumes of carry over may have greater flexibility to sell entitlements and rely more on carry over to manage water supply risk.

Water entitlement traders in the Southern Basin also, on average, were more likely to have received an irrigation infrastructure grant than for non-traders, and were more likely to be in the horticultural industry. There is a direct causal relationship between an irrigator accepting a government irrigation infrastructure grant and selling water entitlements to the government. The association of entitlement trade with irrigators in the horticultural industry may reflect the rapid growth of this sector and these types of farms trading a larger numbers of entitlements.

191 *ibid*, pp. 58–60.

192 Appendix A, figure A.2.

193 Appendix A, figure A.3.

194 The comparison was for entitlement trade in 2015 across the Southern Basin. These differences are indicative of statistically significant associations (between a characteristics and trade behaviour) rather than causation and may or may not be associated to a driver of trading or not trading. The full analysis can be found in S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, table 6.7, pp. 123–124.

None of the personal characteristics of irrigators (such as age, years in the industry or educational attainment) that were found to be significantly different between allocation traders and non-traders above, were significant for entitlement trade. However, entitlement traders were found to engage in certain farm management behaviours at significantly higher rates than non-traders of entitlements. Entitlement traders were also found to be more likely to have planned for climate change on farm, bought income protection insurance and bought crop insurance. These differences may indicate that irrigators who are willing or able to engage in a higher level of forward looking farm management practices are also more willing or able to navigate the information and process requirements to engage in entitlement trade.

There were also a range of significant differences in the attitudes held by irrigators who traded and did not trade entitlements:

- Entitlement traders, like allocation traders, on average reported a more positive attitude to water trading. They also had a more positive attitude to investors. These difference may suggest that irrigators who were more open to the idea of trading water in principle were more willing to use water trading in practice.¹⁹⁵
- Entitlement traders were also more positively disposed to environmental water recovery and the Basin Plan.¹⁹⁶

Beyond the two differences in attitudes above, the views of those who trade entitlements typically do not differ significantly to those who do not trade entitlements.¹⁹⁷

Irrigator use of leases and newer water products

As with allocation and entitlement trade, an irrigator's use of newer water products (for example, single and multi-year leases, carry over parking and single and multi-year forward contracts) should vary depending on a range of market-based, institutional, government policy and individual drivers. However, analysis indicates that only a relatively small proportion of irrigators use leases and an even smaller proportion use carry over parking and forward contracts. This analysis is detailed below.

Leases

Analysis of irrigator survey data from 2018 found that approximately 6.7% of irrigators across the whole Basin reported using water that, in part, was sourced from leased entitlements.¹⁹⁸ Of all irrigators surveyed across the whole Basin in 2018 on how they secured water for their farms:

- 1.4% reported using water from their own entitlements and from entitlements they leased from others
- 3.6% reported using water from their own entitlements, leased entitlements, and allocations purchased on the temporary market
- 3.2% reported using no water from their own entitlements (all water used was from purchases on temporary market and/or leased entitlements).¹⁹⁹

195 Entitlement traders agreed more than non-traders with statements 'I believe water trading has been a good thing for farming' and also agreed more than non-traders with the statement 'Corporate non-farm entities should be allowed to invest in water'.

196 Entitlement traders agreed more than non-traders with the statements 'Most irrigators think increasing environmental water flows is a good thing', 'It is essential to make allocations to the environment otherwise irrigation will not be long-term sustainable', 'The Murray-Darling Basin Authority is serious about helping our community to solve our own environmental flow problems' and 'More money should be spent on water buybacks by the Commonwealth', and they agreed less with the statement 'The Commonwealth Environmental Water Holder belongs in the agriculture not the environment department' and 'I believe the Basin Plan should be suspended'.

197 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, p. 47.

198 The question did not differentiate between single and multi-year leases. *ibid.*, table 8, p. 13. Basin irrigators using surface water (excludes those who rely solely on groundwater).

199 *ibid.*, table 8, p. 13. Basin irrigators using surface water (excludes those who rely solely on groundwater).

Information on irrigators' use of leases also comes from semi-structured qualitative interviews undertaken in 2018 with water trading stakeholders in the Basin, which similarly found that most irrigators and many agribusinesses did not use leases.²⁰⁰

Information on irrigators' use of leases from semi-structured qualitative interviews undertaken in 2018 also found that use of leases was strongly associated with the amount of water owned; smaller irrigators with smaller holdings of permanent water ownership were less likely to use leases than irrigators and agribusinesses with larger water holdings.²⁰¹

However, the research found that smaller irrigators that did use a lease, tended to lease water from friends and relatives, from their own self-managed super account, or from other irrigators, while larger irrigators and agribusinesses that used leases, tended to use longer-term leases sourced from commercial operators, either as part of leasing land, or as a stand-alone water lease from non-landholder investors.²⁰²

Newer water products

There is little data available on the number of irrigators using newer water products such as carry over parking and forward contracts. Analysis of this limited data indicates that while relatively significant volumes of water are being transferred under carryover parking and forward contracts, the number of irrigators using these water products is likely to be very small.

ACCC analysis of trading activity undertaken by investors in Victoria in 2018-19 shows that these investors took in approximately 17GL of water from irrigators under carryover parking contracts and returned approximately 10 GL to irrigators that year. The same analysis showed that these investors provided just over 50 GL of water under forward contracts in Victoria in 2018-19.²⁰³

Other analysis undertaken by the ACCC's consultants of a sample of a large Southern Basin water intermediary's trade data²⁰⁴ found that over the three years from 2016-17 to 2018-19, this particular intermediary mediated only 40 carryover parking contracts and 48 forward contracts between irrigators and various counter parties, including other irrigators, investors, IIOs and other (unidentified) parties.²⁰⁵

Submissions in response to the Interim Report

Submissions received in response to the Interim Report in relation to the engagement of irrigators with the water market varied greatly. Some submissions suggested that engagement was high and irrigators were generally satisfied with the operation of water markets, while others raised significant concerns.

Cotton Australia submitted that most irrigated cotton producers would have engaged in the water market at some point in time.²⁰⁶ Waterexchange submitted that consultation to date may have only captured the views of a narrow subset of stakeholders, and that the majority of irrigators are satisfied with the current operation of the water markets.²⁰⁷ Renmark Irrigation submitted that there are no specific barriers to engagement with the market, other than cost, and that information on water market products is readily available.²⁰⁸

The Sunrice Group and the Ricegrowers' Association of Australia (the RGA) submitted a survey of its members that provides a number of data points:

200 S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, p. 142.

201 *ibid.*

202 *ibid.*, p. 143.

203 Chapter 5, figure 5.13.

204 The broker was responsible for approximately 11% of all non-zero dollar Basin allocation trade volumes in 2018-19.

205 S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, pp. 143-145. See also C Seidl, S Wheeler and A Zuo, 2020b, 'Treating water markets like stock markets: Key water market reform lessons in the Murray-Darling Basin', *Journal of Hydrology*, vol. 581, pp. 124-39.

206 Cotton Australia Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 3.

207 Waterexchange, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 1.

208 Renmark Irrigation Trust Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 4.

- 50 of 56 respondents to the survey stated that they actively engage in the water market
- 17 of 53 respondents²⁰⁹ to the survey utilised carryover parking products
- 8 of 53 respondents to the survey utilised lease products
- 7 of 53 respondents utilised forward contracts
- 8 of 20 respondents said that water price was the reason that they did not engage in the water market, 1 additional respondent said that it was a combination of price and lack of knowledge of the water market.²¹⁰

A submission from the Australian Dairy Industry Council (the ADIC) referenced an October 2020 survey of dairy irrigators in the MDB commissioned by Dairy Australia. The survey received almost 100 responses from dairy irrigators across the MDB, and found, among other things:

- dairy irrigators are highly engaged in the water market, buying and selling a wide range of water products
- price was the number one barrier to irrigators using different water products, followed by cash-flow and exposure to allocation risk.²¹¹

Citrus Australia also undertook a survey of its members, with little response. Citrus Australia submitted that the limited response is an indication that growers are not familiar with, or do not regularly utilise, the practices being questioned.²¹² Citrus Australia submitted that there is limited uptake of newer water market products due to a general mistrust in the system.²¹³

Submissions from Cotton Australia, the RGA, the ADIC and Citrus Australia indicate that engagement with the water market is not consistent across all irrigators but varies depending on the type of farm and agricultural product that an irrigator produces.

The Victorian Farmers Federation (the VFF) submitted that the biggest barrier to water trading in Victoria is farmers being priced out of the market due to increasing water prices, particularly in low allocation years. The VFF submitted that increasing water prices has strongly influenced attitudes toward the water market.²¹⁴ The VFF submitted that irrigator attitudes toward the market also depend on how their trade decisions turn out. The VFF submitted that inherent risks such as water supply and price are priced into new water market products such as leases and forward contracts, making such products less attractive to many irrigators.²¹⁵

Coleambally Irrigation Co-operative Limited (CICL) submitted that, based on its observations, irrigator knowledge of the different water market products and the allocation system combined with mistrust of brokers may impact their participation in the water market.²¹⁶

The National Farmers Federation (the NFF) submitted that a lack of confidence caused by distrust in third parties is a barrier to participation in the market.²¹⁷

Select Harvests submitted that consumptive users of water are faced with barriers preventing them from engaging in the market, including but not limited to the tradability of water, deliverability, and the reliability of the entitlement class.²¹⁸

209 Respondents to the survey had the option to skip questions, as a result, the number of respondents is different for each question.

210 Sunrice Growers and RGA submission, appendix 1 (from p. 37).

211 Dairy Industry Council of Australia Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 8.

212 Citrus Australia Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 4.

213 *ibid.* p. 3.

214 Victorian Farmers Federation, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 5

215 *ibid.* p. 6.

216 Coleambally Irrigation Co-operative Limited, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 4.

217 National Farmers Federation, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 12.

218 Select Harvests Limited, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 4.

It is evident that irrigator engagement with the water market has a strong correlation to the attitudes held towards the market generally, which vary significantly between irrigators. For example, a number of irrigators hold strong views that carryover should be abolished.²¹⁹ The correlation between attitude and engagement with the market would suggest that irrigators that hold negative attitudes towards carryover rules would not engage with newer water market products such as carryover parking. In contrast, some irrigators submit that the trading of carryover parking products is a critical risk management tool and allows water holders to make commercial decisions about their risk exposure.²²⁰ Others submit that changes should not be made to carryover arrangements.²²¹ The submissions received in response to the Interim Report indicate that irrigator engagement with, and attitudes toward, water markets vary significantly across the MDB.

Issue 2: Some irrigators appear to have adopted riskier water ownership and trading strategies that rely principally on sourcing water in allocation spot markets to manage their water supply risks

A number of submissions raised issues of irrigators not being able to access enough water or having to pay high water prices because they do not hold enough water entitlements to meet their typical water needs and are required to source water from the allocation markets. In these cases, the irrigator typically does not appear to have taken action to mitigate water supply and price risk by using water products (such as single- or multi-year leases or forward contracts) that would allow them to 'lock in' future water supplies at a fixed price.

The Australian Dairy Industry Council (ADIC) submission noted that many dairy farmers sold water entitlements during the previous drought and their businesses are now not profitable due to the amount that allocation prices have risen:²²²

'We know during the millennium drought that dairy farmers disproportionately sold permanent entitlements, and now require 60% more water than they own, increasing business risk by requiring the purchase of this water on the market...dairy farmers are [now] 'facing a perfect storm of low milk prices, dry conditions, and high water prices, which is threatening viability across the Basin, and putting at risk 20 percent of Australia's milk supply.'

Jeremy Rourke highlighted the case of farmers who chose to sell entitlements to investment in infrastructure but now regret the decision as they are unable to afford water in the temporary market:²²³

'Without having the ability to see 'the bigger picture', many farmers thought that it was a good idea to trade their water asset for a more efficient and state of the art farm irrigation system and rely more heavily on a temporary water market where water could be sustainably accessed until further farming profitability would allow them to once again purchase permanent water rights. How disastrously wrong those decisions have turned out to be! Many farmers now find themselves with expensive irrigation infrastructure without the ability to utilize it due to the high price of water therefore having no way of running a viable farming business.'

Murray Valley Wine Growers noted that they have observed an increase in permanent planting in the Sunraysia region without sufficient holdings of permanent water rights to secure water supply for these

219 See, for example, Gavin Dehne Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, Robert Caldwell Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, and John Brian Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, suggest that carryover should be removed from the market.

220 See, for example, Australian Dairy Industry Council, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 16; GoFARM, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 4; National Irrigators Council, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 24; National Farmers Federation, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 19; Bill Baxter, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 1.

221 NSW Irrigators Council, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 6.

222 Australian Dairy Industry Council, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

223 Jeremy Rourke, Submission to Murray-Darling Basin water inquiry issues paper, January 2020.

plantings.²²⁴ Citrus Australia highlighted the issue of irrigators buying farms without permanent water rights and being exposed to supply and price risks in water allocation markets.²²⁵

While many submissions pointed to the benefits to irrigators of leases and forward contracts²²⁶, others expressed a view that many irrigators are not considering using these products, or have chosen not to because of cost.²²⁷

The evidence available to the ACCC supports the view expressed in these submissions, that there are a number of irrigators who, for various reasons, have and continue to adopt water ownership and trading strategies based principally on sourcing water needs from water allocation 'spot' markets to manage their water supply risks.

In particular, data available to this inquiry indicates that a higher proportion of irrigators have sold entitlements in recent years than purchased entitlements²²⁸, with a higher proportion of irrigators of some farm commodities selling water entitlements relative to others (such as dairy and horticulture).²²⁹ This has likely increased their reliance on purchasing water on temporary markets.²³⁰ At the same time as this change has been occurring, our analysis of data and anecdotal evidence above also indicates that only a relatively small proportion of irrigators across the Basin are using alternative water products such as leases or forward contracts to source their water.²³¹ This is supported by recent research in this area.²³²

The University of Canberra's report indicates that attitudes toward farm planning varied only slightly between irrigators who trade on the water market and those who don't. The only significant difference identified was that diverse traders were significantly more likely to report having a written farm plan.²³³ This may indicate that those irrigators that rely more on water allocation purchases are required, due to their riskier water management strategies, to develop farm plans.

Submissions in response to the Interim Report

Submissions in response to the Interim Report relating to the adoption of riskier water ownership and trading strategies were limited.

CICL submitted that the volume of entitlements that have left CICL's licence since separation from government represents a 26% reduction in the volume of general security entitlements available for irrigated agriculture in their footprint. CICL submitted that this reduction is not matched by a change in the irrigation footprint. CICL submitted that the Basin Plan sustainable diversion limit is 30% less than the long-term average water use under the basin Plan cap on diversion (1993-94 levels of development), and this change is a key driver of concerns with the water market.²³⁴

Renmark Irrigation (RI) submitted that only a small number of irrigators in their area rely on the allocation market for their water needs. RI submitted that these irrigators sold their entitlements toward

224 Murray Valley Wine Growers, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

225 Citrus Australia, Submission to Murray-Darling Basin water inquiry issues paper, January 2020.

226 H2OX, Submission to Murray-Darling Basin water inquiry issues paper, February 2020; Almond Board Australia, Submission to Murray-Darling Basin water inquiry issues paper, March 2020; AWBA, Submission to Murray-Darling Basin water inquiry issues paper, January 2020.

227 AJ and MH Spiers, Submission to Murray-Darling Basin water inquiry issues paper, January 2020.

228 S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market inquiry, 2020, figures 6.1 and 6.2, pp. 128-129.

229 Appendix A, figure A.6 from ABARES Murray-Darling Basin Irrigation Survey.

230 Appendix A.

231 Appendix A, J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market inquiry, 2020, table 8, p. 13, and S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, pp. 143-145.

232 C Seidl, S Wheeler and A Zuo, 2020b, 'Treating water markets like stock markets: Key water market reform lessons in the Murray-Darling Basin', *Journal of Hydrology*, vol. 581, pp. 124-39.

233 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, p. 64. In 2016, 54.3% irrigators that engaged in trading reported having a farm plan compared to 42.9% of all irrigators.

234 Coleambally Irrigation Co-operative Limited, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 5.

the end of the millennium drought when the water market was immature and allocations were cheap, assuming allocation prices would stay low.²³⁵ In addition, the VFF submitted that many irrigators in Northern Victoria had little choice but to sell entitlements and increase reliance on allocation markets in response to the financial hardship caused by the millennium drought.²³⁶

Issue 3: Some irrigators express a lack of confidence in various aspects of water markets and water policy

Stakeholders at public forums and in submissions have expressed a range of positive and negative views on issues directly and indirectly related to water markets and water trading.²³⁷

To gain a clearer and representative understanding of what views irrigators hold of water markets and trading, the ACCC has commissioned analysis of data collected in a number of surveys undertaken across the Basin between 1998 and 2016.²³⁸

Researchers from the Centre for Global Food and Resources at the University of Adelaide asked irrigators in various areas of the Basin about their views on the benefits of water trading in 1999, in 2010 and in 2016:²³⁹

- Almost three quarters of irrigators surveyed (73%) in the GMID in 1999 agreed (agreed or strongly agreed) with the statement that ‘water trading was a good idea’, while only 14% disagreed (disagree or strongly disagree). This contrasts with results in 2010, where less than half of irrigators surveyed (46%) in the Southern Basin agreed with the statement that ‘water trading had been good for farming’ while 41% disagreed. By 2016, the positive attitude to water trading declined further with only 28% of irrigators in the Southern Basin agreeing that ‘water trading had been good for farming’ while a majority (56%) disagreed with that statement.
- Irrigators in the same survey also expressed negative attitudes toward investors in water markets. A large majority of irrigators surveyed (85%) in the Southern Basin in 2016 disagreed with the idea of non-farm entities being allowed to buy water, while almost half (48%) disagreed with the idea that retired farmers should be being allowed to retain and trade water.

In the 2015 and 2016 Regional Wellbeing Surveys, researchers at the Health Research Institute at the University of Canberra, asked irrigators across the Basin to what degree they agreed or disagreed with statements related to the process of trading water, and their confidence in water markets and market rules and regulations. The results are summarized below.²⁴⁰

More than half of the irrigators surveyed in 2015 and 2016 expressed positive views on the ease of making temporary and permanent trades, and expressed confidence on being able to access the information they needed to trade. In both cases a relatively small minority of irrigator expressed the opposite view:

- A majority of irrigators across the Basin in 2015 and 2016 (65 to 71%) agreed that trading temporary water was easy. A slightly smaller majority (57 to 63%) also agreed that trading permanent water was easy. However, a minority of irrigators (between 12 and 18%) disagreed with the idea that trading temporary or permanent water was easy.
- A majority of irrigators across the Basin in 2015 and 2016 (53 to 64%) also agreed that the information needed to trade water was easy to access. However, a minority of irrigators in both years (17 to 19%) did not agree with this view.

235 Renmark Irrigation Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 4.

236 Victorian Farmers Federation, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 6.

237 Submissions and summary notes of public forums can be found on the ACCC’s water inquiry webpage at: <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/submissions>.

238 The surveys were undertaken by researchers at the Centre for Global Food and Resources at the University of Adelaide, and the Health Research Institute at the University of Canberra over a number of years. More details on the surveys, the analysis the ACCC commissioned and the results can be found in Appendix A, box A.1.

239 Appendix A, figures A.10 and A.11, pp. 20–22 from S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, figures 6.9 and 6.13, pp. 150, 153.

240 See Appendix A, box A.1 from J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray–Darling Basin*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, pp. 25–27.

Approximately half of irrigators surveyed also expressed confidence in being able to trade water as a tool to manage their farms. However, on this question a significant minority of irrigators did not express confidence in their abilities to trade water. Around half of irrigators in 2015 and 2016 (48 to 53%) agreed that they felt confident in trading water as part of their farm management, while a quarter or more of irrigators (25 to 28%) did not agree that they felt confident in using water trading.

However, when researchers asked about attitudes to water markets and water market rules, less than a third of irrigators across the Basin in 2015 and 2016 expressed confidence in the fairness of water markets or in water market rules, while up to half of irrigators expressed a lack of confidence:

- Only 23% and 32% of irrigators in 2015 and 2016 respectively, agreed that the water market was fair for all users, while 48% and 37% of irrigators in 2015 and 2016 respectively, did not.
- 16% and 26% of irrigators in 2015 and 2016 respectively, agreed that market rules were stable, while 49% and 43% of irrigators in 2015 and 2016 respectively, did not.
- 22% of irrigators in 2015 agreed that recent changes to rules had increased their confidence in water markets, while 48% in 2015 did not.²⁴¹

Researchers also asked irrigators about their attitudes to the security of their permanent water rights. While a majority of irrigators expressed confidence in the security of their permanent water access rights, between a quarter and a third of irrigators did not. 54% and 60% of irrigators in 2015 and 2016 respectively, agreed that their rights to access water were secure, while 33% and 24% of irrigators in 2015 and 2016 respectively, did not.

Moreover, when researchers asked irrigators whether they agreed that all entitlements were subject to the same rules, a quarter or less irrigators agreed that entitlements held by the government were subject to the same rules and charges as other participants' entitlements. Only 17% and 26% of irrigators in 2015 and 2016 respectively, agreed that entitlements held by the government were subject to the same rules and charges as other participants' entitlements, while 44% and 41% of irrigators in 2015 and 2016 respectively, did not agree that government and non-government held entitlements received equal treatment.

The University of Canberra's report concluded that their findings suggest that:

'rapid change to rules and regulations governing trade can reduce perceptions of fairness of the market: stability of market rules is important to building confidence in the market. Also important is addressing concerns about whether the market involves a 'level playing field' between irrigators and other water market participants, and ensuring that irrigators can trade easily. With multiple irrigators highlighting that challenges to trade include issues such as high transaction costs, and rapid fluctuation in prices, as well as delays in processing of trades for some, investing in improving ability to trade easily and rapidly is likely to be an important part of building confidence in the water market.'²⁴²

Submissions in response to the Interim Report

Submissions in response to the Interim Report cited various factors that have contributed to the lack of confidence in the market.

The VFF submitted that a lack of confidence in the fairness of water markets may be driven by increased prices, and concerns that net trades out of districts has damaged those local communities. The VFF submitted that irrigators consider it unfair that they must compete against the Commonwealth on the market following changes to water trading rules to accommodation Commonwealth water purchases. In addition, the VFF submitted that automation of the Victorian Water Register has improved confidence in the market.²⁴³

241 This question was not asked in 2016.

242 J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, p. xi.

243 Victorian Farmers Federation, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 13.

Citrus Australia submitted that most of the distrust that has built up in the market is due to not knowing the depth of the market, the value and volume of trades, so as to make informed business choices.²⁴⁴

The New South Wales Irrigators Council (the NSWIC) submitted that information accessibility and confidence in reported spot market prices is a core issue.²⁴⁵

The Murray Darling Association (the MDA) submitted that improvements must be made to trade information to enhance access to and the quality of core market data if confidence in the market is to be restored.²⁴⁶ The MDA submitted that the number and diversity of agencies tasked with delivering the objectives of the Basin Plan has resulted in an overly complex and unwieldy sector, undermining confidence in reporting and data.²⁴⁷ The MDA suggested that combining state databases into a single database that is easy to use, adheres to relevant standards and ensures privacy and security of data will drive confidence in the market.²⁴⁸

CICL submitted that its members actively sell or buy annual allocation based on commercial returns and are confident participants in the annual allocation water market.²⁴⁹

The NIC submitted that clearer, simpler, more timely and more transparent market information is required to build confidence in the market.²⁵⁰ The NIC also agree that water metering compliance is a key factor in market confidence as in building community trust around water users.²⁵¹ In addition, the NIC agreed with the ACCC's analysis that transparent communication of allocation decisions to stakeholders is critical in maintaining market confidence.²⁵² Murray Irrigation also submitted that compliant and accurate metering systems and the streamlined data from these systems will be important to ensure that users are confident of the integrity of the water market.²⁵³

The NFF submitted that lack of regulation had undermined trust and confidence in the market.²⁵⁴ In addition, the NFF submitted that the information asymmetry between water brokers and market participants forces participants to rely on brokers, facilitating broader scepticism about the integrity of the market.²⁵⁵ The NFF submitted that an independent regulator would provide visibility and allow participants to have greater confidence in the water market, however, recognises that this would be the most expensive option. Both a cost-benefit and analysis and the ACCC's investigation will inform an appropriate solution in this regard.²⁵⁶

Boundary Bend (BB) submitted that improvements in market transparency are necessary, however they need to be combined with structural changes ensuring allocation water can only be purchased by consumptive users. BB submit that this will dramatically improve the trust and confidence that irrigators have in their business and the market.²⁵⁷

GoFARM submitted that improved clarity and predictability around of allocation announcements through open and transparent processes would significantly enhance market confidence, particularly in New South Wales.²⁵⁸ In addition, GoFARM suggests that ongoing regulatory uncertainty about how groundwater over extraction will be addressed, particularly in the Lachlan and Murrumbidgee valleys, undermines the confidence of irrigators to make long-term investment decisions.²⁵⁹

244 Citrus Australia Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 5.

245 NSW Irrigators Council, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 23.

246 Murray-Darling Association, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 4.

247 *ibid.*, p. 6.

248 *ibid.*, p. 8.

249 Coleambally Irrigation Co-operative Limited Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 5.

250 National Irrigators Council, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 19.

251 *ibid.*, p. 30.

252 National Irrigators Council, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 23.

253 Murray Irrigation Limited, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 9.

254 National Farmers Federation, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 7.

255 *ibid.*, p. 12.

256 *ibid.*, p. 13.

257 Boundary Bend, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 7.

258 GoFARM, Submission to Murray-Darling Basin water inquiry interim report, 13 November 2020, p. 3.

259 *ibid.*, p. 4.

Murray Valley Private Diverters (MVPD) submit that transparency is essential to ensure public confidence in the market.

The Murrumbidgee Valley Food and Fibre Association (the MVFFA) submit that overlapping governance arrangements resulting in regulatory fragmentation lead to market participants believing that key institutions are not fair or working to the benefit of all water users, and that these attitudes further impede informed and confident trading.²⁶⁰

Renmark Irrigation submitted that large investors entering the market and driving up prices, as well as investors access to better quality market information, has reduced market confidence since 2015.²⁶¹

4.5.2 First Nation and Traditional Owner groups

Traditional Owner organisations have submitted to the ACCC that, as a participant group, they own few water rights in the Basin, are largely absent from water markets, and face historic and contemporary barriers to owning and accessing water through water markets:

‘Australia’s colonial history and the exclusion of Aboriginal peoples from holding land when water entitlements were distributed prior to the capping of water extraction and the separation of land and water means that Aboriginal peoples are largely excluded from holding water today (McAvoy 2006). Indeed, Traditional Owner-specific water rights are reported to be less than 0.01% of water use rights in Australia (Jackson and Langton, 2012). Given the unaddressed injustices of the dispossession and associated ongoing legacies raised here, many Traditional Owners – and supporters – object to the notion that Aboriginal peoples should have to buy back these rights. Adding to this, historical and structural inequities mean Aboriginal peoples are often without access to financial resources to buy water in this way.’²⁶²

Traditional Owner organisations have expressed an aspiration to increase their access to water to allow them to generate cultural, environmental and economic benefits for their communities and organisations:

‘There is an urgent need to re-allocate water to Traditional Owners. This historic (and ongoing) lack of access to water rights not only deprives Traditional Owners of the means by which to care for Country and support economic development, but it also precludes them from participating in the water market itself (O’Donnell and Garrick, 2019; McAvoy 2006).’²⁶³

Traditional Owner organisations have noted that while treating water as a property right²⁶⁴ which can be traded is at odds with many Traditional Owner beliefs, water markets are seen by some participants as a pathway to increasing access to water.

‘For many First Nations peoples, the separation of water from land, the formulation of water ‘products’ as commodities that can be held and traded for private profit and the disembodiment of water from its sacred and spiritual contexts are fundamentally at odds with deeply enshrined water values and custodial responsibilities.’²⁶⁵

260 Murray Valley Food and Fibre Association, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 2.

261 Renmark Irrigation Trust, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 4.

262 Murray Lower Darling Rivers Aboriginal Nations, Submission to Murray–Darling Basin water inquiry issues paper, February 2020.

263 *ibid.*

264 Note that the ACCC refers to property rights throughout this report with reference to their definition in economic theory, which is that a property right implies ‘the powers to consume, obtain income from, and alienate ... assets’. Economic theory commonly notes characteristics of property rights as excludable, enforceable and transferrable and can include ‘incomplete’ property rights. Barzel Y, 1997, *Economic analysis of property rights 2nd edition*, Cambridge University Press, p. 64.

265 Murray Lower Darling Rivers Aboriginal Nations, Submission to Murray–Darling Basin water inquiry issues paper, February 2020.

These stakeholders consider that, under current governance arrangements, the most viable, immediate pathway for Traditional Owners in the Basin to access water is via entering the water market.²⁶⁶ Commonwealth and state governments have responded to such concerns in recent years by taking several actions to increase Aboriginal peoples and Traditional Owner groups' access to water in the Basin (box 4.2).

Box 4.2: Recent government initiatives to increase Aboriginal peoples and Traditional Owner groups' access to water

Commonwealth and state governments have initiatives to improve Aboriginal peoples' access to water in the Basin include:

- State and Commonwealth government and non-government environmental water holders have entered into partnerships with Aboriginal peoples in areas across the Basin to use environmental water in ways that support both environmental objectives and generate cultural flows.²⁶⁷
- First Nations in the Basin have entered into partnership agreements with the MDBA to jointly undertake water research, planning and management in the Basin, and to develop a framework for planning, delivering, and assessing cultural water flows.²⁶⁸
- The Australian Government has committed \$40 million in funding to establish a water investment program that supports Aboriginal communities to plan for and acquire cultural and economic water entitlements.²⁶⁹
- The Victorian Government, through the Aboriginal Water Program, has committed to increasing Aboriginal participation in water resource management by supporting the use of water to meet cultural values, and identifying how to transfer water rights to Aboriginal groups to support economic development.²⁷⁰

As part of the first stage of the Victorian Government's Aboriginal Water Program, the University of Melbourne published a discussion paper which outlines Aboriginal peoples' aspirations on water access and use in the Basin, and the options and barriers to expanding access to water.²⁷¹ The paper emphasised a range of financial barriers to Traditional Owner groups buying and holding permanent water rights and accessing water allocations to those rights, including funding to acquire water, to pay ongoing fees and charges and for building and maintaining infrastructure to deliver water.²⁷²

The Murray Lower Darling Rivers Indigenous Nations (MLDRIN) noted in their submission to the ACCC that while there has been some recent policy and funding commitments by Commonwealth and state governments, these have not yet resulted in any reallocation of water to Aboriginal peoples in the Basin.²⁷³ Further, MLDRIN urged the ACCC to consider water market outcomes as part of the inquiry, including the historic exclusion of Aboriginal peoples from basin water markets.²⁷⁴ They submitted that changes to water markets to increase Aboriginal peoples' participation should include:

- 'lowering barriers to entry for Aboriginal participants, such as time-limited exemptions to [water] fees and charges, purchasing and reallocating of water entitlements, and other barriers

266 *ibid.*

267 Water Access for Aboriginal Economic Development Stage 1: Discussion Paper, 2019, p. 22.

268 MDBA, Partnerships with Traditional Owners, <https://www.mdba.gov.au/about-us/partnerships-engagement/aboriginal-partnerships>, viewed 22 June 2020.

269 *ibid.*

270 Department for Environment, Land, Water and Planning (Vic), The Aboriginal water program, <https://www.water.vic.gov.au/aboriginal-values/the-aboriginal-water-program>, viewed 22 June 2020.

271 Water Access for Aboriginal Economic Development Stage 1: Discussion Paper, 2019. The discussion paper is part of the first stage of work in Program 1, but intersects significantly with Program 2 (the individual business concepts developed by Traditional Owners) and Program 3 (which includes much of the evaluation and oversight components of the work). This paper has been prepared by Erin O'Donnell at Melbourne Law School. I gratefully acknowledge the feedback from Murray and Lower Darling Rivers Indigenous Nations (MLDRIN) and the Federation of Victorian Traditional Owner Corporations (FVTOC).

272 Water Access for Aboriginal Economic Development Stage 1: Discussion Paper, 2019, p. 15.

273 Murray Lower Darling Rivers Aboriginal Nations, Submission to Murray-Darling Basin water inquiry issues paper, February 2020.

274 *ibid.*

- ensuring any adjustment to water market operations needs to strengthen the capacity for water markets to enable re-allocation of water to Aboriginal people in future
- taking into account findings from significant state-level projects which are currently underway, including the Water Access for Economic Development project in Victoria.²⁷⁵

The ACCC's analysis of ownership of permanent water rights in the Victorian and South Australian Basin indicates that Traditional Owner groups own a very small proportion of the permanent water rights on issue in the Basin (see figures 4.1 to 4.3 above). Similarly, analysis of allocation trade data in the Southern Connected Basin over the 2012–13 and 2018–19 period indicate that Traditional Owner groups very rarely purchase allocations, but do consistently make a very small number of allocation sales each year (see figures 4.4 to 4.7 above).

4.5.3 An education program is needed for water market participants

The ACCC anticipates that recommendations presented in Parts III to VI of this report will help address irrigator concerns about water markets identified in this Chapter, and deliver markets that they can participate in more effectively.

In addition to improving the way markets function, the ACCC also considers a water market education program would assist in improving understanding of, and confidence in, water markets, leading to greater engagement by irrigators and other water users. Education and information accessibility and transparency will assist in addressing the key barriers to market participation examined in this Chapter. For example, education on what water market products are available and how they meet irrigators' needs will assist in facilitating access to newer water market products and lead to improved water risk management strategies. In addition, more effective education and communication of water market products and allocation announcements will assist in increasing confidence in water markets.

The New South Wales Irrigators Council (the NSWIC) submitted that the largest impediment to market participation is access to information.²⁷⁶ The VFF submitted that more information on newer water products, such as leases, forwards and carryover parking, is required to ensure improved transparency and understanding.²⁷⁷ The National Irrigators Council (the NIC), in its submission, agreed with the Interim Inspector-General's recommendation of increased education for people entering farming, and suggested that it be combined with removing barriers (real and perceived) and costs to improve market participation.²⁷⁸ GoFARM submitted that education and training has an important role in ensuring all market participants understand factors influencing water markets and how to access information that will assist them to make informed trading decisions.²⁷⁹ The MDA welcomed the development of more communication and educational content to support higher levels of water literacy and increased understanding and awareness of the role and operation of the water market.²⁸⁰

In April 2020, the Interim Inspector General of Water Compliance (the IIG) released a report on the impact of lower inflows on state shares under the Murray–Darling Basin Agreement. As part of this report, the IIG recommended that:

The BOC should consider ways through which States and agencies could work together across their respective jurisdictions to include water literacy in high school and higher education curriculums, including VET, in regional areas.

²⁷⁵ *ibid.*

²⁷⁶ NSW Irrigators Council, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 16.

²⁷⁷ Victorian Farmers Federation, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 4.

²⁷⁸ National Irrigators Council, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 9.

²⁷⁹ GoFARM, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 2.

²⁸⁰ Murray–Darling Association, Submission to Murray–Darling Basin water inquiry interim report, 13 November 2020, p. 12.

The ACCC endorses the IIG's recommendation of increased education in high school and higher education curriculums in regional areas, but considers a more targeted Water Market Education Program is needed specifically for current and prospective water market participants. Information accessibility and transparency is addressed further in Part IV of this report, however data collected and submissions received over the course of the inquiry indicate that there may be gaps in education of market participants that need to be addressed. In combination with increased information accessibility transparency, market participants will be able to more effectively engage with water markets. Discussion of the ACCC's recommendations in this space are presented in chapter 12, which presents the ACCC's recommendation package to improve water market information and transparency more generally.

03

Market integrity and conduct

This Part includes five chapters relating to the activities and practices of certain water market participants and regulatory solutions to increase confidence in the integrity and fairness of the Murray-Darling Basin water markets.

Chapter 5 examines the role, strategies and trading activities of water investors, with a particular focus on the four large investors and four small investors operating in Basin water markets.

Chapter 6 provides an assessment of the conduct of water investors. The chapter sets out the concerns raised by stakeholders and presents the ACCC's analysis and findings regarding investors' conduct in Basin water markets.

Chapter 7 examines the water use, water strategies and allocation trading activities of 11 agribusinesses.

Chapter 8 examines the role, practices and conduct of water market intermediaries, in light of concerns raised by market participants. The chapter assesses how these concerns undermine confidence in Basin water markets and affect perceptions of market integrity and fairness.

Chapter 9 examines the effectiveness of the existing regulatory settings for Basin water markets. The chapter then recommends solutions to improve market conduct and integrity.

5. Investor role, strategies and trading activities

Key points

- Investors provide benefits to water markets. They provide new sources of capital to irrigated agriculture, increase water market liquidity and provide a range of water products which help irrigators to manage water supply risks.
- There are four large investors operating in the Murray–Darling Basin water markets. As at 30 June 2019, they collectively held 7% of all high reliability/security entitlements across the Southern Connected Basin.
- The large investors broadly pursued buy and hold entitlement strategies that aimed to achieve long term capital growth, and generated income by supplying water products.
- Leasing entitlements was a key income stream for the large investors as it provided a predictable source of medium to long-term income.
- Collectively the four large investors were large traders of water allocations. They accounted for around 19% of the volume of allocation trades-out (excluding zero dollar trade) in 2018–19 and 16% in the first half of 2019–20. The ACCC estimated that in 2018–19, they collectively sold around 176 GL of water allocations on the spot market and traded approximately 102 GL for the purpose of fulfilling lease or forward agreements. They received 167 GL of seasonal allocation from their own entitlements and purchased 129 GL of allocation through spot water trade.
- One large investor was a significant purchaser of water allocation in 2018–19. From late 2017 to mid-2019, this investor raised capital and invested that capital in temporary allocation trading until it was able to secure suitable permanent entitlements.
- Irrigators and agribusinesses were the most significant customers of the large investors in 2018–19. Importantly, all large investors had a business model that enabled them to meet demand from customers requiring large parcels of water.
- There is also a number of small investors operating in Basin water markets. The ACCC closely analysed four small investors. Most owned no or very few entitlements but were active traders, frequently buying and selling water allocations. Some bought and sold water allocations more frequently than some large investors.
- Both large and small investors had the time and knowledge needed to analyse the complexities of the Southern Connected Basin water markets. As such, investors are better placed than others, in particular smaller irrigators, to take advantage of trading opportunities in Basin water markets.
- It was not possible to ascertain the investors' trading activities from a single source of information. The current quality of Basin State and IIO data and data collection arrangements made analysis of trading behaviour difficult, time consuming and resource intensive. The ACCC had to rely on its information gathering powers to obtain additional data and other information and documents from investors. In spite of this extensive data collection exercise, there remained some gaps and limitations to the data. Improving data quality and coordination of data collection across Basin States and IIOs is essential to achieve more effective market oversight.

5.1 Introduction

The inquiry's terms of reference included consideration of the 'role and practices of market participants, including water brokers, water exchanges, investment funds and significant traders of water allocations and entitlements'. This chapter examines the role, strategies and trading activities of water investors.

As set out in chapter 4, the ACCC considers water investors to be those holding, trading and/or managing water assets for the purpose of future financial gain, which is unrelated to their use as an input in agricultural, industrial or other production.

There are many different types of water investors operating in the Southern Connected Basin. These include superannuation funds and fund management businesses; retired farmers who have retained their water access entitlements, including in self-managed superannuation funds; farmers who trade water alongside their farming business; and other small firms and individual traders. Some investors do not own permanent entitlements and generate income solely through water allocation trading activities and by purchasing and selling other water products.

Investment in water entitlements provides opportunities for both capital growth (entitlement value) and yield (from the sale of water products such as leases, forwards and spot allocation sales), and allocation trading can also provide pure trading gains.

The ACCC understands that the increased involvement of investors in water trading has been incentivised by the long-term increase in water asset values, the opportunity to diversify their investment portfolios with water assets which share little price correlation with other asset classes, and the fact that variability in water market prices presents significant opportunities for trading returns.²⁸¹ Water entitlements offer investors long term capital appreciation due to increasing water demand from high-value permanent horticulture producers, the constraint on water supply due to the impact of climate change²⁸², and reduced supply due to government recovery of water entitlements for environmental purposes.

Many stakeholders raised concerns about the conduct of water investors in water markets. The ACCC examined these concerns, as well as other trading activities that appeared unusual or suspicious. This analysis is contained in chapter 6.

5.2 Investors provide benefits to the Murray-Darling Basin water markets

5.2.1 Investors provide new sources of capital to irrigated agriculture

Investors' participation in water markets has provided new sources of capital for irrigated agriculture. This was acknowledged by a number of stakeholders.²⁸³ The National Irrigators Council (NIC) submitted that the presence of investors in the water market has enabled some irrigators to invest available capital into land or agricultural production rather than owning water entitlements, and manage their business more effectively.²⁸⁴ This has assisted some irrigators to expand their irrigated production area, without the significant capital outlay that would be required for water entitlement purchases.²⁸⁵

Water products supplied by investors provide avenues for irrigators to better structure their finances according to business needs. For example, water acquired through a lease may represent an operating expense, as opposed to the capital cost of a water entitlement. Riparian Capital Partners submitted that water products such as leases and forward contracts allow irrigators to appropriately manage both operational water risks and the structure of their capital and water balance sheets.²⁸⁶

281 S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Water Market inquiry, 2020, p. 58.

282 C Seidl and others, 'Treating water markets like stock markets: Key water market reform lessons in the Murray-Darling Basin', *Journal of Hydrology*, vol. 581, 2020, p. 7.

283 New South Wales Irrigators' Council, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 11; Riparian Capital Partners Pty Ltd, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 11; Bega Cheese Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 7; Select Harvests Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 16 April 2020, p. 3.

284 National Irrigators' Council, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 14; also raised at the ACCC Murray-Darling Basin inquiry, Kerang public forum.

285 Southern Cross Farms, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 14.

286 Riparian Capital Partners Pty Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 4.

Box 5.1: Example: expanding agricultural production

An irrigator has a tree nut orchard. The irrigator has further land adjacent to the orchard that they are considering developing.

To support additional permanent plantings, the irrigator wants to secure access to high reliability water access entitlements. However, the irrigator does not have enough capital to develop the land and purchase additional water entitlements.

The irrigator could lease water entitlements from an investor and invest their available capital in developing the land, planting new trees and investing in irrigation infrastructure. The irrigator would have access to all the benefits associated with owning the entitlements, without the significant upfront capital expenditure required to purchase them.

The lease provides an alternative to obtaining finance or outlaying capital to purchase water access entitlements.

5.2.2 Investors increase water market liquidity

Water market liquidity describes the readiness with which participants are able to buy and sell water assets at predictable prices. Indicators of market liquidity are the presence of many buyers and sellers in the market and a narrow spread between bid and offer (buy and sell) prices with transactions taking place reasonably frequently.

The NSW Farmers' Association (NSW Farmers) submitted that policy reforms to separate water from land ownership has facilitated the entry of new investors in water markets.²⁸⁷ Investor participation in water markets has increased the number of potential buyers and sellers of water allocations, improving market liquidity. Increased liquidity makes it easier for market participants to buy and sell water at prices that reflect underlying supply and demand conditions.

NSW Farmers noted that investors provide out-of-cycle investment in the water markets by selling water allocations at a time when irrigators need to buy. Investors do not have water needs linked to agricultural production cycles. As a result, investors are a natural counterparty to irrigators, which increases the liquidity of the water markets.

The National Farmers' Federation submitted that investors add financial liquidity to markets, enabling producers to hedge risk efficiently, particularly against a variable climate. It submitted that, if appropriately regulated, they provide a valuable service to communities.²⁸⁸

Increased liquidity in the market may also allow irrigators to better achieve the full market value for their water assets, particularly, for example, if they seek to sell their water entitlements.²⁸⁹

5.2.3 Investors provide irrigators with a range of water products which help manage water risks

Investors offer a range of products that assist irrigators in managing their businesses, including leases, forward contracts, and carryover parking (as described at subsection 5.4.2).

These products provide irrigators with flexibility in terms of on-farm production decisions, managing water supply risks and forward planning, and the option of reducing their exposure to the allocation market.²⁹⁰ As noted by the Victorian Farmers Federation Sunraysia Branch, these products allow buyers to spread their risk and ensure adequate water supply at a known price across several years.²⁹¹

287 NSW Farmers' Association, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 5.

288 National Farmers' Federation, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 8.

289 Kilter Rural, *Submission to the Murray-Darling Basin inquiry issues paper*, 5 March 2020, p. 10.

290 ACCC Murray-Darling Basin inquiry, Renmark public forum.

291 Victorian Farmers Federation Sunraysia Branch, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 6.

The NIC noted that investors' participation in the water market enables many irrigators to more effectively hedge water access or water supply and water price (input cost) risk. Forward water contracts also enable irrigators to secure water allocations for future years, which may allow irrigators to more confidently forward sell their expected production at times when the forward commodity price is relatively high and profitable.²⁹²

Riparian Capital Partners submitted that water products allow irrigators to manage the water risks of their operations, and to structure both their capital and water balance sheets appropriately. Further, they stated that these products are likely to have resulted in the smoothing of supply and demand conditions from season to season, as irrigators secure leases and/or forward water allocations at lower prices. This allows them to produce in seasons when in-season supply and pricing conditions may not have allowed (that is, in dry conditions when water allocation prices are higher, and would otherwise make the watering of a particular crop unprofitable).²⁹³

Box 5.2: Example: using water products to mitigate risk

ABC Farms has 20,000 ML of high security entitlements, which it partly owns and partly leases from a third party. At 100% allocation the entitlements do not generate enough water to meet ABC Farms' needs, so it has been purchasing water on the temporary market. The forecast is for below average rainfall in the region. ABC Farms is concerned that temporary market purchases are exposed to significant price volatility. To reduce its water supply risk, ABC Farms enters into a three year forward contract with an investor for supply of 2,500 ML of water each year. Under the forward contract, the investor is required to supply ABC Farms with a fixed amount of water on agreed delivery dates at a fixed price.

While there is some risk that it might rain and the price of water on the temporary market will not increase, the forward contract provides a number of benefits to ABC Farms:

- water supply certainty – the investor is obliged under the contract to supply the agreed volume of water.
- price certainty – water is supplied at the agreed price under the forward contract, regardless of the fluctuation of prices on the temporary market
- no upfront capital outlay – ABC Farms pays for the water at the time it is delivered under the forward contract
- production cost certainty – ABC Farms has a better sense of water costs so may be more confident to forward sell its crop.

5.3 The inquiry examined the position of the four large investors operating in the Murray-Darling Basin

There are four large institutional investors operating in the Murray-Darling Basin. These are Argyle Investment Management and Argyle Capital Partners (together Argyle Group), Kilter Rural, Duxton Water and Aware Water. A reference to the large investors is a reference to these four investors.

The ACCC used its compulsory information gathering powers under the CCA to obtain information and documents on the large investors' water holdings, transactions and trading strategies. The ACCC used this information together with Basin State and irrigation infrastructure operator (IIO) data to examine their activities in the Murray-Darling Basin water markets.

292 National Irrigators' Council, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 14.

293 Riparian Capital Partners Pty Ltd, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 4.

5.3.1 Methodology for analysing the large investors' water access entitlements

Unless otherwise indicated, information on the large investors' permanent water holdings includes both water access entitlements and irrigation rights within IIOs.

There are significant differences between various entitlement classes. In this section we treated Victorian high reliability, South Australian high reliability and New South Wales high security entitlements (collectively referred to as high security entitlements) as analogous because they each provide reliable access to water across multiple water years.

In contrast, New South Wales general security entitlements and Victorian low reliability entitlements serve different purposes reflecting Victoria and New South Wales' respective approaches to water management. In wet and average years, New South Wales general security entitlements will receive a volume of water against their entitlements. Outside of extreme wet years, Victorian low reliability entitlements in the Murray and Goulburn valleys will not receive any water.²⁹⁴ Therefore, Victorian low reliability entitlements are held almost exclusively for the purposes of carryover. In this section, the ACCC distinguished between New South Wales general security entitlements and Victorian low reliability entitlements unless otherwise indicated.

5.3.2 Entitlements held for agricultural production

Some large investors had invested in agricultural enterprises in addition to their water market trading operations. These investors dedicated a portion of their water access entitlements to these agricultural operations.

These entitlements and the associated water allocations were rarely, if ever, available to be traded on the water market. Therefore, the ACCC's analysis sought to exclude these entitlements and associated allocations when analysing investor behaviour in water markets. Unless otherwise indicated, the following analysis of investor water access entitlements excluded entitlements investors reported as being held for agricultural production.

5.3.3 The large investors' water access entitlements were predominantly in the Southern Connected Basin

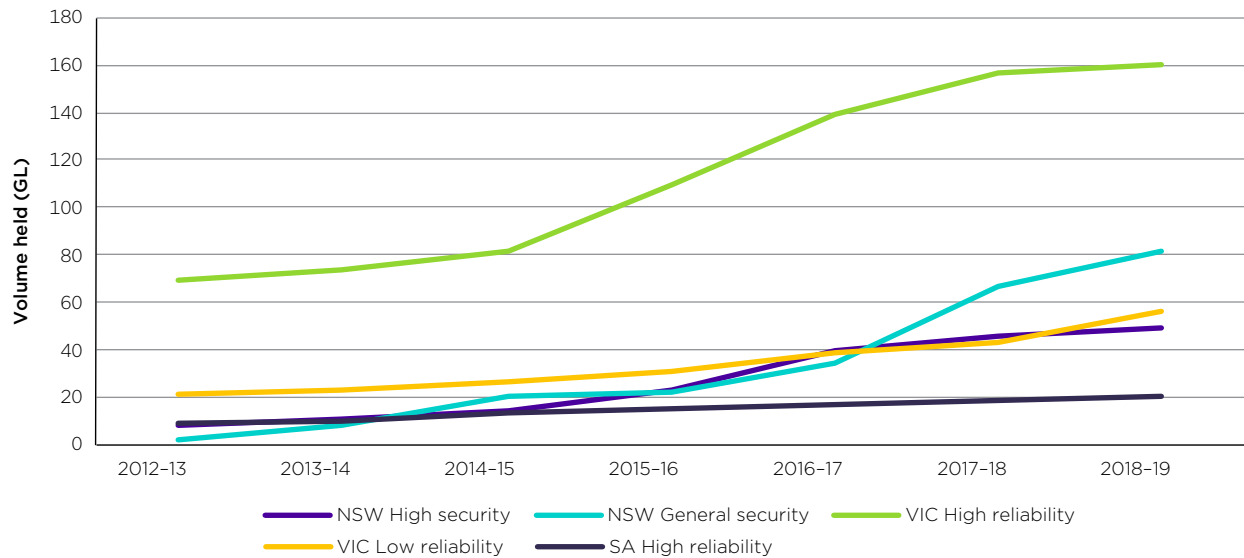
The vast majority of the investor entitlement holdings were concentrated in the Southern Connected Basin.

As at 30 June 2019, the large investors collectively held 230 GL of high security entitlements, 81 GL of New South Wales general security entitlements, 56 GL of Victorian low reliability entitlements and 4 GL of supplementary entitlements across the Southern Connected Basin. The investors' entitlement holdings were more heavily weighted towards high security entitlements, with between 54 and 68% of their respective portfolios consisting of high security entitlements. Collectively, this represented approximately 7% of all high security entitlements on issue across the Southern Connected Basin, 7% of all Victorian low reliability entitlements and 2% of all New South Wales general security entitlements on issue.

Outside the Southern Connected Basin, the investors held a total of 26 GL of water entitlements in various entitlement classes, including high and low security, medium security, groundwater and unsupplemented water entitlements.

²⁹⁴ Historical allocation determination data from the Northern Victorian Resource Manager: <https://nvrvm.net.au/resources-and-data/historical-allocation-data>; public data on allocation determinations also available for New South Wales from the Water New South Wales Register: <https://waterregister.watersw.com.au/water-register-frame>.

Figure 5.1: Large investor entitlement holdings, by class and year



Source: ACCC analysis based on s. 95ZK responses from the large investors.

Figure 5.1 illustrates that the large investors' entitlement portfolios have grown markedly since 2013, particularly in Victoria and New South Wales. The investors' holdings of Victorian high reliability entitlements increased from around 69 GL in June 2013 to almost 160 GL in June 2019. Their holdings of New South Wales high security entitlements increased by around 42 GL over the same period. The large investors have not invested in South Australian Murray entitlements to comparable levels, with the investors' holdings only increasing by approximately 11 GL between June 2013 and June 2019.

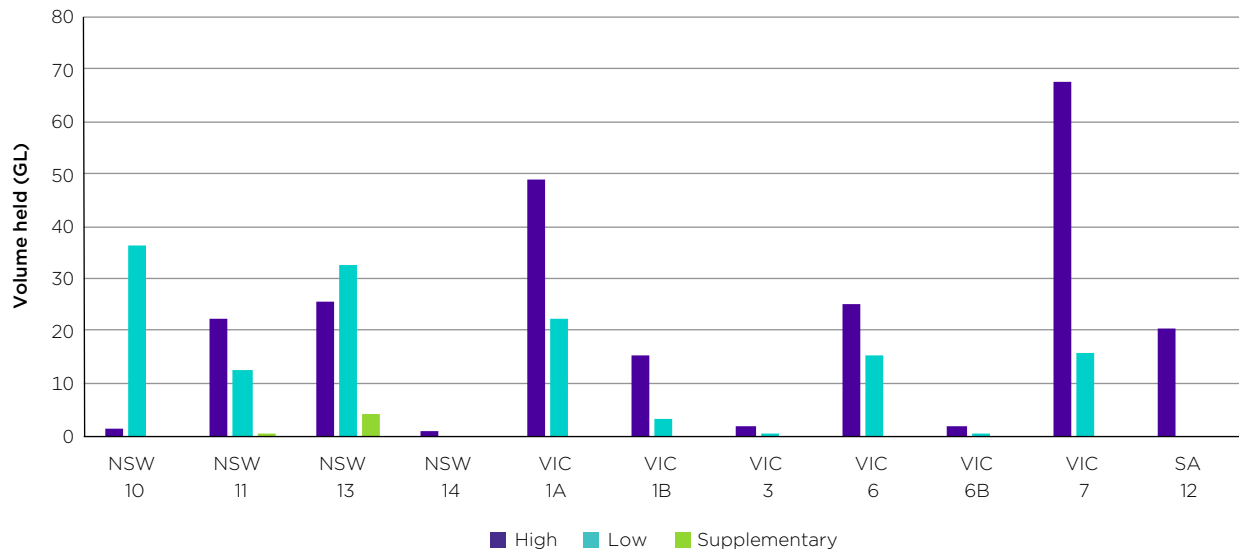
The large investors' low reliability and general security entitlement holdings have also grown considerably. In Victoria, the investors' low reliability holdings have grown steadily since June 2013, more than doubling by volume. Their investment in New South Wales general security entitlements increased significantly from the end of the 2015-16 water year, with their holdings increasing from approximately 22 GL in June 2016 to over 81 GL in June 2019.

The four large investors commenced their respective investments in the water markets at different times, with some commencing before 2013. The extent of each investor's contribution to the aggregate entitlement holding growth of investors shown in figure 5.1 varied.

5.3.4 Composition of the large investors' water entitlement portfolios

The large investors' entitlement holdings were distributed across the Southern Connected Basin as set out in figure 5.2.

Figure 5.2: Large investor entitlements by trading zones, 30 June 2019



Source: ACCC analysis based on s. 95ZK responses from the large investors.

Collectively, the majority of investor-held Victorian high reliability entitlements were concentrated in two trading zones, the Greater Goulburn (zone 1A) and Victoria Murray – Barmah Choke to SA (zone 7). New South Wales high security entitlements were spread evenly between the New South Wales Murray below the Barmah Choke (zone 11) and the Murrumbidgee (zone 13).

Collectively, the four investors' general security entitlements were concentrated in the New South Wales Murray above the Barmah Choke (zone 10) and Murrumbidgee (zone 13). They also held between 15 to 22 GL of low reliability entitlements in three major Victorian trading zones, those being 1A, 6 and 7.

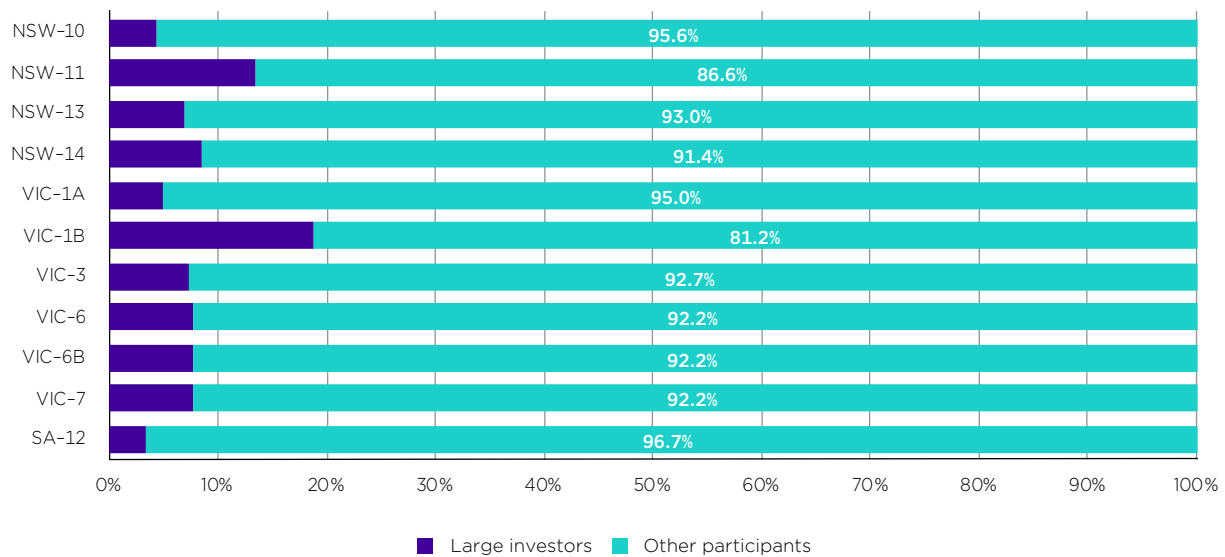
The investors also held a small volume of supplementary water access entitlements. These entitlements allow water to be extracted during announced periods when flows exceed those required to meet other licensed obligations and environmental needs.²⁹⁵

Figures 5.3 and 5.4 respectively set out the proportion of all high and low/general security entitlements held by the large investors across the Southern Connected Basin as at 30 June 2019. The share of high security entitlements held by the investors in any particular zone was generally in the 7 to 8% range. However, in Boort (zone 1B) and the New South Wales Murray below the Choke (zone 11) there was a higher concentration of investor holdings. Figure 5.4 indicates that low reliability investor entitlements were more concentrated in a number of zones in Victoria when compared to New South Wales general security entitlements.

Figures 5.3 and 5.4 include environmental water holdings. This means that the four large investors' share of high security entitlements in the consumptive pool was higher than these figures indicate.

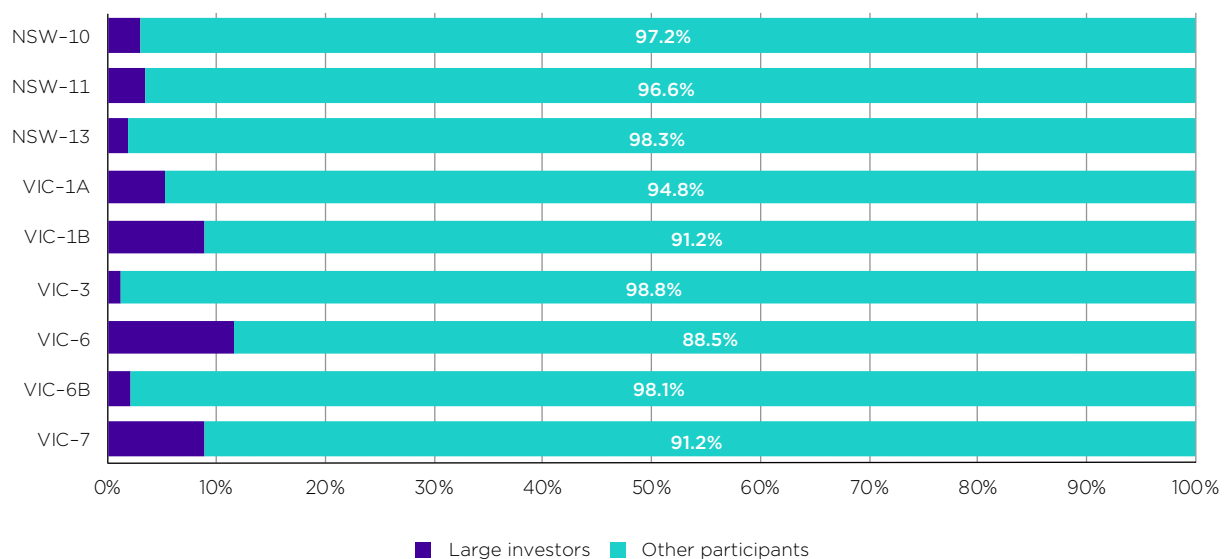
²⁹⁵ For more information, visit the [Water NSW website](#).

Figure 5.3: Large investor high security entitlements as a proportion of total entitlements on issue, by trading zone, 30 June 2019



Source: ACCC analysis of South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors.

Figure 5.4: Large investor low/general security entitlements as a proportion of total entitlements on issue, by trading zone, 30 June 2019



Source: ACCC analysis of Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors.

5.3.5 Large investors' shares of allocation trading activities

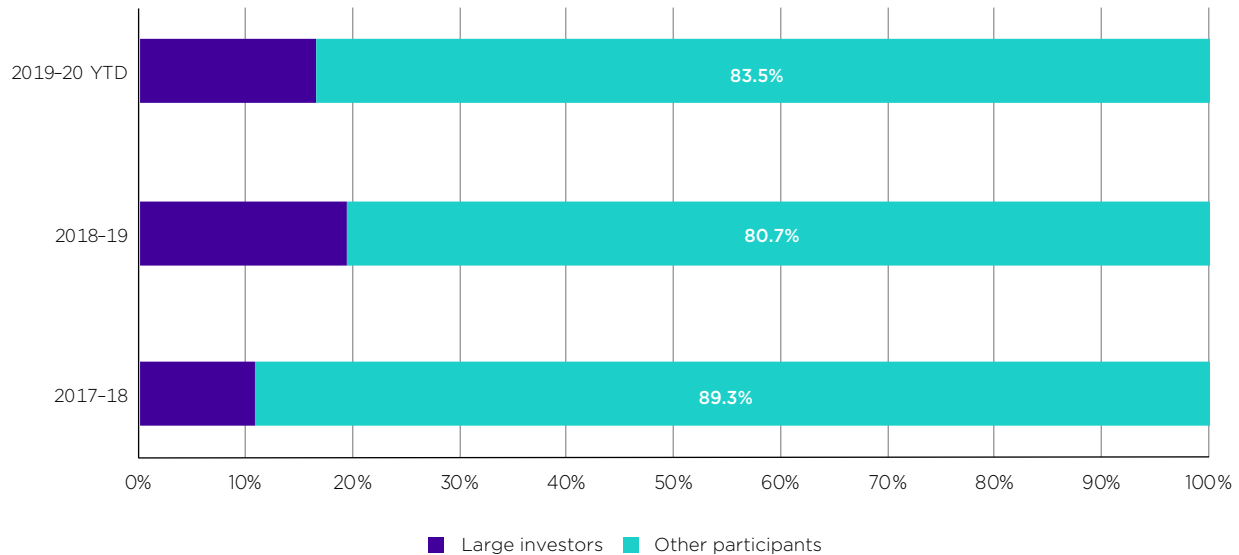
Figures 5.5–5.8 present the large investors' shares and volumes of Southern Connected Basin allocation trades-out and trades-in respectively, excluding zero dollar trades. These charts were prepared by combining Basin-State allocation trade data received from the South Australian, Victorian and New South Wales Governments in response to voluntary information requests.

The ACCC excluded zero dollar trades to better identify commercial trades between distinct buyers and sellers. The ACCC notes that this is an imperfect measure of commercial allocation trading activity, as

it does not reliably distinguish between allocation sales, deliveries on lease and forward contracts, and deliveries for carryover parking purposes.²⁹⁶

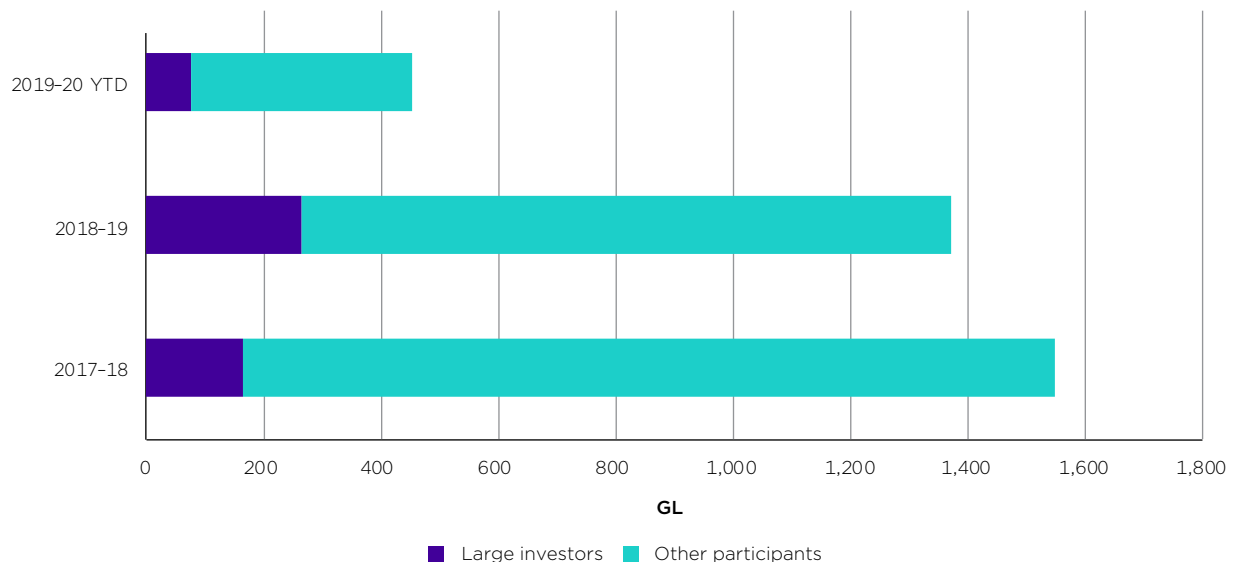
Figure 5.5 shows that the four large investors collectively represented 11% of non-zero dollar trades-out in 2017-18, 19% in 2018-19 and 16% in the first 5 months of 2019-20. The extent of the investors' allocation trades-out in the Southern Connected Basin was significantly greater than their entitlement holdings suggested. This is partly because, unlike investors, a large number of other entitlement holders do not frequently sell water allocations. This is also partly because some investors purchase allocations for resupply.

Figure 5.5: Large investors' share of non-zero dollar allocation trades-out (volume) by year, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors. The 2019-20 water year only includes data from July to November 2019. The chart excludes zero dollar trades.

Figure 5.6: Large investors' non-zero dollar trades-out by volume by year, Southern Connected Basin

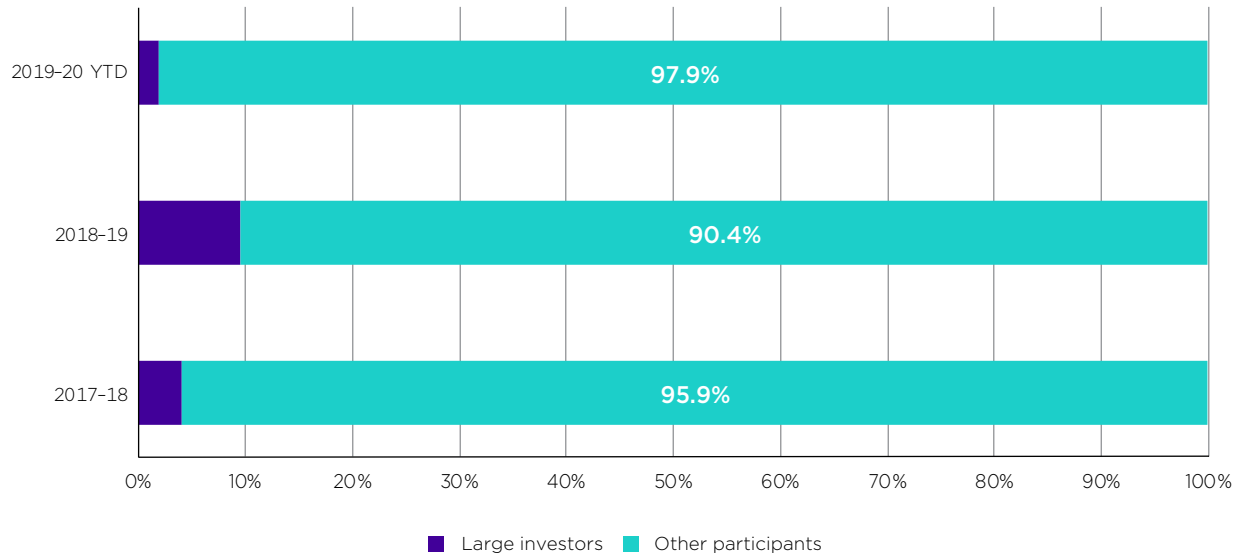


Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors. The 2019-20 water year only includes data from July to November 2019. The chart excludes zero dollar trades.

²⁹⁶ The ACCC obtained information from the investors on the trade type of their transactions. However, this information could not be used for this analysis, as the ACCC did not have similar information for all market participants.

Figure 5.7 shows that the large investors collectively represented 4% of non-zero dollar trades-in in 2017-18, 10% in 2018-19 and 2% in the first half of 2019-20. The ACCC considers that the investors still comprised a significant proportion of allocation trades-in in 2018-19, when considering investors also had access to seasonal allocations assigned to their entitlement holdings. However, there was considerable variance in the scale of allocation trades-in between different investors, with one of the investors accounting for the majority of investor allocation trades-in in each of the presented water years.

Figure 5.7: Large investors' share of non-zero dollar trades-in (volume) by year, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors. The 2019-20 water year only includes data from July to November 2019. The chart excludes zero dollar trades.

Figure 5.8: Large investors' non-zero dollar trades-in by volume by year, Southern Connected Basin



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors. The 2019-20 water year only includes data from July to November 2019. The chart excludes zero dollar trades.

This analysis shows that the scale of allocation trading activity of particular investors was not necessarily linked to the size of their entitlement holdings, as some investors purchased (and then sold) more allocations than others.

Figures 5.9A to 5.12B present a more detailed analysis of the four large investors' shares of allocation trades-in and trades-out in the Lower-Murray as a whole (zones 7, 11 and 12) and zone 7 specifically across the 2018-19 water year. As the Basin State data only recorded the date the trade was submitted for approval and the date the trade was approved, there was a level of uncertainty as to the exact date of each trade. For this reason, the analysis was undertaken on a monthly basis.

Large Investor share of allocation trades-in in the Lower Murray and zone 7

The level of the investors' engagement with water allocation markets fluctuated throughout the season.

Figures 5.9A and 5.9B respectively set out the volume and proportion of non-zero dollar allocation trades-in by the investors in the Lower Murray (zones 7, 11 and 12) each month for the 2018-19 season. Around three quarters of all allocation trades-in by the investors in 2018-19 were into or within the Lower Murray.

The investors' share of allocation trades-in fluctuated between 3.5 and 18% of all non-zero dollar allocation trades-in each month. On average, the investors represented around 13% of allocation trades-in per month. The vast majority of these trades-in were conducted by a single investor.

Figure 5.9A: Volume of large investor non-zero dollar trades-in within the Lower Murray (zones 7, 11 and 12), by month, 2018-19

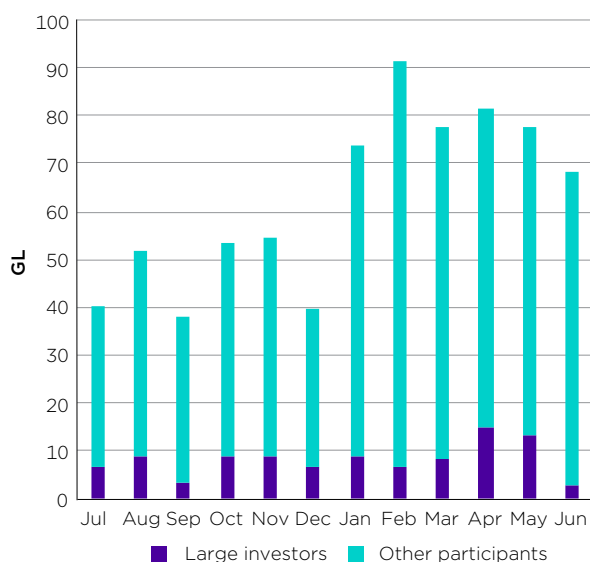
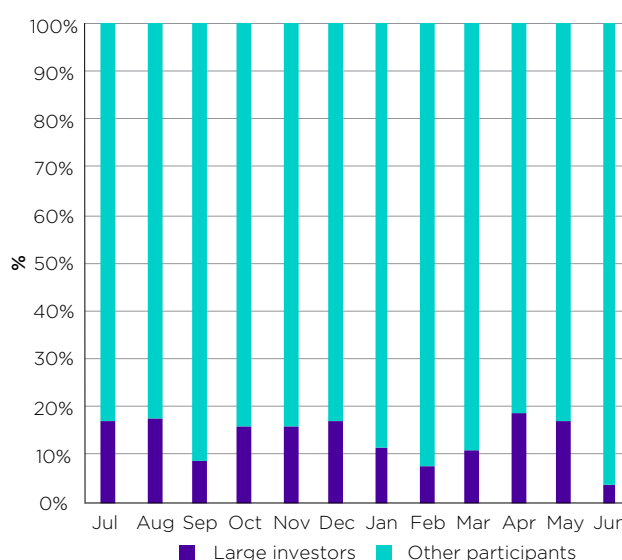


Figure 5.9B: Proportion of large investor non-zero dollar trades-in within the Lower Murray (zones 7, 11 and 12), by month, 2018-19



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors.

Figures 5.10A and 5.10B respectively set out the volume and proportion of allocation trades-in attributed to the investors in the 2018-19 water year in zone 7 (Murray-Barmah to SA). The proportion of allocation trades-in captured by the investors was amplified slightly when focusing exclusively on zone 7. This was because trades into zone 7 alone accounted for nearly 80% of allocations acquired by the investors in the Lower Murray. Like figures 5.9A and 5.9B above, the vast majority of this water was acquired by a single investor.

Figure 5.10A: Volume of large investor non-zero dollar trades-in within zone 7, by month, 2018-19

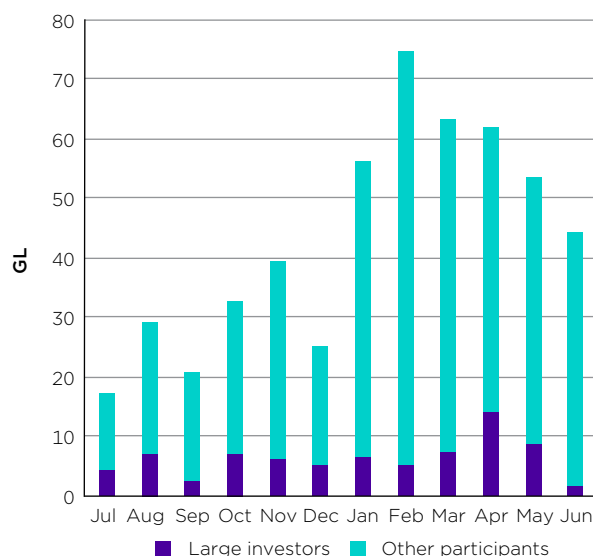
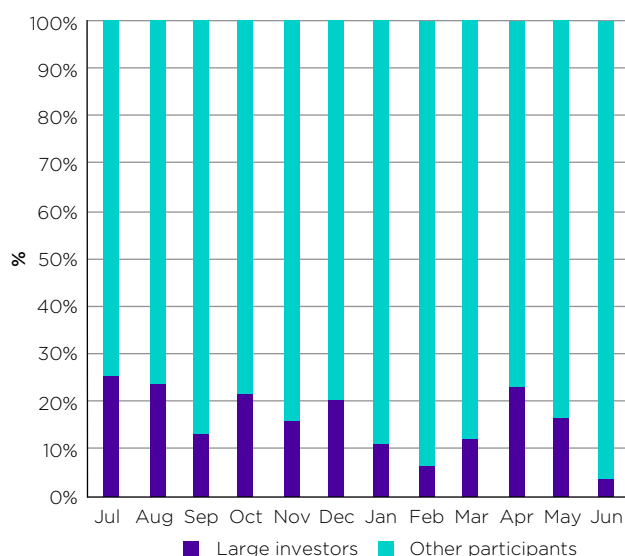


Figure 5.10B: Proportion of large investor non-zero dollar trades-in within zone 7, by month, 2018-19



Source: ACCC analysis based on the Victorian Government's response to a voluntary information request and s. 95ZK responses from the large investors.

Large Investor share of allocation trades-out in the Lower Murray and zone 7

As a group, the large investors were far more active in the trades-out of allocations.

Figures 5.11A and 5.11B set out the monthly volume and proportion of allocation trades-out by the investors in comparison to the rest of the market in the Lower Murray (zones 7, 11 and 12) in the 2018-19 water year.

Figure 5.11A: Volume of large investor non-zero dollar trades-out in the Lower Murray (zones 7, 11 and 12), by month, 2018-19

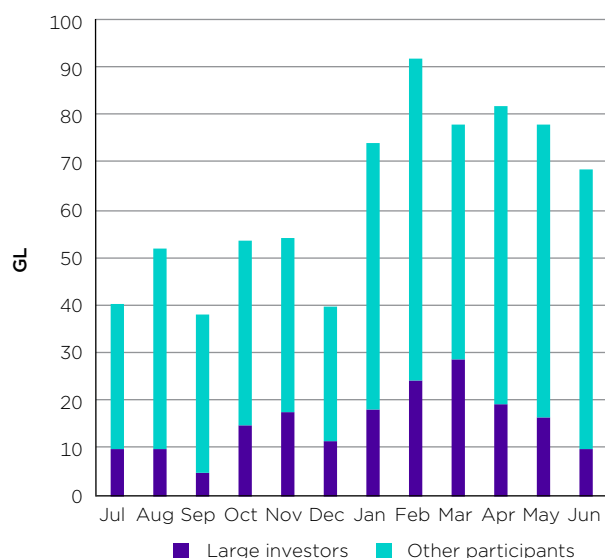
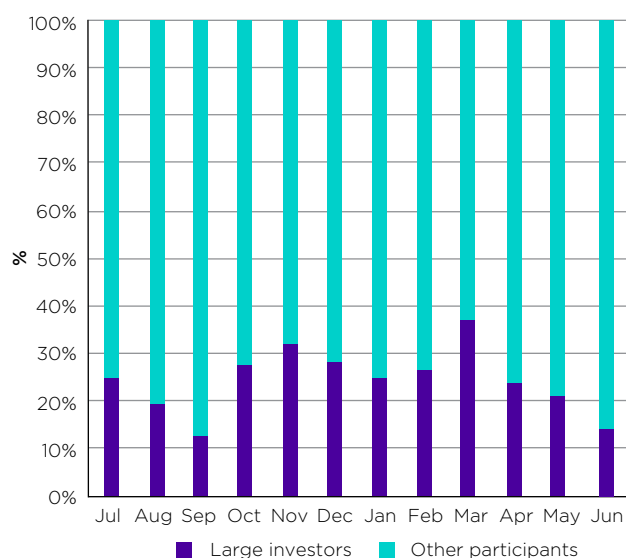


Figure 5.11B: Proportion of large investor non-zero dollar trades-out in the Lower Murray (zones 7, 11 and 12), by month, 2018-19



Source: ACCC analysis based on South Australian, Victoria and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors.

Similarly to allocation trades-in, around 70% of water allocations sold by the investors were sold into or within the Lower Murray. Zone 7 alone accounted for more than 45% of all the investors' allocation

trades-out for the year. As shown in figure 5.11B, in 2018-19, the investors accounted for around 24% of all non-zero dollar trades to the Lower Murray. The proportion of sales captured by the four investors on a monthly basis peaked around 36% in March 2019, when the investors sold a combined 28 GL of allocations.

In the first half of the 2018-19 water year, each of the investors was responsible for a significant proportion of the group's overall trade out, and no single investor was responsible for a majority of that monthly trade. However, from April to June 2019 one single investor was responsible for most of the trades-out by the group in the Lower Murray.

The volume and proportion of allocations traded-out in zone 7 are set out in figures 5.12A and 5.12B and followed a similar trend to the broader Lower Murray system.

Figure 5.12A: Volume of large investor non-zero dollar trades-out in zone 7, by month, 2018-19

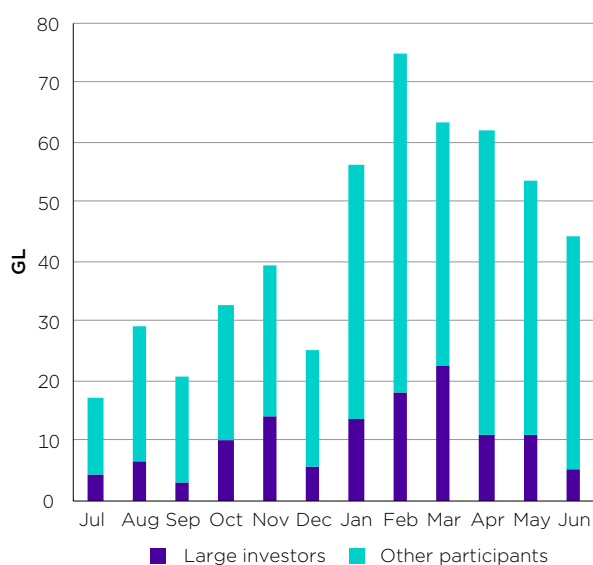
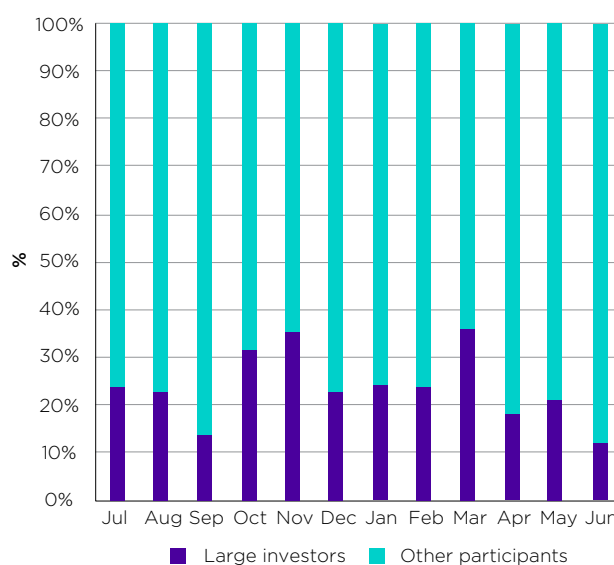


Figure 5.12B: Proportion of large investor non-zero dollar trades-out in zone 7, by month, 2018-19



Source: ACCC analysis based on the Victorian Government's response to a voluntary information request and s. 95ZK responses from the large investors.

The ACCC examined the implications of the investors' trading activities for the water markets, and this is discussed in chapter 6, including whether any investor was able to exercise market power.

5.4 The inquiry examined the strategies of the four large investors

The four large investors adopted broadly similar investment and trading strategies, primarily deriving capital growth from investment in entitlements and deriving income by supplying water products.

5.4.1 The large investors had similar buy-and-hold entitlement strategies

The large investors principally pursued buy-and-hold entitlement investment strategies that aimed to achieve long-term capital growth and yield by investing in a diversified portfolio of water entitlements across the Basin. Some investors specifically relied on the interconnectivity of the Southern Connected Basin as part of their investment strategy.

The large investors held greater volumes of high security entitlements than low reliability and general security entitlements, and high security entitlements provided the bulk of the large investors' seasonal allocations. Some investors saw high security entitlements as providing a superior combination of

capital growth and yield, but some investors also acquired low reliability entitlements to utilise them to carry over water between water years.

The large investors considered a range of factors when deciding which entitlements to acquire, including:

- the concentrations and types of industries comprising the demand for allocations assigned to the entitlement and their capacity to pay for these allocations
- the transferability of allocations from the entitlement trading zone to other trading zones
- the expected income to be generated from the assigned allocations under the entitlement
- other structural factors, including the reliability of allocations under the entitlement, carryover flexibility and the prevalence of buyers and sellers for the entitlement
- mandates or directions by the investor's own investors.

Some large investors identify target portfolios of specific entitlements or entitlements defined by trading zone, type and/or security class that they aim to acquire in order to deliver optimal long-term capital growth and yield.

Although the large investors primarily adhered to long term buy-and-hold investment strategies, they sold entitlements from time to time. For instance, some large investors were able to extract a premium on large parcels of entitlements, and then sought to progressively reacquire the sold volume of entitlements from the market at a cheaper overall price. Some investors also sold entitlements when they believed specific entitlements were overvalued, or to rebalance their entitlement portfolio against their target portfolio, or to generate cash to pay out redemptions to their clients.

5.4.2 The large investors generated income from their entitlements by supplying water products

The large investors generated income from their underlying entitlements by offering a range of water products to irrigators. These products included entitlement leases, forward contracts, spot allocations and carryover parking.

Entitlement leases

Our enquiries identified two broad forms of entitlement leases:

- A limited term transfer or term transfer lease, which involves the allocations and other rights of an entitlement, or parcel of entitlements, being directly assigned to the lessee's water accounts. The lessee receives all the benefits and rights of the entitlement and is also liable for its associated costs (like storage fees) during the term of the lease. Such a lease is registered on a state register.
- An allocation transfer lease or entitlement supply agreement which requires the lessor to deliver the seasonal allocation volumes attached to a specified volume of entitlements to the lessee during the term of the lease. Such leases are not registered on a state register. They can reduce counterparty risk for the lessor, as allocation transfers may be withheld until lease payments are received and allocations may be met using seasonal allocations received on entitlements in other zones.

Entitlement leasing was a key income stream for the large investors as it provided a predictable source of medium to long-term income. Some investors targeted an annual lease fee based on a percentage of entitlement value. The investors commonly offered three to five-year lease terms exclusive of renewal options.

As at 1 July 2019, the large investors had between 40 and 80% of the volume of their high reliability entitlements committed to leases for the 2019–20 water year. Some investors had significantly increased their lease commitments in the 2019–20 water year compared to previous water years.

With entitlement leases the investor (as the lessor) does not bear the effects of seasonal allocation variability (allocation risk) as the lease is not tied to a specific volume of water. Instead, the lessee bears allocation risk under a lease.

Forward contracts

In contrast to entitlement leases, forward contracts shift allocation risk to the selling party. Investors can supply water under a forward contract from allocations assigned under their own entitlements and/or by purchasing water allocations. Investors supplying under forward contracts are exposed to the risk of seasonal allocations being below expectations. Investors can also be exposed to an associated price risk if they need to purchase water to meet forward contract commitments, as allocation prices could have increased by the time the water is to be supplied.

Some investors mitigated their allocation and price risks by carrying over allocations or by purchasing allocations beforehand to service forward contract commitments.

The investors charged forward prices at a premium to the prevailing spot price at the time of agreement. In the case of multi-year forward contracts, some investors also required a sufficient premium to the prevailing lease rate, and at times required a premium to annual forward contracts.

Spot allocation sales

The investors adopted different spot allocation selling strategies with respect to the timing of sales. Some adopted a more passive approach of selling down their expected annual allocations in a linear manner, with roughly equal volumes of monthly spot allocation sales during the water year. Some investors timed the market in a general sense by targeting their allocation sales to times of high seasonal demand. In timing the market, some investors specifically accounted for the seasonal water usage profiles of regional agricultural industries. Some investors had occasionally suspended spot allocation sales on the basis that spot allocation prices were likely to increase in the short-term, or to retain flexibility to capitalise on sudden increases in allocation prices. Some investors adopted price and/or volume targets to direct their allocation trade.

Carryover parking

Carryover parking involves the renting of the carryover capacity of an owned entitlement to a counterparty. In practice, this involves receiving a volume of allocations from the counterparty prior to the end of a water year and returning the net allocations to the counterparty after the start of the next water year.²⁹⁷ The provider of carryover capacity receives a fee for this service. Carryover renting fees commonly represented less than 5% of net annual income for some large investors.

5.4.3 The large investors had different approaches to purchasing allocations

The large investors adopted different strategies regarding allocation purchases.

As indicated above, some of the investors purchased allocations to meet their forward contract commitments, either to cover unplanned shortfalls in allocation holdings or as part of a deliberate forward contract strategy. Some had also a strategy to purchase allocations in wet years to carry over into future dry years for sale.

Other investors actively purchased and sold allocations on the spot market to generate income. This involved the buying and selling of allocations to capitalise on opportunities in the fragmented water markets. It also involved the purchasing of allocations before reselling in periods of expected short-term higher demand to derive profit. One investor was a particularly active purchaser of allocations in 2018-19, as set out in the analysis below.

²⁹⁷ In Victoria, 5% of the volume carried over is forfeited to account for evaporation losses. New South Wales and South Australia's carryover rules do not provide for a similar adjustment of carryover volumes and the transferor will take back the full volume of water transferred to the investor. See section 15.2 for more detail on carryover arrangements.

5.5 The ACCC examined the temporary water allocation trading activities of the large investors

The ACCC undertook a review of the allocation trading activities of the large investors for the 2017-18, 2018-19 and 2019-20 (July to November) water years in the Southern Connected Basin. Over the past three years, all of the investors engaged in temporary allocation trading to some degree. This section details the investors' trading activities in 2018-19. This water year was selected because significant trading activity took place and many concerns raised by stakeholders related to this water year. The ACCC notes that some unique circumstances arose in 2018-19 and this water year should not be taken as representative of all past and future water years.

5.5.1 The highly fragmented and incomplete nature of trading information in the Murray-Darling Basin makes effective market oversight difficult

Information on trading activity in the Murray-Darling Basin is highly fragmented and incomplete. Each of the Basin States maintains its own register of water trading activity. Each IIO also retains its own record of trades inside its network. Each of these systems and repositories operate in isolation. As water market trading becomes more sophisticated and water market participants increasingly trade water between Basin States or a Basin State and an IIO network, the fragmented nature of the data collection will prohibit effective market oversight.

To review the trading activities of the investors in the Southern Connected Basin, the ACCC compiled state registry data provided by the New South Wales, Victorian and South Australian state governments and further information obtained compulsorily from the investors. The ACCC also sought to examine IIO data where available.

Based on the ACCC's experience in the inquiry, it is not possible to ascertain the conduct or trading patterns of market participants from a single source of information. The current quality of data and data collection arrangements made analysis of market participants' trading behaviour difficult, time consuming and resource intensive. To conduct this analysis, the ACCC joined the multiple sources of data together to properly analyse the water allocation trading activities of the large investors across the Southern Connected Basin. In spite of this extensive data collection exercise, there remained some gaps and limitations to the data. Better data collection and coordination across Basin States and IIOs are central to effective market oversight.

Trade categories

The Basin State data did not distinguish between the various sub-categories of trade, such as sales and purchases of allocation, trades under a lease or forward agreement, and trades under a carryover parking arrangement, which can distort interpretation of transaction prices. Without this information, it was difficult to clearly identify spot market activities and therefore analyse the conduct of market participants. To address this issue, the ACCC obtained additional information from the investors in order to identify the different sub-categories of trade. The ACCC notes that New South Wales and Victoria (for electronic trade forms) have recently implemented changes to their trade processes to collect information on allocation trade types. South Australia is currently investigating opportunities to implement similar changes as part of a broader initiative to modernise South Australian water management and registry systems (see subsection 11.2.2).

Price reporting and zero dollar trades

While the Basin State registers provided a relatively accurate record of account and trade volumes, they did not necessarily reflect the actual price paid. This is a result of diverging data collection approaches

between the various states²⁹⁸ and different practices when reporting the prices of various types of trades by market participants.²⁹⁹ The ACCC considers there are a number of legitimate reasons for zero dollar trades, such as where a water holder is moving water between zones (either on its own accounts or through a broker's) or where allocation is traded under a 'wet' entitlement sale.

Strike Date

In the period considered by the inquiry, the Basin States did not require market participants to report the date a trade was agreed to on their trade approval forms. Instead, Basin State registers recorded the date a trade was submitted to the trade approval authority and the date the trade was approved. Although exchange platforms had a record of the date and time bids and offers were matched, this information needed to be collected from multiple platforms. In addition, strike date information was not readily available for trades negotiated through other means, and was not collected by Basin States in any event. Without this data, it was not possible to retrospectively know how much water was traded in different trading zones on any given date.

The ACCC notes that New South Wales and Victoria (for electronic trade forms) have recently implemented changes to their trade processes to collect information on strike dates. South Australia is currently investigating opportunities to implement similar changes as part of a broader initiative to modernise South Australian water management and registry systems (see subsection 11.2.2).

Commercial identifiers

In some instances, it can be difficult to identify the true parties conducting a trade if an entitlement has been acquired, disposed of or leased, or the name associated with an account or licence is very different to the name of the overarching commercial entity responsible for the trading activity. From a market oversight perspective, it is important for water market participants to be easily and consistently identifiable in the data. This highlights the need for a unique identifier for each commercial entity to be used for each transaction.

NSW and South Australia IIO trades

The fragmented nature of Basin State allocation trade register data and IIO internal temporary irrigation right trade data makes it difficult to trace the counterparty and the purpose of trades into and out of NSW and South Australian IIO networks.

As described in Chapter 2, trades into or out of an IIO's network generally entail a water allocation trade to or from the IIO's licence or account, and a crediting or debiting of the internal customer's account (see section 2.4). These arrangements mean that the IIO appears as the buyer or seller in the Basin State registry data (rather than the name of the internal trader within the IIO's network). In addition, IIOs are not required to report temporary irrigation right trades within their networks to the relevant Basin State trade approval authority or register. Information about internal trades is recorded by IIOs for their own internal purposes and for some IIOs to comply with the requirement to report to the Bureau of Meteorology.

Due to these arrangements, the ACCC was unable to create a combined dataset of all water trades by the investors across the Southern Connected Basin including trades within NSW and South Australian IIOs. The ACCC considers that Basin State and IIO data must be consistent and joinable in order to provide regulators with a complete and accurate picture of the water trade occurring within the Basin. The ACCC's recommended options to improve the consistency of data across the Basin is discussed in subsection 12.4.2.

298 The Victorian and South Australian Registers record price on the basis of the total transaction value divided by the quantity traded; the New South Wales Register records price on a per ML basis.

- Victoria: Form 39
- New South Wales: Form 71 for surface water assignment
- South Australia: Form A1.

299 Market participants have indicated that they report the value of certain trade differently to the Register, in particular regarding leases and forwards.

Carryover

It is not possible to identify the true volume of allocation carried over by market participants from a single data source. Basin State registers and IIO water management systems do not distinguish between carryover belonging to the account holder and carryover held under a carryover parking agreement with a third party. Furthermore, any party that utilises carryover parking services will have water stored outside of their own water accounts.

Consequently, at least three data sources were required to determine the volume of carryover by a market participant, including Basin State registers, an IIO's water management records, and a market participant's own trading records.

Further discussion of data quality issues is at Appendix G.

5.5.2 The ACCC examined the trading activities of the large investors in the Southern Connected Basin the 2018-19 water year

Methodology

In conducting this review the ACCC analysed the water allocations held by the large investors on their licences or accounts for the purpose of trading water products.³⁰⁰ Trading activity recorded on a Basin State register was combined with the investors' internal trading records to allow the ACCC to more accurately classify the various types of trades. The figures aggregate the trading data of the large investors.

The ACCC excluded internal transfers between an investor's own accounts or licences and zero dollar trades with water brokers for the purposes of trading water between zones from the figures below. These were excluded on the basis that they did not represent a disposal or acquisition of water because ownership of the allocation remained with the investor, and would misrepresent the volume of water actually traded by the investors.

The ACCC classified the various types of trading activities as follows:

- seasonal allocation: temporary allocation received through an investor's entitlement holdings
- spot water trade: sale or purchase of temporary allocation to or from a third party for consideration
- trade under a lease: a trade pursuant to an arrangement under which the investor passes any water received against its leased entitlements to the lessee
- forward: a trade pursuant to an agreement under which the investor supplies an agreed volume of temporary allocation to the buyer on an agreed date
- 'internal transfer to/from IIO: a transfer of allocation into or out of an IIO network
- carryover parking: temporary allocation transferred to an investor at the end of a water year to be stored against the investor's entitlements, which is then returned to the client after the beginning of the following water year
- carryover: unused temporary allocation stored for trade in the following season(s). Note that the carryover volume includes both the investor's own water as well as water held under a carryover parking arrangement. If an investor used the carryover parking services of third parties, those trades have been categorised as carryover for the purposes of this analysis.
- settlement transfer: temporary allocation associated with the sale or purchase of a 'wet' entitlement (an entitlement purchases or sold with its allocation for that water year).

The analysis includes a category called 'other'. This category includes a small number of trades with irrigators, for which a trade type has not been identified, and some debit errors and corrections.

The analysis in this section of the report is primarily concerned with allocation trading activity. Certain types of trading activity, such as Limited Term Transfers or Term Transfers under which the lessee

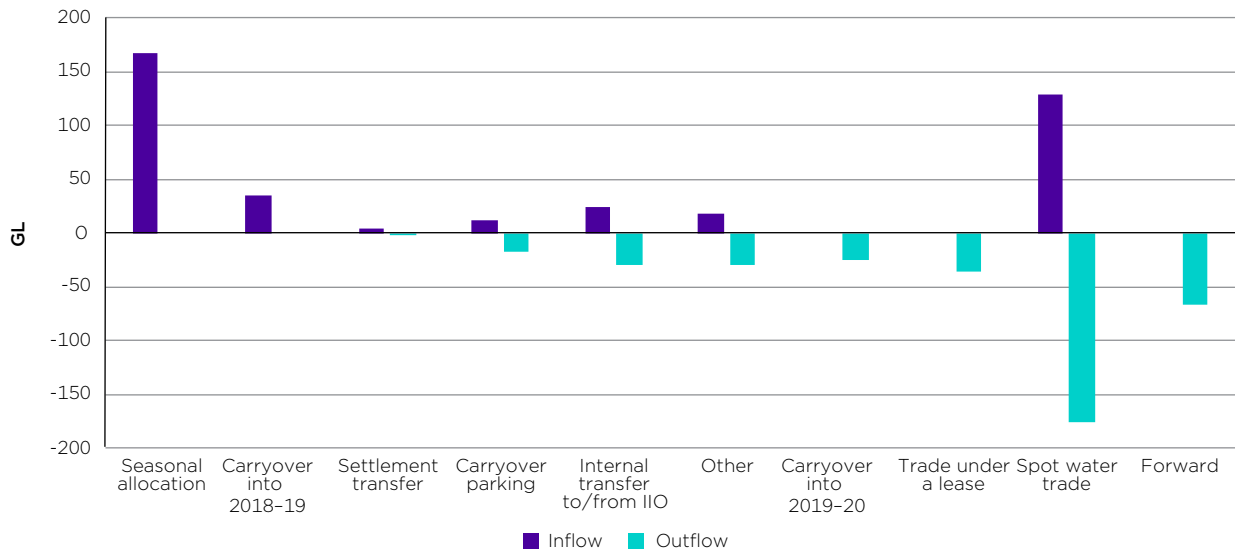
³⁰⁰ Water acquired for agricultural purposes is excluded from the analysis.

obtains possession of the underlying entitlement, do not involve a trade of allocation and are not represented in the following analysis.

Large Investor trades for 2018–19 water year

Figure 5.13 shows the seasonal allocation, carryover and different types of trading activities on the large investors' Basin-State trading accounts or licences in 2018–19.

Figure 5.13: Seasonal allocations, carryover and types of trading activity undertaken by the large investors, Southern Connected Basin, 2018–19



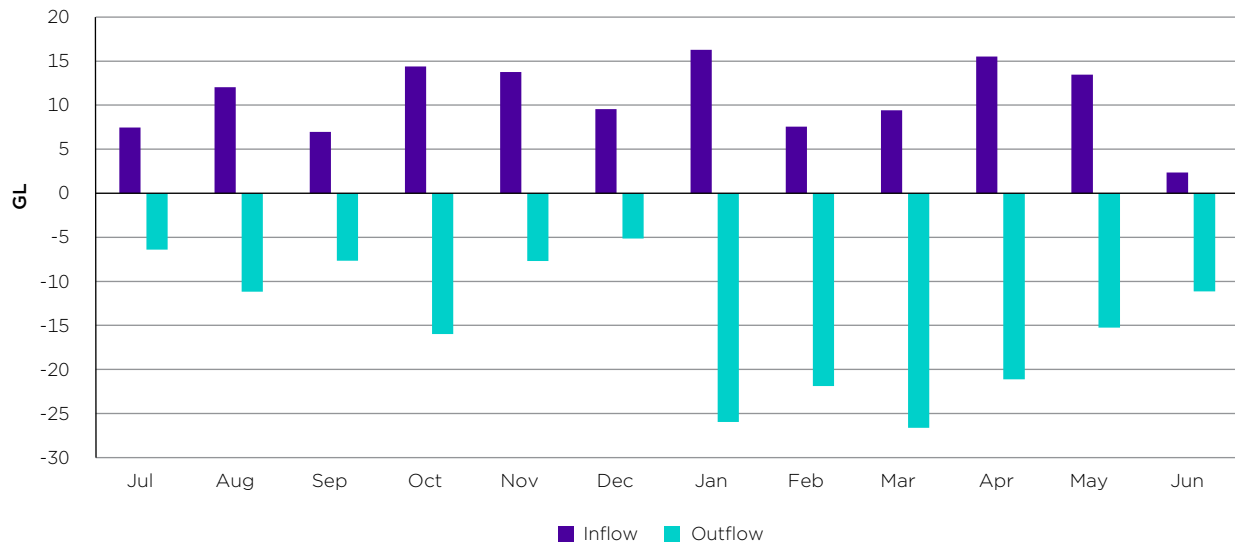
Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to voluntary information requests and s. 95ZK responses from the large investors.

The investors offered a range of water products in the Southern Connected Basin in 2018-19. They provided approximately 176 GL of water on the spot market and traded approximately 102 GL for the purpose of fulfilling a lease or forward water agreement. The investors collectively received 167 GL of seasonal allocation from their own water access entitlements and purchased 129 GL of allocation through spot water trade. Three of the investors delivered the majority of their water products to the market using their own seasonal allocation.

Spot Allocation Trading

Figure 5.14 shows the volume and timing of spot water trade undertaken by the large investors in the 2018–19 water year for the Southern Connected Basin.

Figure 5.14: Large investors' purchases and sales, Southern Connected Basin, 2018-19



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to a voluntary information request and s. 95ZK responses from the large investors.

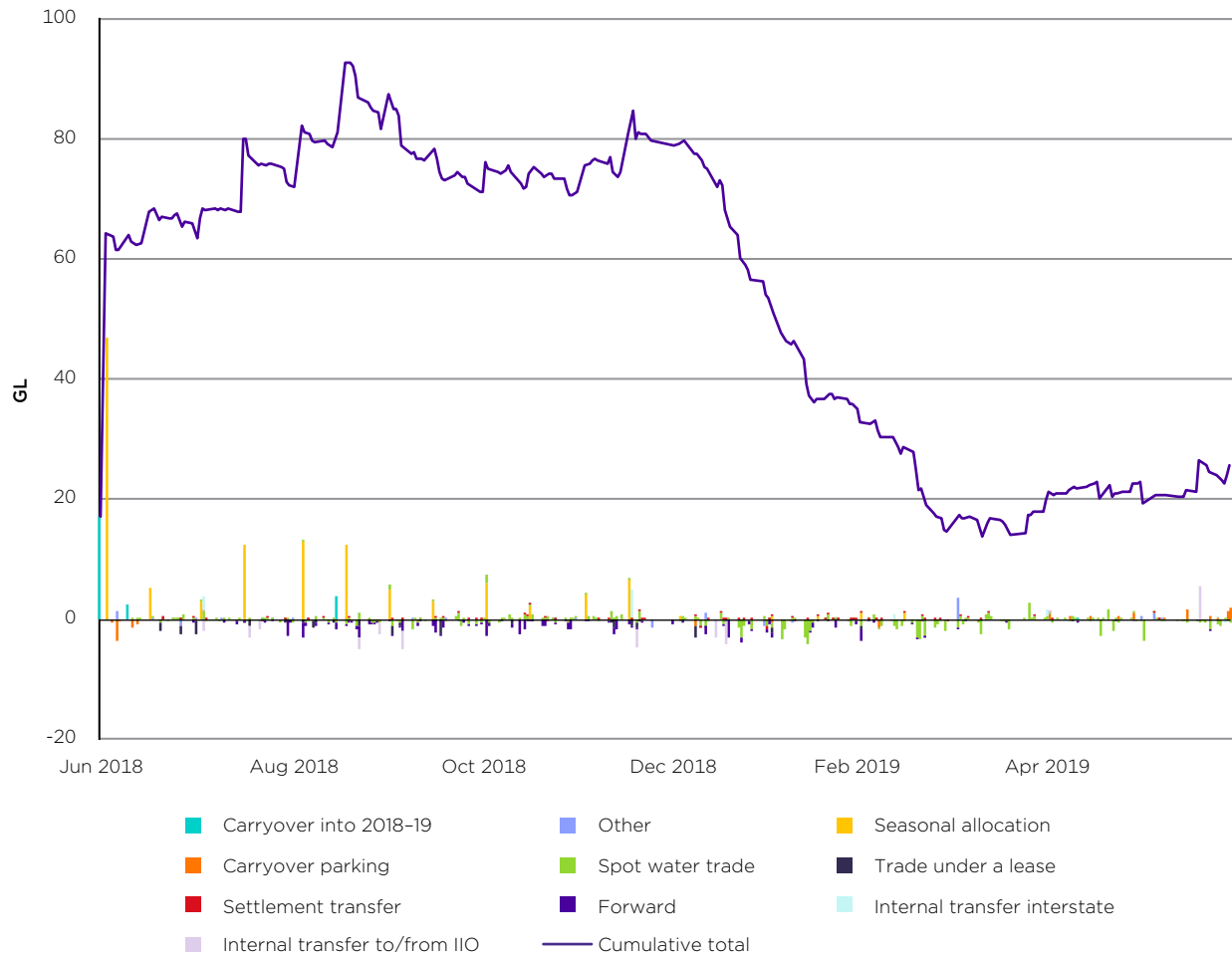
A key concern for many stakeholders was the participation of investors in spot allocation purchasing. Approximately 89% of the volume of all large investor spot allocation purchases and 67% of the volume of all large investor spot allocation sales in the Southern Connected Basin in the 2018-19 water year were attributed to one investor. The ACCC observed that this investor was a very active participant in the water market, mainly in Victoria. It purchased a significant number of small parcels of water and sold water back into the market in larger parcels.

This investor's temporary allocation trading activity was unlike the other three investors. From late 2017 to mid-2019, the investor raised capital and temporarily deployed that capital into the temporary allocation market as it waited for suitable permanent entitlements to become available to purchase. As it secured permanent entitlements, it entered into a large number of lease arrangements with individual irrigators. The ACCC observed that in the first half of the 2019-20 water year, this investor had not been as active in trading water allocations as it was in the previous water year.

Large investors' water allocation holdings on a State by State Basis in 2018-19

The ACCC examined the cumulative volume of the allocation held by the investors on a state by state basis. Figure 5.15 shows the cumulative water allocations held by the investors in Victoria over the course of the 2018-19 water year.

Figure 5.15: Large investors' cumulative volume of water allocation held, Victoria, 2018-19

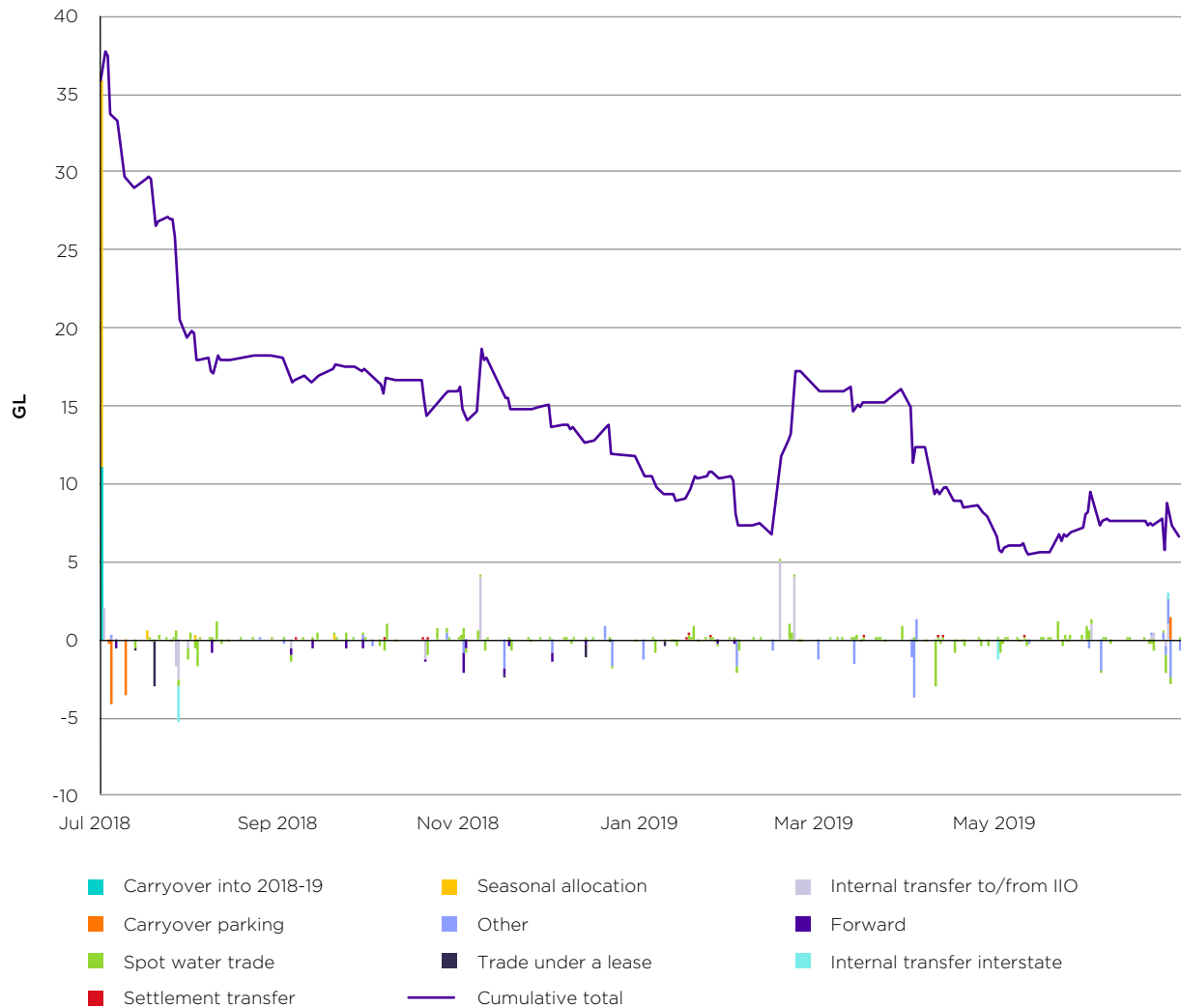


Source: ACCC analysis of Victorian Government's response to a voluntary information request and s. 95ZK responses from the large investors.

Figure 5.15 shows that the investors received a significant portion of their water through seasonal allocations at the start of the water year. The ACCC observed that in 2018-19, some investors began to reduce their overall water allocation holdings in Victoria from September-October 2018, while others began to substantially reduce their overall Victorian water allocation holdings from January 2019.

Figure 5.16 shows the cumulative water allocations held by the investors in New South Wales over the course of the 2018-19 water year.

Figure 5.16: Large investors' cumulative volume of water allocation held, New South Wales, 2018–19

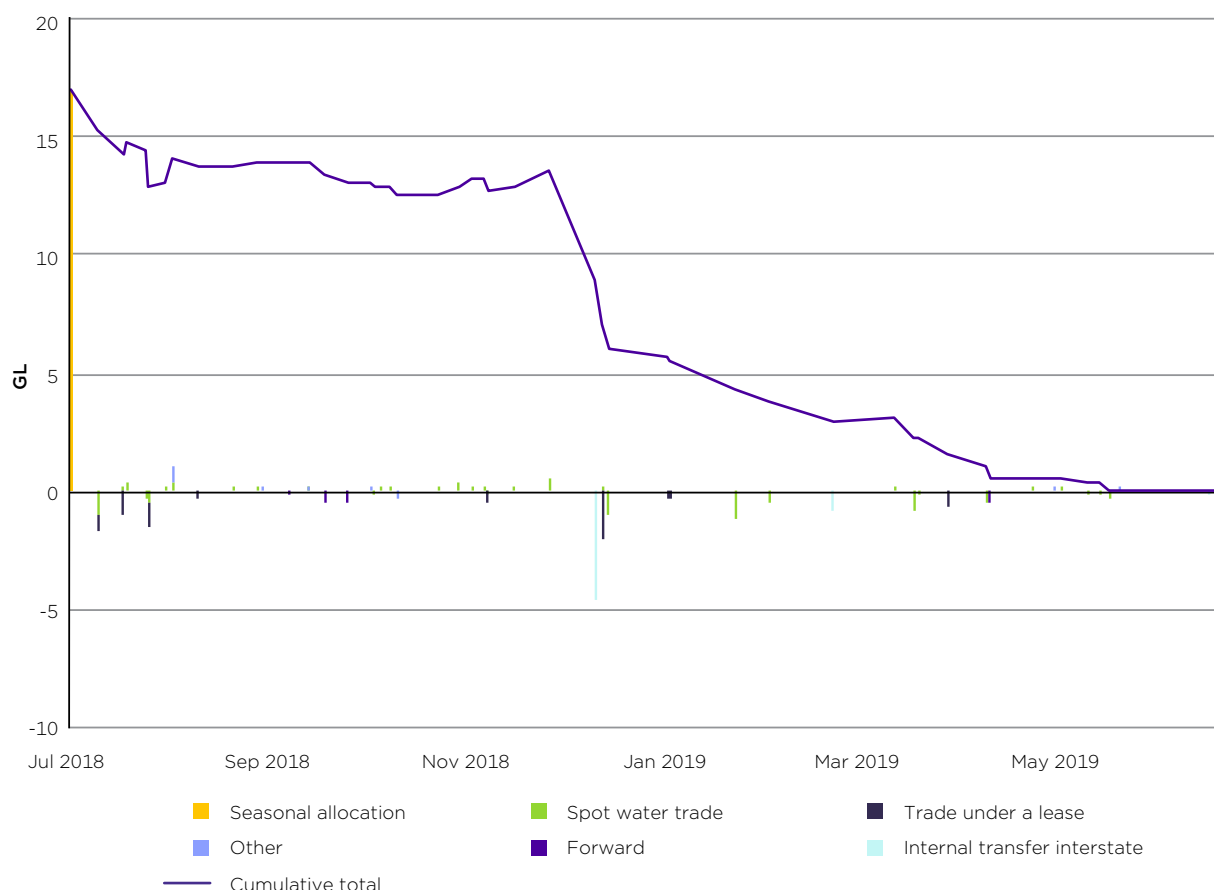


Source: ACCC analysis of New South Wales Government's response to a voluntary information request and s. 95ZK responses from the large investors.

Figure 5.16 shows that the investors received the majority of their allocation through seasonal allocation and carryover from the 2017–18 water year. Compared to Victoria, the investors undertook limited spot water trading on their New South Wales licences. Instead, most trades were for the purpose of transferring allocation into an IIO network, or to deliver on a lease or forward contract.

Figure 5.17 shows the cumulative water allocations held by the investors in South Australia over the course of the 2018–19 water year.

Figure 5.17: Large investors' cumulative volume of water allocation held, South Australia, 2018-19



Source: ACCC analysis of the South Australian Government's response to a voluntary information request and s. 95ZK responses from the large investors.

The investors collectively undertook significantly less trading on their South Australian accounts. The investors received the majority of their water through seasonal allocations, and either provided it back to the market through spot water trades or trades under a lease or forward contract. Two investors collectively transferred approximately 5.5 GL of allocation to their Victorian ABAs.

Examining the investors' South Australian water accounts does not provide a complete picture of their trading activity in South Australia. The interconnected nature of the Southern Connected Basin allows water market participants to trade water across State boundaries. In addition to water products generated from their South Australian entitlements, the investors also collectively provided approximately 28 GL predominantly to South Australian irrigators and agribusinesses from their Victorian and New South Wales accounts and licences.

Internal Transfers

The volume of trade between the investors' accounts was significant. In 2018-19, the investors transferred approximately 89 GL of water between their Basin State accounts and licences.³⁰¹ In addition, the investors also transferred water between their Basin State accounts and licences to their accounts within IIOs. This is discussed further in the next section.

The investors' collectively transferred approximately 63 GL of water into their zone 7 (Vic Murray-Barmah to SA) accounts from other zones. The majority of this water came from zone 1A (Greater Goulburn - 29 GL) and zone 6 (Vic Murray above the Barmah Choke - 20 GL). The investors relied heavily on water brokers to assist with their transfers of allocation through IVT restrictions and the Barmah-Choke.

³⁰¹ This figure includes interstate and intrastate transfers.

Investors' trading with IIOs

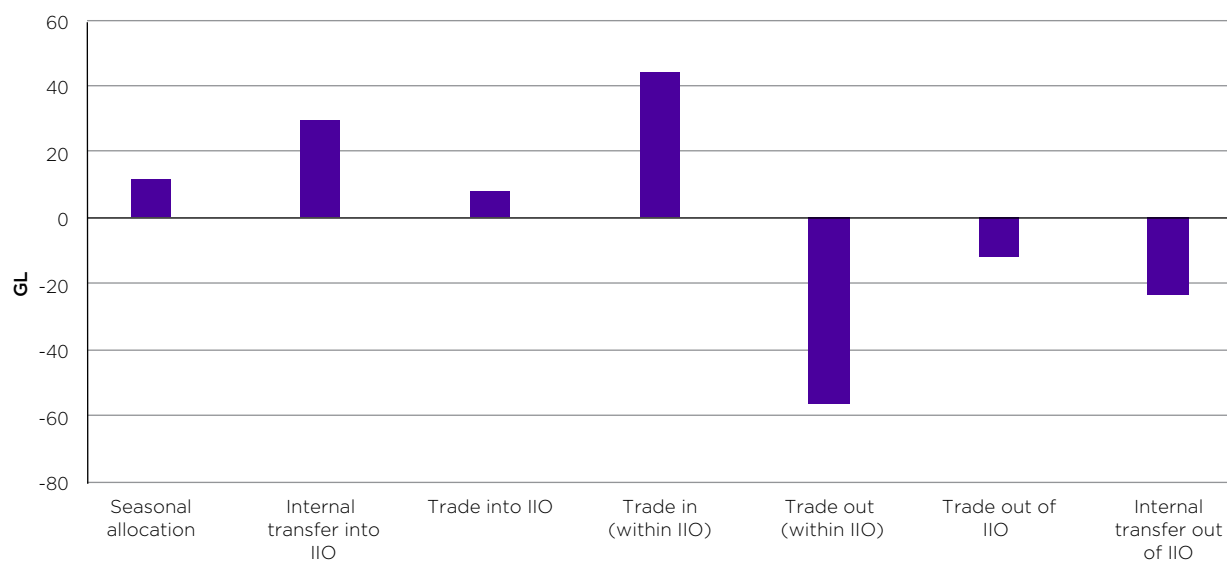
Each of the large investors traded with customers located within IIO networks. Some investors also held accounts and irrigation rights within a number of the IIO networks.

As indicated in subsection 5.5.1, the ACCC was unable to create a combined dataset of all large investors' trades across the Southern Connected Basin including trades within NSW and South Australian IIOs. The ACCC therefore examined the large investors' trading with IIOs separately.

The ACCC used data from the Basin State registers and IIOs, and supplemented this with information compulsorily gathered from the investors themselves.

Figure 5.18 sets out the investors' allocation trading activities with the large IIOs, Murray Irrigation Limited (MIL), Murrumbidgee Irrigation (MI) and Coleambally Irrigation Cooperative Limited (CICL). The figure includes trades within MIL, MI and CICL, as well as trades between the investors' Basin state accounts or licences and their accounts within the IIOs.

Figure 5.18: Large investor IIO trades (MIL, MI and CICL), 2018-19



Source: ACCC analysis of the Murray Irrigation, Murrumbidgee Irrigation and Coleambally Irrigations' responses to information requests, Victorian and New South Wales Governments' responses to voluntary information requests and s.95ZK responses from the large investors.

The different types of trades are separated out as follows:

- seasonal allocation: allocations received against irrigation rights held within an IIO network
- internal transfers into and out of an IIO: allocation trades between an investor's Basin State account or licence and its own IIO account
- trade into an IIO: allocation purchased into an IIO from a seller outside the IIO
- trade out of an IIO: allocation sold from an investor's IIO account to a buyer outside the IIO
- trade in (within IIO): allocation acquired by an investor from a seller also located within the same IIO
- trade out (within IIO): allocation sold by an investor to a buyer also located within the same IIO.

A large proportion of the investors' overall engagement with IIO customers was actively purchasing and selling temporary allocations within an IIO (i.e. where both the buyer and seller were located within the IIO network). In 2018-19 the large investors acquired over 44 GL of water from sellers within MIL, MI and CICL, and sold over 56 GL to buyers in those IIOs from their own IIO accounts. The overwhelming majority of these purchases and a large majority of these sales are attributable to one investor.

The large investors also moved significant volumes of water into and out of IIO networks through internal transfers between their own accounts. In the 2018-19 season, they traded over 29 GL of water from their Basin state accounts and licences into their IIO accounts. Approximately 22.5 GL related to

transfers of allocation from zone 7 into the MIL irrigation network. The investors transferred around 23 GL of water back from their IIO accounts to their zone 7 ABAs or zone 11 water access licences.

To a lesser extent, the investors also bought and sold water allocations that were transferred between their and customers' Basin state accounts and licences and IIO accounts. For example, in 2018-19 the investors sold around 2 GL of water to customers in IIOs from their Basin state accounts and licences, and purchased around 7.5 GL of water from customers outside IIOs into their IIO accounts.³⁰²

Carryover

The ACCC estimated that the large investors collectively carried over approximately 40 GL of water from the 2017-18 water year into the 2018-19 water year in the Southern Connected Basin. At the end of the 2018-19 water year, the large investors carried over approximately 39 GL of water into 2019-20. These figures were derived by calculating the total volume of carryover on the investors' Basin State and IIO accounts and licences and also incorporated carryover parking undertaken for the investors by third parties.

Carryover was an important part of an investor's strategy for delivering water products. The large investors collectively carried over approximately 19 GL of water into 2018-19 and approximately 12 GL of water into 2019-20 on behalf of customers through carryover parking services.³⁰³

The ACCC estimated that overall, the large investors carried over for themselves around 20 GL into the 2018-19 water year and around 27 GL into the 2019-20 water year. This represented less than 2% of the total volume of water carried over by all market participants. However, not all water carried over into the 2019-20 water year was available for allocation sales.

Some investors used carryover to deliver on forward contracts. In 2019-20, the large investors collectively committed to deliver approximately 33 GL of water through forward contracts. Towards the end of the 2018-19 water year, one investor purchased allocation to carry over in anticipation of low seasonal allocation at the beginning of the following water year. Another investor used carryover to mitigate their delivery risks and lock in a margin for the sale of their forward contracts. One investor also purchased allocations at the end of the 2018-19 water year as water prices softened, to carry over and sell in the following year.

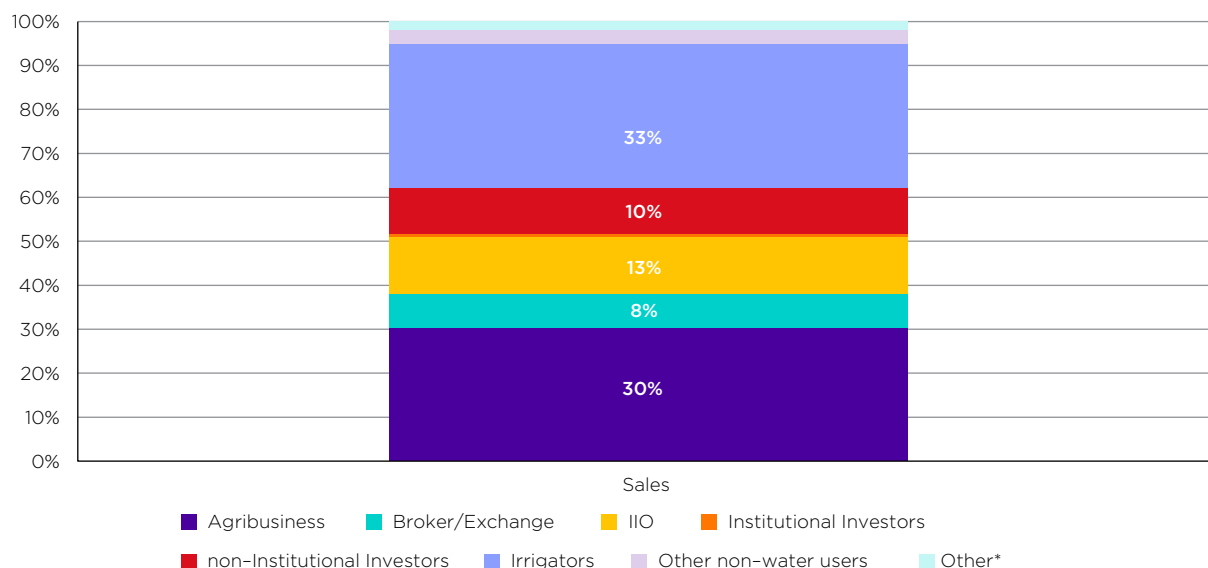
5.5.3 Agribusinesses and irrigators were the large investors' key customers

The ACCC examined the customer profile of the large investors for spot allocation sales. Figure 5.19 shows the proportion of water allocation sold by the large investors for the 2018-19 water year to different customer type. This chart was prepared using Basin-State data and includes trades with an IIO recorded on a Basin State register, but does not include trades within an IIO.

302 Both of these kinds of trades are listed as 'Trade into IIO' in figure 5.18.

303 This analysis relies on information provided by the large investors in response to s.95ZK notices.

Figure 5.19: Large investors' customers, spot allocation sales, Southern Connected Basin, 2018-19



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to a voluntary information request and s. 95ZK responses from the large investors. *Includes recreational, government, urban and industrial customers.

Collectively, irrigators and agribusinesses were the most significant customer types of the investors in the 2018-19 water year, accounting for approximately 63% of the volume of allocation sales. The proportion of sales between irrigators and agribusinesses varied depending on the investor. IIO networks and brokers/exchanges accounted for 13.1 and 7.7% of the volume of the investors' allocation sales respectively. These parties typically hold water on trust for irrigators and agribusinesses to facilitate trade. The investors traded approximately 10.5% of their water allocations to non-institutional investors.

The large investors sold their water products to customers via direct negotiations with customers, engaging a water broker to sell water on their behalf or an exchange platform. Direct negotiations enable investors to reduce transaction costs, improve their understanding of a customer's business, build customer relationships and maintain confidentiality with their client. If an investor trades via a water broker or an exchange platform, the investor normally does not know the identity of their customer. For some large investors, direct engagement with customers was an important part of their strategy, while others traded more through intermediaries.

The ACCC observed that the four large investors tended to sell larger parcels of allocation than other sellers. In 2018-19, the average volume of allocation sales by the large investors was 312 ML, the median volume was 200 ML and the maximum volume of allocation sold in a single trade was 3,000 ML. All large investors' business models enabled them to meet demand from customers requiring large parcels of water, from the allocations received under their entitlements and/or by aggregating small purchases.

5.6 Smaller investors were also active in the Southern Connected Basin

In conducting this inquiry, the ACCC identified a number of small investors that traded water allocations in the Southern Connected Basin.

The ACCC used its compulsory information gathering powers under the CCA to obtain information about the water holdings and trading strategies of four small investors. A reference to the small investors in this section refers to these four investors.

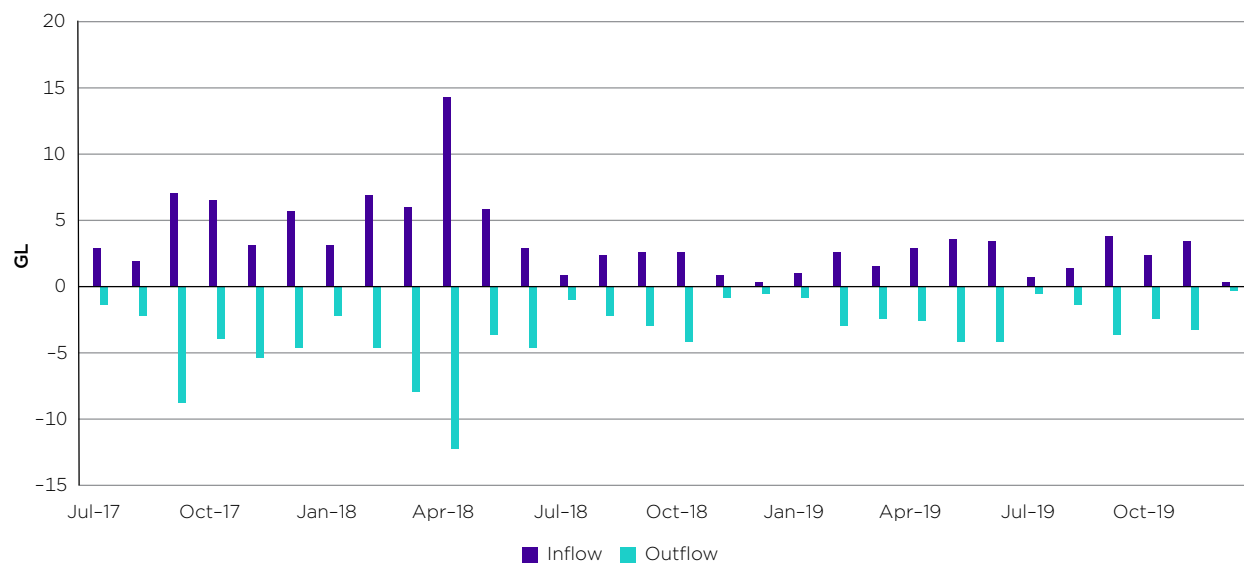
Some of the small investors were individuals while others were small trading companies. Some conducted trading activities alongside their farming activities. Some small investors had been active in water markets for a long period of time, while others had entered the market in recent years.

Generally small investors owned no or very few water entitlements, however some small investors were focused on entitlement ownership. Some small investors received water pursuant to entitlement leases and forward contracts, and some provided water via forward contracts, usually to irrigators.

Most small investors were active traders in the market, frequently buying and selling water allocations. The ACCC observed that some small investors bought and sold water allocations more frequently than some large investors. Most relied upon water brokers and broker exchange platforms, rather than dealing with a customer directly.

Figure 5.20 shows that each month the four small investors generally sold a similar volume of water to the amount they purchased. This reflects frequent buying and selling of water allocation, and avoidance of risks associated with holding water.

Figure 5.20: Combined volume of spot allocation purchases and sales by the small investors, by month, July 2017–November 2019



Source: ACCC analysis based on South Australian, Victorian and New South Wales Governments' responses to a voluntary information request and s. 95ZK responses from small investors.

For some small investors, trading across the Southern Connected Basin was an important part of their trading strategy. Most were successful in moving water from zone 6 to zone 7 through the Barmah Choke, and between valleys. Some small investors developed technology which assisted them to trade through the Barmah Choke, while others spent time monitoring public websites. In the 2018–19 water year the small investors moved over 7GL of water from zone 6 to zone 7. During the first five months of the 2019–20 water year the small investors moved almost 4GL from zone 6 to zone 7. Other small investors avoided IVTs and considered them too risky.

Some small investors had specific strategies where they only bought in one zone and sold in another specific zone. Others bought and sold depending on market conditions and prices across the Southern Connected Basin. Most traded allocations year round, but some only participate in the market when specific market conditions arose that suited their trading strategy.

Most small investors spent a significant amount of time monitoring the market, including allocation announcements, IVT openings, the price of water allocations in different zones and/or the types of agriculture in different zones.

During the course of the inquiry, the ACCC identified a number of other trading accounts that may be categorised as small investors. Some trading accounts were linked to irrigators or water brokers, highlighting that some small investors may participate in water markets in multiple capacities. Some accounts appeared to be individuals or small companies who focused solely on trading water allocation. It appeared that some small investors participated in water markets continuously, while others were only active intermittently.

In addition, information provided to the inquiry indicated that retired farmers may retain their water entitlements, including in self-managed superannuation funds, and supply water products from these entitlements (leases or water allocation sales).

5.7 Investors understand the complex market dynamics of the Southern Connected Basin

The large investors had a sophisticated understanding of the market dynamics of the Southern Connected Basin. They were conscious of the seasonal and long-term water needs of different industries in the Basin and how that demand may impact Basin water markets. In addition, three of the large investors had agribusiness arms and were able to leverage knowledge of irrigated agriculture from their groups' respective agribusiness portfolios.

All four small investors had a high level of knowledge about how the water markets operate, which they obtained through previous employment or their involvement with irrigated agriculture, and could dedicate the time to investigate and pursue trading opportunities.

Generally, the investors considered the Southern Connected Basin holistically and sought to move water to the areas of greatest demand, as permitted by the trading rules at the time. Both large and small investors had a good understanding of the price differentials that could arise between different zones within the Southern Connected Basin. The investors often transferred water between water accounts, including within an IIO, to move some allocations to the trading zones with a higher demand and price prior to sale. They also moved water between zones to take advantage of price differentials for forward contracting and water leases. This involved moving water between different trading zones separated by the Barmah Choke or the Murrumbidgee and Goulburn intervalley trade restrictions. The investors were conscious of the risks associated with restrictions and had adopted strategies to manage these risks.

The ACCC's observations of small investors suggests that participants in water allocation markets do not need to employ large teams of people or have access to substantial capital in order to trade successfully.

6. Examination of investors' conduct

Key Points

- During the inquiry, many stakeholders raised concerns about the conduct of investors in water markets. In broad terms, the concerns related to the ability of investors to influence water markets and specific conduct resulting in market distortions and artificially inflated prices.
- The ACCC did not find evidence that investors exercised market power or manipulated prices to increase water prices in the Southern Connected Basin water markets.
- Broadly, price manipulation is conduct that results in a price that does not reflect genuine forces of supply and demand. It generally includes creating or maintaining an artificial price.
- The data suggests that rising prices over the 2018–19 and the first half of the 2019–20 water years was due to limited inflows and increasing water scarcity, and the level of water demand over this period.
- The ACCC undertook extensive analysis to reach this conclusion. The ACCC used its information gathering powers to obtain data from investors and exchange platforms, as well as other information and documents, to complement the Basin State data. The ACCC also conducted private hearings of representatives of a large investor to examine its investment and trading strategy and activities.
- One large investor was the largest trader of water allocation in 2018–19. During the first half of 2018–19 when prices were lower, the large investor was a net buyer, accumulating water allocations but maintaining an active role as a seller. During the second half of 2018–19 when water prices were higher, it was a net seller but it continued to buy water allocations. During this period there were a large number of competing sellers of water allocation. The data suggests that neither the large investor nor any other water sellers exercised market power.
- The ACCC found that there were wide market spreads between buy orders and sell orders. This could result in large price movements in trades. Such trade outcomes may be best attributed to poor liquidity rather than price manipulation.
- The ACCC was only able to conduct its analysis by using its information gathering powers, and obtaining data from a wide range of sources to enable a detailed picture of trade activities. However, the ACCC was unable to examine some allegations due to deficiencies in the available data and the time that had elapsed since the issue occurred.
- The ACCC considers that poor quality public data contributed to misconceptions and misinformation about the conduct of market participants, and harmed confidence in water markets.

Over the course of the inquiry, stakeholders raised concerns about the conduct of investors in the Basin water markets. The ACCC examined these concerns, as well as other trading activities observed in the data that appeared unusual or suspicious.

This chapter sets out the ACCC's analysis and conclusions regarding investors' conduct in the water markets.

6.1 Stakeholders raised concerns about the conduct of investors

In public forums, complaints to the ACCC, and submissions in response to the issues paper and the interim report many stakeholders raised concerns about the conduct of investors in water markets. Some stakeholders raised general concerns about the presence of investors in the water markets and

questioned their value.³⁰⁴ Many alleged that investor behaviour had resulted in materially higher water allocation prices.³⁰⁵ In broad terms, the concerns related to the investors' ability to influence Basin water allocation markets and specific conduct resulting in market distortions and artificially inflated prices.

For instance, Robert McGavin, CEO of Boundary Bend, submitted that:

The conduct of non-water users in water markets is harming not only farmers, but also rural communities and, ultimately consumers by artificially inflating prices in a manner that does not reflect the natural forces of supply and demand. We estimate that during the last 3 irrigation seasons, the conduct of non-irrigators has raised the price of temporary water by \$100/ML to \$500/ML above the price that would otherwise prevail in the current climate, if irrigators were only competing with each other for the available temporary water.³⁰⁶

6.1.1 Stakeholders were concerned about investors' ability to influence water markets

Stakeholders raised concerns about the competitive dynamics of water markets. Some alleged that investors had market power which they used to influence the market.

Some stakeholders submitted that investors had advantages in analytical resources, financial market access and financial backing, and were unconstrained by the need to apply water for agricultural production.³⁰⁷ Participants at the Shepparton forum submitted that larger buyers operating in shallow markets may have been able to influence market quantities and prices to their advantage.

6.1.2 Stakeholders alleged investors withhold water to raise prices

Some stakeholders raised concerns that investors were buying water allocations and withholding water from the water markets to artificially drive prices higher.³⁰⁸

Some stakeholders alleged that investors bought a large proportion of available allocations early in the water year, when seasonal allocation and trade volumes are low. This cleared lower-priced allocations and forced up the price for allocations. Stakeholders alleged that investors did not supply these purchased allocations for a large part of the season, while also withholding allocations received under their own entitlements. This allegedly restricted market supply sufficiently to artificially raise allocation prices by a material amount. Stakeholders alleged investors then supplied allocations to the market at inflated prices at times of peak demand.

Stakeholders also alleged that investors carried over allocations at the end of the water year to withhold allocations across multiple water years to push prices up. They stated these allocations could otherwise have been used by irrigators in preceding water years at lower prices.³⁰⁹

304 Southern Basin public forums; Gavan and Bernardine Robinson, *Submission to the Murray-Darling Basin inquiry interim report*, 13 November 2020; Greg Watkins, *Submission to the Murray-Darling Basin inquiry interim report*, 13 November 2020; Robert Caldwell, *Submission to the Murray-Darling Basin inquiry interim report*, 13 November 2020.

305 Murray River Group of Councils, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 4; Select Harvests Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 16 April 2020, p. 2; ACCC Murray-Darling Basin inquiry, Southern Basin public forums.

306 Robert McGavin, *Submission to the Murray-Darling Basin inquiry interim report*, 13 November 2020.

307 Select Harvests Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 16 April 2020, p. 2.

308 NSW Farmers' Association, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 5; ACCC Murray-Darling Basin inquiry, Renmark public forum.

309 Australian Grape & Wine Incorporated, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 8; National Irrigators' Council, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 15; Fruit Growers Victoria Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020; Goulburn Murray Irrigation District Water Leadership, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 2; ACCC Murray-Darling Basin inquiry, Deniliquin and Shepparton public forums; Gavan and Bernardine Robinson, *Submission to the Murray-Darling Basin Inquiry interim report*, 13 November 2020, p. 2.

6.1.3 Stakeholders alleged investors conduct allocation transactions to manipulate water markets

Some stakeholders raised concerns that investors, by themselves or jointly with brokers, conducted allocation transactions in such a way as to create or maintain artificially higher allocation prices.³¹⁰ In particular, stakeholders made the following allegations:

- investors placed substantial buy orders on allocation announcement days, and around forecasted rain events, to ensure allocation prices were not eroded
- investors paid above market prices on small parcels of allocations to drive up the value of underlying entitlements
- investors placed concurrent buy and sell orders to maintain prices within a narrow predetermined band
- investors manipulated offer prices on exchange platforms to create price spikes
- investors manipulated intervalley trade to create or maintain a floor price in the destination zone
- investors traded on inside information.

6.1.4 Stakeholders alleged investors distort market information to suit their interests

Stakeholders raised concerns about investors engaging in conduct that distorted market information to suit their interests.

Some stakeholders alleged that investors sometimes conducted trades outside exchange platforms to influence information about market price. They alleged that investors bought allocations on exchange platforms pushing the reported prices up but then directly, or through a broker, approached irrigators to offer large parcels of water allocations. As these trades were not transacted on commonly-used exchange platforms, the agreed prices were not publicly reported and were not reflected in quoted platform-traded prices. It was alleged this conduct resulted in information asymmetries between investors and market participants that were reliant on exchange platforms for price information, and maintained artificially high 'market prices'.

6.2 Methodology

To undertake the analysis of investors' conduct, the ACCC relied on a number of data sources and other information.

The ACCC relied in part on allocation trade data provided by Basin States in response to voluntary information requests. The advantage of this dataset was that it covered all trades in the Southern Connected Basin, except trades within NSW and SA IIOs. However, as discussed in subsection 5.5.1, this data did not identify the exact date of the transaction nor distinguish allocation trade from other transaction types (such as leases or forwards).

In addition, the ACCC used its information gathering powers to obtain data from the exchange platforms Waterexchange, H2OX, Waterpool and Waterfind. The ACCC also obtained data from Murray Irrigation Limited (MIL)'s Water Exchange and WaterMart under voluntary requests and compulsory notices.³¹¹ The data included all buy orders, sell orders and trades for the period 1 July 2017 to 31 December 2019. In contrast to Basin State data, the platform data included the date and time the transactions occurred.

The platform data is a subset of all allocation transactions in the Southern Connected Basin. In volume terms, the platform data, excluding MIL's Water Exchange and WaterMart, represented around 60% of

310 Almond Board of Australia, *Submission to the Murray–Darling Basin inquiry issues paper*, 5 March 2020, p. 21; Select Harvests Limited, *Submission to the Murray–Darling Basin inquiry issues paper*, 16 April 2020, p. 2; ACCC Murray–Darling Basin inquiry, Deniliquin public forum.

311 All confidential identified information was obtained under compulsory notices.

the volume of non-zero dollar transactions in the Basin State data for the Southern Connected Basin. In addition, the platform data included allocation trades within MIL and Coleambally irrigation networks, which are not recorded on Basin State registers.

Not all exchange platforms operated in the same way. Some platforms could facilitate the reporting of negotiated trades to Basin State approval authorities. For some platforms, there was a level of negotiation or manual intervention around some buy or sell orders placed on the platform.

That is, the platform data included:

- on-platform trade (where buy and sell orders are matched on the platform, either automatically or selected by the customers without negotiation)
- off-platform trade (reported trade where the trade was negotiated directly by parties or through a broker and then placed on the platform for processing and settlement, or where there is some manual intervention around buy or sell orders listed on a platform).

One platform could not provide any details to differentiate between on-platform and off-platform transactions. As a result, the ACCC's analysis relied on assumptions to identify on-platform trades within this platform.³¹²

The ACCC estimated that approximately two thirds of the trades in the platform data were on-platform trades.

The ACCC sought to recreate the order book of each exchange platform; that is, the list of buy orders and sell orders submitted to a platform at any one time. A complete trace of an order's lifecycle covers submission, amendments and any cancellation or execution. It was not possible to completely recreate the order book for all exchange platforms from the available data.

The ACCC used its information gathering powers to obtain information and documents from the large investors and a broker to assess specific allegations and examine specific transactions. The ACCC also sought additional information on a voluntary basis from certain market participants.

The ACCC also conducted two private hearings of representatives of a large investor to examine its investment and trading strategy and trading activities.

6.3 The water market is opaque which leads to participants misinterpreting market activity

The ACCC obtained information about certain transactions undertaken by the four large investors, reported on Basin State water registers, that the ACCC considered to be unusual. This was also informed by specific concerns raised in submissions. These unusual transactions included zero dollar and priced transactions.

Many transactions that appeared suspicious were explained once the transaction type was known.

- A number of transactions had a reported price per ML that appeared out-of-line with other transactions in the same period. These transactions were in fact a transfer of allocations under a lease reported with the price of the lease payment, or under a forward contract reporting the contract per ML price. However, other allocation transfer under leases were reported as zero dollar transactions.
- There were a number of zero dollar transactions involving a range of volumes in the investors' accounts. It appeared that the investors were receiving or providing water allocation at no cost. The zero dollar trades were in fact allocation transfers tied to the sale or purchase of a 'wet' entitlement (that is, an entitlement traded together with its current allocation), for which the price of the allocation forms part of the total price paid for the entitlement.

312 The ACCC understands that when the platform is used to process trades negotiated off-platform, the buy order, sell order and trade are submitted to the platform quasi simultaneously. The ACCC assumed that off-platform trades were those trades where the buy order, sell order and trade occur within five seconds.

- A number of transactions of different sizes recorded for zero dollar or a small dollar value were identified as carryover parking and carryover return to and from investors' accounts, reflecting both carryover parking services provided by and to the investors.
- A large number of zero dollar transactions were movements of water between an investor's own accounts mostly from one zone to another, including via broker.

Reporting of transaction types on Basin State water registers would assist in dispelling some misunderstanding about allocation trading activities in the Southern Connected Basin.

The large number of trades conducted by one investor on certain days was cited to the ACCC as evidence of the investor exercising market power. These days were identified using information from the Victorian Water Register. The ACCC used its information-gathering powers to obtain the investor's records of trades conducted on a number of identified days. It was only possible to identify the true date of a trade from invoices and communications at the time the trade was struck.

The ACCC found that less trades were actually concluded on the identified days than the published approval date on a register suggested. ACCC analysis indicated that the length of time between a trade occurring and being approved by the relevant authority can vary significantly (see chapter 10). The variation can be due to a range of factors, including the time taken to pay the invoice.

The ACCC considers that the publication of strike dates (being the date the trade was agreed/occurred) on State Basin registers for all transactions would improve market confidence by assisting stakeholders to assess market activities and avoid misinterpretation. It is also relevant to understanding the volume of water available in the markets on any given day. The ACCC notes that Victoria and NSW have commenced collecting information on trade types and strike dates. South Australia is also currently investigating opportunities to implement similar changes as part of a broader initiative to modernise South Australian water management and registry systems. This is discussed in more detail in chapter 11.

6.4 The analysis suggests that investors were not holding water allocations for long periods of time

The ACCC examined whether the investors held the water allocations they purchased or received as seasonal allocation for long periods of time during the year. In particular, the analysis sought to ascertain whether investors had withheld water from the market for long periods of time, before releasing it at times of high prices.

The ACCC used water account data obtained from the Basin States for the period 1 July 2016 to 30 November 2019 to create a consolidated list of all credit and debit entries for all water accounts in the Southern Connected Basin.

The credits took the form of carryover water, seasonal allocation and any allocation traded into the account. The debits included usage and any allocation traded out of the account.³¹³ All movements of water within an account were considered on a first in – first out basis. That is, older credits were debited first from any account. In this analysis, movements of water between accounts of the same entity (internal transfers) also appeared as credits and debits.

The ACCC examined the holding times and volume of water allocation held by five investors in their accounts. They were the four large investors and one of the highly active, small investors. Overall, these five investors did not tend to keep water in their accounts for long periods of time. The ACCC observed that 60% of all water held in their accounts was held for less than 30 days, with 75% of all water being held for less than 60 days during the analysis period.

The ACCC observed differences between investors reflecting their different trading strategies. The more heavily involved in buying and selling water allocations an investor was, the shorter their holding periods, compared to other investors less engaged in purchasing temporary water allocations. In

³¹³ The Basin state account data include positive and negative adjustments which remain in the dataset used for this analysis.

periods when an investor was less actively purchasing water allocations in the temporary market, the average holding period of the water in its account increased.

The ACCC notes that investors only realise their profits (that is, convert 'book' profits into cash) by disposing of water allocations held in their accounts. This includes committing water in advance through leases and forwards, and selling uncommitted water.

The ACCC also examined the water holding patterns of the investors when prices were high. This analysis sought to address the concern that investors were withholding water for longer periods to increase prices and only selling once prices were higher.

This analysis considered all water allocation sales conducted on days with a volume weighted average price in the top 10% for each year. The analysis then identified the holding period for each parcel of water that was sold and combined this data.

The analysis showed that at those times of higher prices during a year, 60% of the water traded out by investors had been in their accounts for less than 15 days, 68% for less than 30 days and 80% for less than 60 days.

The analysis suggested that at times of high water prices, the holding times of the water that was traded out by investors tended to be shorter. This suggested that investors turned over water in and out of their accounts more quickly at times of high prices.

6.5 The ACCC did not find evidence of investors exercising market power

Stakeholders raised concerns about the competitive dynamics of water markets and the ability of large investors to influence market prices. The ACCC analysed the 2018–19 Basin State trading data to establish if the investors were capable of exercising market power to influence water market prices.

A firm's market power comes from a lack of competitive constraint. Such a firm is able to act with a degree of freedom from competitors, potential competitors, suppliers and customers in choosing what they sell, when and for how much. A firm with market power may be able to influence the price it receives in ways that other firms cannot (for example, by changing the volume it trades). In contrast, a firm without market power has no control over the market price for its goods or services (that is, it is a 'price taker').

6.5.1 Is there potential for large market participants to exercise market power?

In any market, the potential for market power depends on the characteristics of supply and demand. Putting aside carryover, the total volume of water available to be used each year is largely inelastic. That is, over a very large range of prices the total volume of water available does not increase when water prices increase.

In contrast, the demand for water is more elastic over part of the price range. When the price of water is low, irrigators may find it profitable to plant water-intensive annual crops such as rice. However, as the price of water increases, these farmers would be expected to reduce their plantings or not plant. However, permanent plantations require a similar volume of water each year to sustain and develop the trees. As a result, above a certain price, the demand for water is likely to become particularly inelastic.

This point is set out in a submission from Ricegrowers Limited:

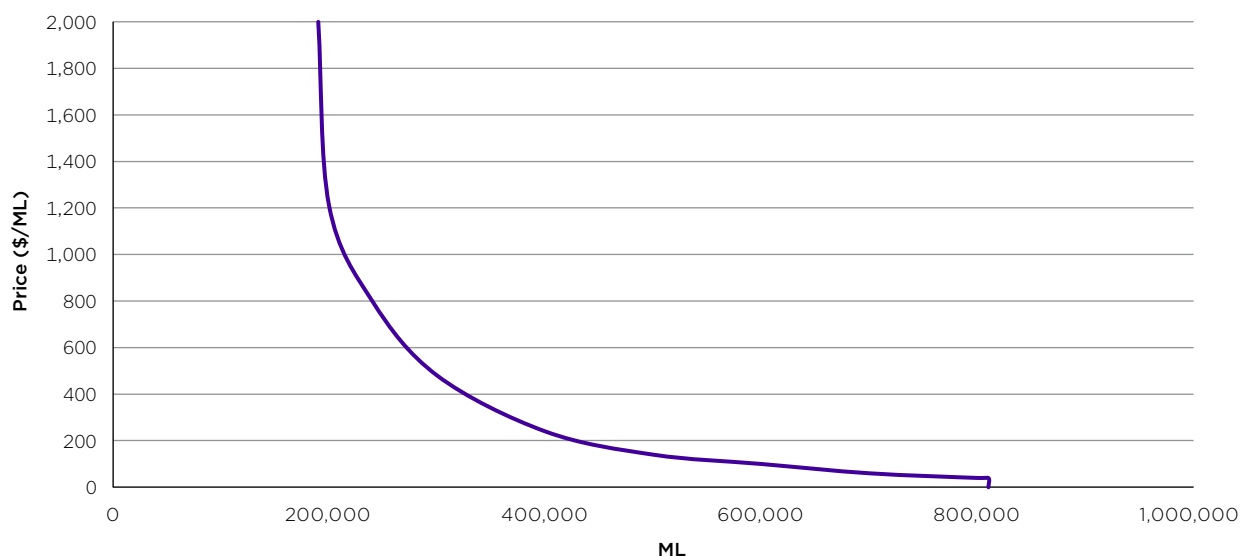
Agribusiness enterprises that involve permanent plantings (such as tree nuts) involve significant upfront capital commitment to establish an orchard, and then require the operator to ensure sustained water supplies for the life of the trees (which may be a 10 to 12-year investment) in order to realise appropriate returns. This means that unlike an annual crop (for which water demand is determined on a year-by-year basis), a tree nut operation

is committed to very similar annual water usage over the life of the plantation, irrespective of the commercial returns available in a given year.³¹⁴

This analysis is further supported in industry-estimated demand curves. Figure 6.1 below shows a demand curve for water in fruit and nut plantations, as estimated by Aither. Writing in February 2016, Aither notes:

Current and expected future almond prices are sufficiently high that growers are prepared to pay extremely high water prices to ensure the survival of the plantings. At land values in excess of \$50,000 per hectare for established almond orchards, growers would be prepared to pay over \$3,000 per ML for water allocations.³¹⁵

Figure 6.1: Estimated annual water demand for fruits and nuts in the Southern Basin, 2013-14



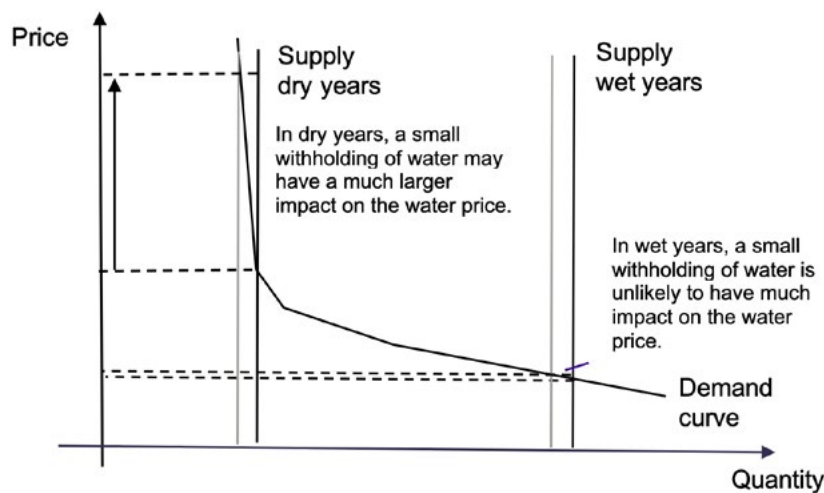
Source: Reproduced by the ACCC from Aither 2016, Aither estimates

The combination of inelastic demand and inelastic supply at times of tight supply-demand conditions implies that the price may increase substantially with only relatively small changes in water supply. This potentially gives rise to opportunities to exercise market power. At times when the supply-demand balance is tight, a market participant with even a relatively small share of the total water allocation may be able to profitably increase prices by withholding water from the market. Figure 6.2 illustrates how an exercise of market power could increase the price of water in dry or drought years.

³¹⁴ Ricgrowers Ltd, *Submission to the ACCC inquiry into water markets in the Murray Darling Basin Issues Paper*, 20 December 2019, p. 15-16.

³¹⁵ Aither, *Contemporary trends and drivers of irrigation in the southern Murray-Darling Basin*, RIRDC Publication No. 16/07, February 2016, p. 43.

Figure 6.2: Impact of market power on the price of water allocations in wet and dry years



In a wet year, the water price is expected to be low and is likely to be largely unresponsive to changes in supply. As a consequence, even very large water suppliers are not likely to have market power at such times and attempts to withhold large amounts of water from the market will not have much effect on water prices. In contrast, in dry or drought years, the water price is expected to be higher and is likely to be sensitive to small changes in water supply. At such times, even water suppliers with a relatively small market share (10% or less) could, in principle, exercise material market power by withholding a volume of water from the market to drive up the price, denoted by the arrow in the chart above.

In principle, a water trader seeking to exercise market power would withhold a volume of water from sale to generate scarcity. This could be profitable for the water trader if the higher price received for the sales of the remainder of the water holding outweighed the loss of revenue from the withholding (and potentially the lower price received when that water is sold at a future time). One of the consequences is that the exercise of market power in the water market is likely to have the effect of increasing the price variation between wet years and dry years.

The ability to store water or carry over water from one year to the next likely diminishes the incentive and ability to exercise market power. Entitlement holders usually have some ability to carryover water from one water year to the next. There are also carryover parking products available for market participants to access carryover space of other entitlement holders. If water allocation holders expect the following year to be a dry year and therefore prices to be higher, they are likely to carry over some water from the current year. This effect is stronger the higher the price is expected to be in the following year. Carryover increases the supply of water in dry years when prices would be higher, thus increasing the elasticity of supply in dry years. Therefore, carryover would have the effect of lowering prices in the dry year (compared to what prices would otherwise be without carryover) and moderating price fluctuation between the years. The effect of carryover is typically to dampen the ability of a water trader to exercise market power.

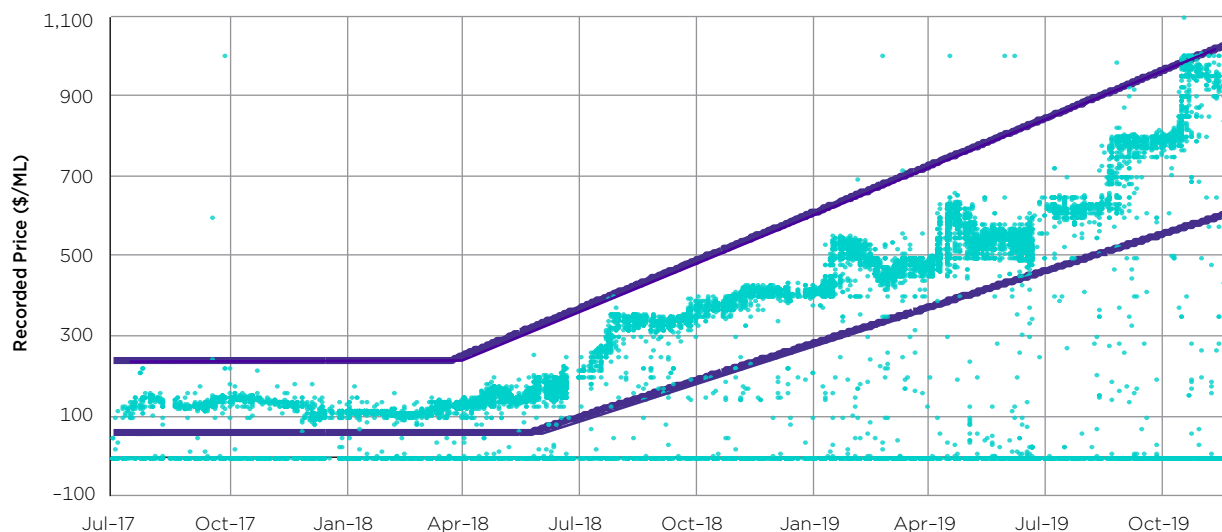
6.5.2 Have the investors exercised market power?

To look for evidence of market power, the ACCC reviewed the Basin State water allocation trade data for the Southern Connected Basin for the period 1 July 2017 to 30 November 2019. The ACCC concentrated on zone 7 (Vic Murray–Barmah Choke to SA Border) which had been the focus of concern by stakeholders. This zone had seen a large increase in permanent plantings, especially almonds. Over the course of this period, the water price was steadily increasing.

Although many trades clustered in a tight price range, a large number of trades occurred with reported prices outside this range, as shown in figure 6.3. This reflects how the Basin State datasets record a range of different transaction types as explained in section 6.3. However, there is a clear pattern of trades clustered around what appears to be a typical, increasing market price. In order to clean up the

data, all trades that lie outside the upper and lower bounds indicated in figure 6.3 were discarded. The remaining trades formed the dataset for the analysis in this section.

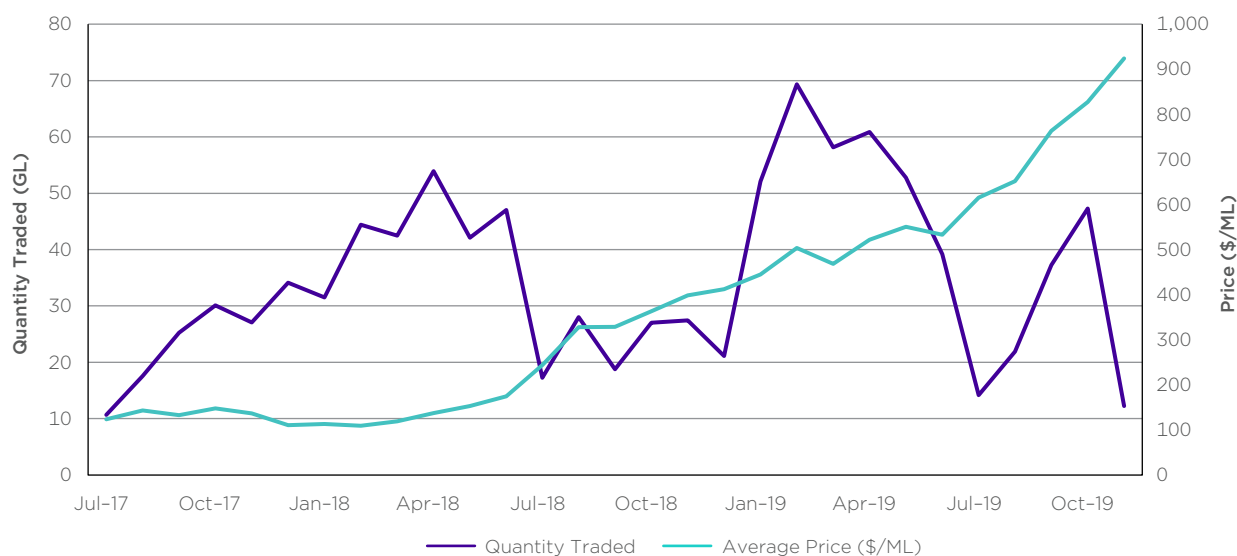
Figure 6.3: Allocation trade prices in zone 7 – July 2017 to November 2019



Source: Victorian Government response to a voluntary information request. Upper and lower bounds chosen by ACCC. Recorded prices are in nominal dollars.

Figure 6.4 shows the total volume of allocation trades and the average price for each month during this period. Traded volumes tended to increase in the second half of the water year, with the peak during this period in the second half of the 2018–19 water year. As noted above, the water price for water in zone 7 was increasing over this period.

Figure 6.4: Monthly allocation trade volumes and average prices



Source: Victorian Government response to a voluntary information request. Average prices are in nominal dollars.

To examine whether or not there was evidence of market power in the Southern Connected Basin, the ACCC carried out two different analyses using the above dataset:

- The first analysis looked at whether there is any evidence that one large investor who was also a large trader had some impact on the allocation price in its short-term trading activity. This analysis looked at the water trades in each month in isolation, to explore whether, at times of high water demand, one large investor could have some impact on the water price.

- b. The second analysis explored whether or not a water seller was able to obtain a dominant position in the market for water in zone 7 during this period – in other words, whether or not throughout this period the largest buyers of water always faced a range of competing sellers.

The ACCC notes that the large investor was both a buyer and seller in all months of the 2018-19 water year. During the first half of the water year when water prices were lower it was a net buyer, accumulating water allocations, but it maintained an active role as a seller. During the second half of the water year when water prices were higher, it was a net seller, but it continued to act as a buyer.

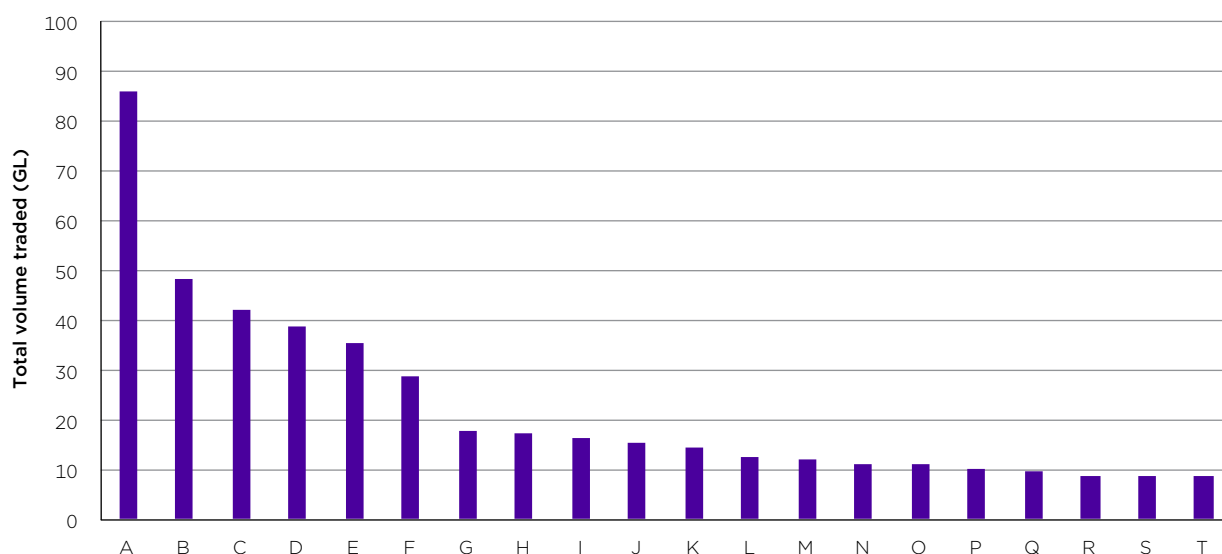
As noted in chapter 5, the data indicates that the large investor consistently pursued a strategy of purchasing a large number of small volume water allocations, aggregating these water holdings and selling them as large parcels. On average, the large investor earned a small margin on these transactions.

In regard to the first analysis, the ACCC estimated the short-term demand curve faced by the large investor each month during the 2018-19 water year by looking at the price-quantity combinations reflected in the trades approved each month. The analysis found that the demand curves faced by the large investor were almost entirely 'flat' which suggested that the large investor was a price taker on the volume purchased and sold over short time periods (a month). There is no evidence that the large investor had influence over the water price in the short term.

The ACCC then examined whether a large water seller would be able to affect market price over a year by withholding water. To this end, the ACCC examined the activities of large sellers.

The 20 largest water sellers collectively accounted for 45% of all the water traded in zone 7 over this period. The four large investors and some small investors were among the largest sellers. One large investor was the largest seller by a substantial margin, but still only accounted for a small share of the total water sales in this zone.

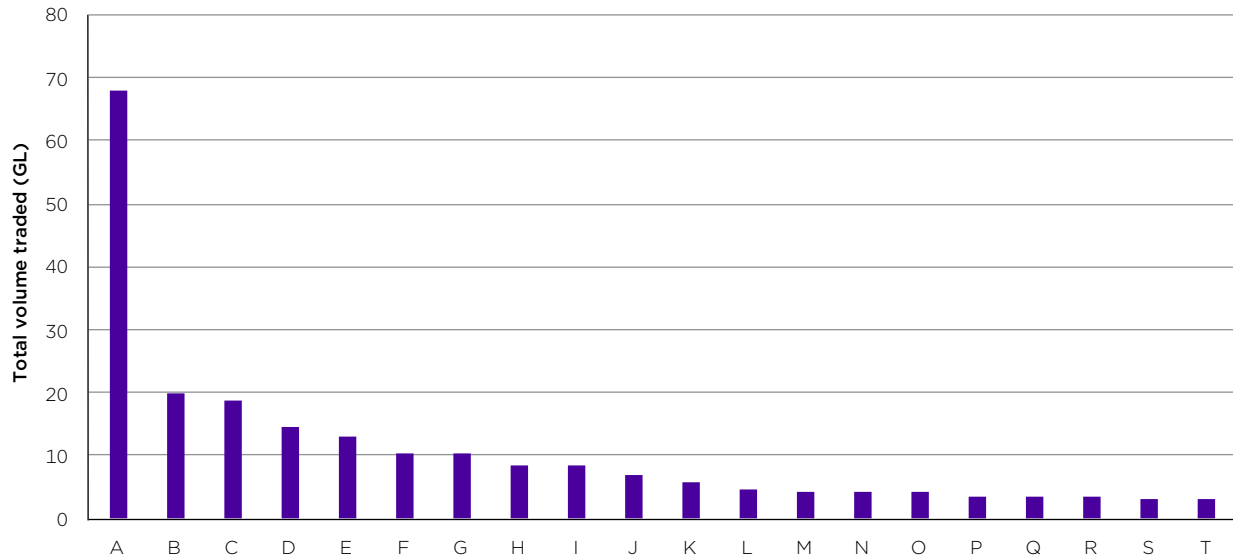
Figure 6.5: Largest 20 sellers into or within zone 7 – 1 July 2017 to November 2019



Source: ACCC analysis based on the Victorian Government's response to a voluntary information request and s. 95ZK responses.

Restricting the analysis to the 2018-19 water year, the large investor was the largest seller by an even greater margin. The other large investors and one small investor were present in the top 20 sellers in 2018-19.

Figure 6.6: Largest 20 sellers into and within zone 7 – 2018-19 water year

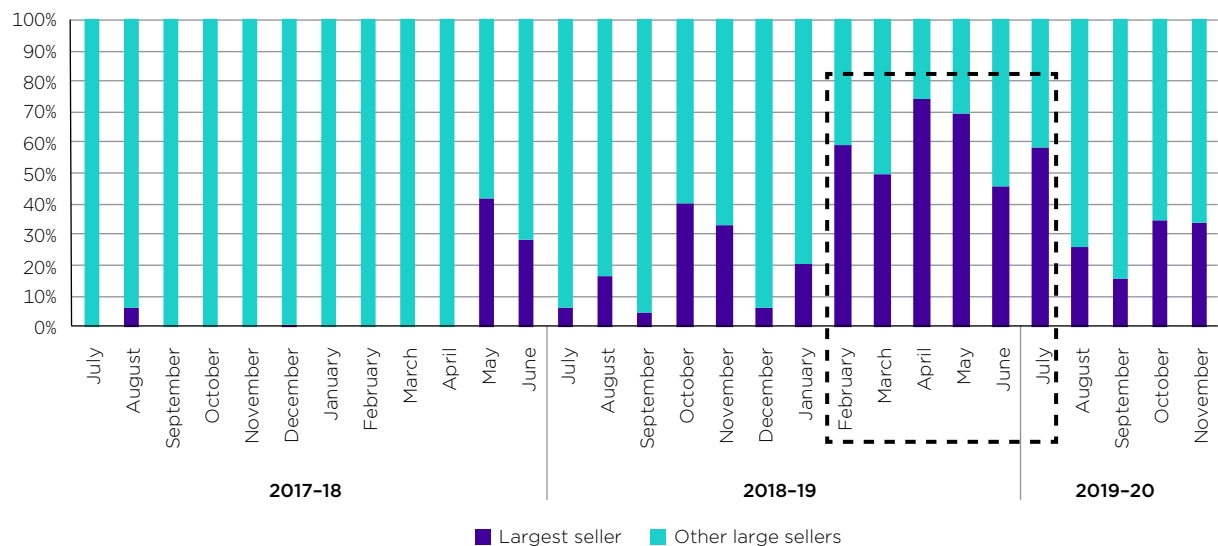


Source: ACCC analysis based on the Victorian Government's response to voluntary information request and s. 95ZK responses.

The ACCC further examined the share of water sold by the 10 largest sellers in zone 7 by month over the period 1 July 2017 to 30 November 2019.

Figure 6.7 shows the share of the largest seller relative to the total volume sold by the ten largest sellers into or within zone 7 each month during the period 1 July 2017 to 30 November 2019. The data shows that in the period from February to July 2019, the large investor was more prominent than any other large sellers.

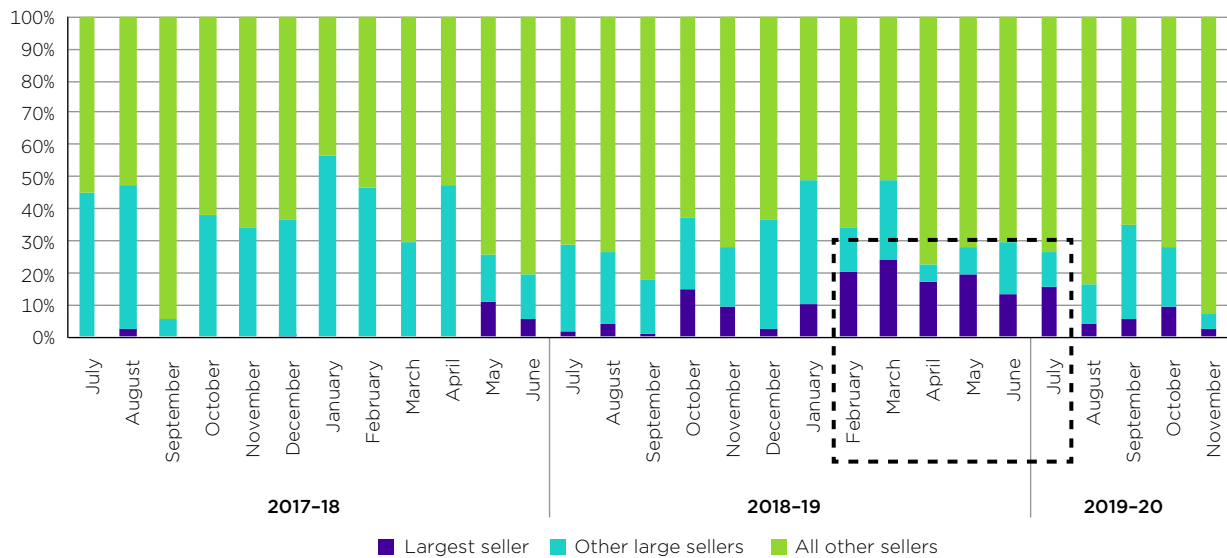
Figure 6.7: Share of volume sold by the 10 largest sellers into and within zone 7 – July 2017 to November 2019



Source: ACCC analysis based on the Victorian Government's response to voluntary information request and s. 95ZK responses.

However, as shown in figure 6.8, the large investor still had a relatively low share of the total sales into or within zone 7. At all times during this period, there were many other sellers of water in zone 7. Even though the large investor was a large market participant, it was still competing with many other sellers at all times.

Figure 6.8: Share of large sellers in total volume sold by all sellers into or within zone 7 – July 2017 to November 2019

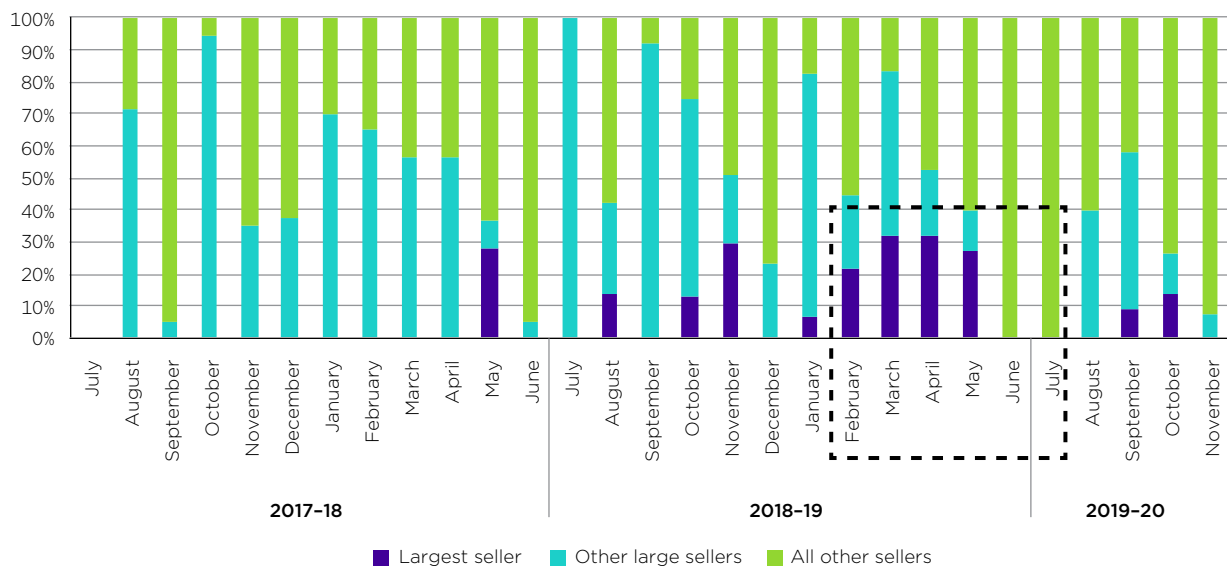


Source: ACCC analysis based on the Victorian Government's response to voluntary information request and s. 95ZK responses.

The ACCC also considered the issue from the buyer side to determine whether large buyers of water may have been exposed to a degree of market power because they can only buy water from a limited group of sellers.

The ACCC identified in the dataset the five largest buyers of water in or within zone 7 that were water users. These were all agribusinesses with permanent plantings, four of them being almond growers. During the period February to July 2019, when the large investor was the single biggest seller of water in zone 7, the large investor accounted for no more than 32% of the water allocations sold to these five large buyers, as set out in figure 6.9.

Figure 6.9: Shares of sales to the five largest water-user buyers in zone 7



Source: ACCC analysis based on the Victorian Government's response to voluntary information request and s. 95ZK responses.

During the second half of the 2018-19 water year, the five largest buyers transacted with many different sellers. For each of these large buyers, the majority of the water purchased came from sellers other than the one large investor. In other words, at all times during the period examined, even the largest buyers had a choice between competing sellers of water. There is no evidence that these large buyers were

ever forced to trade with the one large investor or any one of the other water sellers. One of the large buyers did not purchase any water from the large investor.

Similarly, the data does not suggest that the large investors were withholding water in zone 7 in the second half of 2018–19 to increase prices. While one large investor was a net buyer of water allocations in the first half of the 2018–19 water year, it was a larger net seller in the second half of the year. As indicated in chapter 5, the investors had large net transfers of water into zone 7 from other zones in 2018–19. Overall, this evidence is more consistent with the view that the large investor was responding to market prices across the 2018–19 water year (that is buying when prices were lower and selling when prices were higher) than withholding water in order to push up prices.

At the end of the 2018–19 water year, based on the seasonal determination outlook for the 2019–20 water year³¹⁶ it was likely that prices would rise further, and prices did continue to rise in the first half of 2019–20. In this circumstance, even a water holder without market power might seek to carry over some water into 2019–20. As indicated in chapter 5, the ACCC estimated that the large investors collectively carried over around 27GL into 2019–20, with some of the water committed to forward contracts in 2019–20. This behaviour is consistent with investors simply responding to market price signals and prior commitments.

One large investor was the largest water trader and did play a major role as a water seller in the second half of 2018–19, however there remained a large number of competing suppliers of water.

Overall, the analysis of trading data in zone 7 did not find evidence that any investor was able to exercise market power, or engage in withholding of water to increase prices. The data is more consistent with the increase in prices being due to limited inflows and increasing water scarcity with more inelastic demand over this period.

6.6 The ACCC examined whether price manipulation and other harmful conduct occurred

The ACCC utilised the framework of common misconduct patterns outlined by the Fixed Income, Currencies and Commodities (FICC) Markets Standards Board (FMSB)³¹⁷ to analyse trade data for possible signs of misconduct or manipulation. The framework includes seven broad categories of behaviour indicative of:

- price manipulation
- inside information
- circular trading
- transactions meant to influence other assets or prices
- collusion
- improper order handling or failing to act in the best interest of clients
- misleading customers.

These behaviour patterns identify core behaviours which occur most frequently in market misconduct cases. Market misconduct can harm market integrity, efficiency and fairness.

To respond to the concerns raised, the ACCC focused its analysis on price manipulation, inside information and collusion. The analysis mostly used exchange platform data which provides the date and time of trades. This was to respond to stakeholders' concerns that investors have used exchange platforms to manipulate market prices.

316 Northern Victoria Resource Manager, Northern Victorian Resource Manager updated 2019–20 seasonal determination outlook, 15 May 2019, <https://nvrn.net.au/outlooks/historical-outlooks/2019-20-season/outlook-15-may-2019.html>, viewed 13 January 2021.

317 FICC Markets Standards Board, *Behavioural cluster analysis – Misconduct Patterns in Financial Markets*, July 2018, https://fmsb.com/wp-content/uploads/2018/07/BCA_v32_1.pdf.

6.6.1 Platform activities

Investors' participation

Analysis of platform data from the six exchange platforms over the period 1 July 2017 to 31 December 2019 indicated that institutional investors were responsible for 11% of all transactions and 10% of the volume of on-platform trades. Institutional investors comprised the large and small investors examined in chapter 5.

One large investor was the most prevalent trader across all exchange platforms. It tended to buy much more on-platform than it sold (in terms of volume and number of transactions). Conversely, it tended to sell much more off-platform than it bought. Its participation rates also varied across water years. It was a larger buyer on exchange platforms over 2018-19 than it was in 2017-18 or 2019-20. In 2018-19, it purchased a significant volume of the water that was available on exchange platforms in zones 7, 11 and 13.

Other large and small investors were also present on these exchange platforms. They had substantially lower participation rates and did not tend to utilise all exchange platforms. However, the ACCC observed that small investors can be quite active traders. One of the small investors had a higher participation rate across the exchange platforms than three large investors.

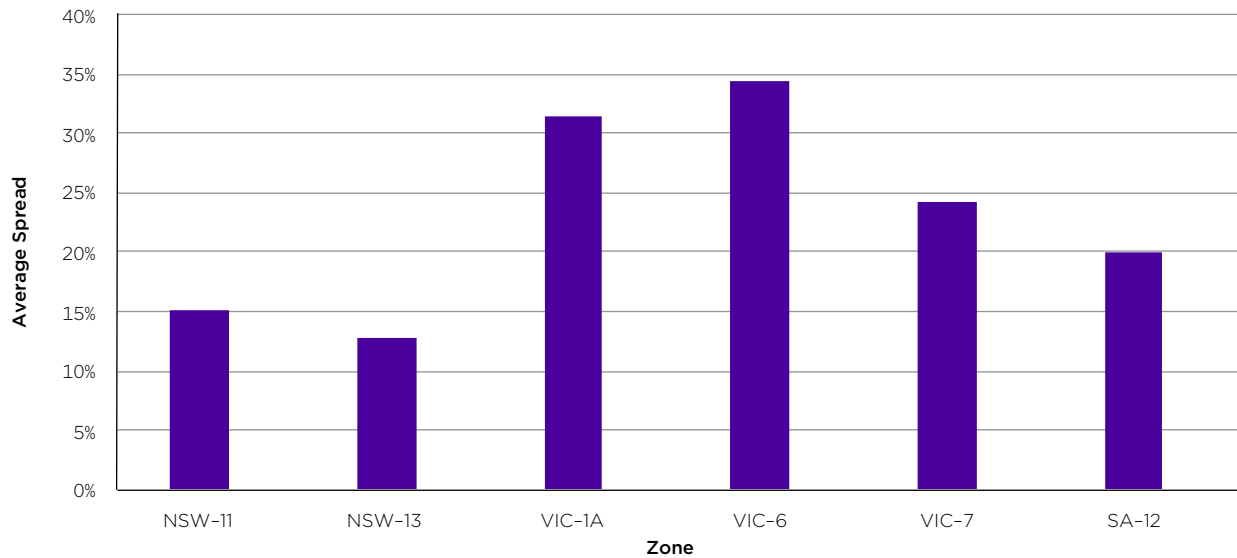
Bid-offer spreads on exchange platforms

The ACCC calculated the market spreads, being the difference in price between the buy orders (bids) and sell orders (offers), on the Waterexchange platform over the period 1 July 2017 to 31 December 2019.³¹⁸

The market spreads were wide. The ACCC estimated that the average market spread across the major zones on Waterexchange was 23%. In addition, considerable variations existed between zones. Figure 6.10 summarises the time-weighted average spreads for the major trading zones. Zone 11 (NSW Murray below Barmah Choke), zone 12 (SA Murray) and zone 13 (Murrumbidgee) exhibited the smallest spreads of 13 to 20%, while zone 6 (Victoria Murray – above Barmah Choke) and zone 1A (Goulburn) had much wider spreads (31% and 34%).

³¹⁸ All spreads over the period 1 July 2017 to 31 December 2019 were collated and all small volumes (less than 50 ML) were excluded. Market spreads are expressed as a percentage of the prevailing mid-point price. Bids and offers are exclusive of fees. Market spreads for each zone were calculated on a time-weighted basis. Every quoted spread that contributed to a zone average was weighted by its period of observation. For example, if the duration of a particular spread was short then it would be given less weight than a spread that existed for a longer period of time. A single market spread across the zones was then calculated on a volume-weighted basis. Each zone spread that contributed to the market average was weighted by the volume of on-platform trading in that zone.

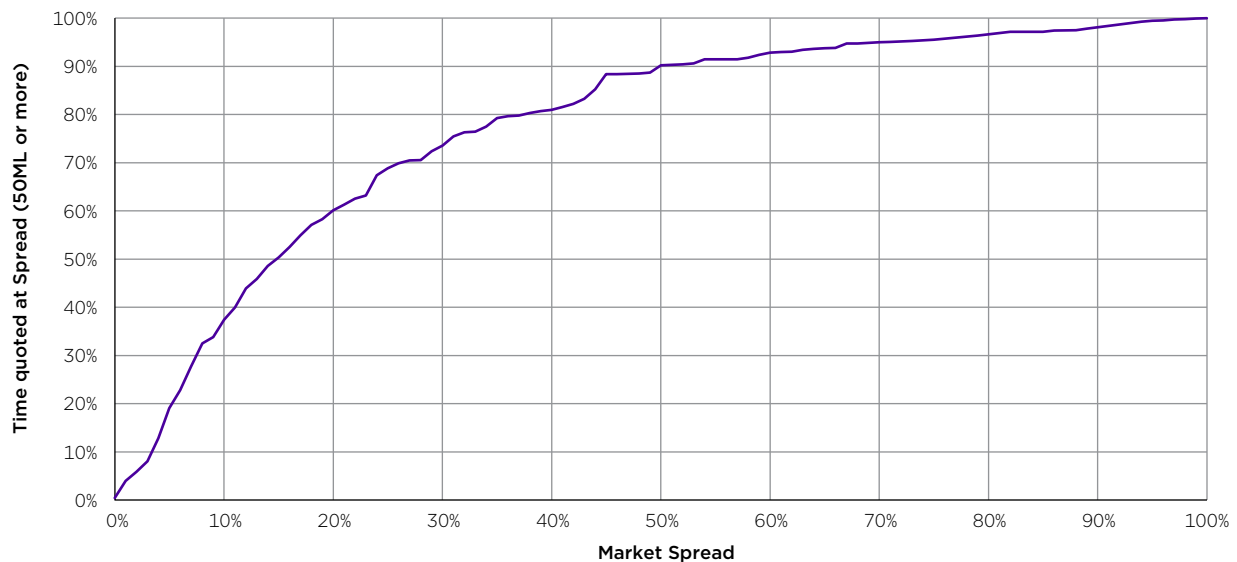
Figure 6.10: Market Spreads on Waterexchange, by zone, 1 July 2017 to 31 December 2019



Source: ACCC analysis based on s. 95ZK response.

Figure 6.11 shows the cumulative distribution of the observed market spreads on Waterexchange over the period 1 July 2017 to 31 December 2019.³¹⁹ The data suggests that 37% of the time, the market spreads on this platform were 10% or less; and 60% of the time, the market spreads were 20% or less. However, at times the bid-offer spreads were much wider. The tail of the distribution in figure 6.11 suggests that 20% of the time, the bid-offer spreads (across all zones, and for buy orders and sell orders exceeding 50 ML) were greater than 38%.

Figure 6.11: Cumulative distribution of market spreads



Source: ACCC analysis based on s. 95ZK response.

³¹⁹ Observations were restricted to buy orders and sell orders of at least 50 ML.

The wide bid-offer spreads reflected the poor liquidity of water allocation markets. Large movements in water prices may occur when one trade occurs at the buy order price and the following trade occurs at the sell order price. Argyle Capital Partners noted in its submission that two irrigators that purchase on the same day in the same zone may trade at very different prices, depending on their willingness to 'cross the spread' (that is, one buyer purchasing at the sell order price, and the other waiting for a seller to accept the buy order price).³²⁰ Such discrepancies in outcomes may be best attributed to poor liquidity rather than trader misconduct.

6.6.2 The ACCC did not find evidence of price manipulation

Broadly, price manipulation is conduct which has resulted in a price that does not reflect genuine forces of supply and demand. It generally includes creating or maintaining an artificial price.

The ACCC examined participant conduct against the FMSB common behavioural patterns of misconduct. This included patterns of price manipulation often referred to as squeezing, ramping and spoofing.

Squeezing

Squeezing would involve an investor purchasing water allocations to obtain a sufficient volume with the intention of increasing or maintaining prices, and profiting from those activities as others are forced to purchase from that investor at inflated prices.

As indicated in previous sections, collectively the four large investors purchased and sold water throughout the 2018–19 water year. One large investor was the largest buyer and seller during that year. There is no evidence that it reached a volume sufficient to manipulate prices. In contrast, there is evidence that in months when it was significantly the largest seller, other buyers continued to have a choice of alternate water sellers.

Purchasing water allocation on allocation announcement days

More specific concerns were raised by stakeholders that large investors had placed substantial allocation buy orders on key allocation days in order to maintain prices, thus effecting a squeeze.

To examine this concern, the ACCC analysed the allocation buy orders and trades on four exchange platforms.³²¹ For this analysis, the ACCC focused on buy orders and trades in zones 1A, 6, 7 and 11 during the 2018–19 water year, and on allocation announcement days where there was an increase in water allocation plus the two days before and after the announcement.

In the zones analysed, the ACCC did not find that any market participant routinely placed substantial allocation buy orders on a platform on allocation announcement days, and did not find systematic purchasing of water allocations in the two days prior or following an allocation announcement. Generally, on each of the allocation announcements analysed, there were different market participants placing buy orders to purchase water.

The ACCC did observe that on some allocation announcement days, on one platform in zone 7, one large investor purchased a significant proportion of the total volume traded on that day. However, the total volume of buy orders placed on the platform on these allocation announcement days varied significantly. On other allocation announcement days, the large investor either purchased no, or a very small proportion of the water available in zone 7. Overall, the investor's purchasing activity around allocation announcements did not appear to be different from its strategy for purchasing water on other days.

320 Argyle Capital Partners, *Submission to the Murray–Darling Basin inquiry interim report*, 13 November 2020. .

321 Waterexchange; H2OX; Waterpool and Waterfind.

Spoofing

Spoofing is a form of fictitious trading. It is generally characterised as the placing of orders with the intention to cancel those orders prior to them being filled. The purpose of this manipulation strategy is to seek to induce or influence the buy order or sell order price level.

The ACCC examined order-to-trade ratios across a number of platforms. An order-to-trade ratio measures how many orders are placed on platforms against the resultant number of trades. Orders include all buy order and sell order submissions, amendments and cancellations posted onto a platform.

A high order-to-trade ratio is an indication of possible spoofing. The repetitive submission, amendment and cancellation of orders may influence prices to levels that are not reflective of genuine demand and supply. A high order-to-trade ratio is an indication that an account may attempt to influence prices by creating a false impression of activities.

Platform data shows that order-to-trade ratios for the largest trading accounts were consistently low. These traders had order-to-trade ratios that were consistently below 2:1. Their orders tended to remain on the platform and were static once posted. The platform orders were not removed with any strategic intent to avoid trading.

The platform data shows that there were some accounts with high order-to-trade ratios. In general, accounts with high order-to-trade ratios tended to belong to smaller individual water traders that traded occasionally. These individuals tended to trade in one direction (only buying or only selling) and their order amendments were likely associated with market inexperience or caution. This was not indicative of a purposeful strategy to influence price.

Ramping

Ramping refers to the actions of a market participant designed to artificially increase prices through the impact of its own trading.

The ACCC examined the trading activities of one large investor using data from five exchange platforms.³²²

As noted in subsection 6.5.2, the data shows a regular pattern of multiple smaller purchases against a small number of larger volume sales. The data also shows occasions of concentrated purchases on a single day.

The ACCC examined whether concentrated purchases by the large investor were driving up prices. The ACCC observed in the data concentrated purchases in a single day when prices were increasing, but also when prices were decreasing or remained level. This suggested that the purchasing behaviour of that investor was not causing prices to increase.

³²² Waterexchange, H2OX, Waterfind, Waterpool and Murray Irrigation's Water Exchange.

Analysis of anomalous price movements

To seek to identify potential price manipulation, the ACCC also looked for anomalous price movements (or price spikes) in on-platform trade data across the six platforms over the period 1 July 2017 to 31 December 2019.

A price spike would suggest that trading is suddenly moving to a different level. It could be an indication of price manipulation because of the action of a market participant seeking to induce others to trade at a certain level or attempt to force an artificial price.

The ACCC identified the largest 5% of all observed price movements as price spikes.³²³ The ACCC then examined the categories of market participants that were responsible for these price spikes. The ACCC also examined the counterparties to these transactions. That is, which category of market participant was selling water when a buyer pushed prices up, and was buying water when a seller pushed prices down.

Institutional investors were responsible³²⁴ for 7% of the price spikes observed in the data, which was below their underlying on-platform participation rate of 11%. However, investors had a greater participation as a counterparty to price spike transactions, with 13% of all observed instances, in particular in transactions where prices spike down.

One large investor was the single largest contributor to price spikes overall. However, its contribution was less than its overall participation rate in on-platform trading.

A large investor and a small investor were the largest counterparties to price spike transactions, much more when price spiked down. These were discretionary traders who can time their purchases opportunistically. The data suggested they were more able to respond to opportunities in the form of low priced offers.

The ACCC examined each price spike a large investor was responsible for in the context of the surrounding transactions to identify whether manipulation concerns were present. The ACCC observed that many price spikes up followed a trade by another party at a low price outside the trading range, and were followed by trades within the trading range. The ACCC did not identify conduct of concern.

Market participants could misinterpret a price spike if they only observe prices on one platform. For instance when the ACCC identified price spikes in the Waterexchange trade data, it found that for 31% of these price spikes there had in fact been trades at intervening pricing points on other platforms.

³²³ A price spike was identified as a move in price that exceeds the 2 standard deviation mark. This would correspond to the largest 5% of all observed price movements. To ensure that changes in the water price over the period did not influence the calculation, the standard deviation was recalculated over a rolling 3 month period.

³²⁴ The party responsible for the price spike is the buyer when prices spike up and the seller when prices spike down.

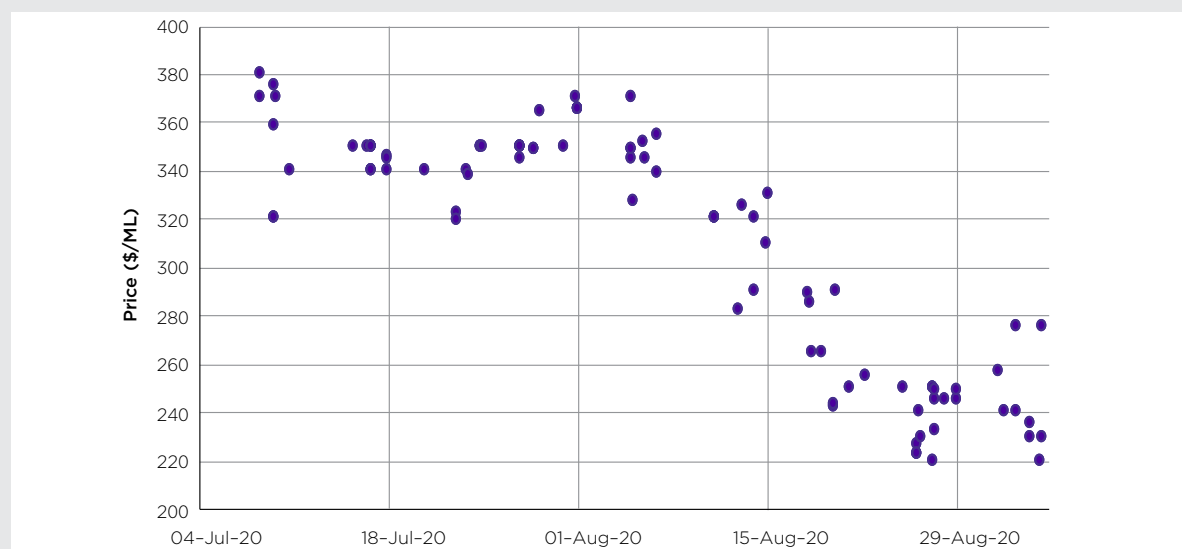
Box 6.1: Case Study

Concern about price spike in zone 7 on 7 September 2020

Concerns were raised with the ACCC regarding an apparent \$50 increase in the price of water allocation available to purchase in zone 7 on one exchange platform, between Friday 4 September 2020 and Monday 7 September 2020. The ACCC was advised that water had been available to purchase at around \$230–\$250 per ML on the Friday, and had risen to \$285–\$300 per ML on the Monday for no apparent reason.

Figure 6.12 shows that prices for on-platform trades on that platform for zone 7 were between \$320–\$380 per ML in July 2020, and then started to decrease in August 2020 reaching \$220 per ML. In the week beginning 31 August 2020, water was trading at the low end of the range between \$220 and \$240 per ML, with some isolated trades at close to \$280 per ML.

Figure 6.12: On-platform trades on one platform, zone 7, 1 July 2020 – 4 September 2020



Source: ACCC analysis based on response to a voluntary information request. Prices in nominal dollars.

With this context, water for sale priced at \$285–\$300 per ML on Monday 7 September 2020 may be against the decreasing price trend, but was not outside the recent trading price range.

The ACCC analysed the buy and sell orders on the platform for zone 7.³²⁵ On Friday, 4 September 2020 the price that market participants were offering to buy and sell water in zone 7 remained relatively static. The best (highest) buy orders were at \$221 per ML (for 200 ML). The best sell order was for 10 ML at \$240 per ML, followed by \$245 per ML for 135 ML.

By close of business on 4 September 2020 there were two parcels totalling 45 ML for sale at \$245 per ML. The next sell order was at \$295 per ML (limited to 30 ML); an increase of \$50 per ML. There was more volume offered for sale at around \$300 per ML and then \$350 per ML and above. By Monday 7 September 2020, the two sell orders at \$245 per ML had been removed from the platform, and water subsequently traded at around \$300 per ML, in line with the offers that were listed on 4 September.

The analysis does not indicate any misconduct behind the observed price spike on the one platform on 7 September 2020. The data suggests that the large recorded price movement was a result of low liquidity. Any market participant which needed water immediately and was prepared to 'cross the spread' and purchase the allocations available at around \$300 per ML would trigger a large jump in reported price.

³²⁵ In the data the ACCC obtained from this exchange platform, the buy order prices were inclusive of fees and the sell orders were exclusive of fees.

Examination of suspicious transactions and trading patterns

The ACCC also observed in the platform data a few transactions and transaction patterns that appeared suspicious. The ACCC obtained information and documents from the traders and was satisfied that the transactions did not raise concerns.

6.6.3 The ACCC examined concerns about inside information

In broad terms, insider trading involves trading in water products based on material information that has not been made generally available to all market participants and which can be expected to affect the price of the water product. Insider trading could be undertaken by a person employed by the organisation that has ownership of the information, but also by an external person who is informed by an insider either intentionally or inadvertently. The Basin Plan trading rules prohibit trading based on information about a water announcement that is not 'generally available' (rule 12.51, see subsection 9.10.4).

Allegation of insider trading prior to an announcement regarding trade through the Goulburn IVT

The ACCC examined a specific allegation of insider trading made to the inquiry. This allegation was in regard to an announcement on 20 August 2019 by the Victorian Government that the flow of water out of the Goulburn Valley would be reduced in order to better protect the environment³²⁶ (Goulburn IVT announcement). The Goulburn IVT announcement included an interim operational regime that limited variable summer flows in the Goulburn to levels well below then prevailing levels, to be implemented before the high-risk period began that summer.³²⁷

It was alleged that an investor used insider information on the Goulburn IVT announcement to purchase a significant volume of water on an exchange platform immediately prior to it being made public. The complainants considered these purchases by the investor meant allocation prices in the Lower Murray increased rapidly and resulted in a greater price difference between zone 1A and zone 7 or zone 11.

Considering the nature of the policy change, the ACCC would expect the price difference between zone 1A and zones in the Lower Murray to increase as less water would be able to be transferred out of zone 1A.

However, the Goulburn IVT was generally closed from 1 August 2019, so water could not be moved from zone 1A to zone 7 and the Lower Murray. This would have made it difficult for a market participant to benefit from trading on inside information if they purchased water in zone 1A.

If a market participant was trading on inside information then the ACCC would expect to see in the data unusual or large purchases in zone 7 or 11 (where prices would be expected to rise) before the Goulburn IVT announcement.

The ACCC used its information gathering powers to obtain documents relating or referring to the Goulburn IVT in August 2019 from large investors. The ACCC also examined the trading data from exchange platforms³²⁸ to determine whether there was trading activity of concern.

The documents obtained in relation to the Goulburn IVT did not indicate that these large investors had advanced information about the Goulburn IVT announcement. The documents, however, indicated that earlier in August some investors anticipated possible changes to the Goulburn IVT rule following the Victorian Water Minister's statement on 31 May 2019 that the Goulburn IVT rules would be reviewed by

326 <https://www.premier.vic.gov.au/inter-valley-trade-changes-protect-our-waterways>.

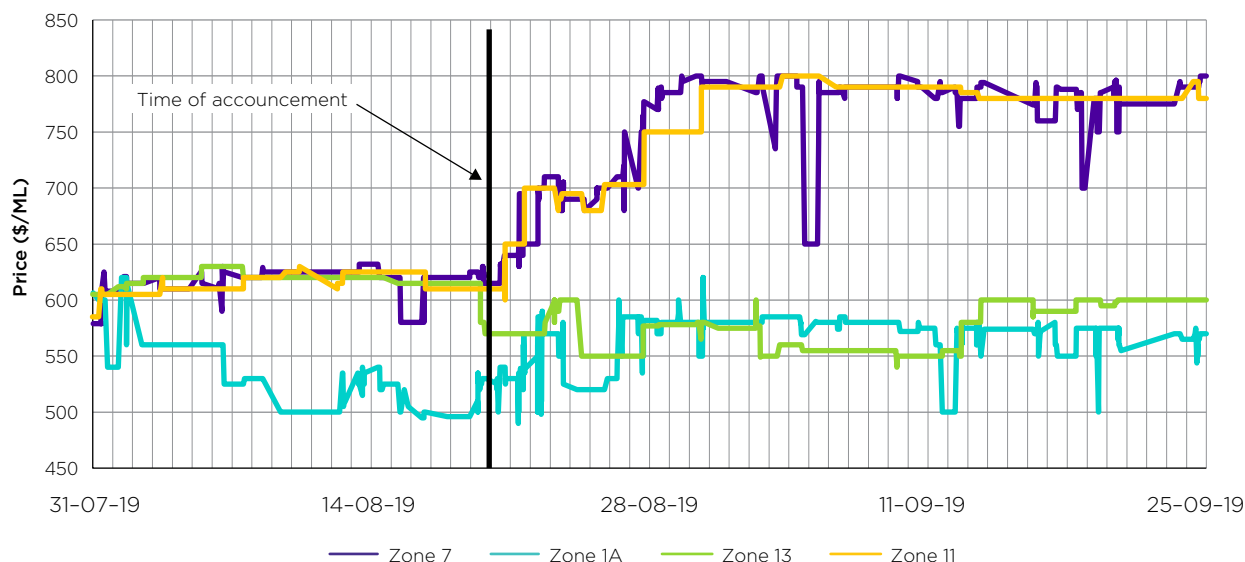
327 The announcement included three actions. The three actions were summarised as: (1) an interim operational regime that achieves variable summer flows in the Goulburn well below recent volumes, to be implemented before the high-risk period begins in summer; (2) ensuring that from December all trades from the Goulburn system, including water use from tagged accounts, will be treated consistently with Victorian rules for inter-valley trade and in line with the Basin Plan trading rules; (3) the start of public consultation in January next year about long-term options to change the current Goulburn to Murray trade rule to maximise trade opportunities within environmental thresholds.

328 The ACCC analysed data from three platforms – Waterexchange, H2OX and Waterpool.

the end of July 2019.³²⁹ Some investors also considered that entitlement prices would adjust to factor in any new Goulburn IVT restrictions.

Analysis presented in figure 6.13 shows the price of water in zones 7 and 11 increased by almost \$200 per ML over the subsequent ten days following the Goulburn IVT announcement, increasing the price differential with zone 1A.

Figure 6.13: Allocation trade prices on exchange platforms – August–September 2019



Source: Trade data from Waterexchange, H2OX and Waterpool. Prices in nominal dollars.

On 20 August 2019, one large investor did purchase a large volume of water via water exchange platforms; however, the purchases occurred **after** the Goulburn IVT announcement. The large investor purchased a large portion of this volume late in the day at increasing prices, particularly in zones 7 and 11. The large investor did not purchase water allocations in the preceding two days on exchange platforms.

The number of participants purchasing large combined volumes of water in zones 7 and 11 increased in the days following the Goulburn IVT announcement.

The data and documents obtained by the ACCC do not provide evidence that any large market participant traded on inside information in relation to the Goulburn IVT announcement.

Other concerns about insider trading

During consultation, the ACCC received a number of general allegations of insider trading involving parties other than investors.³³⁰

Stakeholders raised concerns about the conduct of some IIO companies or persons associated with IIOs, including insider trading around water allocation or enhancement announcements, and rule or policy changes.

The ACCC considered these concerns, but due to deficiencies in the available data the ACCC was unable to determine whether there was behaviour of concern. Without adequate and complete data, it would not be possible for any regulator to properly investigate allegations of insider trading.

³²⁹ <https://www.premier.vic.gov.au/water-market-improvements-northern-irrigators>.

³³⁰ Murray–Darling Basin Inquiry, Summary of virtual feedback sessions with stakeholders post interim report, 1 February 2021.

6.6.4 The ACCC examined concerns about collusion between a water broker and an investor

Concerns were raised with the ACCC about an investor and a water broker conducting a combination of zero dollar and priced trades between themselves for the purpose of colluding to manipulate market pricing. This allegation was investigated by the ACCC.

The ACCC firstly used Basin State data to examine the identified trades and a broader cluster of trades of the same nature. The ACCC then relied on its compulsory information gathering powers to obtain further information and documents about the cluster from both the investor and the broker. On closer examination of the relevant zero dollar trades, it became evident that the investor engaged the water broker to assist it to navigate the Goulburn IVT as the Victorian Water Register's Broker Portal enables water brokers to process IVT applications more efficiently than other market participants.

Noting these comparative advantages, the ACCC further examined whether the water broker gave the investor priority access for intervalley transfers. This does not appear to be the case. If the water broker was unable to transfer all of its clients' allocation through an IVT in aggregate, it gave priority to clients that had a genuine use for the allocation in the destination valley. Examining the specific transactions, the information indicated that not all the volume sought to be transferred by the investor was successfully transferred at each IVT opening. Ongoing IVT openings eventually allowed the broker to transfer the full volume of allocation between zones. The information and explanation were confirmed by Basin State data. The ACCC also established that what appeared to be preferential payment terms were in fact available to other market participants.

The ACCC also examined the specific priced trades and concluded that they did not raise concern. In these trades, the water broker's account was used to facilitate allocation sales from the trader to different accounts of a buyer, as requested by the buyer.

6.6.5 Conclusion

The ACCC did not find evidence of market manipulation and other market misconduct in Basin water markets over the period 1 July 2017 to 31 December 2019. The extensive analysis undertaken was a difficult, time consuming and resource intensive task in the absence of a single comprehensive, quality dataset of trading activities. The ACCC was only able to conduct its analysis by using its information gathering powers to obtain additional data from investors and exchange platforms to supplement the Basin State data. While there remains limitations in the data, the ACCC is confident in its analysis and findings.

Concerns about the conduct of investors in water markets have reduced irrigators' confidence in the integrity and fairness of the markets. While the ACCC was able to scrutinise market activities as part of this inquiry, this only provided a snapshot of the markets over a limited period of time.

The analysis has highlighted the need for significant improvements in the consistency and completeness of Murray Darling Basin water market data. This would better enable ongoing surveillance and regular reporting of market activities, with the ability to undertake investigations and take enforcement action if misconduct were identified. It would help to address the underlying concerns of many stakeholders, and restore confidence in water markets.

7. Agribusinesses' strategies and activities

Key Points

- The ACCC has examined the strategies and activities of 11 agribusinesses between July 2017 and November 2019. These agribusinesses were Auscott, Australian Food and Agriculture, AustOn, Boundary Bend, Brownport Almonds, Costa, MRA Merrowie, Select Harvests, Public Sector Pension Investment Board, Olam and Webster. These agribusinesses engaged in permanent horticulture, annual broadacre cropping and livestock management.
- The agribusinesses were large water users. In 2018-19, the agribusinesses used a total of 636 GL, with the water used by individual agribusinesses ranging between 21 GL and 174 GL. While the agribusinesses operate in many locations across the Basin, the Lower Murray (zones 7, 11 and 12) and Murrumbidgee (zone 13) accounted for a large proportion of the agribusinesses' water use.
- The agribusinesses employed diverse strategies to manage their water and financial risk. Among the agribusinesses with permanent horticulture, some owned sufficient entitlements to meet all or most of the water needs of their permanent plantings while others had made a deliberate choice to rely almost entirely on water allocation purchases. A number of agribusinesses employed more complex strategies utilising a diverse combination of water market products. Some of these agribusinesses were among the largest water purchasers in the Southern Connected Basin.
- As at 1 July 2018, the agribusinesses held in total (owned or leased) 197 GL of higher reliability surface water entitlements in the Basin. This included 144 GL in the Lower Murray which represented 9% of the higher reliability entitlements on issue in this area.
- All of the agribusinesses engaged with the water allocation markets. The agribusinesses were significant purchasers of water allocations, but not significant sellers.
- The agribusinesses accounted for 14% of the volume of water allocation trades-in (excluding zero dollar trades) over the period July 2017 to November 2019. During the first five months of 2019-20 when the Basin experienced continued dry seasonal conditions, the agribusinesses accounted for 24% of the volume of allocation trades-in. In November 2019, the agribusinesses accounted for 40% of the volume of allocation trades-in.
- The agribusinesses purchased 132 GL of water allocations in 2017-18, 150 GL in 2018-19 and 79 GL during the period from July to November 2019. One agribusiness purchased almost 23 GL of water allocations in a single month. When the agribusinesses entered the spot allocation markets, they purchased larger parcels than the market average, and even larger parcels from the institutional investors.

7.1 Introduction

The inquiry's terms of reference include consideration of the role and practices of market participants, including water brokers, water exchanges, investment funds and significant traders of water allocations and entitlements. This chapter examines the strategies and activities of agribusinesses in Basin water markets.

As set out in chapter 4, the ACCC has defined agribusinesses as larger agricultural corporations that engage in irrigated farming. As a group, agribusinesses hold large volumes of entitlements and engage extensively with water markets to undertake a mixture of agricultural activities in the Southern and Northern Basin. This includes using irrigated water for:

- permanent horticulture (such as fruits and nuts)
- annual broadacre cropping (such as cotton, cereals and legumes)
- livestock (such as growing pasture).

However, the level and type of entitlements held, engagement with water markets and commodities produced vary widely from business to business. To understand the strategies and activities of agribusinesses, the ACCC focused on the 11 companies (the agribusinesses) set out in table 1.

Table 7.1: Agribusinesses examined by the ACCC

Agribusiness	Description
Auscott	Auscott specialises in growing and processing cotton in the Namoi, Macquarie and Murrumbidgee water systems. Auscott is a subsidiary of the US-based company JG Boswell, although JG Boswell has sought expressions of interests for Auscott. ³³¹
Australian Food and Agriculture (AFA)	AFA produces a mix of cereal grains, oilseeds, legumes, rice and cotton in the NSW Murray and Murrumbidgee water systems.
AustOn	AustOn specialises in growing almonds in the Victorian and South Australian Murray water systems. AustOn is a subsidiary of the Canadian-based company Ontario Teacher's Pension Plan. ³³²
Boundary Bend	Boundary Bend is one of Australia's largest olive growers and producers of extra virgin olive oil. Boundary Bend owns 2.2 million trees on over 6,200 hectares in the Victorian Murray and Goulburn water systems. ³³³
Brownport Almonds	Brownport Almonds specialises in growing almonds, operating two orchards in the Victorian Murray water system.
Costa	Costa is one of Australia's leading growers, packers and marketers of fresh fruit and vegetables, producing a range of products including avocados, citrus and table grapes. ³³⁴ Costa operates properties throughout Australia including in the Victorian Murray and South Australian Murray water systems.
MRA Merrowie	MRA Merrowie produces a mixture of cereal grains, legumes and cotton. MRA Merrowie operates in the Lachlan water system. MRA Merrowie is a subsidiary of the US-based company MERS Global Investments. ³³⁵
Select Harvests	Select Harvests is one of Australia's largest almond growers and operates orchards in the Victorian Murray, NSW Murray, Murrumbidgee and Lachlan water systems. ³³⁶

331 Auscott, *News – Auscott*, 2020, <https://www.auscott.com.au/news>, viewed 20 January 2021.

332 Ontario Teachers' Pension Plan, *Infrastructure & Natural Resource Portfolio*, n.d., <https://www.otpp.com/investments/asset-groups/infrastructure/portfolio>, viewed 27 January 2021.

333 Bounday Bend Limited, *About Boundary Bend Limited*, 2019, <https://www.boundarybend.com/about/>, viewed 20 January 2021.

334 Costa Group, *Costa*, 2019, <https://costagroup.com.au/>, viewed 20 January 2021.

335 L Kiernan, 'Three NSW farms sold to U.S., Dutch investors for US\$89M', *Global Investing*, 9 April 2018, <http://www.globalinvesting.com/three-nsw-farms-sold-u-s-dutch-buyers-us89m/>, viewed 20 January 2021.

336 Select Harvests, *Our Company*, n.d., <https://selectharvests.com.au/our-company/>, viewed 20 January 2021.

Public Sector Pension Investment Board (PSP Investments)	<p>PSP Investments is a Canadian pension investment manager. PSP Investments owns or part owns four Australian entities. Two of these entities, Stahmann Farms and Australian Food and Fibre produce pecans and cotton in the Border Rivers, Namoi Valley and Gwydir Valley.</p> <p>In February 2020, PSP Investments acquired Webster Limited.³³⁷ Webster Limited merged with Stahmann Farms to operate as Stahmann Webster, producing walnuts, pecans, macadamias and almonds.³³⁸</p>
Olam Orchards Australia (Olam)	<p>Olam operates almond orchards in the Victorian Murray, NSW Murray, Murrumbidgee and Lachlan water systems.</p> <p>In late 2019, PSP Investments purchased Olam's permanent water entitlements. In a separate transaction, PSP Investments also purchased around 12,000 hectares of almond orchards which were owned by a third-party and leased to Olam.</p> <p>Both the land and water entitlements purchased by PSP Investments were leased back to Olam as part of a long term lease for 25 years, with an option to renew for another 25 years.³³⁹</p>
Webster	<p>Webster was one of Australia's largest producers of walnuts, supplying around 90% of Australia's walnuts. It also produced annual crops (including cotton, wheat and maize) and livestock (including sheep and cattle). Webster operated in the Murrumbidgee, Lower Darling, Barwon-Darling, Gwydir and Condamine water systems.</p> <p>In February 2020, PSP Investments acquired Webster. The purchase of Webster included approximately 150 GL of water entitlements.³⁴⁰ Webster now operates as Stahmann Webster.</p> <p>During the period examined by the ACCC, Webster was a separate entity, and has been considered as such for the purposes of the agribusiness analysis in this chapter.</p>

The ACCC used its compulsory information gathering powers under the CCA to obtain information and documents on the agribusinesses' water holdings, transactions and strategies. The ACCC combined this information together with Basin State data to examine how these agribusinesses engaged with water markets and the practices they employed. The analysis focused on the period from 1 July 2017 to 30 November 2019.

7.2 The agribusinesses had large water needs in the Basin

Between 2017–18 and 2019–20, the agribusinesses operated properties in the Southern Connected Basin and other parts of the Basin. These agribusinesses used large volumes of water as part of their operations. This water came primarily from surface water but some agribusinesses also used groundwater. The volume of water used by the agribusinesses in response to drier seasonal conditions in 2018–19 and the first half of 2019–20 varied depending on the nature of their operations.

Figure 7.1 shows the total water used by the agribusinesses between 2017–18 and 2019–20. All of the agribusinesses provided actual water use in 2017–18 and 2018–19. However for 2019–20, some provided forecast water use as at around January 2020 while others provided actual water use. For the purposes of this section, the ACCC grouped forecast and actual water use in 2019–20 together.

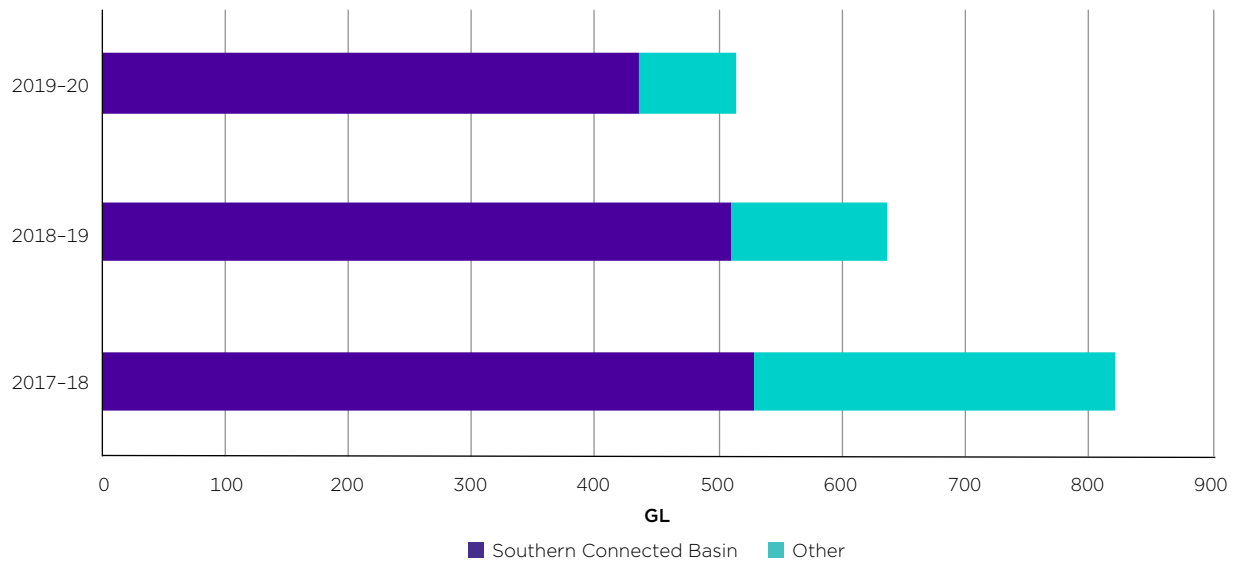
³³⁷ Webster, *Webster announces implementation of scheme of arrangement*, media release, 18 February 2020, <https://www.listcorp.com/asx/wba/webster/news/webster-announces-implementation-of-scheme-of-arrangement-2293754.html>, viewed 20 January 2021.

³³⁸ Stahmann Webster, *Home*, 2020, <https://stahmannwebster.com.au/>, viewed 20 January 2021.

³³⁹ Olam Orchards Australia, *Olam Orchards Australia announces sale of permanent water rights in Australia to PSP Investments for A\$490.0 million*, media release, 3 December 2019, <https://www.olamgroup.com/news/all-news/press-release/olam-orchards-australia-announces-sale-of-permanent-water-rights.html>, viewed 20 January 2021.

³⁴⁰ B Thompson, 'Canadian Pension fund swoops on Webster in \$854m bid', *Australian Financial Review*, 3 October 2019, <https://www.afr.com/companies/agriculture/canadian-pension-fund-swoops-on-webster-s-in-854m-bid-20191003-p52x82>, viewed 2 December 2020.

Figure 7.1: Location of water used by agribusinesses, 2017-18 to 2019-20



Source: ACCC analysis based on s. 95ZK responses from the agribusinesses. The 2019-20 water year includes actual or forecast water use.

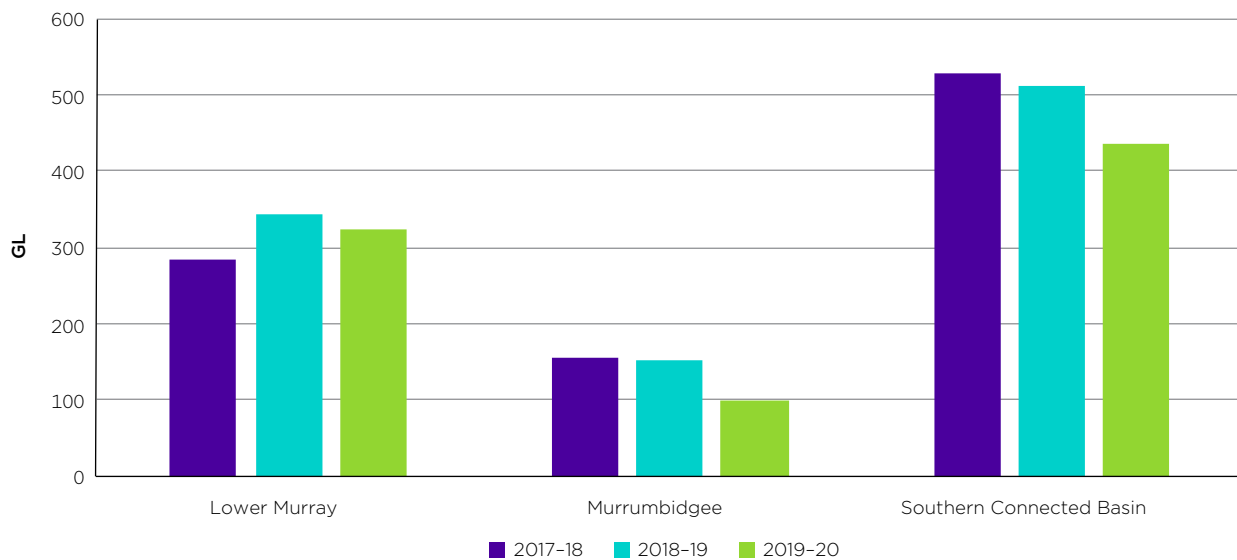
In 2017-18, a total of 822 GL of water was used by the agribusinesses. The total volume of water used by individual agribusinesses ranged from 13 GL to 158 GL. In 2018-19 water availability was limited due to drier seasonal conditions, the total volume of water used by the agribusinesses decreased to 636 GL (or 23%). The total volume of water used by the individual agribusinesses ranged from 21 GL to 174 GL.

The water use response of each agribusiness under drier seasonal conditions depended on their operations. Compared to 2017-18, the change in water used by individual agribusinesses ranged from one decreasing its usage by 106 GL (or 80%) and another increasing its usage by 30 GL (or 138%). Four of the agribusinesses decreased their water usage, with a collective water use decrease of 275 GL. As would be expected, those agribusinesses focused on annual cropping generally decreased water use, while those focused on permanent horticulture maintained or increased their water use.

In 2019-20, the total volume of water used (or expected to be used) by the agribusinesses decreased to 515 GL or by 19% compared to the previous year. The total volume used by agribusinesses ranged from 12 GL to 183 GL. Compared to 2018-19, the change in water used by individual agribusinesses in 2019-20 ranged from one agribusiness decreasing by 59 GL (or 78%) to another agribusiness increasing by 6 GL (or 4%). Further to this, seven of the agribusinesses decreased water usage, with a collective water use decrease of 134 GL. Similar to 2018-19, those focused on annual cropping decreased water use and those focused on permanent horticulture maintained or increased their water use.

Nearly all of the agribusinesses operated properties in the Southern Connected Basin. Collectively, water use in the Southern Connected Basin accounted for almost 75% of total water use by the agribusinesses between 2017-18 and 2019-20. Figure 7.2 shows that within the Southern Connected Basin, the Lower Murray (combining zones 7, 11 and 12) and Murrumbidgee (zone 13) were two key regions where the agribusinesses used large volumes of water.

Figure 7.2: Agribusiness water use in Lower Murray, Murrumbidgee and Southern Connected Basin, 2017-18 to 2019-20



Source: ACCC analysis based on s. 95ZK responses from the agribusinesses.

The ACCC has examined the agribusinesses' collective water use in particular zones in terms of volume and share of total water usage in each zone. Total water usage was drawn from the Basin State data and includes water used for any purpose, such as agriculture, environment, industry and urban.

For the Lower Murray, the agribusinesses' water use increased by 21% from 284 GL to 343 GL between 2017-18 and 2018-19, and then decreased to 324 GL in 2019-20. Across this period, the water used by the agribusinesses accounted for around 7% and 13% of the water used in this zone in 2017-18 and 2018-19. Some of the agribusinesses were some of the largest users of water after environmental users.

For the Murrumbidgee, the agribusinesses' water use decreased by 3% from 156 GL to 151 GL between 2017-18 and 2018-19, and decreased further to 99 GL in 2019-20. During this period, the water used by the agribusinesses accounted for around 11% and 22% of the water used in this zone. As was the case for the Lower Murray, some of the agribusinesses were among the largest users of water after environmental users.

7.3 The agribusinesses used diverse strategies to manage water and financial risks

The agribusinesses employed a number of different strategies to meet their water usage requirements and manage water and financial risks. Broadly, these were as follows:

- using a mixture of entitlements and water allocation market products
- leasing entitlements
- holding surface water entitlements with different reliabilities
- using forward contracts
- carrying over water between water years
- accessing groundwater
- using flexible production systems where production and associated water use can be increased or decreased in response to water availability and price changes.

7.3.1 Mixture of entitlements and water market products

A major strategic decision facing agribusinesses in managing water and financial risks is determining the mixture of entitlements owned (relative to their water needs) and usage of different water market products. In referring to water market products, the ACCC included entitlement leases, allocation forwards and spot allocation trade. The decisions made by agribusiness can be framed as a choice between up-front capital expenditure with lower ongoing operating expenditure versus less significant up-front capital expenditure and higher ongoing operating expenditure. This choice fundamentally affects the cash flow and financial position of a business.

At one end of the spectrum, one agribusiness owned enough entitlements to meet their water usage requirements through expected seasonal allocation. This agribusiness may purchase allocation water to meet any water shortfall if necessary to finish a crop. A number of other agribusinesses also had sufficient entitlements to meet all or most of the water requirements of their permanent horticulture. The ACCC notes this strategy requires high up front capital investment to purchase sufficient entitlements. However, it results in lower susceptibility to seasonal allocation price risk as it reduces exposure to drought-related high water prices in the allocation market.

At the other end of the spectrum, some agribusinesses relied almost entirely on water allocation markets to meet their water needs and owned minimal entitlements. These agribusinesses held a few weeks of water in their water accounts and purchased water allocations based on short-term forecast usage.

For example, Boundary Bend indicated in its 2018-19 annual report that it had owned sufficient entitlements to fully cover its average expected water use. However during the millennium drought, Boundary Bend noted it received only 35% of water allocations to its entitlements. This meant it 'had to purchase two-thirds of its yearly requirements on the open market at great expense'.³⁴¹ Boundary Bend stated this led to significant financial costs, where it had the holding cost of the entitlements and the purchase cost for water allocations. Subsequently, Boundary Bend considered that owning entitlements 'did not give enough available water or financial security in a severe drought and like many other irrigators decided to secure water as needed in the [allocation] water market'.³⁴² Following this, Boundary Bend sold all of its water entitlements.

The ACCC notes that this strategy exposes a business to fluctuating water prices, which can mean lower water costs in wet years, but significantly higher water costs in dry years.

In between these two broad approaches, some agribusinesses employed more complex strategies that utilised a combination of water market products. For example, Select Harvests submitted that it employed a strategy of:

- owning one-third of their water usage requirements through owned entitlements
- leasing one-third of their water usage requirements through leased entitlement
- purchasing one-third of their water usage on the allocation market.³⁴³

As at 1 July 2018, the agribusinesses owned in total almost 606 GL of entitlements in the Basin. These owned entitlements included a mixture of reliabilities as well as both surface water and groundwater. The volume of entitlements owned by each agribusinesses ranged between 100 ML and 213 GL. In total, owned entitlements across the Basin accounted for 81% of the volume of entitlements held by the agribusinesses (with the remaining entitlements being leased from third parties).

Around 307 GL, or over 51%, of volume of entitlements owned by the agribusinesses are located in the Southern Connected Basin. Key zones within the Southern Connected Basin were the Lower Murray and Murrumbidgee, accounting for 36% and 55% of entitlements owned by the agribusinesses.

341 Boundary Bend, *Boundary Bend Limited and controlled entities: Financial report for the year ended 30 June 2019*, 2019, p. 7, https://s3-ap-southeast-2.amazonaws.com/boundarybend.com/BB_FY_Report_30_June_2019.pdf, viewed 20 January 2021.

342 Boundary Bend, *Boundary Bend Limited and controlled entities: Financial report for the year ended 30 June 2019*, 2019, p. 7, https://s3-ap-southeast-2.amazonaws.com/boundarybend.com/BB_FY_Report_30_June_2019.pdf, viewed 20 January 2021.

343 Select Harvest Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 16 April 2020, p. 2.

7.3.2 Entitlement leases

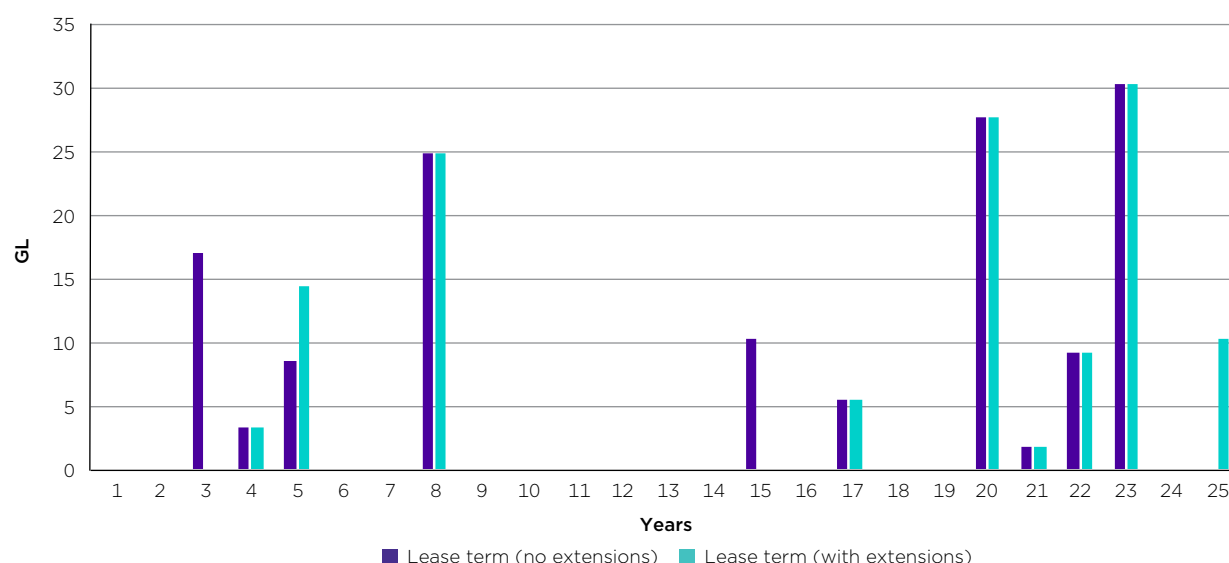
Some of the agribusinesses used entitlement leases rather than owning entitlements. Leasing an entitlement instead of owning it means a business has ongoing operating expenditure for the lease but avoids the large capital expenditure needed to own the entitlement. This capital expenditure savings can then be directed to other parts of the business.

As at 1 July 2018, over 138 GL of entitlements were leased by six agribusinesses across the Basin. The volumes of those leases ranged between 3 GL and 51 GL or between 15% and 97% of the total volume of entitlements held by the respective agribusinesses.

Chapter 5 examines the role of institutional investors in water markets. It focused on the four large institutional investors; Argyle, Aware, Duxton and Kilter, as well as a number of smaller water investors. As discussed in that chapter, an aspect of an investor's strategy is providing entitlement leases to other users. However, entitlement leases supplied by institutional investors to the agribusinesses comprised only 5% of the total volume of entitlements that were leased by the agribusinesses.

The majority of the volume of entitlements leased by the agribusiness were from parties other than the institutional investors, including agricultural or rural fund managers. This is because most of the leases held by the agribusinesses included both land and water. For example, Rural Funds Management is an agricultural fund manager which owned and leased almond orchards and water entitlements to Select Harvests and Olam.³⁴⁴ Such leases tended to be for longer terms. Figure 7.3 shows that a large volume of the agribusinesses' entitlement leases had a lease term greater than 20 years. Some of the leases provided the option to extend their lease term. That is, a leased entitlement could have an agreed initial term of 5 years but also include an option of extent the lease term to 10 years.

Figure 7.3: Lease terms for entitlement leases held by the agribusinesses as at 1 July 2018



Source: ACCC analysis based on s. 95ZK responses from the agribusinesses.

7.3.3 Reliability of surface water entitlements

Entitlements in the Basin have differing reliabilities. Broadly, the higher the reliability of an entitlement the greater the certainty of allocation volume and the greater the price to purchase the entitlement. In addition, entitlement reliabilities are different among the Basin States. To assist with comparisons in this subsection, the ACCC has categorised entitlements as follows:

- higher reliability entitlements which includes NSW High Security, Victoria High Reliability and SA surface water entitlements

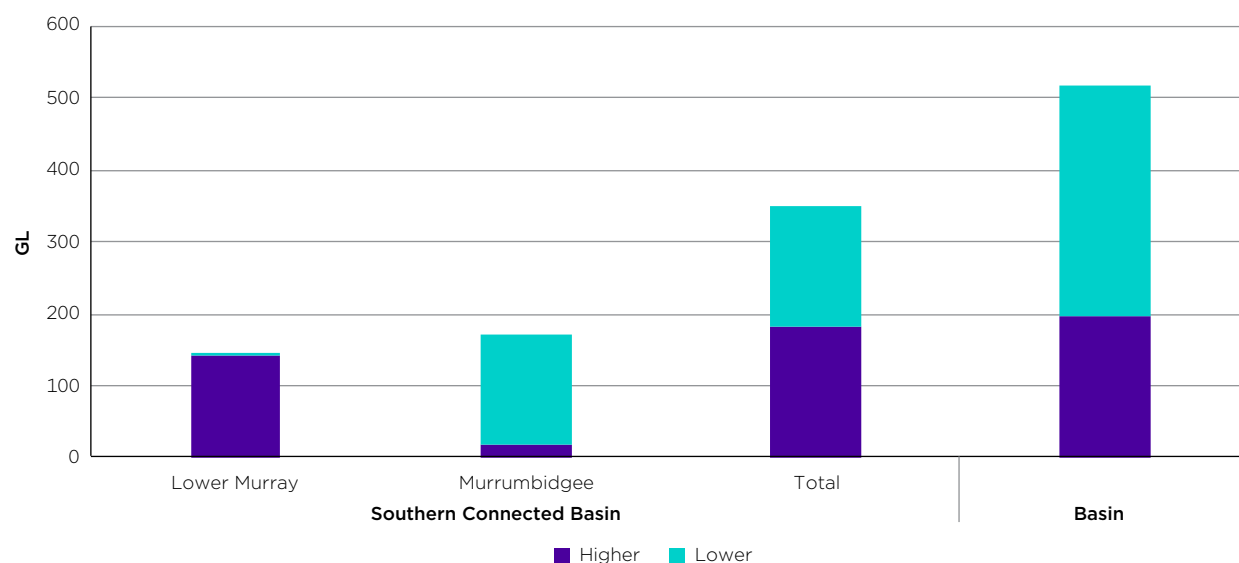
³⁴⁴ Rural Funds Group, *Almonds*, 2021, <https://ruralfunds.com.au/rural-funds-group/fund-information/assets/almonds/>, viewed 20 January 2021.

- lower reliability entitlements which includes NSW General Security, Victoria Low Reliability and Queensland Medium Priority surface water entitlements.

The mix of entitlements of different reliabilities held by agribusinesses varied. For example, an agribusiness focused on permanent horticulture generally held higher reliability surface water entitlements, while an agribusiness focused on annual broadacre cropping generally held lower reliability surface water entitlements.

As at 1 July 2018, the agribusinesses held (both owned and leased) in total 197 GL of higher reliability entitlements in the Basin (figure 7.4). The volume held by individual agribusinesses ranged between 179 ML and 93 GL. All but two of the agribusinesses held some higher reliability entitlements. Even those agribusinesses that relied almost entirely on water purchased from the allocation markets owned small volumes of higher reliability entitlements.

Figure 7.4: Reliability of entitlements held by the agribusinesses as at 1 July 2018, by selected zone



Source: ACCC analysis based on NSW, Victoria, and SA governments' responses to voluntary information requests and s. 95ZK responses from the agribusinesses.

The Lower Murray accounted for a large proportion of higher reliability entitlements held by the agribusinesses. As at 1 July 2018, the agribusinesses held 144 GL of higher reliability entitlements in the Lower Murray. This represented almost 9% of the higher reliability entitlements on issue.³⁴⁵ The largest holding of higher reliability entitlements by an agribusiness was over 78 GL (or almost 5% of all higher reliability water entitlements on issue).

As at 1 July 2018, the agribusinesses held in total almost 319 GL of lower reliability entitlements. The ACCC notes that one of the important features of lower reliability surface water entitlements for some zones in the Southern Connected Basin is that it allows water to be carried over. For example, one agribusiness which primarily focused on permanent horticulture held lower reliability surface water entitlements to facilitate carryover between years.

The Murrumbidgee accounted for a large proportion of lower reliability entitlements held by the agribusinesses. The agribusinesses collectively held over 153 GL, or over 8% of the entitlements on issue in the Murrumbidgee. The largest holding of lower reliability entitlements in the Murrumbidgee by an agribusiness was almost 79 GL.

7.3.4 Carryover

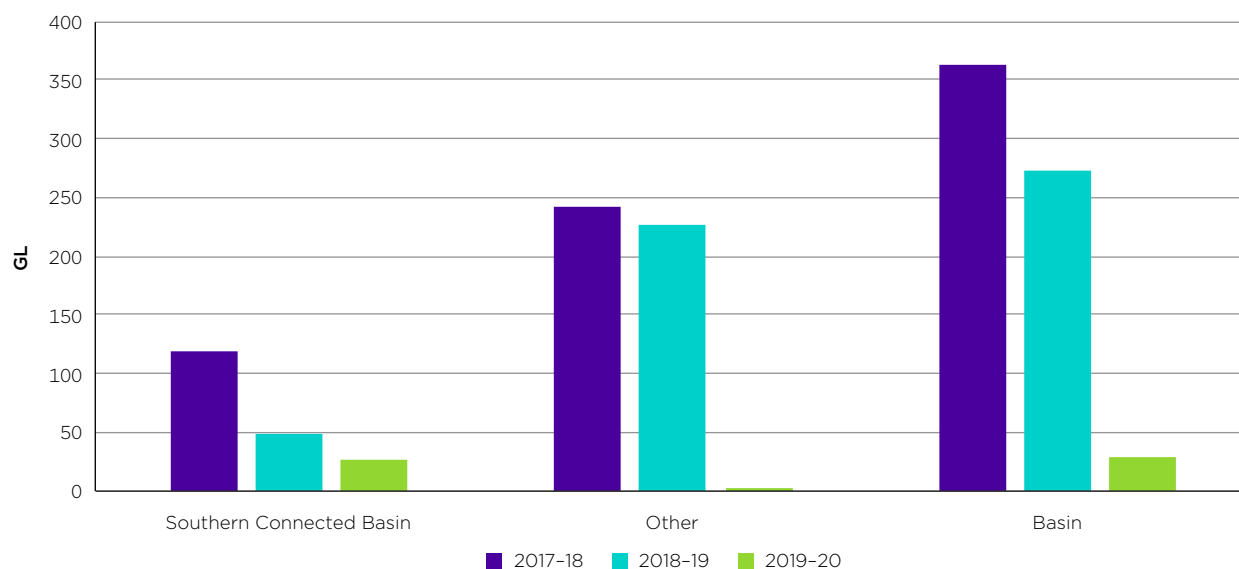
Carryover strategies varied between the agribusinesses, but most agribusinesses stated they utilise carryover in any given water year if they have surplus water available. A smaller proportion of

³⁴⁵ Entitlements on issue includes entitlement held by all user types, such as agriculture, environmental, industry and urban.

agribusinesses stated they purchase water at the end of a water year for the purposes of carrying over that water into the next water year.

Figure 7.5 shows the volume of water carried over into 2017-18, 2018-19 and 2019-20 by the agribusinesses. The figures are based on the Basin State data. They do not include the agribusinesses' carryover within the NSW and SA IIOs.

Figure 7.5: Volume of carryover by agribusinesses, 2017-18 to 2019-20



Source: ACCC analysis based on NSW, Victoria, and SA governments' responses to voluntary information requests and s. 95ZK responses from the agribusinesses.

Between 2017-18 and 2019-20, the total volume of water carried over by the agribusinesses decreased from 362 GL to 27 GL. Over this period, the agribusinesses carried over around 29% of their total carryover volume in the Southern Connected Basin, with the remainder carried over by the agribusinesses in other areas of the Basin.

For the Southern Connected Basin, the total volume carried over by the agribusinesses between 2017-18 and 2019-20 decreased from 120 GL to 27 GL (or almost 78%). Given the different types of entitlements held and varied strategies of the agribusinesses, the volume each carried over greatly varied and ranged from:

- 19ML to 84 GL carried over into 2017-18
- 8 ML to 23 GL carried over into 2018-19
- 14 ML to 13 GL carried over into 2019-20.

The Murrumbidgee was a key zone where the agribusinesses carried over water into 2017-18 and 2018-19, totalling around 39 GL in each year. In 2019-20, nearly all of the water carried over was in the Murrumbidgee (11 GL) and Victoria Murray-Barmah to SA (10 GL).

7.3.5 Forward contracts

Forward contracts are agreements to provide a set volume of water allocations at an agreed date in the future. They are another means for managing water and financial risk by agribusinesses. Forward contracts allow an agribusiness to secure future water allocations at a fixed price. This agreed price may ultimately be above or below the prevailing market price at the time the water allocation is provided.

In 2018-19, 6 of the agribusinesses received water pursuant to forward contracts, totalling almost 14 GL of water allocation. The volume of allocations received by each of these agribusinesses under forward contracts ranged from 500 ML to 5 GL. Nearly all of the water allocation received by agribusinesses under forward contracts was provided by the large institutional investors examined in chapter 5.

7.3.6 Groundwater

While surface water was most widely used by the agribusinesses to meet their water needs, a number of the agribusinesses also made use of groundwater entitlements. As at 1 July 2018, 7 of the agribusinesses held in total 103 GL of groundwater entitlements. The volume of groundwater entitlements held by each agribusiness varied between 3 GL and 34 GL, accounting for between 6% and 60% of the total volume of entitlements held. These entitlements were held in the following water systems:

- Lower Gwydir
- Lower Lachlan
- Lower Macquarie
- Lower Murrumbidgee Deep
- Lower Namoi.

A number of agribusinesses noted there were several key benefits associated with groundwater entitlements. For example, one agribusiness noted that its groundwater entitlements have been highly reliable. In addition, these groundwater entitlements allow 100% of the volume of the entitlement to be carried over between water years.

It should be noted that the ability to trade groundwater is generally much more limited than is the case for surface water.

7.3.7 Annual croppers responded to prices and water availability

Agribusinesses with annual crops employed flexible strategies and vary production depending on the price and availability of water in any given area in any given year. The area of annual crop planted by these agribusinesses at a particular property may decrease or increase based on the availability and purchase costs of water in the area. Other similarly flexible strategies were employed to ensure maximum return on their water entitlements. For example, if the return available from selling water on the allocation market is higher than the anticipated return from the annual crop, then an agribusiness may decide to sell its seasonal allocation and not plant crops that season. Similarly, if prices for water on the temporary allocation market were low, the agribusiness may purchase water and increase crop areas. These decisions are made year to year, based on a number of factors, including temporary allocation water prices, seasonal allocation quantities and commodity prices for particular crops.

7.4 The ACCC examined the water allocation trading activities of the agribusinesses in the Southern Connected Basin

The ACCC reviewed the allocation trading activities of the agribusinesses for 2017-18, 2018-19 and 2019-20 (July to November) in the Southern Connected Basin. Over this period, all of the agribusinesses engaged in allocation trade to some degree.

Similar to the assessment of investor trading activities in chapter 5, the ACCC's assessment of the agribusinesses trading activities drew on trading information from Basin States and the agribusinesses themselves. However, trading information for the Southern Connected Basin is highly fragmented and incomplete. Section 5.5 provides further details on the challenges experienced and the methodology used for assessing investors' trading activities. The same methodology was used for assessing the agribusinesses' trading activities.

7.4.1 Seasonal allocations, carryover and forwards

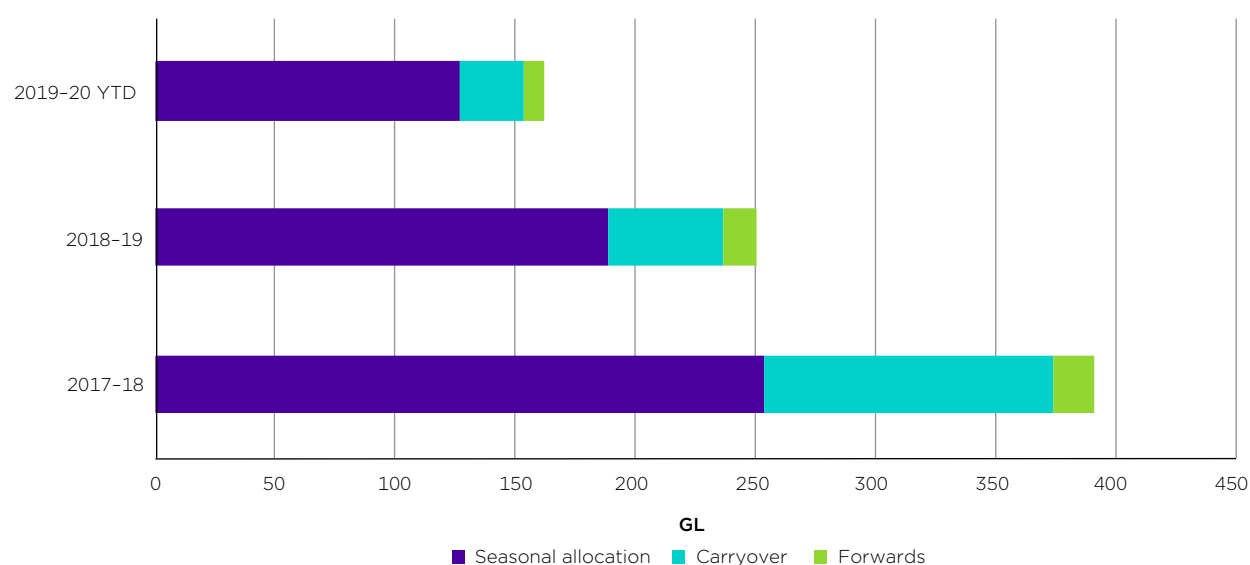
Broadly, the extent to which the agribusinesses engaged with water allocation markets in the Southern Connected Basin depended on their expected water needs less water received from:

- seasonal allocations to entitlements held (including allocation transfer leases or entitlement supply agreements³⁴⁶)
- carryover water from the previous year
- forward contracts.³⁴⁷

Figure 7.6 shows that between 2017-18 and 2018-19, the volume of water the agribusinesses received from seasonal allocations, carryover and forward contracts decreased from 391 GL to 251 GL or by almost 36%.³⁴⁸ In 2019-20 (July to November), the volume of water allocation in the agribusinesses' accounts (excluding water allocation purchases) was 163 GL. For each agribusiness, the volume in their individual accounts ranged between:

- 732 ML and 146 GL in 2017-18
- 161 ML and 100 GL in 2018-19
- 136 ML and 60 GL in 2019-20.

Figure 7.6: Volume of water from seasonal allocation, carryover and forward contracts for agribusinesses, 2017-18 to 2019-20



Source: ACCC analysis based on NSW, Victoria, and SA governments' responses to voluntary information requests and s. 95ZK responses from the agribusinesses.

Note: The 2019-20 water year only includes data from July to November 2019. Seasonal allocation includes allocations received by the agribusinesses as part of allocation transfer leases or entitlement supply agreements.

Between 2017-18 and 2018-19, across the agribusinesses the difference between water usage and water received through seasonal allocation, carryover and forward contracts increased from 42 GL to 124 GL (excluding NSW and SA IIOs). The proportion of water usage met by seasonal allocations, carryover and forward contracts decreased from 91% to 67% (excluding NSW and SA IIOs). That is, in 2018-19, the water usage of the agribusinesses exceeded their available water by 124 GL. It is important

³⁴⁶ An allocation transfer lease or entitlement supply agreement which requires the lessor to deliver the seasonal allocation volumes attached to a specified volume of entitlements to the lessee during the term of the lease. Such leases are not registered on a state register (see subsection 5.4.2).

³⁴⁷ This does not take into account the dynamic nature of water needs, where an agribusiness may need water but has not received seasonal allocations yet.

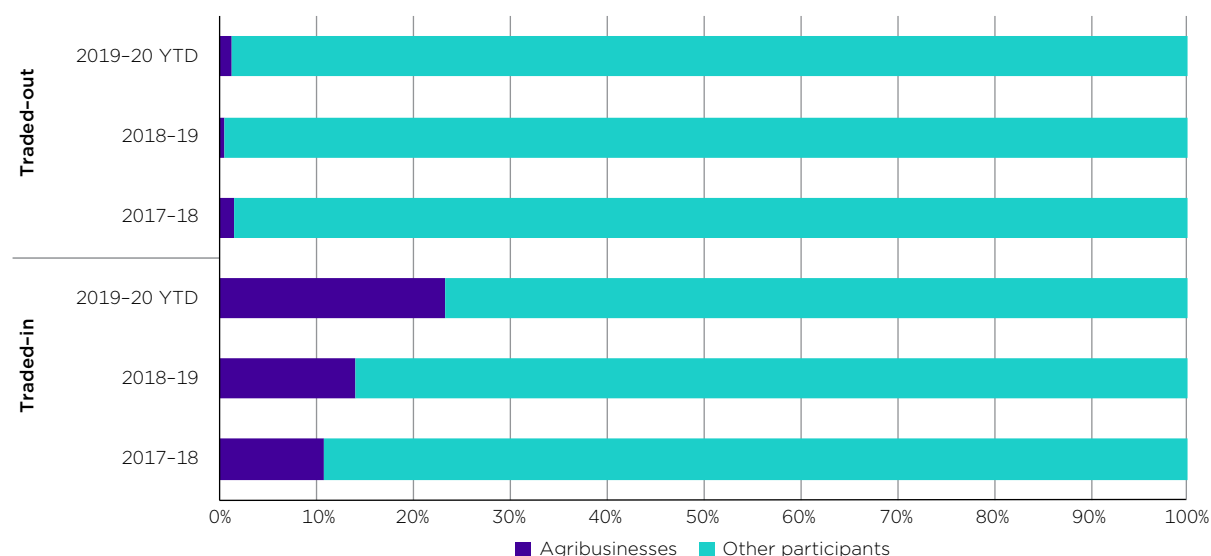
³⁴⁸ The calculations in this subsection do not incorporate carryover, allocations, forward contracts and usage within NSW and SA IIOs.

to note that this 124 GL is a conservative figure and additional water allocations were likely needed for carryover into 2019–20, evaporation losses, operations within NSW and SA IIOs and other factors.

Given this gap between usage and availability, the agribusinesses were required to engage with water allocation markets.

The ACCC examined the participation of the agribusinesses in water allocation markets in comparison with total market activities. Figure 7.7 presents the agribusinesses' shares of volume of trades-in and trades-out in the Southern Connected Basin, excluding zero dollar trades. The ACCC notes that this is an imperfect measure of commercial allocation trading activity, as it does not reliably distinguish between allocation sales, deliveries on lease and forward contracts, and deliveries for carryover parking purposes.³⁴⁹

Figure 7.7: Agribusinesses' share of non-zero dollar water allocation trades-in and trades-out, by year



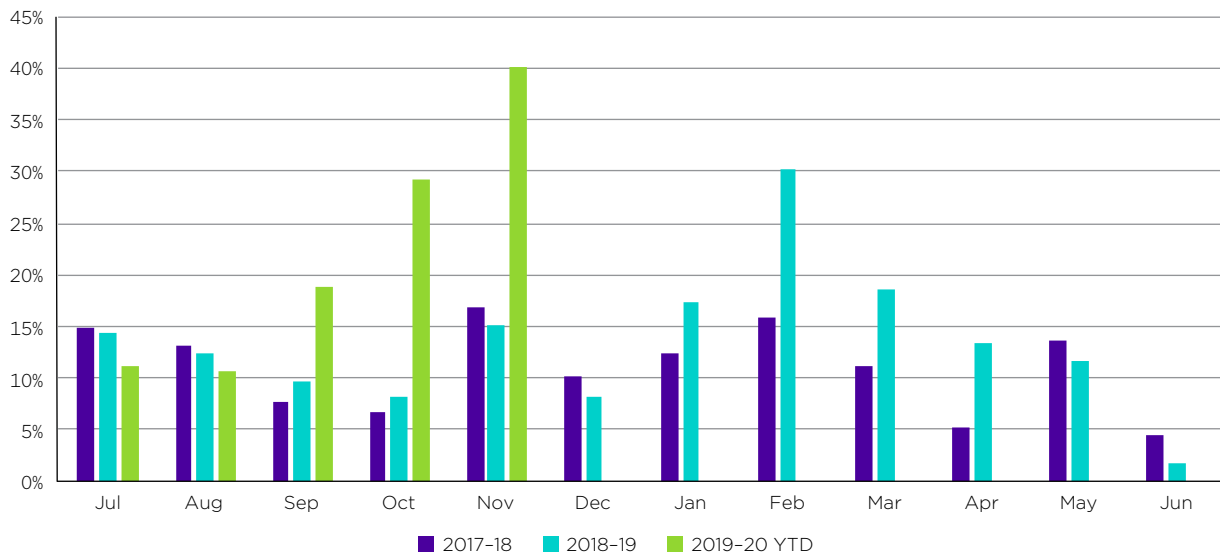
Source: ACCC analysis based on NSW, Victoria, and SA governments' responses to voluntary information requests and s. 95ZK responses from the agribusinesses. The 2019-20 water year only includes data from July to November 2019. The chart excludes zero dollar trades.

Between 2017-18 and 2019-20, the agribusinesses accounted for 14% of the volume of non-zero dollar water allocation trades-in and 1% of the volume of non-zero dollar water allocation trades-out.

Figure 7.7 shows that between July and November in 2019-20, the agribusinesses accounted for 24% of water allocations trades-in. This was higher than the share the agribusinesses accounted for in both 2017-18 (11%) and 2018-19 (14%). The trading activities of the agribusinesses between September and November 2019 explained the higher share (figure 7.8). During November 2019, with continuing dry seasonal conditions, the agribusinesses accounted for 40% of non-zero dollar allocation trades-in. In comparison, the agribusinesses' shares of non-zero dollar allocation trades-in were 17% in November 2017 and 15% in November 2018.

³⁴⁹ The ACCC obtained information from the agribusinesses on the trade type of their transactions. However, this information could not be used for this analysis, as the ACCC did not have similar information for all market participants.

Figure 7.8: Agribusinesses' share of non-zero dollar water allocation trades-in by month, July 2017 to November 2019



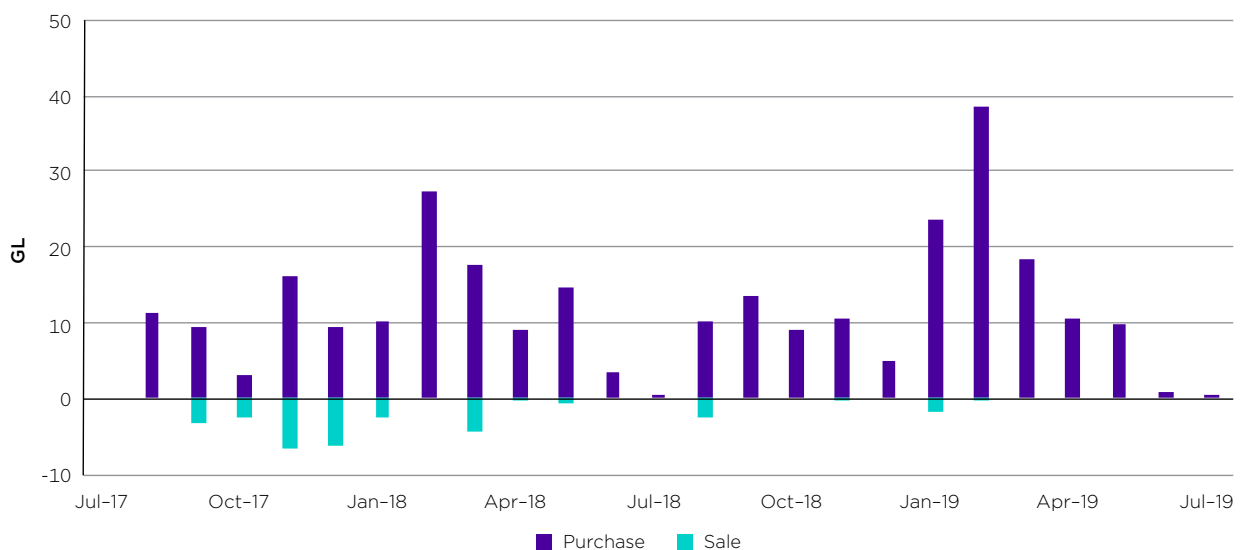
Source: ACCC analysis based on NSW, Victoria, and SA governments' responses to voluntary information requests and s. 95ZK responses from the agribusinesses. The chart excludes zero dollar trades.

7.4.2 The agribusinesses were significant purchasers but not sellers on the spot market

Based on information received from the agribusinesses, a large share of the volume of non-zero dollar water allocation trades undertaken by the agribusinesses were spot allocation trades. Figure 7.9 shows that the agribusinesses either purchased or sold water allocation in almost all months from July 2017 to November 2019. The extent to which they engaged with water allocation markets was seasonal, with higher levels of engagement over summer and autumn, and lower levels over winter.

In 2017-18, the agribusinesses purchased 132 GL and sold 26 GL of spot water allocations. In 2018-19, the agribusinesses' spot water allocation purchases increased to 150 GL (an increase of 14%) and sales decreased to 4 GL (a decrease of 84%). For 2019-20 (July to November), the agribusinesses spot water allocation purchases were 79 GL and sales were 5 GL.

Figure 7.9: Agribusinesses' purchase and sale of spot water allocations, July 2017 to November 2019



Source: ACCC analysis based on NSW, Victoria, and SA governments' responses to voluntary information requests and s. 95ZK responses from the agribusinesses.

The agribusinesses represented a significant group of purchasers of spot allocation in the Southern Connected Basin. Between July 2017 and November 2019, the total volume purchased by the agribusinesses on a monthly basis varied between 125 ML in July 2018 and 39 GL in February 2019. A number of the individual agribusinesses were significant purchasers of water allocations. For example, one agribusiness accounted for almost 23 GL of spot water purchases within a single month.

The contribution of individual agribusinesses is amplified when focusing on specific water zones. For example, 204 GL of spot water allocations were purchased by the agribusinesses in the Lower Murray between July 2017 and November 2019. This region accounted for 57% of spot purchases by the agribusinesses. Over this period, the monthly purchases by the agribusinesses ranged from 328 ML to 32 GL. One agribusiness's spot allocation purchases totalled almost 20 GL in a single month.

When the agribusinesses entered the spot allocation market, the size of the parcels purchased were larger than the market average. Between July 2017 and November 2019, the volume of spot water allocation parcels purchased by the agribusinesses averaged 278 ML per transaction. In comparison, the average non-zero dollar parcel traded over the same period was 97 ML per transaction.

The agribusinesses also purchased larger parcels from the institutional investors (as examined in chapter 5). Over the same period, the average parcel size of spot allocation purchased by the agribusinesses from the institutional investors was 638 ML per transaction, in comparison to 238 ML per transaction from other sellers. The ACCC notes this supports the view that one of the roles of institutional investors is to provide larger parcels of water allocations to large users and so reduce the number of transactions required.

The agribusinesses were not significant or active sellers of spot water allocations. Over the period from July 2017 to November 2019, for a number of months, several of the agribusinesses did not sell any spot water allocations. Further to this, in 2018–19, only three of the agribusinesses sold water allocations.

Some of the agribusinesses stated that they do not seek to actively trade water or profit from the buying and selling of water. Some of the agribusinesses also stated that water is purchased exclusively for their own agricultural use. Therefore, any volumes of surplus water were generally quite small and carried over for use in the following season.

The agribusinesses provided some circumstances in which they would sell water allocations. Some agribusinesses irrigating mostly annual crops indicated they would sell water back to the market where the price for water exceeds the total productive value of their crops. Others indicated that they may sell water in one zone and repurchase in another zone where trade restrictions prevent them from moving the water to the zone required for use. Some of the larger agribusinesses had arrangements in place to sell surplus water to related entities, whether at an agreed price or by reference to the current market price.

8. Water market intermediaries: roles, practices and conduct

Key Points

- Water market intermediaries play an important role in water markets. They assist market participants to trade and provide a diverse range of services.
- Intermediaries are currently subject to limited regulation. A voluntary code of conduct exists that has not been broadly adopted by the industry and is ineffective in addressing the concerns identified.
- Brokers' roles are often unclear, as contracts will not commonly set out the obligations brokers owe to their clients. While clients may mistakenly believe their broker is acting solely in their best interests, it is uncommon for such fiduciary responsibility (which is normal for brokers operating in most other markets) to arise within this relationship.
- The interests of an intermediary can diverge from those of its client, including when brokers provide services to both parties in a trade or when intermediaries take a personal position in a trade.
- Intermediaries hold significant amounts of client funds and client water rights in intermediary accounts without any trust-accounting obligations. The use of water holding accounts by intermediaries reduces transparency.
- Some brokers have developed strategies to increase the likelihood of their clients' intervalley trades (IVTs) being approved. This is a competitive service for their clients within the framework of the current IVT approvals processes. Brokers have discretion in allocating successfully transferred IVT volumes among their clients and this process is not transparent.
- There are no record-keeping requirements for intermediaries, which affects the quality of price-reporting audits and enforcement.
- The ACCC's view is that a robust regulatory framework is required to establish protections for water market intermediaries and their clients, in the form of clear obligations on intermediaries, including irrigation infrastructure operators (IIOs) who provide intermediary services.

8.1 Introduction

The ACCC received feedback from market participants raising concerns about broker conduct and calls for increased regulation of water market intermediaries, including from intermediaries themselves. There has been continued support for regulation following the interim report. The ACCC is of the view that there is a strong basis for these concerns due to the lack of obligations water brokers owe to their clients and inadequate regulatory oversight of brokers and exchange platforms in a variety of contexts.

Without appropriate regulatory safeguards, such as those which apply to intermediaries in other markets including real estate agents³⁵⁰, stock brokers and stock and station agents, there are opportunities and incentives for water market intermediaries to exploit their clients with no consequences. This undermines confidence and trust in water market intermediaries and the practices they engage in, which reduces confidence in the market and lowers perceptions of market integrity and fairness, inhibiting full participation by parties that would otherwise have had incentives to engage in trade. If trades that would benefit buyers and sellers of water rights do not occur due to a lack of confidence in intermediaries then water rights are not traded to their highest value use. In these circumstances, incentives for investment to be directed to the most productive industries are distorted and efficient economic outcomes in the water and related markets are not achieved. As a result,

³⁵⁰ *The Property and Stock Agents Act 2002* (NSW) refers to 'stock and station agents' and this phrase will be used throughout this chapter. Terminology differs across states. For example, in Victoria these agents are referred to as 'livestock agents'.

Australians fail to realise the welfare benefits associated with water resources being used to achieve their highest value.

8.2 Intermediaries play an important role in water markets and offer a diverse range of services

The ACCC uses the term ‘water broker’ to refer to a water market intermediary who, for a commission or fee or other form of remuneration or payment, offers one or more of the following services:³⁵¹

- providing advice to clients regarding the trading of water rights
- trading tradeable water rights on behalf of another person
- investigating tradeable water right trading possibilities on behalf of another person
- preparing and submitting documents necessary for the trade of a tradeable water right on behalf of another person.

Brokers assist potential buyers and sellers to assess the market, form price expectations, and make decisions in the market. As discussed in section 8.8 of this chapter, brokers provide this advice to their clients based on their access to information and ongoing analysis of water markets.

Water market participants can trade independently of brokers, for example with their neighbours or through another organisation acting as an intermediary, such as an exchange platform.³⁵² Trades can also be negotiated and lodged for approval without the involvement of any water market intermediary.³⁵³ While brokers negotiate trading options for their clients off-platform, exchange platforms operate as online intermediary portals facilitating direct trading between sellers and buyers, using algorithms for automated matching, auction style listings or ‘buy-it-now’ listings. Exchange platforms can also offer similar services to brokers such as organising and submitting the necessary paperwork to the relevant trade approval authority. In some cases, an entity will offer both brokerage and exchange platform services. Trades involving intermediaries may be:

- broker-negotiated, outside of platform³⁵⁴
- negotiated by a broker or individuals off-platform, lodged via platform (also referred to as an ‘off-platform’ trade)³⁵⁵, or
- matched on-platform.³⁵⁶

By bringing together multiple potential traders including irrigators, intermediaries can contribute to increased market liquidity and depth, reduce searching costs, improve information availability and otherwise reduce transaction costs associated with water trade. In short, competitive and competent water market intermediaries can make a substantial contribution to the development of efficient water markets.³⁵⁷

The ACCC’s view is that obligations on water market intermediaries should be tailored to the service the intermediary is providing. Obligations should also be imposed on exchange platforms under the proposed regulation (in addition to water brokers), with obligations tailored to the particular services they are providing. Chapter 10 and appendix B explore the roles and functions of exchange platforms in more depth.

351 This definition of ‘water broker’ aligns with sub-clauses a to c of the definition of ‘water market intermediary’ in the Basin Plan 2012, s. 1.07.

352 Some of the larger exchange platforms include H2OX, Waterfind, Murray Irrigation, Waterpool and Waterexchange.

353 These are referred to as principal-negotiated, outside of platform trades.

354 Trades negotiated and lodged via a broker, without the involvement or use of an exchange platform.

355 Trades negotiated via a broker or individuals without the involvement or use of an exchange platform, but lodged for approval via an exchange platform.

356 Trades matched and lodged for approval via an exchange platform. Covers different kinds of on-platform matching, including automated matching via algorithm, ‘buy-it-now’ (i.e. buyer selects advertised parcel), automated exchange pools, and platform-based auctions.

357 ACCC, *Water market intermediaries: industry developments and practices*, December 2010, Canberra, p. 2, www.accc.gov.au/system/files/Water%20market%20intermediaries%20-%20industry%20developments%20and%20practices_0.pdf, viewed 26 June 2020.

As brokered trades are less common in the Northern Murray–Darling Basin (Northern Basin)³⁵⁸, this chapter largely refers to the practices of brokers who trade in the Southern Murray–Darling Basin (Southern Basin). However, any recommendations are intended to apply to both Northern Basin and Southern Basin intermediaries. Despite some submissions suggesting regulation for all water brokers nationally, the proposed regulation recommended in chapter 9 is intended to apply to only those intermediaries providing services within the Murray–Darling Basin.

8.2.1 Brokers charge varied fees and commissions

As the market for intermediary services has matured, brokers have diversified their service offerings and perform some or all of the services outlined above.

The diversity in brokerage services is also reflected in the ways brokers charge clients for their services. Refer to appendix C for further details regarding broker and exchange platform fees. Brokers charge parties to the trade (in some instances the broker will charge the buyer and seller) a percentage commission based on the total value of a trade or a flat fee per ML, or a combination of these, and these charges vary according to a range of factors. Brokerage firms may, for example, provide their brokers (employees and contractors) with guidance as to the percentage of commission they can charge their clients (setting a maximum and minimum charge) for temporary and permanent trades.³⁵⁹ Commission can be tailored depending on the volume of the trade; whether the client is a buyer or seller, and the product and region in which the trade is located. When considering offering a commission outside the standard rate, brokers have regard to the competitive context, the complexity of the trade, the relationships involved and the uniqueness of the trade. Some brokers offer clients a tiered commission rate for large volumes of trade.

Some intermediaries have acknowledged there is potential for a circumstance to arise where their interests are incompatible with that of their clients, where commissions are related to the price of the water right, and have taken steps to shift away from this model towards a flat fee (for example, \$2/ML excl. GST).³⁶⁰

8.2.2 Approval of trades and intermediaries

With the exception of trades of irrigation rights and water delivery rights that are internal to an IIO's irrigation network (which require IIO approval), all trades of tradeable water rights require approval (and/or registration) by state government trade approval authorities.³⁶¹ Therefore, while an intermediary will match buyers and sellers and provide services for some aspects of the settlement process (for example, submitting trade application forms to the relevant trade approval authority and arranging payments), a trade will still be subject to obtaining the appropriate approvals. Some IIOs also provide brokerage services or operate online exchange platforms. Concerns that have been raised about IIOs providing intermediary services, while acting as a trade approval authority, are discussed at section 8.11 of this chapter.

8.2.3 Brokers compete strongly for clients

It is difficult to establish the exact number of water brokers currently operating in the market as there is no formal registration process, and some water brokers provide water brokerage services as a sideline to other activities, such as real estate. The ACCC identified approximately 80 brokerage firms that operate in the Murray–Darling Basin (Basin) with some firms having multiple employees and/or

358 The ACCC was informed by stakeholders at the ACCC Murray–Darling Basin inquiry, St George public forum that there are proportionately less brokered trades in the Northern Basin than the Southern Basin. At the ACCC Murray–Darling Basin inquiry, Narrabri public forum stakeholders noted that there were just a few brokers that provided brokerage services in that area.

359 For example, for temporary trades there can be a high rate (% commission or \$/ML (whichever is greater), a standard rate and a low rate.

360 H2OX 2018, New Exchange Fee, H2OX Australia, <https://h2ox.com/new-exchange-fee/>, viewed 6 May 2020.

361 Internal trades of irrigation rights and water delivery rights require the approval of the relevant IIO, and trades of water access rights to or from an IIO's entitlement require the approval of both the relevant IIO and the relevant Basin State trade approval authorities.

contractors engaged in brokerage services.³⁶² Currently, some of the larger water brokers operating within the Basin include Elders, Ruralco Water Brokers, Waterfind, Wilks Water, National Water Brokers and Integra Water Services.

It is unclear exactly what proportion of trades conducted in the Basin are facilitated in some way by a broker or other intermediary. A 2009 ACCC report noted that, 'it has been estimated that between 80 and 90% of trades are facilitated by intermediaries, but this figure can be expected to vary throughout the MDB.'³⁶³ Data from 2015 indicates that approximately 82% of irrigators within the Basin used an intermediary to facilitate the trade of a water right.³⁶⁴ The ACCC also understands that in 2018–19 around 76% of trades in Northern Victoria were lodged through the Victorian online Broker Portal, meaning they were facilitated by an intermediary.³⁶⁵ What is clear is that the use of intermediaries across the Southern Basin is widespread. Table 8.1 shows the share of the top 5 brokers and exchange platforms in Victoria in 2018–19 (by number of allocation trades).

Table 8.1: Derived market share of Victorian total allocation trade, 2018–19 (by number of trades)

Broker or Exchange Platform	Derived market share of Victorian total allocation trade, 2018–19 (by No. trades)
A	28.1%
B	9.8%
C	6.6%
D	5.9%
E	4.8%
Total	55.2%

Source: ACCC analysis based on Victorian Government's response to voluntary information request. Data has been updated since the interim report.

While there appears to be a moderate level of concentration in the market for brokerage services in Victoria, the ACCC observed water brokers engaging in highly competitive strategies across the Basin and understands that brokers' shares of trades in water markets varies between regions and products.³⁶⁶ For example, brokerage firms regularly examine aspects of their businesses to assess their ongoing competitiveness including ongoing analysis of competitors' pricing strategies and structures to further develop their own strategies and prices. Additionally, brokers employ a range of direct sales methods to seek to win clients, including strategies that involve regular contacts with market participants. The ACCC also found evidence that brokers compete very strongly for large clients in their marketing and pricing strategies.

8.3 Intermediaries are subject to limited regulation

Brokers and exchange platforms are subject to few specific legislative obligations.

³⁶² This number does not include exchange platforms, or government agencies, such as Environmental Water Holders.

³⁶³ ACCC, *Water Trading Rules*, issues paper, Canberra, 2009, p. 60, www.accc.gov.au/system/files/Water%20trading%20rules%20issues%20paper.pdf, viewed 12 June 2020.

³⁶⁴ S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Water Market inquiry, 2020, p 116. The data is drawn from table 6.12 of the draft report and is based on the Centre for Global Food and Resources, University of Adelaide, survey data from 2015. However, note that this refers to intermediaries and therefore includes exchanges.

³⁶⁵ Victorian Government, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 3.

³⁶⁶ There may be certain geographic areas or systems where competition is lower (for example, groundwater systems generally, or surface water systems in the Northern Basin).

Like other businesses, water market intermediaries must comply with the *Competition and Consumer Act 2010* (the CCA)³⁶⁷, which incorporates the fair trading provisions within the Australian Consumer Law (ACL).³⁶⁸ Businesses are prohibited by the ACL from:

- engaging in misleading or deceptive conduct, or conduct that is likely to mislead or deceive³⁶⁹
- making particular kinds of false or misleading representations in connection with the supply or acquisition of services, including making false or misleading representations about the quality, value or price of services³⁷⁰
- accepting payment for services where they do not intend to supply the services, intend to supply materially different services or are aware of reasonable grounds for believing that they will not be able to supply the services within the relevant time³⁷¹
- engaging in conduct in relation to the supply or acquisition of services that is, in all the circumstances, unconscionable³⁷²
- using physical force or undue harassment or coercion in connection with the supply of services or the payment for services.³⁷³

Under the ACL, a term of a standard form 'small business contract' is void if the term is 'unfair', within the meaning of the ACL.³⁷⁴

Services supplied to consumers are also subject to the statutory guarantees set out in the ACL, including that the services will be provided with due care and skill.³⁷⁵ A person (including a corporation) who pays less than \$40,000 for the services will be a 'consumer' in this context.³⁷⁶

The CCA prohibits anti-competitive conduct, such as contracts, arrangements, understandings or concerted practices that have the purpose, effect or likely effect of substantially lessening competition in a market³⁷⁷, creating a cartel³⁷⁸, or misusing market power.³⁷⁹

The ACCC, as part of its ongoing functions (outlined above), monitors complaints against brokers and other water market intermediaries.³⁸⁰ In recent years, the ACCC has only received a small number of complaints concerning brokers and other water market intermediaries. Some stakeholders raised

367 However the conduct of an intermediary that is part of the Crown will not be subject to the ACL as a law of the Commonwealth or a State or Territory if the conduct did not occur in the course of the entity carrying on a business. Conceivably some government owned irrigation infrastructure operators could be considered part of the Crown. Whether the water trading activities of a Crown entity amounts to carrying on a business must be considered on a case by case basis and involves consideration of the entity's activities and the context in which the activities of concern have occurred.

368 The Australian Consumer Law (ACL) consists of Schedule 2 of the CCA and regulations under s. 139G of the CCA. The ACL applies as a law of the Commonwealth, and as a law of each State or Territory by separate jurisdictional application acts. The provisions of the ACL most relevant to water brokers are discussed in ACCC, *Water trading—a guide to your fair trading rights when using brokers and exchanges*, Canberra, 2011, <https://www.accc.gov.au/system/files/Water%20trading%20-%20a%20guide%20to%20your%20rights.pdf>, viewed 12 June 2020.

369 s. 18 of the ACL.

370 s. 29 of the ACL.

371 s. 36 of the ACL.

372 ss. 21-22 of the ACL.

373 s. 50 of the ACL.

374 s. 23 of the ACL. A 'small business contract' for this purpose is a contract where if one party employs fewer than 20 persons and either (i) the upfront price does not exceed \$300 000, or (ii) the contract duration is more than 12 months and the price does not exceed \$1 million.

375 s. 50 of the ACL.

376 s. 3 of the ACL.

377 s. 45 of the CCA.

378 Relevant sections regarding cartel conduct are 45AA; 45AF; s45AG; s45AJ and s. 45AK of the CCA.

379 s. 46 of the CCA prohibits the misuse of market power and provides that a business with a substantial degree of power in a market is not allowed to engage in conduct that has the purpose, effect or likely effect of substantially lessening competition in a market.

380 As part of this role, the ACCC published the following guides to explain the rights and obligations of intermediaries and their clients under the ACL and similar state and territory fair trading legislation: ACCC, *Water trading – a guide to your fair trading rights when using brokers and exchanges*, Canberra, 2011, www.accc.gov.au/system/files/Water%20trading%20-%20a%20guide%20to%20your%20rights.pdf, viewed 12 June 2020; ACCC, *Water trading – an overview*, Canberra, 2011, www.accc.gov.au/publications/water-trading-an-overview, viewed 12 June 2020; ACCC, *Water broker and exchanges – your fair trading obligations*, Canberra, 2011, www.accc.gov.au/system/files/Water%20brokers%20and%20exchanges%20-%20your%20fair%20trading%20obligations.pdf, viewed 12 June 2020.

concerns with the inquiry about the extent of action taken by the ACCC to date regarding certain water-broker related complaints.³⁸¹ Most of the concerns raised in recent years and in stakeholders' submissions to the inquiry relate to broader conduct issues that are not covered by these provisions, or to situations where there has not been sufficient evidence available to take action.

The ACCC in recent years received two complaints alleging a broker engaged in forgery and fraudulent practices. The issue of theft and fraud was also raised in a 2010 ACCC report regarding water market intermediaries. That report noted that while the criminal law would apply to these practices, further measures could be taken to reduce the opportunity for brokers to engage in such practices and to protect their clients, including the introduction of an industry-wide fidelity fund, a requirement for brokers to use audited trust accounts, and to have professional indemnity insurance.³⁸² A subsequent report identified that fraud and theft by water brokers should be safeguarded against by the introduction of an industry-led regulation scheme or, where this did not develop, 'the Australian Government should regulate water market intermediaries.'³⁸³ While theft and fraud are regulated by criminal law, the issues set out in this report highlight that without clear obligations on brokers towards their clients, enforcement of those obligations and greater transparency within water markets, there will be opportunity for brokers to engage in fraud and related practices. The management of client funds and professional indemnity insurance for intermediaries are discussed in section 8.7 of this chapter.

Water market intermediaries who offer products or services that are financial products or services, such as advice on water derivatives, have additional obligations under the *Australian Securities and Investments Commission Act 2001* (Cth) (the ASIC Act) and the *Corporations Act 2001* (Cth) (the Corporations Act). This is discussed further in chapter 9.

8.3.1 The Australian Water Brokers Association's voluntary code of conduct

The Australian Water Brokers Association (AWBA) is the industry association that represents water brokers. Members agree to comply with the voluntary AWBA industry code of conduct which seeks to establish standards for the conduct of brokers and intermediaries. The code does address some of the client-facing conduct discussed in this chapter, such as the broker's obligation to disclose a conflict of interest or that a broker's promotional material must not contain false or misleading statements.³⁸⁴ However, its capacity to achieve compliance across the industry is limited given it has only been voluntarily adopted by 29 full members and 10 provisional members.³⁸⁵

Concerns have also been raised by water market intermediaries that there is no confidence in the voluntary code and the AWBA.³⁸⁶ It is clear from the concern expressed to the ACCC at public forums³⁸⁷ and in submissions that the industry is not satisfied the voluntary code has capacity to effectively manage broker conduct. The AWBA's own submission highlighted the limitations of the code. It stated, '...we are acutely aware that not all entities who act as water market intermediaries are members of the AWBA. As such the AWBA would welcome government regulation that applies to any entity that lodges water trades on behalf of clients.'

381 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020 p. 2; Riverland Horticulture Futures Group, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

382 ACCC, 2010, op. cit., pp. 31–37.

383 Commonwealth of Australia, 2014 *Report of the Independent Review of the Water Act 2007*, Commonwealth of Australia, Canberra, November, p. 54, <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/water/independent-review-water-act-2007.pdf>, viewed 26 June 2020.

384 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, Appendix 1.

385 Provisional AWBA members are in training to become water brokers and do not have AWBA voting rights. Of the individual AWBA members, some are employed by brokerage firms who employ multiple brokers and/or engage contractors. Although the AWBA's constitution does not at the time of writing enable it to offer company-level membership, companies are offered affiliate membership and there are currently five affiliate members. Therefore, AWBA members reflect a small percentage of individual brokers who operate in the market.

386 H2OX, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 6, 9; Goulburn Murray Irrigation District Water Leadership, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

387 This issue was raised at the Murray-Darling Basin inquiry, Deniliquin public forum.

8.4 Significant concerns have been raised about broker conduct

Stakeholders raised issues of concern relating to the role, practices and conduct of water brokers that are capable of impeding the efficient operation of water markets. These issues were raised in the interim report and feedback on each of these issues was invited. The ACCC analysed this feedback and this chapter considers where intermediary obligations are needed to address these issues. Recommendations related to intermediaries are set out in chapter 9.

8.4.1 Concerns raised about brokers

The concerns raised by stakeholders in response to the inquiry can be grouped into (a) concerns between a broker and their client, such as client fund management and perceived or real conflicts of interest (client-facing issues); and (b) concerns which extend beyond client-facing issues to impact competition in the market more broadly (market-facing issues). While the ACCC acknowledges some of the issues raised as client-facing issues also arise in some of the market-facing issues, these categories are designed to describe the overarching nature of the conduct. Table 8.2 below sets out the key issues raised with the ACCC during this inquiry, and each of these issues are discussed in this chapter.

Table 8.2: Table of client-facing and market-facing concerns discussed in chapter 8

Part	Concerns	Description
Client-facing concerns		
8.5	Unclear role	There is a lack of clarity about the role that brokers play in water transactions and misunderstanding about the obligations they owe to their clients.
8.6	Incompatible interests	Some intermediaries do not disclose matters that their clients perceive as a conflict of interest, nor seek their client's consent to proceed with the trade. For example, when brokers act for both buyers and sellers, or an intermediary acts as a principal in a trade.
8.7	Client funds are not subject to management obligations	There is currently no regulatory framework to require water market intermediaries to establish statutory trust accounts, or to require intermediaries to obtain professional indemnity insurance, as is the case in other markets.
8.8	Information asymmetries exist between broker and client	Intermediaries could use their access to information, their ability to analyse that information, and the reliance on information provided by intermediaries, to misrepresent the market to their clients to maintain or increase the price and volume of water rights traded.
Market-facing concerns		
8.9	Incomplete or misleading information to state registers	Intermediaries are able to influence the 'market price' of a water right by misrepresenting the price on trade approval applications to signal to the market (via the state register) that the price of a water right is different to the agreed price for the transaction.
8.10	Intervalley trade strategies	<p>Some brokers use strategies when transferring water through intervalley trade which raised equality of access and transparency concerns, including:</p> <ul style="list-style-type: none"> aggregating clients' water rights onto broker held accounts for transfer in one large trade, which closes intervalley trade openings prematurely in the view of some stakeholders IT strategies for submitting approval applications to improve the likelihood a trade will be approved. <p>It is also alleged that price differentials between the valleys can be maintained by brokers who use their accounts for intervalley trading.</p>
8.11	Perceived conflicts arising from multiple IIO roles	Concerns regarding the potential conflict of interest where an IIO has a dual role in providing intermediary services and approving trades.

8.5 Brokers' obligations to their clients are generally unclear

Market participants raised substantial concerns with the ACCC regarding a lack of clarity about the role that brokers play in water transactions and misunderstanding about the obligations they owe to their clients.³⁸⁸ Stakeholders have called for brokers to be required to comply with clearly articulated obligations regarding their relationship with their clients.³⁸⁹ The Australian Dairy Industry Council noted a challenge faced by dairy farmers in engaging a broker was not knowing whether they were acting in the farmer's best interests.³⁹⁰

The obligations owed by a broker to their client depend primarily on the terms of their contract, and potentially a range of other circumstances surrounding their dealings. There are no standardised contracts for water brokerage services. It follows that the specific obligations of a broker to their client vary substantially from case to case, causing significant misunderstanding and potential financial detriment to the client where these obligations are not set out in the contract.

8.5.1 Establishing a fiduciary relationship

In general terms, a fiduciary relationship is one where one of the parties stands in a position of trust and confidence in relation to the other such that the fiduciary is bound to place the other's interests ahead of his or her own personal interests.

The relationship between agent and principal is often regarded as a fiduciary relationship. However, as set out in the following paragraphs, the existence or otherwise of a fiduciary relationship depends on the circumstances of each case. Despite what market participants might generally assume, it appears that the incidence of a fiduciary relationship arising between a water broker and its client are rare.

While there is no single test to identify a relationship as fiduciary, at its simplest, a fiduciary relationship exists where the circumstances establish that a person has undertaken to act for or in the interests of another person, and not in his or her own, or a third party's interest. Standard categories of relationship have been recognised as fiduciary relationships, including lawyer/client and doctor/patient.

A fiduciary has duties they owe to the other person. A fiduciary may not enter an engagement in which it has or could have a personal interest conflicting with that of his or her principal, nor may a fiduciary gain a profit for him or herself or a third person, without the informed consent of the principal.

The law of fiduciary relationships has developed over time through the courts rather than by legislation. However, most intermediary relationships are subject to industry-specific state and Commonwealth laws³⁹¹, imposing obligations akin to the obligations of a fiduciary.

There is no such regulation for water market intermediaries.³⁹² Obligations owed by exchange platforms and other online platforms to their potential users are established through their online conditions of use. The ACCC understands there is no expectation that these platforms owe users a fiduciary duty. In contrast, water brokers' obligations to their clients will generally be established in their contracts and from the conduct of the parties and will vary from case to case. For example, a broker's authority to act may be enduring, or it may be confined to a specific timeframe or volume and will be established in

388 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 6; H2OX, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 10.

389 Waterfind, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 4. Waterfind supports the introduction of regulation or other obligations that would require brokers to enter into clear, written terms that are agreed with their customers that set out the relationship with the intermediary.

390 Australian Dairy Industry Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

391 For example, the *Property and Stock Agents Act 2002* (NSW) regulates real estate agents, stock and station agents and strata managing agents. Stock brokers are regulated by the *Corporations Act 2001* (Cth) and the ASIC Market Integrity Rules for security markets and futures markets.

392 While a broker's failure to disclose a contrary interest may have the effect of misleading or deceiving a customer, and may be a breach of the ACL, there is no industry-specific regulation requiring water brokers to disclose where their interests are contrary to their client's interests; ACCC, *Water market intermediaries: industry developments and practices*, December 2010, Canberra, p. 40.

their contract. Without more, these cases are likely to be insufficient to establish the requisite intention to create a fiduciary relationship.

It is foreseeable that in these circumstances, the client could have an expectation that the contract establishes a fiduciary relationship between themselves and their broker, and that the broker is acting as their agent and in their best interests, when this is not the case. The ACCC received a complaint that highlights the confusion and mistrust that can arise when a broker's obligations to the parties engaged in a trade are not clearly set out in the contract and incorrect assumptions are made. Typically the contracts reviewed by the ACCC do not clearly disclose the existence of a fiduciary relationship.

8.5.2 Some intermediaries perform multiple roles

A client's understanding of the obligations owed to them by a water broker in any particular trade are further complicated by the fact that the water broker could also be their solicitor, stock and station agent or real estate agent. A solicitor, stock and station agent or real estate agent will often owe specific statutory obligations to their clients when performing those roles, which in many cases will not apply when they engage with the same client as a water broker. For example, a client may not appreciate that the obligations their stock and station agent owes them when acting in that capacity, can differ from the obligations that same individual owes them when acting as a water broker. Additionally, a firm offering water brokering services may also be operating an exchange platform.

To address uncertainties around what services are being provided and what obligations are owed to the client, the following obligations should be established to clarify the relationship between intermediaries and their clients:

- An obligation on intermediaries to act in the best interests of a client³⁹³
- An obligation to provide the following information in writing to a client at the outset of each engagement (rather than a blanket statement by an intermediary) to allow for negotiation on a trade by trade basis:
 - the services being provided
 - the obligations owed to the client
 - the fees/commissions to be charged.

The ACCC considers that any regulation placing obligations on intermediaries, should include:

- an obligation to inform the client in a timely manner of any reasons for a trade approval authority rejecting or delaying the processing of an application
- an obligation to implement a complaints handling process, and to keep records relating to complaints or resolution of complaints
- an obligation to hold written authorities to submit trades for approval on behalf of clients.

The ACCC considers that obligations should be placed on intermediaries, when they are providing certain services which are typically provided only by brokers, to:

- hold written authorities to act as an agent on behalf of clients
- act in accordance with client instructions
- communicate all buy and sell offers to clients in relation to the proposed trade.

³⁹³ When they are providing certain services which are typically provided only by brokers.

8.6 Intermediary interests can be incompatible with their client's

The interests of water market intermediaries and their client can be incompatible where:

- the broker provides brokerage services, that includes advice regarding price or volume of water rights, and charges a commission/fee³⁹⁴, to both the buyer and the seller³⁹⁵, or
- an intermediary takes a position as a principal in a trade, while providing services to the other party to that trade.³⁹⁶ For example, a broker may engage as a principal in a trade to or from their own water account, or their firm's account, while providing brokerage services (beyond any administrative services they provide) to another party to that trade.

There is no express regulatory requirement on brokers to disclose a practice that is incompatible with their client's interests. As noted above at section 8.5 of this chapter, the circumstances of each broker-client relationship will determine whether the broker stands in the position of a fiduciary, and therefore has a duty to act in their client's interests ahead of their own. It is currently unclear which individual relationships would be found to have this character, although it seems likely that these would be few in number.

8.6.1 Some brokers provide services to, and receive payment from, both parties in a trade

In some instances, there is a lack of clarity and misunderstanding about the services brokers provide to parties involved in a trade of water rights and to whom they are providing those services. The ACCC is aware that some brokers act, or appear to act to some degree, for both parties to a trade and the services being provided involve some level of broker discretion (beyond administrative services). Where a broker has been engaged to negotiate or provide advice regarding price by both parties, each party to the transaction will have opposing interests (the seller wants the highest price, and the buyer wants the lowest price). The ACCC considers this is problematic, as, in such circumstances, a broker cannot act in the best interests of clients that have competing interests.

Some brokers have sought to address this issue through disclosure to the parties engaging in the trade in their standard form documentation, such as by disclosing they may act for both buyer and seller and may receive a commission from both. However, stakeholders have identified that where brokers charge commissions to both buyer and seller, it is difficult to discern who is the broker's client and primary interest.³⁹⁷

The following case study illustrates how these issues were addressed by the Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry.

394 Other than trade approval authority fees.

395 Select Harvests, *Submission to Murray-Darling Basin water inquiry issues paper*, 16 April 2020, p. 4.

396 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 6.

397 Select Harvests, *Submission to Murray-Darling Basin water inquiry issues paper*, 16 April 2020, p. 4.

Box 8.1: Case study

Mortgage brokers and the Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry

The Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry (the Royal Commission) highlighted concerns regarding conflicts of interest in the relationship between mortgage brokers and borrowers, due to brokers receiving payments from lenders.

The Royal Commission reiterated from its interim report, 'how difficult it may be to decide for whom intermediaries act and to whom a particular intermediary may owe duties and responsibilities.'³⁹⁸ The Royal Commission then noted, 'the general rule that should apply throughout the financial services industry is that an intermediary who is paid to act as intermediary:

- acts for the person who pays the intermediary
- owes the person who pays a duty to act only the interests of that person, and
- ordinarily owed the person who pays a duty to act in the *best* interests of that person.'³⁹⁹

The Royal Commission then went on to find that:

- 'Value-based commissions paid by lenders to mortgage brokers are a form of conflicted remuneration. That is, value-based commissions are a form of remuneration that can reasonably be expected to influence the choice of mortgage, the amount to be borrowed, and the terms on which the amount is borrowed'⁴⁰⁰
- 'trail commissions have the effect of aligning the broker's interests with those of the lender, rather than those of the borrower'⁴⁰¹
- 'The law should be amended to provide that, when acting in connection with home lending, mortgage brokers must act in the best interests of the intending borrower'⁴⁰²
- '...the best interest's obligations should be enforceable by civil penalty.'⁴⁰³

The ACCC acknowledges the differences in scale, scope and nature of harms between the issues dealt with by the Royal Commission set out above, and the issues addressed in this chapter. In particular, they relate to different markets that impact a different number of individuals and businesses. However, the ACCC considers there are clear parallels in that the risk of substantial financial harm are common to both.

The ACCC is less concerned about exchange platforms being engaged by both parties to a trade (and receiving a commission from both parties) because matching processes on exchange platforms are designed to facilitate direct trading between buyers and sellers. However, even when only one party to the trade, most commonly the seller, is paying the commission or fees for the brokerage services⁴⁰⁴, there are instances where the nature of the obligations owed and the services provided by the broker may be misunderstood.

The ACCC acknowledges that such potential conflicts exist for intermediaries across a range of markets. However, in other markets for intermediary services, such as real estate or financial services, a comprehensive regulatory framework exists to establish clear obligations on the intermediary and to manage any conflicts.

398 The Treasury (Cth), *Final Report of the Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry*, Report (2019) p. 14.

399 *ibid.*

400 *ibid.*, p. 67.

401 *ibid.*, p. 71.

402 *ibid.*, p. 72.

403 *Ibid.*, p. 73.

404 However, there may be instances where the buyer in a trade may be the only party responsible for trade approval fees.

The ACCC's view is that an obligation is required for intermediaries⁴⁰⁵ to disclose to their client when they are receiving multiple commissions/fees in relation to a single trade.

8.6.2 Intermediaries are able to engage in water trading as a principal, for profit

Stakeholders raised concerns about instances when brokers or a related party to the broker or brokerage firm, act as a principal (a buyer or seller) in a trade while also providing intermediary services to the other party to the trade. This is problematic, as the interests of the broker and the client can directly conflict, and this leads to mistrust in brokers. For example, this occurs where brokers are trading their own water rights as a principal without disclosing their personal interest in the trade and may be charging commission. Some brokerage firms disclose to their clients that they may trade using their own water holding accounts or licences, although not necessarily in respect of any particular trade. Some brokers disclose their personal interest and receive written consent for entitlement trades, but not necessarily for allocation trades. The AWBA's view is that:

...whilst we are supportive of brokers having the ability to invest in water products at their own discretion, it is entirely inappropriate that a broker enter into a transaction with a water market participant directly.⁴⁰⁶

The AWBA's policy requires member brokers to use a broker from a separate business when engaging as a principal in the water market.⁴⁰⁷

The ACCC received feedback expressing strong support for introducing conflict management obligations for intermediaries, including disclosure requirements.⁴⁰⁸ Some submissions went further, calling for a ban on brokers having the ability to take an interest in a trade as a principal.⁴⁰⁹

The ACCC considers that an outright prohibition on intermediaries trading their own water rights is unwarranted. Conflicts can be managed by imposing a fiduciary-like obligation on intermediaries to enter such engagements only with the informed consent of the client. An obligation on intermediaries to disclose a personal (or related entity's) interest in a trade is required. Intermediaries should have separate broking water accounts (which are used to hold client water rights) and trading water accounts (which are used to hold water rights in which they have a personal interest). The intermediary must also disclose that the water rights they have a personal interest in are to be transferred to/from the intermediary's or related entity's trading water account (that is, not the intermediary's broking water account which is used to hold client water rights). The intermediary must provide an opportunity for the client to get independent advice, and obtain the written consent of the client before proceeding with the trade.

Disclosure of a conflict or potential conflict allows for clients to seek information or advice elsewhere, and, where an intermediary is taking a personal interest, allows the client to consider in all the circumstances whether any advice provided can be trusted, and whether the services provided by the intermediary warrant the payment of a commission, given the potential of the intermediary to profit directly from the trade.

Water market intermediaries benefit from some information asymmetries because of information they receive from clients in the course of providing intermediary services. Intermediaries are able to use this information to gain an advantage in trading their own water rights. For example, a broker may be

405 This obligation is not required for trades that have been matched through an exchange platform.

406 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

407 Australian Water Brokers Association, *Water Accounts and Conflict Policy Statement*, <http://awba.org.au/wp-content/uploads/WATER-ACCOUNTS-AND-CONFLICT-Policy-Statement.pdf> (viewed 12 January 2021).

408 Lachlan Valley Water, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 1; Australian Dairy Industry Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 14; Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; Murray River Group of Councils, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

409 Public Interest Advocacy Centre, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; Citrus Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

informed by a client that they intend to buy or sell a large volume of water rights, which would have an impact on the prevailing market price. The broker could then gain an advantage by trading their personal water rights before this information is public and the price changes. Chapter 9 recommends broadening and strengthening the insider trading prohibition in water markets, to apply to the use of any material information prior to it being made public in order to gain an unfair advantage in the market. This recommendation is discussed in subsection 9.10.4.

8.6.3 Brokers' use of their own accounts to facilitate trade reduces transparency

In the 2018–19 water year, 12% of all approved allocation trades in the Southern Connected Basin listed a broker or exchange platform⁴¹⁰ as a principal in the trade.⁴¹¹ Presently, a broker's use of their water accounts when providing brokerage services reduces transparency as:

- the price the seller receives for the water rights is unclear to the buyer
- the price the buyer pays for the water rights is unclear to the seller⁴¹²
- the buyer and seller are not identified to each other when water rights are transferred through the broker's water account, and
- clients are unable to distinguish broker facilitated trades from those trades where the broker, or a related party, is the counterparty in the trade.⁴¹³

Box 8.2: Case study

Is the broker the principal in the trade?

The ACCC received an allegation that a broker offered a parcel of water rights for sale on its website, and engaged in negotiations with the prospective buyer without disclosing that the broker owned those water rights and was therefore a principal in the trade.

A broker is currently able to hold water on their own accounts, either to provide a service to their clients or to undertake their own trades. They may provide this service to their clients for a range of reasons including privacy or to aggregate small parcels of water rights from a number of clients and sell as a larger parcel. The practice of brokers facilitating trade through their own accounts means that when water rights are transferred off the broker's water account to the buyer's account, this could mean that the broker is either the seller (and a principal in the trade) or the broker has been holding the water rights on their water account on behalf of a client or number of clients.

This lack of transparency makes it easier for a broker to take a position as a principal (and possibly profit from the trade in excess of their fees or commissions) without the buyer's knowledge.

There are a range of circumstances in which brokers offer the use their firm's water accounts to facilitate their client's trade (rather than to act as a principal in a trade) including:

- aggregating small parcels of their client's water rights to reduce transaction costs including interstate fees and to meet large buy orders. This can include the movement of temporary allocation through intervalley trades (IVTs).⁴¹⁴ The issue of brokers using their water accounts to facilitate IVTs is discussed more broadly at section 8.10 of this chapter

410 The ACCC found it is more common for brokers to own water holding accounts than exchange platforms.

411 ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

412 H2OX, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 10. This submission notes vendors would be unable to determine the price received for their water right if it was sold off the broker's account.

413 Fruit Growers Victoria Ltd, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 2. This submission notes that brokers should disclose if they or a related party are the counterparty to any trade they facilitate.

414 H2OX, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, pp. 9–10; Australian Water Brokers Association, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2. The AWBA submission to the interim report highlighted that there is some dissent within the AWBA on the issue of broker water accounts, however, on balance the majority of members are in favour of the use of broker water accounts to assist clients navigate IVT movements, acknowledging the challenges involved in these movements.

- facilitating the transfer of their client's water rights to regions where clients do not hold accounts, and
- enabling their clients to trade with privacy.

It is not always necessary for the parties to the transaction to have visibility over all of the details of a trade. However, the list above highlights the reduced transparency that arises from trading water rights held on a broker's water account, even when it's held for a client. As clients are unable to determine the actual price in a transaction and/or to whom they are trading, there is also an opportunity for brokers to profit from price differentials (a low sell price or a high buy price) by transacting with each party separately on the broker's own or the firm's account.⁴¹⁵ The ACCC does not believe that this practice is systemic, however, the reduced transparency from the pooling of water rights in broker accounts and lack of uniform standards for accounting for water rights in these accounts means it is difficult to identify where the practice may be occurring.

The ACCC conducted analysis of 'broker-mediated trades' in the trading data from voluntary information requests, to identify potential instances of brokers capturing a price spread, where an identical volume was traded on to a broker's account and off that broker's account within a specified timeframe but at different prices, and sought to compare this with data from a broker. Analysis of the results showed that trades were not necessarily linked (for example, there might be transfers on to a broker's account in one zone and off an account in a different zone), and when compared with data sought from the broker, the trades identified through the analysis could not be reconciled with the accounting systems maintained by that broker. This example highlights the need for accounting standards which link the seller/s and buyer/s for trades through intermediaries' water accounts.

An additional concern has been expressed by stakeholders about the lack of clarity about legal ownership of the water right when brokers transfer clients' water rights on to their accounts.⁴¹⁶ Stakeholders have called for improved visibility of brokers' trades⁴¹⁷ and the AWBA has expressed support for statutory water trust accounts for brokers' water accounts which are used to hold client water allocations (broking water accounts).⁴¹⁸ The AWBA has also agreed a policy for their members regarding the use of broker water accounts to facilitate trades for clients. The policy states that no personal water allocation owned by the broker is to be held in such a water account.⁴¹⁹

The ACCC's view is that the lack of transparency that arises from brokers using their own water accounts is problematic, as brokers can take a position in the trade without the other party knowing. This creates mistrust between brokers and irrigators, and reduces the quality of information that irrigators have when making buying decisions. To address this concern, client water rights management and accounting obligations are required for intermediaries with water accounts which are used to hold client water rights (broking water accounts).

Intermediaries' use of water accounts to facilitate trades can provide a valuable service to clients and client water rights can be protected with the application of a statutory trust accounting framework to these accounts. The ACCC's view is that any such trust accounting framework should also prohibit the co-mingling of water rights owned by the intermediary or a related entity, in that intermediary's broking water account which is used to hold client water rights. In addition, the framework should provide for a standard of accounting which is able to link the trade(s) into the account (from the seller/s) with the corresponding trade(s) out of the account (to the buyer/s). An intermediary should also have an obligation to disclose to a client when water rights are to be transferred to or from the intermediary's broking water account which holds client water rights, to make it clear to the client that the water is not being transferred to/from the counter-party's account.

415 Citrus Australia, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 14.

416 H2OX, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 10.

417 Kilter Rural, *Submission to Murray-Darling Basin water inquiry issues paper*, 5 March 2020, p. 10. This submission noted that an area for improvement includes better visibility of all brokers' trades.

418 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

419 Australian Water Brokers Association, Water Accounts and Conflict Policy Statement, <http://awba.org.au/wp-content/uploads/WATER-ACCOUNTS-AND-CONFLICT-Policy-Statement.pdf>, viewed 12 January 2021.

Box 8.3: Case study

How a broker could take a personal interest in a trade under the proposed obligations

A seller wants to sell 100ML of water allocation, but a broker only has a buyer for 80ML and the broker agrees to purchase the remaining 20ML personally. Under the proposed obligations set out in this chapter, the broker would be obliged to:

- Confirm to the seller in writing that the 20ML would be transferred to a trading water account owned by the broker, and disclose their interest as the purchaser of the 20ML.
- Seek written consent from the seller that the 20ML is to be purchased by the broker personally, after giving the client the opportunity to get independent advice.
- If consent is received, confirm to the seller in writing that the 80ML would be transferred to the broker's broking water account which is used to hold client water rights (if not being transferred directly to the buyer's water account).
- Arrange for the 20ML to be transferred from the seller's water account to the broker's trading water account and not the broker's broking water account which is used to hold client water rights.
- Ensure that the seller is paid for the 20ML out of the broker's separate bank account, and the payment for the 80ML is paid for from the broker's trust account for client funds (after receipt of the funds from the buyer of the 80ML).

The obligations discussed in this section should apply such that the relevant disclosure must be made for each trade, and general disclosures about the practices of the intermediary would be insufficient.

8.7 Client funds are not subject to management obligations

Intermediaries hold a significant percentage of the total value of the trade in escrow until settlement.⁴²⁰ The establishment of a robust industry wide legal framework for water market intermediaries and their clients, in the form of statutory trust accounts and an obligation that intermediaries hold professional indemnity insurance, would foster greater trust and confidence between these parties. The ACCC received submissions proposing audited statutory trust accounts⁴²¹, fidelity or assurance funds⁴²² and professional indemnity insurance⁴²³ for brokers. These issues have also been raised by water market participants in previous reports regarding water market intermediaries in the Basin.⁴²⁴ There was strong

420 National Water Commission (NWC), 2011, *Strengthening Australia's water markets*, NWC, Canberra, June, p. 123, https://web.archive.org/awa/20140801095110mp_/http://archive.nwc.gov.au/_data/assets/pdf_file/0008/11240/StrengtheningAustraliasWaterMarketsReport.pdf, viewed 26 June 2020, noted the concern of 'brokers not maintaining an audited trust account to hold client deposits in escrow.'

421 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5; H2OX, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, pp. 5-6; Waterfind, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5; Goulburn Murray Irrigation District Water Leadership, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

422 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5.

423 Goulburn Murray Irrigation District Water Leadership, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

424 Commonwealth of Australia, 2014, loc. cit.; National Water Commission, loc. cit; ACCC, 2010, op. cit., pp. 31-37.

support for the creation of statutory trust accounts⁴²⁵ and an obligation for intermediaries to hold professional indemnity insurance⁴²⁶ in submissions in response to the interim report.

8.7.1 Statutory trust accounts for client funds

It is the ACCC's view that water brokers and exchange platforms should be required to establish audited statutory trust accounts for client funds. This would address stakeholder concerns about the current management of client funds.⁴²⁷ Kilter Rural submission to the interim report expressed concerns in relation to;

...the lack of statutory requirements for water brokers to maintain and operate audited trust account facilities in a similar way to licensed real estate agents. The transaction deposit amounts held by brokers often involve large sums of money. In addition, for some transactions, brokers may hold deposit monies for up to 5 years. In the absence of proper trust account facilities, the ultimate recipient of these deposits is likely to be treated as an unsecured creditor in the event of broker insolvency. We are of the view that this is an unacceptable situation. Other industries including the legal and real estate professions have been able to establish statutory trust account standards to address these issues. We recommend that the same approach be taken to water brokers.⁴²⁸

A trust account is a bank account in which the account holder retains funds on behalf of another person such as a client. The legal frameworks governing certain professions, including solicitors, accountants and real estate agents, require members to establish trust accounts and comply with particular auditing and reporting obligations.⁴²⁹

This use of a trust account lessens the risk that client funds will be dispersed to creditors in the event of intermediary insolvency or bankruptcy.⁴³⁰ A trust account also increases transparency with regard to management of client funds and reduces the opportunity for fraud or misuse of client funds.⁴³¹ Trust accounting would provide another avenue for clients to seek redress in relation to the management of their funds, without having to institute legal proceedings.

The trust account framework should include prohibitions on comingling of client funds with any personal funds of the intermediary, for example, from the sale of their own water rights. An

425 The Law Society of NSW, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; H2OX, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; National Farmers' Federation, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12; NSW Irrigators' Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12; Renmark Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; Kilter Rural, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3; Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; Lachlan Valley Water, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 1; Cotton Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; Central Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5. Central Irrigation Trust noted that if regulation were imposed, it should include the use of trust accounts. Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2. Waterexchange submitted that there should be a requirement for proper management of customer funds, including regular independent audits.

426 The Law Society of NSW, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; H2OX, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; National Farmers' Federation, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12; NSW Irrigators' Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12; Select Harvests, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7; Renmark Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

427 Kilter Rural, *Submission to Murray-Darling Basin water inquiry issues paper*, 5 March 2020, p. 10; H2OX, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020 at p. 6.

428 Kilter Rural, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

429 Examples of other industries where trust accounts are required by legislation: Lawyers (s. 136 of Schedule 1 of the *Legal Professional Uniform Law Application Act 2014* (Vic)); Conveyancers (*Conveyancers Act 2006* (Vic) s 66); Money paid to a financial services licensee (*Corporations Act 2001*, Volume 4 (Cth) s 981B).

430 Department of Sustainability, Environment, Water Population and Communities, 2013, *Regulation of Water Market Intermediaries—Draft COAG Regulation Impact Statement for consultation*, April, p. 11, <https://ris.pmc.gov.au/sites/default/files/posts/2013/04/03-Water-Market-Intermediaries.pdf>. The Draft COAG RIS for regulating water market intermediaries (brokers) did not proceed to final. There was an independent review in 2014 of the *Water Act 2007* which received submissions and made a recommendation (no.9) on an industry led approach to broker regulation.

431 *ibid.*, p. 12.

intermediary should be required to ensure funds are deposited into or paid from a separate bank account for any trade, or part trade, in which the intermediary has a personal interest.

Some brokers have established separate bank accounts to hold client funds. However, the use of the words 'trust account' by brokers to describe some of these accounts is likely to mislead or confuse some clients who assume the broker is under the same obligations as professionals subject to statutory trust accounting obligations.

Where a firm's business engages in both water brokerage services and, say, real estate, the funds relating to water trading are likely to be held in a real estate statutory trust. Market participants have submitted that funds held in statutory trust accounts must relate to funds from the provision of the related industry's services, for example, the sale of property, and that funds relating to the sale of water rights held in these accounts might not be protected in the event of dispute or insolvency. The ACCC notes that issues related to the use of real estate trust accounts for non-real-estate funds will differ between jurisdictions.⁴³² In any case, the option to use a statutory trust account is only open to those businesses which are members of the relevant profession, and while some overlap of these services and water brokerage services has been identified, many of the larger brokerage firms solely provide services associated with the water market.

The AWBA's submission advocates that audited statutory trust accounts should be coupled with the establishment of an assurance fund, administered by the government, that could mirror those that have been established in other intermediary industries.⁴³³ Some submissions also expressed support for an assurance/fidelity fund.⁴³⁴ One market participant has suggested including a capital adequacy requirement.⁴³⁵ The ACCC considers that such a requirement may act as a barrier for new entrants and notes that some brokers are competing by offering to 'make good' trades if one of the parties withdraws or cannot complete the trade. While the ACCC has not identified widespread support for such a fund or a capital adequacy requirement at this time, the ACCC is of the view that an obligation on intermediaries to comply with a statutory trust accounting framework for client funds is required.

8.7.2 Professional indemnity insurance is not mandatory

Submissions in response to the interim report included support for regulation to require intermediaries to hold professional indemnity insurance.⁴³⁶ Professional indemnity insurance would provide water brokers with some protection when providing advice to their clients that may result in those clients incurring financial or other losses. It would also offer some protection against intermediary insolvency or bankruptcy that can otherwise occur when compensation must be paid. In turn, this insurance can protect the funds of other clients, held by the intermediary, from being distributed among creditors.⁴³⁷

It is the ACCC's view that, given that solicitors, conveyancers and financial planners must obtain professional indemnity insurance⁴³⁸, and water market intermediaries have similarly serious levels of responsibility and influence over their client's finances, water market intermediaries should be required to hold professional indemnity insurance. While it has been noted in previous reports that professional indemnity insurance has to date been difficult for water market intermediaries to obtain, this has in part

432 National Water Commission, loc. cit.

433 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5. An example of an assurance fund that has been established for clients of Real estate agents is established by ss. 79 and 80 of the *Estate Agents Act 1980* (VIC).

434 The Law Society of NSW, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; H20X, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

435 Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

436 The Law Society of NSW, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; H20X, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; National Farmers' Federation, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12; NSW Irrigators' Council, *Submission to Murray-Darling Basin water inquiry interim report*, 1 November 2020, p. 12; Select Harvests, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7; Renmark Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

437 For example, solicitors in Victoria are regulated by sections 211 and 212 of Schedule 1 of the *Legal Profession Uniform Law Application Act 2014* (Vic); Conveyancers are regulated by section 41 of the *Conveyancers Act 2006* (Vic); financial planners are regulated by section 912B of the *Corporations Act 2001* (Cth); Department of Sustainability, Environment, Water Population and Communities, op. cit., p. 12.

438 ACCC, 2010, op. cit., p. 33.

been due to a lack of targeted regulation that establishes clear standards and obligations. Regulation that provides greater clarity around the role of brokers and exchange platforms, the services they provide and the nature of the risks to be insured, would facilitate the development of appropriate insurance products for water market intermediaries.⁴³⁹

8.8 Information asymmetries exist between brokers and clients

8.8.1 Irrigators rely on brokers for market information

As discussed at subsection 8.2.3 of this chapter, the majority of Southern Basin trades are conducted using a broker. Irrigators and other market participants therefore rely heavily on the information that brokers provide. Brokers play an important role in providing information to the market and aid in the distribution of a scarce resource to its highest value use.

Information asymmetry is a possible cause of market failure that occurs when one side of the transaction has less information about relevant market factors than the other. The presence of information asymmetries can reduce market efficiency, because parties with less information are unable to make fully informed decisions, resulting in market prices that are too high or too low..

Brokers have an information advantage over almost all water market participants. This is due to the complexity of water trading rules, along with the ability of brokers to devote time, resources, and technology to analysing market activities. Brokers are also advantaged by their ability to access information which is not accessible to their clients. For example, brokers have access to the cumulative data arising from their previous and existing clients' water use, trading histories and proprietary holdings, and often their clients' short-term trading intentions.⁴⁴⁰

While information is available from different channels (that is, Waterflow, state registers), a number of participants have highlighted that there is insufficient timely, reliable and objective market price information and stressed their reliance on broker-provided information. For instance, WaterNSW's submission to the inquiry stated that while more sophisticated market participants are able to understand the complex water market, smaller parties are reliant on third-party information.⁴⁴¹

It has also been alleged that buyers and sellers of water rights often simultaneously list their parcels of water rights with multiple intermediaries, making it more difficult for participants to gauge the price and availability of water rights.⁴⁴² A submission to the inquiry, summarising stakeholder concerns regarding the opaqueness of the Southern Basin water market, stated that because there are so many exchanges, participants are left overly reliant on brokers who have a better understanding of true market volume and value, which in turn can be inconsistent with transactions recorded on the three state registers.⁴⁴³

Feedback to date suggests that Basin State register data is not timely, and provides an insufficient level of detail, to meet the information needs of market participants. Accordingly, information provided by brokers cannot always be compared to information on state registers. There are often significant time delays between when an agreement to trade is struck, when trade applications are submitted, when trade approvals are finalised, and when the transaction information is released on the public state register, as well as integrity issues between different registers and different values in pricing for transactions made on the same day.⁴⁴⁴ These trade processing delays are examined further in chapter 10 of the report and price reporting is examined further in sections 9.4 and 11.3 of the report.

439 ACCC, 2010, op. cit., p. 33; National Water Commission, loc. cit.

440 Civic Ledger, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 1. This submission notes that water broker's access to proprietary information via their water trading activities causes 'information asymmetry' in the market.

441 WaterNSW, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 13.

442 H2OX, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

443 Ricegrowers' Association of Australia's, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 5.

444 Commonwealth Environmental Water Holder, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 6.

8.8.2 Brokers provide information in a variety of forms

Brokers communicate information to clients directly or present information to the wider market on their websites. Brokers engage in vigorous marketing strategies to promote their services to prospective and current clients. This includes sending regular SMS messages, email messages or making phone calls offering regional specific information and water strategies along with their proposed rates. Some brokers target these messages to potential and existing clients based on their licence volume and value, to assess the potential value of trade each client will engage in. The brokerage firm will then engage with each client based on their assessment as to their likely value of trade.

Individual brokers within some firms are required to meet key performance indicators based on the number of calls made to current or prospective clients, orders placed, number of client's served, client feedback and commission targets. These pricing and marketing strategies are competitive strategies to encourage clients to engage the broker.

Brokers and exchange platforms will often list recent trades on their websites. Some brokers also list buy and sell offers on their websites (while exchange platforms provide a platform to match buy and sell offers). Water market participants rely on this pricing and market depth information to make trade decisions.

8.8.3 Some irrigators do not trust the information provided by brokers

It has been alleged that some brokers make misrepresentations about the price and availability of water rights, or give misleading advice about predictions or trends, to encourage market participants to pay higher prices and trade higher volumes than they otherwise would.⁴⁴⁵ This has led to mistrust in brokers.⁴⁴⁶ The Almond Board of Australia's submission stated that, 'Many growers rely on water broker pricing information that is not comprehensive and could be seen to be selective in nature for the purpose of sustaining high prices.'⁴⁴⁷

Stakeholders at forums and in submissions also alleged that some brokers make unfounded statements in emails to their clients about the rising price and decreasing availability of a water right in a particular location, to induce clients to enter into a trade.⁴⁴⁸ Even so, some market participants consider that the information provided by brokers is the most accessible and trusted information available.⁴⁴⁹

8.8.4 Buy and sell-offers on broker websites

Brokers do not always list all opportunities for buying and selling water rights on their websites or on exchange platforms as buy and sell offers. In these cases, trade approval application forms are lodged directly to the relevant trade approval authority without the parcels being made available for sale or purchase to the public. However, it is also the case that trades not involving intermediaries will also generally not appear on any website or other publicly available place.

There is no obligation on brokers to publish all buy and sell offers on their websites and this practice is not unique to water markets; For example, in other markets including for Australian company shares, a transaction for shares might be settled by two parties without involving a stock market. Although the ACCC notes that market participants often refer to these trades as 'off-market' or 'off-exchange' trades (including in the submissions cited below), water market trades do not occur 'off-market' per se as there is no central exchange through which all trades are conducted in the Basin water markets.⁴⁵⁰

445 Robinvale Table Grape Growers Advocacy Group, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5

446 Almond Board of Australia, *Submission to Murray-Darling Basin water inquiry issues paper*, 5 March 2020, p. 16.

447 Almond Board of Australia, *Submission to Murray-Darling Basin water inquiry issues paper*, 5 March 2020, p. 7.

448 The Robinvale Table Grape Growers Advocacy Group, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5.

449 For example, at the Murray-Darling Basin inquiry, Murray Bridge public forum, an irrigator said they got a weekly email from Ruralco and seemed happy to rely on that.

450 In this report, the term 'off-platform' is used to describe a trade negotiated via a broker or individuals without the involvement or use of an exchange platform, but lodged for approval via an exchange platform.

There are multiple reasons why a broker may decide not to publish all buy and sell offers, including at their client's request. For example, where a seller or buyer may be dealing with multiple intermediaries, they may prefer not to list their parcel exclusively with one broker, or the client may request it not be published to maintain their privacy. A broker may not list an offer in the interests of efficiency, such as where they already know of a potential buyer or seller. Additionally, a broker may find that the buy/sell offers on their website do not attract many customers and not prioritise updating these.

Some market participants are concerned that given the incentive to maximise commissions, a broker could decide to exclude a sell offer on their website which is lower than the other offers, to create the impression on that website that the water right is trading at a higher price than would otherwise be the case.

Further, because brokers are able to be selective with the offers they list publicly, it becomes more difficult for market participants to ascertain the actual price and availability of that water right. One submission claimed that most trades in the Southern Basin occur 'off exchanges' via brokers and are therefore not reflected accurately to the wider market. Another submission to the inquiry suggested that large allocation buyers insist on negotiating 'off-market' offers which inhibit transparency.⁴⁵¹

8.8.5 List of recent trades on broker websites

Brokers often present a list of recent trades on their websites. There are concerns that brokers are selective with the trades they display, which provides an incomplete picture of the trades that broker has conducted. This can give a misleading impression of prevailing market prices and result in incorrect average price derivations. Reliance on information provided by brokers means that brokers have the opportunity to misuse their unique position in the market to keep water right prices and their commissions higher than they otherwise would be, by not reporting lower priced trades on their websites.

Without complete and timely information on the Basin State registers, the lists of recent trades cannot be compared against register data. A submission by Waterexchange suggests regulation to require brokers using the Victorian Broker Portal to publish the details of their trades on their website, which is audited against the trades submitted through the Portal, in order to eliminate broker misrepresentations to customers in respect of prices achieved and market activity.⁴⁵²

8.8.6 Improved transparency and market oversight would increase confidence in the market

The ACCC has not found specific evidence of brokers making unfounded statements about the price and/or supply of a water right to induce a client to trade, or selectively publishing buy/sell offers or recent trades with the aim of sustaining perceptions of a higher price.⁴⁵³ However, it is a concern that it is difficult for market participants or regulators to verify the accuracy of statements or information provided by brokers, because the relevant information is not available or is not timely. There is also a perceived incentive for brokers to adopt inappropriate practices to maximise their commissions. When combined with an inability to verify broker provided information, and a lack of oversight of market participant behaviour, these issues have led to mistrust in brokers and a lack of confidence.

Existing prohibitions under the ACL, such as the prohibitions against engaging in misleading and deceptive conduct⁴⁵⁴ and making false or misleading representations regarding the quality, value or price of services⁴⁵⁵, could be relevant to the forms of intermediary conduct described in subsections 8.8.3 to 8.8.5 above. However, as set out at section 8.3 of this chapter, the complaints regarding intermediary conduct that have been raised to date with the ACCC have been either outside

451 Waterexchange, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 6.

452 Waterexchange, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 11 (contained in submission to the Victorian Department of Environment, Land, Water and Planning (DELWP) re: Water Market Transparency, 6 November 2019).

453 One broker noted that higher prices are detrimental to their business as market participants trade less when prices are high, and brokers receive frustration and anger from customers about high prices.

454 s. 18 of the ACL.

455 s. 29 of the ACL.

the ACCC's jurisdiction or there has not been sufficient evidence to take action. Further, the current lack of available, reliable data coupled with the significant volume of trade that is conducted 'off-platform' means the ACCC's ability to effectively gather evidence and prosecute such action is limited.

As detailed in chapter 11, the ACCC considers that the availability of more timely and accurate market information would increase transparency, and reduce the reliance on intermediaries as the primary source of up-to date information.

In addition, the ACCC considers that targeted oversight of the behaviour of market participants, and introduction of prohibitions against market manipulation would address the concern about intermediaries using their discretion when publishing buy and sell offers or recent trades to affect perceptions of the market price. To enable the effective oversight of the behaviour of market participants, exchange platforms should provide details of buy and sell offer data, strike dates and times through a regular data feed to a backbone platform. These recommendations are detailed in chapter 9 and will assist effective oversight of the behaviour of market participants, and the verifiability of information provided by brokers and exchange platforms, and increase confidence in the information provided by intermediaries.

8.9 Accuracy, completeness and timeliness of reporting

Although there is no single exchange platform providing a centralised price index, state registers provide a weighted average price of approved trades. Water market participants rely on this pricing information to make trade decisions.

There is no central regulatory authority that monitors price reporting, so it is difficult to ascertain whether market participants are accurately reporting the price of trades. It has been alleged that brokers seek to influence the price of water rights by inaccurately recording prices on trade approval applications (incorrectly reporting to the state register some of the lower priced water rights traded in the market), including the inappropriate recording of zero dollar trades.⁴⁵⁶ Price reporting and zero dollar trades are discussed in detail in sections 9.4, 11.3 and in appendix G and are only briefly discussed in this section in relation to broker conduct.

We also note the following comments in the Murray–Darling Basin Authority's (MDBA) 2018 media release on this issue:

Access to accurate price information is fundamental to a competitive water market, and under the Basin Plan Water Trading Rules, water trade prices must be made available to authorities, yet a large number of trades are reported at zero value. Some of this is legitimate, but we'll be undertaking an audit of this issue, to increase accurate price disclosure by water brokers and sellers.⁴⁵⁷

Part of the MDBA's audit of water trade price reporting for the 2017–18 water year focussed on water traders' and brokers' compliance with the requirement to report prices.⁴⁵⁸ The audit identified a range of issues including confusion about the requirement to report price, inconsistent approaches to reporting price by different traders and brokers, and not being able to verify price on nearly half of all (sampled) transactions. Deloitte, who conducted this part of the audit, determined it was not able to obtain enough evidence to form a conclusive opinion on the extent to which water traders and brokers were reporting prices accurately. Deloitte noted this was largely due to the inability to contact some of the selected traders or brokers and a lack of adequate supporting evidence for selected transactions.

The ACCC notes that while it is the role of the MDBA to monitor compliance of the price reporting obligations through such audit processes, it is the Basin State registers that include the price as a field in the forms used when submitting a trade for approval. On the issue of enforcement, the MDBA's audit found that, 'Mandatory price reporting across all Basin States is a relatively new requirement brought

456 Citrus Australia, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 17.

457 Murray–Darling Basin Authority, 5 June 2018, Compliance spotlight on water brokers, unauthorised take and metering, www.mdba.gov.au/media/mr/compliance-spotlight-water-brokers-unauthorised-take-metering, viewed 31 March 2020.

458 Murray–Darling Basin Authority, 29 May 2019, Water Trade Price Reporting Audit, www.mdba.gov.au/sites/default/files/pubs/water-trade-price-audit-process_0.pdf, viewed 5 June 2020.

under the Basin Plan in 2014, and as a consequence compliance and enforcement was found to be sporadic.⁴⁵⁹

The ACCC notes that 28%⁴⁶⁰ of the number of approved water allocation trades in the Southern Connected Basin had a reported price of zero dollar in 2018–19. Based on Victorian data, 14% of the number of all trades lodged through the Victorian Broker Portal in 2018–19 were reported as zero dollar trades.⁴⁶¹ These statistics are 66%⁴⁶² and 45% respectively if viewed from the percentage of the volume of approved water allocation trades (rather than percentage by number) for 2018–19.⁴⁶³

Some Basin State registers have recently begun requiring information on the reason for a trade, for all trades including zero dollar trades. Some states are yet to capture data on the party that lodges a trade when an application is lodged by a third party on behalf of one of the principal parties. Section 11.2 discusses the recent improvements to data capture and chapter 12 details recommendations to further improve accuracy and transparency of trade information, including trades within IIOs.

In addition, there are no industry-wide obligations on brokers or exchange platforms, including within IIOs, which would require them to keep or provide data to the state registers. The ACCC recognises that the Basin Plan Water Trading Rules at section 12.48 requires a person disposing of a water access right to notify the approval authority in writing of the price of the trade. While this obligation applies to the seller, there is no obligation for an intermediary executing the trade application on behalf of their client to ensure the seller's obligation is fulfilled.

In the absence of clear recording-keeping obligations, it is not clear whether the information provided to state registers is complete and accurate. The MDBA audit undertaken by Deloitte (discussed above) noted a lack of supporting evidence to be able to verify transactions. These examples indicate broader transparency and integrity issues which exist in the water market, and the lack of appropriate trade data captured by state registers. They also highlight the inability to enforce accurate price reporting without record-keeping.

Chapter 9 recommends broadening and strengthening price reporting obligations, with a regulator having responsibility for oversight and adequate enforcement. To enable the regulator to investigate and enforce accurate trade reporting for intermediaries, an obligation is required by intermediaries to keep records of client details, client instructions, and trade details (including price, volume, parties, and strike date) for the period of time (five years) required under Australian Tax Law.

Chapter 12 details the use of a digital protocol for consistent and structured sharing of information from all water market intermediaries to a backbone platform, which includes a central information repository that will enable effective monitoring of trade reporting, and improve information flows to remove the potential for errors in reporting (for example, linkages should be established so that the purchase price from exchange platforms is directly provided to the trade approval authority). Further detail about the development of Water Market Data Standards for the collection, storage and transmission of water market data is provided at subsection 12.4.2.

As outlined in subsection 8.8.6 above, chapter 9 recommends targeted oversight of the behaviour of market participants, and the introduction of prohibitions against market manipulation. These recommendations would also go towards addressing the concern about intermediaries misreporting the price of trades to trade approval authorities to affect perceptions of the market price.

8.10 Brokers use a range of strategies to facilitate intervalley trades/transfers

Intervalley trade/transfer (IVT) openings offer an opportunity for water market participants to take advantage of price differentials between the origin valley and the destination valley (arbitrage). These

459 Water Trade Price Reporting under the Basin Plan, Murray–Darling Basin Authority Canberra, 2019. CC BY 4.0, p. 2, <https://www.mdba.gov.au/sites/default/files/pubs/part-1-audit-basin-state-process.pdf>, viewed 8 June 2020.

460 ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

461 ACCC analysis based on Victorian Government's response to voluntary information request.

462 ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

463 ACCC analysis based on Victorian Government's response to voluntary information request.

opportunities are often strongly contested and when price differentials are significant, trade approval applications must be rapidly submitted to trade approval authorities before the IVT limit is reached and the trading opportunity closes. IVT application processes are discussed in detail in subsection 14.1.6.

Market participants have informed the ACCC about a lack of equal opportunity to participate in IVTs. Equality of access concerns can impact perceptions of market integrity, result in a lack of confidence in the market and inhibit participation in intervalley trading, leading to inefficient outcomes. Stakeholders have noted concerns about high levels of complexity of IVTs.⁴⁶⁴ As discussed above at section 8.8 of this chapter, brokers benefit from information asymmetries and have an advantage in accessing IVTs because of their experience and the time they have to devote to assessing trade rules, trade balances, and anticipating openings. A small number of brokers have recently consistently traded large volumes of water rights between valleys in the Southern Connected Basin, particularly with respect to Murrumbidgee IVTs.

The ACCC examined how market participants access IVT opportunities, and some of the behaviour and strategies of brokers with respect to intervalley trading. In particular, the ACCC examined the aggregation of water rights on brokers' accounts prior to IVT openings, IT and automation for faster submission of trade applications and how the use of brokers' accounts could affect price differentials between valleys.

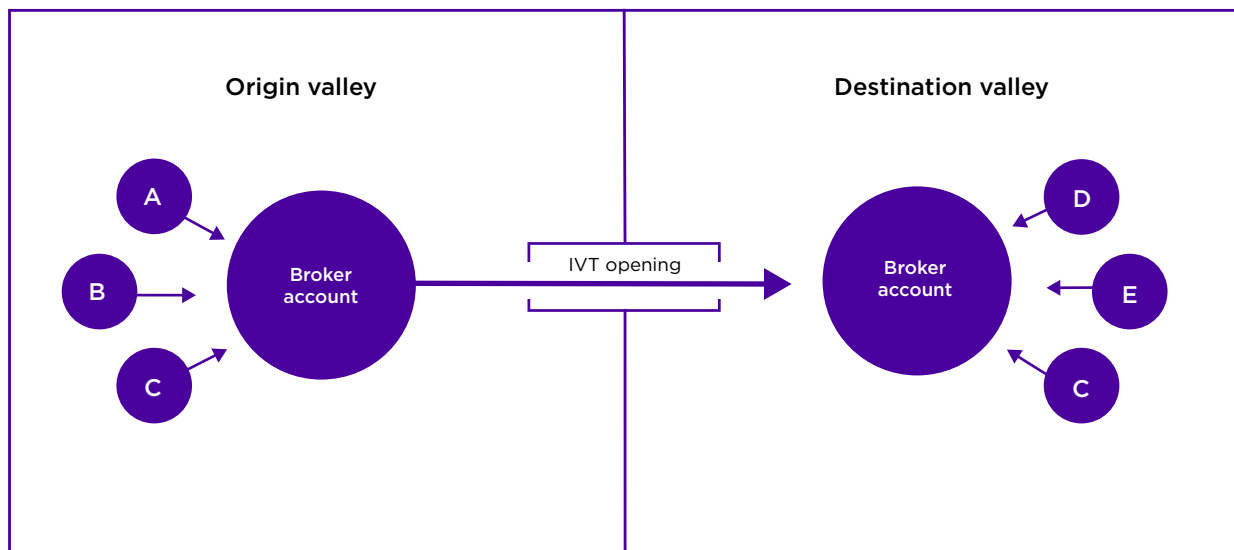
8.10.1 Brokers aggregate multiple parcels of water rights onto brokerage firms' accounts in anticipation of an IVT opening

As part of their service to facilitate the trade of water rights between valleys, some brokers aggregate large parcels of their client's water rights onto their firm's water accounts (in the origin valley) in anticipation of an IVT opening. As discussed in subsection 8.6.3 of this chapter, brokers offer the use of their firm's water accounts to minimise transaction costs for clients or when facilitating transfers to regions where clients do not hold an account. Additionally, brokers aggregate parcels on their own accounts before an intervalley trade opening as a strategy to increase the likelihood of a higher percentage of their clients' trades being approved, before the trade limit is reached.

Commonly, the aggregated parcel of water rights is transferred from a brokerage firm's account in the origin valley, to the brokerage firm's account in the destination valley and recorded on state registers as a zero dollar trade.

⁴⁶⁴ Key Water, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 5.

Figure 8.1: Example of the process of aggregation of water rights from clients A, B and C for transfer through an IVT opening to clients D, E and C.



Brokers aggregate parcels of water from clients who wish to transfer their water for use in another valley (for example, client C in the figure above), and from clients who wish to trade their water in another valley and take advantage of the arbitrage opportunity due to the price differential between the valleys (for example, clients A and B above).

Stakeholders raised the concern that transfers of large parcels of aggregated water rights between valleys by a small number of brokers can result in rapid closing of the trading opportunity (when the trade limit is reached).⁴⁶⁵ The aggregation of parcels of water rights by brokers provides a valuable service to clients who cannot themselves submit a trade for approval during an IVT opening, or for those who consider that using a broker will result in a higher likelihood of a successful transfer. However, when trading opportunities close rapidly, it limits the ability of other market participants to transfer water between valleys and stakeholders raised concerns about a lack of equal opportunity to participate in IVTs.

In the 2019–20 year to date (to 30 November 2019), brokers' accounts were the recipients of 57% of the volume transferred out of Murrumbidgee. However, only 20.6% of the volume transferred out of the Murrumbidgee in the same period was transferred off brokers' accounts.⁴⁶⁶ This may be because some of these IVT openings were less competitive and brokers were able to submit multiple trades during the openings such that the water rights were transferred directly from multiple clients' accounts in the origin valley to the broker's account in the destination valley.

Analysis conducted by the ACCC on individual's shares of the Goulburn IVT capacity when the trading opportunity is open for less than 24 hours found that, during these constrained openings, the shares captured by brokers and agribusinesses significantly increased (see subsection 14.1.6 and figure 14.5).

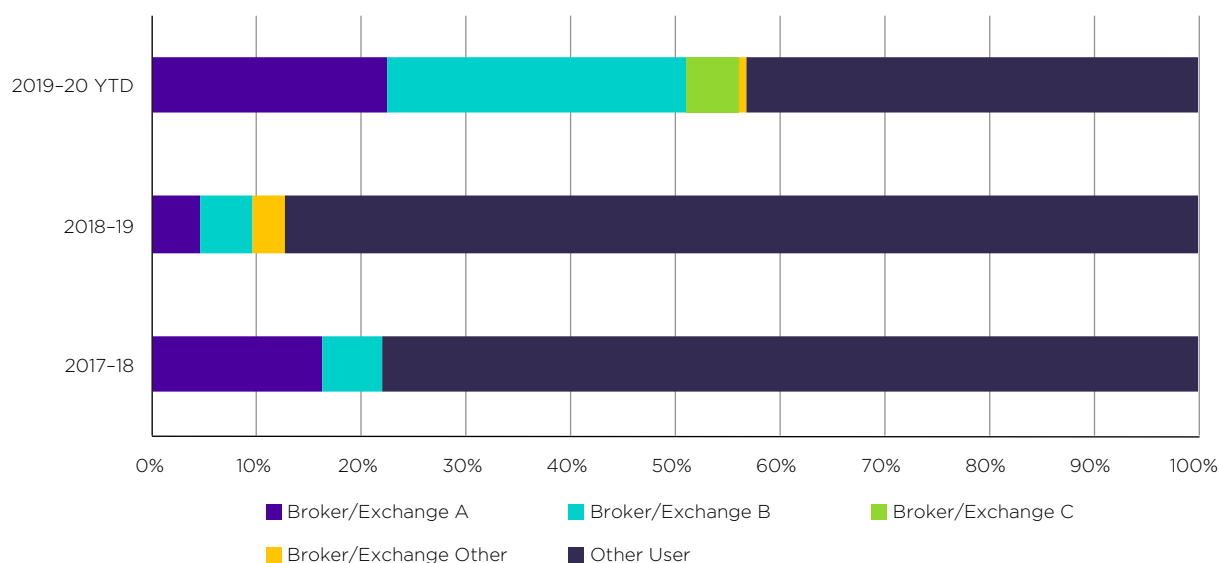
8.10.2 Brokers are developing strategies to get their IVT applications approved

Some brokers have developed trading strategies to improve the likelihood of approval of their trades, through faster submission of their trade applications. Some of these strategies have given rise to concerns about the equality of access to IVTs, transparency of trade approval processes and the design of intervalley trade rules. Additionally, given there are a small number of brokers who have consistently had large volume IVTs approved recently, some market participants consider they must use those brokers to successfully transfer or trade water between valleys.

⁴⁶⁵ H2OX, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 10.

⁴⁶⁶ Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Figure 8.2: Recipients of trades (% by volume) out of Murrumbidgee since 2017-2018.



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

The above figure demonstrates that two brokers have secured the majority of the share of volume traded out of Murrumbidgee in the 2019-20 year to date.⁴⁶⁷

Victoria and NSW have different systems for the lodgement and approval of trades, as discussed in chapter 10 and appendix D. Market participants are critical of the system for applications for trade approvals in NSW that requires applications to be made by email or fax, suggesting that it is low-tech, flawed, and difficult for irrigators to use in competition with brokers during an IVT opening.

The ACCC is aware that some brokers have developed IT strategies for faster lodgement of applications for intervalley trade approvals to take advantage of the NSW approvals system. The ACCC is also aware that patterns in trades submitted to the Victorian Broker Portal show increasing use of automation to rapidly submit trades when an IVT opportunity arises.

The development of IVT approval strategies further signifies that the market for water brokerage services in the Southern Basin is highly competitive. Brokers are developing trade approvals strategies that make the most out of the existing approvals system, to the benefit of their clients. Such competition driven innovation can be positive for markets, provided that the market structure itself does not unfairly exclude some participants from using similar innovations; and the amount spent on the efforts is not disproportionate and inefficient (see subsection 14.1.6). Increased investment in IT and automation will affect the range of parties that are successful with their IVT approval applications. Competitive pressures and arbitrage opportunities could result in more brokers and other market participants developing their own strategies for trade approvals over time. While smaller irrigators will not have the capacity to invest in automation technologies themselves, they could engage a broker who does.

The existence of IVT limits means that IVT opportunities will likely remain highly contested when price differentials are significant. The ACCC's view is that brokers are offering a competitive service to clients which is based on the current design of the IVT approvals process (the 'fastest finger' approach). There has been support from stakeholders to change the IVT approvals process to improve equality of access.⁴⁶⁸ Market architecture recommendations for improving equality of access to IVTs are discussed in subsection 16.2.8. Other recommendations set out in chapter 12 include upgrading trade approval processes to ensure a 'level-playing field' for traders in the Southern Connected Basin.

⁴⁶⁷ The 2019-20 figures are year to date figures to 30 November 2019.

⁴⁶⁸ Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; The Law Society of NSW, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; Central Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8; goFARM Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

The ACCC identified that intermediaries have discretion in allocating successfully transferred volumes among their clients, where large volumes have been aggregated on the intermediary's account in anticipation of an IVT opening, and not all has been able to be transferred. This process is not transparent and the ACCC considers intermediaries should be required to disclose which method they are using to allocate successfully transferred volumes amongst their clients following an IVT opening (for example, in chronological order or pro rata).

8.10.3 Concerns brokers affect price differentials between valleys

A concern was raised that price differentials between the valleys can be maintained by brokers who use their own water accounts for IVTs. It is alleged that the practice of brokers using their accounts to transfer water rights between valleys prevents prices in the valleys from responding quickly or equalising when the constraint is removed.⁴⁶⁹ It has been suggested that prices would more rapidly respond, or equalise, if water could only be moved directly from a seller's account to a buyer's account or between an individual irrigator's accounts and that IVT opportunities would remain open for longer.⁴⁷⁰

The prices recorded when the water rights are aggregated in the origin valley in some instances are not the same as the prices recorded when the water rights are transferred off the brokers account in the destination valley. For example, the prices will not 'match' because a buyer has not been found prior to the IVT opening (when the parcel is aggregated). The use of brokers' water accounts to facilitate trade also limits transparency, which is discussed above at subsection 8.6.3 of this chapter.

A stakeholder has raised further concern that, following the approval of an IVT, a broker can slowly sell water rights off their account into the destination market, to maintain the price differential between the valleys.⁴⁷¹ Brokers can hold parcels of water rights on their accounts in order to maximise their clients' gain from selling their water rights in the destination valley. Strategies to maximise the return on sellers' water assets is in line with the efficient functioning of markets.

Concerns have arisen that brokers may use these strategies to exercise their market power. Some brokers are successfully transferring large amounts of water between valleys, and have demonstrated their ability to capture most or all of the trade limit in one application. This can often be a significant volume of water⁴⁷² which in some instances has the potential to equalise prices between the valleys when the constraint is removed. However, this large amount of water consists of aggregated amounts of multiple client's water, each of whom will have different requirements either for use or for sale in the destination valley. This means it is unlikely to provide brokers with sufficient market power to affect price differentials between valleys.

8.10.4 Brokerage firms taking a personal position in IVTs

The ACCC is also aware of the potential for brokers or brokerage firms to take a position in an IVT through the widespread use of the firm's own water accounts to facilitate the movement of water rights through an intervalley trade opening. The allegation of brokers or brokerage firms taking a position as a principal in a trade is explored above in subsection 8.6.2 of this chapter.

469 H2OX, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 10.

470 *ibid.*

471 *ibid.*

472 Subsection 14.1.1 details the opening, closing and account balances of IVT limits and the Barmah Choke trade restriction.

8.11 IIOs which operate exchange platforms or offer brokerage services are capable of preferencing IIO facilitated trades for approval

Market participants raised concerns with the ACCC about IIOs operating trading platforms or offering brokerage services, while acting as a trade approval authority. A previous report⁴⁷³ and ACCC advice⁴⁷⁴ have considered the potential for conflicts of interest to arise and made recommendations to address such conflict.

IIOs are capable of prioritising the approval of trades facilitated by their own brokerage service or trading platforms over other trade approval requests. A financial incentive could exist for the organisation to bundle water delivery services with the intermediary service in such a way that it limits clients' choice of independent intermediary. To the extent that this occurs, it would result in reduced competition in the market for intermediary services, and result in higher costs to water traders.

Financial gain from acting inappropriately can arise directly from the revenue generated from the exchange platform, or from acting in a way that financially benefits the operator's clients or members at the expense of third parties.

The ACCC received submissions in response to the interim report which recognise this conflict.⁴⁷⁵ The AWBA has stated that 'there is a clear conflict of interest with IIO's being an approval authority, engaging in the market directly, and acting as a water market intermediary.'⁴⁷⁶ Coleambally Irrigation Co-operative Limited disagreed with the proposition that if an IIO operates an exchange or market platform, other traders or intermediaries could be disadvantaged.

The ACCC requested information and met with IIOs who provide intermediary services to explore why IIOs provide these services and how they manage these potentially competing roles. A common aim among IIOs that provide intermediary services, is to keep the costs of trading low for their customers or members. Some smaller IIOs do not consider the services they provide to be intermediary services (even though they are providing matching services for a fee, and using an IIO bank account for settlement). Some IIOs do not receive enough approval applications at any one time, to have to prioritise approval of one application over another. Some IIOs have a policy or practice that they approve trades in chronological order (the order in which applications for trade approval are received).

While there is incentive for an IIO to prioritise approval of a trade for which it is receiving a fee/ commission for brokering/matching that trade, the ACCC has not found evidence that this practice is occurring. The ACCC considers that these IIOs are providing a service to customers to assist them to find potential trading partners, and keeping transaction costs lower for customers is a clear benefit to these users. Therefore the IIO's ability to provide intermediary services should not be removed given little evidence of harm.

However, there is a potential conflict of interest. Chapter 12 sets out that trade approval processes need to be improved, simplified and standardised and that minimum standards and agreed processes need to be consistent and mandated. As part of that move towards standardisation, there is an opportunity to develop a mandated approach for all trade approval authorities (including IIOs) to approve trades in the order in which they are received by the authority.⁴⁷⁷

The ACCC also notes that IIOs providing intermediary services may have similar conflicts to other intermediaries, such as receiving multiple commissions for the one trade, or taking an interest in a trade as a principal. Further, IIOs providing intermediary services may hold client funds or client water rights

473 ACCC, 2010, op. cit., pp. 39–45.

474 ACCC, 2010, Water trading rules, final advice, Canberra, March.

475 Waterexchange, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2; National Farmers' Federation, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 8; Australian Water Brokers Association, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

476 Australian Water Brokers Association, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

477 An exception to this approach may be necessary for IVT trades, should an alternative to the 'fastest finger' approach be introduced.

and should be subject to the same management and accounting obligations as other intermediaries. Accordingly, IIOs providing intermediary services should be required to comply with the obligations identified for intermediaries in this chapter.

8.12 The ACCC's view is that substantial additional water market intermediary regulation is required

8.12.1 Intermediaries are regulated across most markets

This chapter has highlighted that brokers and exchange platforms play an important role in the water market. It is therefore crucial that intermediaries are subject to and comply with obligations that are appropriate for a market intermediary and that market participants are clear about what these obligations are, including how they apply within an IIO. In particular, it is imperative that where there is a real or perceived conflict of interest between an intermediary and their client, these circumstances are clearly disclosed to the client. The client must understand what the intermediary's obligations are and intermediaries must be obliged to act in the client's best interests.

This chapter also identifies the need for the introduction of a client fund and client water right management framework to protect the interests of intermediaries and their clients. Intermediaries across a range of other industries, including real estate agents and stock brokers are regulated specifically to address the risk of similar conduct. It is the ACCC's view that there is merit in likewise addressing these risks in the water market context.

The potential for intermediaries to use their position in the market to mislead clients or the market will be constrained by improvements to market data and information and record keeping to enable effective, targeted oversight of market participants.

8.12.2 The ACCC considers the obligations proposed in this chapter will enhance market integrity

The ACCC's view is that clear obligations for intermediaries are required to address the lack of clarity in the role and obligations of intermediaries, the potential for perceived or real conflicts of interests, and scope for brokers to influence markets without oversight. This regulation would increase the integrity and transparency of water markets, improving their operation for all market participants. The form of the proposed regulation is considered in chapter 9.

9. Regulatory settings and solutions: protecting market integrity and prohibiting harmful conduct

Key Points

- Regulatory settings in Murray–Darling Basin water markets are complex and fragmented between participating jurisdictions. For example, while the Commonwealth Basin Plan Water Trading Rules underpin market regulation, the Basin States each have more specific water trading rules that apply in their jurisdictions.
- For rules such as those dealing with price reporting, the unclear delineation of compliance and enforcement responsibilities between the Commonwealth and Basin States, and the resultant lack of enforcement, means the existing regulation is often ineffectual.
- Notwithstanding the amount of regulation that exists for water markets, much of it relates to water resource management⁴⁷⁸, or state trading rules such as intervalley trade and carry over rules. There is a lack of a cohesive regulatory framework for market conduct and integrity of the kind that exists for other markets.
- There has been increased participation in water markets by investors and agri-businesses over the last 10 years, and the use of intermediaries to facilitate trade in the Southern Basin is now widespread. The regulatory framework has failed to keep pace with these changes.
- While these market participants provide many benefits to Basin water markets, a lack of trust in them by other market participants is inhibiting market confidence. This is partly due to the fact that water market intermediaries such as brokers and exchange platforms are largely unregulated, and there are scant rules to govern the conduct of market participants more broadly.
- While the ACCC was able to scrutinise market activities under this Inquiry, this only provided a snapshot for a given period of time. Nevertheless, some water market participants do not have confidence in the markets, which discourages their participation. This means that opportunities exist to improve trade and economic activity. This requires a regulatory framework which prohibits misconduct such as market manipulation and enables ongoing market surveillance, which could extend to investigation and associated enforcement action if needed.
- The lack of a centralised Basin-wide regulator to monitor trading conduct and activities makes it difficult for market conduct to be assessed holistically and for harmful conduct to be identified.
- The ACCC considers that new centralised Basin-wide legislation is required to prevent harmful conduct, to strengthen integrity, and to improve confidence and fairness in Basin water markets.
- The legislation would be best established through some form of cooperative legislative scheme, and enforced by a centralised regulator – a proposed Water Markets Agency (see chapter 17).
- The legislation should include statutory conduct prohibitions and integrity protections applicable to all market participants, and an enforceable mandatory code for intermediaries.
- Harmonisation of state legislation would not be adequate because it would not be possible to identify market manipulation by looking only within a single trading zone or Basin State. The proposed Water Markets Agency would need to be able to carry out investigations and enforcement activity across state borders.

⁴⁷⁸ Water ‘management’ includes, for example: the management of Basin water resources to meet critical human water needs; the Basin Plan, which provides for limits on the quantity of water that may be taken from the Basin water resources; arrangements for sharing water between the Basin States; and management of water quality and salinity.

9.1 Introduction

This chapter examines the extent to which existing regulation is adequate to govern the conduct and integrity of market participants in Murray-Darling Basin water markets. The chapter then makes recommendations for regulatory solutions to prohibit harmful conduct and to improve market integrity.

The chapter includes information about the existing framework of regulation and regulators. It explains some of the challenges that these arrangements create for compliance and enforcement activity. It also notes that despite the volumes of existing regulation, there are scant rules to prohibit harmful conduct and to protect integrity.

The chapter notes that there isn't a cohesive regulatory framework for Basin water markets comparable to those that exists for other markets, such as the financial services and energy markets. It discusses three options that have been considered for addressing this deficiency. It concludes by recommending that new centralised Basin wide legislation be introduced to improve the integrity and fairness of Basin water markets by regulating conduct of market participants. It recommends the legislation should be enforced by the proposed Water Markets Agency (see recommendation 26).

The chapter also explains which water products are financial products regulated by ASIC, and responds to requests from some market participants for restrictions on investors, both domestic and foreign.

9.2 The existing patchwork of regulation and regulators results in the lack of a cohesive framework for Basin water markets

Regulation of water markets in the Murray-Darling Basin is currently subject to a range of regulatory regimes and regulators.

9.2.1 The Murray-Darling Basin Authority and Basin States

As noted above, the MDBA is responsible for enforcement of the Basin Plan Water Trading Rules, in conjunction with the Basin States. Each of the five Basin States maintains responsibility for legislative and administrative arrangements for water rights (water resource management) and for water trading arrangements in their jurisdictions. These rules must be consistent with the Basin Plan. Each Basin State is responsible for enforcing their own trading rules in their jurisdictions.

The ACCC's role in the Murray-Darling Basin

The ACCC advises the MDBA on the development of Basin Plan Water Trading Rules under the *Water Act 2007*, and advises the Commonwealth minister responsible for water on development of water market rules and water charge rules.⁴⁷⁹ The ACCC also monitors compliance and enforces the water market rules and water charge rules applicable to infrastructure operators. The ACCC refers complaints about possible breaches of the Basin Plan Water Trading Rules to the MDBA which enforces those rules. The *Water Market Rules 2009* prohibit actions or omissions by off-river infrastructure operators that prevent or delay an irrigator from transforming an irrigation right into a water access entitlement. The water charge rules include a termination fee cap and requirements for the publication of Irrigation Infrastructure Operators schedule of charges. The water charge and market rules that the ACCC enforces do not address conduct by individual water market participants, such as brokers, investors or irrigators.

However, like other businesses, water market intermediaries must comply with the *Competition and Consumer Act 2010* (the CCA), which incorporates the Australian Consumer Law (ACL).⁴⁸⁰

479 Subsection 42(2) of the *Water Act 2007* and section 93 of the *Water Act 2007*.

480 However the conduct of an intermediary that is part of the Crown will not be subject to the ACL as a law of the Commonwealth or a State or Territory if the conduct did not occur in the course of the entity carrying on a business. Conceivably some government owned irrigation infrastructure operators could be considered part of the Crown. Whether the water trading activities of a Crown entity amounts to carrying on a business must be considered on a case by case basis and involves consideration of the entity's activities and the context in which the activities of concern have occurred.

The CCA prohibits anti-competitive conduct and the ACL includes consumer protections, such as prohibitions on misleading and deceptive conduct. Section 8.3 in chapter 8 details these protections.

The provisions of the ACL most relevant to water brokers are discussed more fully in a series of ACCC publications including, *Water trading—a guide to your fair trading rights when using brokers and exchanges*, Canberra, 2011.⁴⁸¹

The ACL is legislated at the Commonwealth, state and territory levels. It is enforced by the ACCC at the Commonwealth level and by the state and territory Offices of Fair Trading at the state and territory level.

The ACCC's Water Monitoring Report 2018–19 states:

Through our compliance work, the ACCC is aware of some complaints from irrigators about (alleged) unfair conduct. However none of the conduct was found to be a breach of the Rules or the Competition and Consumer Act 2010.⁴⁸²

The role of the Australian Securities and Investments Commission

The Australian Securities and Investments Commission (ASIC) is responsible for the regulation of financial services and financial markets under the *Corporations Act 2001* (Corporations Act). The regime is limited to financial products and services as defined in the Corporations Act. Financial products includes a broad range of financial instruments including derivatives.

ASIC regulates water market participants who deal in water products that are derivatives and therefore financial products. To be a derivative contract, a water option contract would need to allow for all three prescribed methods of settlement, with the purchaser being given the right to elect the method of settlement at the time of settlement. That is, under the terms of the contract, the purchaser can elect to use either cash-settlement, set-off, or physical-settlement.⁴⁸³ In contrast, products described as water options contracts that only allow for physical settlements are not financial products.⁴⁸⁴ Any water brokers dealing in water options and futures that are financial products would need to hold an Australian financial services licence (AFSL). More detail about financial services regulation is set out in section 9.11 of this chapter.

Role of the Australian Tax Office

Acquiring and disposing of water rights is also subject to general taxation laws administered by the Australian Tax Office (ATO). Foreign acquisitions of water rights are subject to laws for foreign investment administered by the Treasurer, where the acquisition forms part of an agricultural land or agribusiness acquisition that meets the relevant monetary threshold. Foreign acquisitions of water rights must also be registered on the Register of Foreign Owned Water Entitlements, administered by the ATO. More about these arrangements is set out in section 9.13.3 of this chapter.

481 <https://www.accc.gov.au/publications/water-trading-a-guide-to-your-rights>.

482 <https://www.accc.gov.au/publications/accc-water-monitoring-report>.

483 Subsection 761(3)(d) of the Corporations Act and subregulation 7.1.04(8) of the *Corporations Regulations 2001* provide that an arrangement is not a derivative if it does not permit the seller's obligations to be wholly settled by cash, or by set off between the seller and the buyer, as an alternative to [physical] transfer of ownership of the tradeable water rights or replacement water rights.

484 Subregulation 7.1.04(8) of the *Corporations Regulations 2001* provides that, for paragraph 761D(3)(d) of the Corporations Act, each of the following is declared not to be a derivative for chapter 7 of the Corporations Act: (a) tradeable water rights; and (b) an arrangement: (i) under which a person (the seller) has, or may have, an obligation to sell tradeable water rights at a future date; and (ii) under which another person (the buyer) has, or may have, an obligation to buy the tradeable water rights, or replacement water rights, at a future date; and (iii) that does not permit the seller's obligations to be wholly settled by cash, or by set off between the seller and the buyer, rather than by transfer of ownership of the tradeable water rights or replacement water rights; and (iv) in relation to which neither usual market practice, nor the rules, allow the seller's obligations to be closed out by matching up the arrangement with another arrangement of the same kind under which the seller has offsetting obligations to buy the tradeable water rights or replacement water rights.

9.3 Unclear delineation of enforcement responsibility results in inadequate enforcement action

Central to the regulatory settings for the water markets in the Murray–Darling Basin are the Basin Plan Water Trading Rules in chapter 12 of the Murray–Darling Basin Plan.⁴⁸⁵ These rules were developed to contribute to achieving the Basin water market and trading principles set out in Schedule 3 to the *Water Act 2007*.

The MDBA has the role of monitoring and enforcing the Basin Plan Water Trading Rules. These rules apply to the Commonwealth (including the MDBA), Basin States, irrigation infrastructure operators, and individuals participating in water markets and address three broad aspects of market operation, namely reducing restrictions on trade, improving transparency and access to information, and maintaining market integrity and confidence.⁴⁸⁶

The Basin Plan Water Trading Rules aim to ensure free trade in surface water, except where there are defined allowable restrictions.⁴⁸⁷ The rules define the types of trade restrictions that are and are not permissible in the Basin. The Basin Plan Water Trading Rules also aim to increase the level of information available in the market, as access to information facilitates transparency and increases confidence, allowing participants to make informed decisions.⁴⁸⁸ The rules require that certain information must be made available on water announcements, the characteristics of water access rights⁴⁸⁹, and water trading rules applied by Basin State Governments⁴⁹⁰ and IIOs⁴⁹¹. For example:

- a person (generally a Basin State or Commonwealth agency) who makes a water announcement⁴⁹² (such as an upcoming seasonal allocation announcement or a carryover announcement) must ensure it is made generally available⁴⁹³
- a person who is aware of a water announcement that could have a material effect on the price of a trade must not enter into the trade informed by that information until the information is communicated to the market through being made ‘generally available’⁴⁹⁴
- the agreed price of each trade of a water access right must be reported to the relevant approval authority by the seller of the water access right, either before, or at, the time the approval or registration is sought.⁴⁹⁵

The inclusion of water trading rules in the Basin Plan was intended to provide a consistent framework for water trading across the states.⁴⁹⁶ While these rules prohibit or require certain things, the Basin States develop and enforce more specific rules, and have access to more trade information. This causes a lack of clarity regarding the delineation of responsibilities, causing confusion about where the boundaries lie in relation to enforcement responsibilities.

485 Murray–Darling Basin Authority Basin Plan water trading rules, Canberra, 30 May 2019, www.mdba.gov.au/managing-water/water-markets-trade/basin-plan-water-trading-rules, viewed 5 Feb 2021.

486 Murray–Darling Basin Authority, *Guidelines for Water Trading Rules*, https://www.mdba.gov.au/sites/default/files/pubs/01_WTG-REFERENCE_final.pdf, viewed 5 Feb 2021.

487 *ibid.* para. 687, p. 122.

488 Explanatory Statement for the *Basin Plan 2012*, para. 687, p 122; Murray–Darling Basin Authority, *Guidelines for Water Trading Rules*, February 2016, www.mdba.gov.au/publications/policies-guidelines/guidelines-water-trading-rules, viewed 5 Feb 2021.

489 Division 2 of Part 5 of the Basin Plan Water Trading Rules.

490 Section 12.46 of the Basin Plan Water Trading Rules.

491 Section 12.47 of the Basin Plan Water Trading Rules.

492 See definition of ‘water announcement’ at s. 12.49(2) of the *Basin Plan 2012*.

493 Section 12.50 of the *Basin Plan 2012*.

494 Sections 12.49 to 12.52 of the *Basin Plan 2012*.

495 Section 12.48 of the *Basin Plan 2012*.

496 Explanatory Statement for the *Basin Plan 2012*, extracted from the Federal Register of Legislation.

9.4 The objectives of the Basin Plan Water Trading Rules are best met by centralised enforcement

The *Water Act 2007* and the *Basin Plan 2012* give the MDBA powers to enforce compliance with the Basin Plan Water Trading Rules. Basin States are responsible for regulating water users within their jurisdictions, and enforcing compliance with their own trading rules.⁴⁹⁷

Basin Plan compliance and enforcement has received considerable attention in recent years. In 2017, the Australian Government requested the MDBA and an Independent Panel conduct the *Murray-Darling Basin Water Compliance Review* following allegations of water theft in the Basin.⁴⁹⁸ The review included the following comments about the Basin Plan Water Trading Rules:

The MDBA regards the successful implementation of Basin Plan Water Trading Rules as a high priority and acknowledges that lack of compliance can compromise both entitlement holders' and traders' confidence to invest in water access rights. Priorities for enforcing trade rules are outlined in the MDBA Strategic priorities for Basin Plan Water Trading Rules.⁴⁹⁹

As part of the annual statement of assurance process, the MDBA asks Basin States to provide information about how they have managed market sensitive information and how Basin States are meeting relevant obligations under the Basin Plan.⁵⁰⁰

The *MDBA Strategic priorities for the Basin Plan Water Trading Rules* states:

The rules require the price of a trade to be reported (s. 12.48). This obligation rests with the seller, not the approval authority. There are two elements associated with compliance with this rule; firstly that a price is provided, and secondly that the provided price accurately reflects the agreed price for the trade. The MDBA considers that the consequence of any individual not reporting their trade price is minimal. However, it is possible that in a thin market, where trade volumes are large, or the price varies significantly, not reporting a single transaction may have an effect. Furthermore, if there is systemic misreporting or price manipulation then this may represent collusion, or misleading or deceptive conduct. Should the MDBA become aware of individual traders who regularly fail to fulfil their obligations, increased intervention in these cases may be considered. The MDBA intends to work with Basin States to improve our knowledge of current reporting practices.⁵⁰¹

Price reporting requirements are being approached in different and seemingly arbitrary ways by those affected by the rules. For example, some water market participants designate a \$0/ML on application forms when reporting the price of forward contracts, in an effort not to skew public data. Other market participants report the price under the forward contract that has been contractually agreed to with the counterparty. There is also trade between related parties, where no monetary consideration is paid. For example, moving water between licences in a water portfolio. Such transfers are not differentiated from trade in terms of regulatory treatment for price reporting and are often reported as zero dollar trades.

In its 2019 Audit of Compliance with s12.48 ('Price of trade to be reported') of the Basin Plan, Deloitte found that misreporting of water trade prices in the Murray Darling Basin is pervasive. Deloitte uncovered a number of reasons for this:

Reasons include a lack of understanding about the requirement to report trade prices, poor reporting systems that do little to encourage accurate price reporting, and little or no

497 *ibid.*

498 Murray-Darling Basin Authority, *The Murray-Darling Basin Water Compliance Review*, Part A, 2017, www.mdba.gov.au/publications/mdba-reports/murray-darling-basin-water-compliance-review, viewed 5 Feb 2021.

499 Murray-Darling Basin Authority, *Strategic Priorities Basin Plan Water Trading Rules*, www.mdba.gov.au/sites/default/files/pubs/Strategic-priorities-water-trading-rules.pdf, viewed 5 Feb 2021.

500 Murray-Darling Basin Authority, *The Murray-Darling Basin Water Compliance Review*, Part A, 2017, www.mdba.gov.au/publications/mdba-reports/murray-darling-basin-water-compliance-review, p. 59, viewed 5 Feb 2021.

501 Murray-Darling Basin Authority, *Strategic Priorities Basin Plan Water Trading Rules*, www.mdba.gov.au/sites/default/files/pubs/Strategic-priorities-water-trading-rules.pdf, viewed 5 Feb 2021.

validation of the price data provided. Overall, Deloitte found that no relevant government had fully effective controls in place to ensure complete and accurate price reporting.⁵⁰²

Although the MDBA has statutory enforcement powers under the *Water Act 2007*⁵⁰³, it has considered water compliance and enforcement to be largely a matter for the Basin States:

The MDBA's role in compliance allegations concerning individual water users is limited. Such a role was never contemplated for the Authority, and it is not resourced to perform this intensive role across the Basin. Rather, it has been assumed that Basin States are enforcing their own laws diligently.⁵⁰⁴

However, in the course of the 2017 *Murray–Darling Basin Water Compliance Review*, it was made clear that ‘the community does not accept this arrangement’.⁵⁰⁵

In response to concerns about enforcement of the Basin Plan, the MDBA has established an Office of Compliance, and revised its Compliance and Enforcement Policy, amongst other actions.⁵⁰⁶ In December 2018, the Commonwealth and Basin State Governments agreed to the ‘MDB Compliance Compact’.⁵⁰⁷

In addition to these ongoing efforts to improve compliance and enforcement activity, the Commonwealth Minister for Resources, Water and Northern Australia has announced plans to improve arrangements for compliance governance in the Murray Darling Basin by separating the operational and compliance responsibilities of the MDBA. Under the proposed arrangements, the responsibilities of the Inspector-General of Water Compliance⁵⁰⁸ and the MDBA's Office of Compliance would be merged. These arrangements are still being developed.

The ACCC supports a centralised Basin-wide approach to enforcement as this would avoid the unclear delineation of enforcement responsibilities between the Commonwealth and the Basin States described above, enable investigations to cross state boundaries and promote a consistent approach to enforcement.

In addition, to address the enforcement challenges outlined above, existing price reporting obligations⁵⁰⁹ and insider trading prohibitions should be removed from the Basin Plan Water Trading Rules, and incorporated into the proposed new water market conduct and integrity legislation. The new provisions should be broadened and strengthened as set out in recommendation 3.

9.5 New legislation is needed to provide a cohesive framework for water markets and to address market integrity and conduct

Despite the regulation described above, there isn't a cohesive regulatory framework for Basin water markets comparable to those that exist for other markets, such as the financial services, energy, and real estate markets.

While investors, brokers, and exchange platforms provide significant benefits to Basin water markets, a lack of trust in them by other market participants is inhibiting market confidence. Unusual or suspicious transactions and price movements are unable to be formally investigated, making it difficult to rule

502 *ibid.*

503 Part 8 of the *Water Act 2007*.

504 Senate Committee Report, *The integrity of the water market in the Murray–Darling Basin*, Commonwealth of Australia, 29 November 2018, www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/MurrayDarlingPlan/Report, p. 70, viewed 5 Feb 2021.

505 *ibid.*, p. 70.

506 Murray–Darling Basin Authority, Action on Compliance Review, December 2019, www.mdba.gov.au/basin-plan-roll-out/compliance-enforcement/action-compliance-review, viewed 5 Feb 2021.

507 Basin States, Compliance Compact, <https://www.mdba.gov.au/sites/default/files/pubs/Basin-Compliance-Compact-12-December-2018.pdf>, p. 1, viewed 5 Feb 2021.

508 <https://www.igwc.gov.au/>.

509 Section 12.48 of the Basin Plan 2012.

out innocuous reasons for transactions and identify real attempts to manipulate prices or mislead the market. Current governance and regulatory arrangements make it difficult for market conduct to be assessed holistically across the Basin, and for harmful conduct to be identified. NSW Farmers submitted, 'there is insufficient regulatory oversight and associated enforcement and compliance activity, in relation to the practices of some market participants. The perception of misconduct are enough to significantly undermine confidence in water markets'.

The ACCC considers that new regulation is required to improve market integrity. Three options for integrity and conduct regulation for Basin water markets have been considered:

1. A government initiated licence scheme for intermediaries.
2. Applying the financial regulation framework to all water market products.
3. An independent market focused government regulator administering new conduct and integrity legislation.

These options were included in the interim report. Submissions to the interim report have been taken into account in forming recommendations. The following best practice principles, based on principles established by the Office of Best Practice Regulation, have also informed the recommendations:

- Establish a need – are there harms that must be addressed?
- Proportionality – do the benefits outweigh the regulatory burden and other costs?
- Ease of implementation – can the solution be implemented in practice?
- Consistency – does it fit with broader governance and regulatory frameworks?
- Transparency – will the solution lead to enhanced market transparency?
- Flexibility – can the solution evolve with developing water markets?
- Capability and accountability – would it create clear responsibilities and could it be effectively enforced?

In addition, the recommendations in this chapter are informed by the six norms of market conduct, identified in the Final Report of the Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry (Hayne Royal Commission) These are:

1. obey the law
2. do not mislead or deceive
3. act fairly
4. provide services that are fit for purpose
5. deliver services with reasonable care and skill
6. when acting for another, act in the best interest of that other.⁵¹⁰

Both of the above sets of principles have informed the recommendations made in this chapter regarding the substantive content for the proposed new legislation (see sections 9.9 and 9.10).

9.6 A government initiated licensing scheme for intermediaries would be burdensome for industry

A harmonised Basin State licence scheme and a Commonwealth licence scheme have been considered. While a harmonised Basin State licensing scheme for intermediaries could result in consistency in legislation between the states, there could be inconsistencies in state approaches to compliance and enforcement. In addition, investigations of breaches of licence requirements would not be able to be conducted across state boundaries.

⁵¹⁰ Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry (Hayne Royal Commission), February 2019, Final Report, Volume 1, <https://www.royalcommission.gov.au/royal-commission-misconduct-banking-superannuation-and-financial-services-industry>, p. 8, viewed 10 Feb 2021.

A standalone Commonwealth licensing scheme could overcome these deficiencies. However, the conclusion following consultation and analysis is that a licence scheme would impose a disproportionate regulatory burden on intermediaries. Braithwaite's pyramid (see below) highlights the 'big stick' penalty of licence revocation that is available under a licence scheme. Under a licensing scheme, intermediaries would need to apply for a licence in the first instance and those who do not comply with the law could be excluded from the industry through suspension or revocation of their licence. A licence scheme would impose a barrier to entry for new industry participants. Although there was support from some stakeholders for mandatory accreditation or minimum training requirements and a capitalisation threshold, such requirements would be a significant burden for some intermediaries. Industry is, however, encouraged to develop its own accreditation and competency standards, if this is considered to be of benefit.

Figure 9.1: Braithwaite's 'regulatory pyramid'



9.7 The financial services regulation would not be a good fit for basic water products

As noted above at section 9.2 of this chapter, the regulatory framework for financial products, services and markets already applies to certain water products, and some stakeholders were in favour of applying it to all water products by categorising them as derivatives under the Corporations Act. For example, Select Harvest supported 'a push for transparent and robust water market regulation in the Murray Darling Basin similar to oversight of the ASX, and for water brokers to face the same level of regulation as ASX stockbrokers'.⁵¹¹

Although the financial services regulation is an adaptive framework, it would need to be significantly tailored in order to be fit-for-purpose for water products and markets, and even then, there would be significant challenges. In their submission to the ACCC inquiry, ASIC noted that:

The regulation of specialised commodity markets in Australia has generally been undertaken by tailored legislation overseen by specialised regulators, for example in the electricity markets. The nature of water rights and trading in those rights is more analogous to a commodity and this suggests mechanisms to regulate commodity trading may be another avenue to regulate the activity.⁵¹²

ASIC noted that:

ASIC only regulates financial markets. It does not regulate the physical electricity market. The physical market is the responsibility of the AER. ASIC regulates derivatives financial products that are traded over physical electricity such as listed futures and options or swap agreements that relate to the wholesale price of electricity. This separate regulation of the physical electricity market and the financial product market associated with electricity has

⁵¹¹ Water hikes put pressure on growers By Brad Thompson, Australian Financial Review (AFR), Tuesday 1st December 2020.

⁵¹² ASIC, *Submission to Murray-Darling Basin water inquiry interim report*, 4 December 2020, p.5.

operated effectively for more than 15 years. It relies on the expertise of a dedicated energy market regulator to engage with the oversight of a very specialised physical market.⁵¹³

ASIC continued:

The ACCC draft interim report notes on page 256 that the Australian Energy Regulator (AER) is the specialised regulator for the Australian physical electricity market. Also significant in the regulation of the electricity market is the involvement of Australian Energy Market Commission which undertakes rule making and energy market development. The specialised expertise for a unique market is an important aspect of the regulatory framework for electricity. In addition the involvement of the Australian Energy Market Operator (AEMO) as the specialised market operator for physical market highlights the benefit of specialised arrangements for the operation of unique physical markets. AEMO has an exemption from the licensing requirements that apply under the Corporations Act to the operators of clearing and settlement facilities.⁵¹⁴

ASIC also noted challenges with the application of the financial regulation disclosure requirements:

The Corporations Act requires disclosure when a financial product is issued, in a product disclosure statement about the details of the financial product.⁵¹⁵ Each person who is a party to a financial product that is a derivative and that is not entered into or acquired on a financial market will be an issuer of the derivative.⁵¹⁶ This means that if water rights are derivatives then the person who is issued a water right may be required to prepare a product disclosure statement where the sale of the water right occurs to a retail client, as defined in s761G of the Corporations Act. As the creation of water rights relies on the Crown granting the water right under the respective legislation it is possible that the Crown, in issuing the water right, may not be subject to the Corporations Act. This is as result of the operation of the s 5A of the Corporations Act. This provision exempts the Crown from the application of, amongst other things, the product disclosure obligations in Part 7.9 of the Corporations Act. One of the key aspects of the regulation of financial products under the financial service regulation are obligations about product disclosure that may not be adequately accommodated if the financial regulation in chapter 7 of the Corporations Act was adopted [for basic water rights].⁵¹⁷

ASIC also noted the issue of ‘dual regulation of statutory licences’:

Water licences are created by statute in the respective states and transferred in accordance with the relevant rules applicable to the transfer of those licences. Unlike for other financial products, ASIC does not regulate or oversee the initial issue of that product. The characteristics of a licence are determined by the relevant State government which has created types of water rights and the mechanism for the transfer of such rights is a matter for the relevant State legislation. ASIC would have limited engagement with the oversight of the licences that will be traded and the clearing and settlement arrangements for transactions involving water rights.

In addition, each state within the Murray–Darling Basin has its own legislation that creates the relevant water rights. ASIC under the financial regulation scheme has no control over the nature of those rights and the mechanisms that are used to transfer those rights. ASIC does not currently regulate other forms of statutory licences.⁵¹⁸

Noting these concerns, together with concerns expressed by stakeholders that the financial regulation framework would be too burdensome for water market participants, this option is not recommended.

513 *ibid*, p. 2.

514 *ibid*, p. 2.

515 Section 1013C Corporations Act.

516 Section 761E(5) Corporations Act.

517 ASIC, *Submission to Murray–Darling Basin water inquiry interim report*, 4 December 2020, p. 5.

518 *ibid*.

9.8 New centralised Basin-wide legislation is needed for market integrity and conduct

The ACCC considers that new centralised Basin-wide legislation is required to prevent harmful conduct, to improve the integrity and fairness of Basin water markets. In terms of the form of regulation, rules like the Basin Plan Water Trading Rules, or state-level rules like the IVT rules, would not be suitable. For conduct prohibitions, centralised statutory provisions are needed.

The legislation should be achieved through some form of cooperative legislative scheme. A harmonised scheme would not suffice. To address risks of market manipulation, the proposed Water Markets Agency would need to be able to carry out surveillance, and associated investigation and enforcement activity across state boundaries.

The legislation should include integrity protections. It should require exchange platforms and Basin State approval authorities to keep records of trades and to provide trade data to the proposed Backbone Platform. The data should include information about the water product, price and trade date. Continuous disclosure is critical for market integrity. The proposed Water Market Agency should be given access to this data, stored on the Backbone Platform, for ongoing monitoring of market activities and investigation of potential market misconduct. More detail about the Backbone Platform and Central Information Portal, the enabling technology for data collection, storage and disclosure, is set out in chapter 10.

9.8.1 The proposed Water Markets Agency should enforce the new conduct and integrity legislation

The new conduct and integrity legislation should be administered and enforced by the proposed Water Markets Agency (see chapter 17).

To analyse price movements and suspicious transactions holistically across water exchange platforms, including in different states, a Basin-wide regulator would be needed. Establishing the proposed Water Markets Agency as the centralised regulator would promote consistency in enforcement. It would avoid the kinds of enforcement problems that have arisen under the Basin Plan Water Trading Rules and Basin States' water trading rules, due to the unclear delineation of enforcement responsibilities between the Commonwealth and the Basin States. It would enable investigations to cross state boundaries and help to ensure that there is a level playing field for all market participants, regardless of their location in the Basin.

The existing governance arrangements for Basin water markets are out of step with those in place for other markets. For example, ASIC is the independent whole of market supervisor for financial services and markets across Australia. It was considered that having a whole of market supervisor for that sector would streamline supervision and enforcement, and enhance confidence in the integrity of the market, thereby increasing stability in the market.⁵¹⁹ Under the Corporations Act, AFSL holders (financial brokers) are subject to surveillance checks by ASIC when ASIC is alerted to potential problems, and to enforcement action when necessary.⁵²⁰

⁵¹⁹ Under the Corporations Act, AFSL holders (financial brokers) are subject to surveillance checks by ASIC and to criminal sanctions for committing offences and civil penalties for contravening certain provisions: section 912E Corporations Act. ASIC does a certain amount of surveillance of AFSL holders when it is alerted to problems.

⁵²⁰ Section 912E Corporations Act.

► Recommendation 1

Implement centralised, Basin-wide water market conduct and integrity legislation

New centralised Basin-wide legislation should be introduced to protect the integrity of Basin water markets by regulating conduct of market participants, to be enforced by the proposed Water Markets Agency (see recommendation 26).

The proposed new legislation should include:

- an enforceable mandatory code for intermediaries, to address the detrimental conduct and practices identified by the inquiry and ensure that intermediaries are subject to the standard safeguards that apply in similar markets
- integrity protections such as broader price reporting requirements, and conduct prohibitions on market manipulation and insider trading
- a requirement for exchange platforms and trade approval authorities to keep records of trades and to provide trade data to the Water Markets Agency through arrangements for the flow of trading data outlined in recommendations 10 and 11
- a role for the proposed Water Markets Agency to conduct surveillance, enforcement and reporting
- compulsory information gathering powers and appropriate enforcement powers for the Agency
- a requirement to issue a unique common identifier to each market participant, to enable trades to be traced and traders to be identified across regions and multiple accounts (see recommendation 4).

9.9 The new centralised conduct and integrity regulation should include an enforceable mandatory code for intermediaries

In its submission to the ACCC interim report, H2OX noted, ‘Brokers are able to act in a way that would not be allowed by real estate agents, stockbrokers, solicitors, accountants and any other regulated profession’. The existing voluntary AWBA code has been largely unsuccessful in terms of take-up and therefore industry-wide compliance. Industry itself is supportive of a stronger approach.⁵²¹ Mandatory codes are generally stronger than voluntary codes, both in terms of enforceability and the potential for inclusion of substantive obligations to address risks of harmful conduct. Mandatory codes are particularly suitable for providing tailored regulation for a particular occupation, trade or industry. Mandatory codes are often prescribed by regulation, making them easier to modify over time as industry evolves. For example, the ACCC regulates mandatory industry codes that are prescribed under the Competition and Consumer Act 2010, including the Dairy Industry Code of Conduct, the Electricity Retail Code and the Horticulture Code of Conduct.⁵²²

A mandatory code for intermediaries could be prescribed under the CCA. However, CCA codes focus on consumer protections whereas the code for intermediaries will be broader. A mandatory code for intermediaries could be prescribed under the financial services regulation. However, this would require basic water products to be treated as derivatives. The ACCC does not support this option. The better approach would be for a mandatory code for intermediaries to be included in the new centralised legislation for market integrity and conduct (see recommendation 1).

While mandatory codes are often prescribed by regulation, making them easier to modify over time as industry evolves, they can also be included in primary legislation. The *National Consumer*

521 Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

522 <https://www.accc.gov.au/business/industry-codes>.

Credit Protection Act 2009 includes the National Credit Code as Schedule 1 to the Act. This replaces previous state-based consumer credit codes and the Uniform Consumer Credit Code and applies to the conduct of all Australian credit licence holders. ASIC administers this single national consumer credit regime. The legislative vehicle for the code for water intermediaries should be considered at the implementation stage.

Obligations and requirements for intermediaries could be interspersed in the higher level legislation, together with the more general conduct and integrity provisions that will apply to all market participants. However, having all of the intermediary obligations and requirements set out in one place would assist the industry and avoid legislative complexity.

The recommended substantive content for the enforceable mandatory code is set out in recommendation 2 and in table 9.1 below. Intermediaries should also be subject to the new integrity and conduct provisions that are recommended to apply to all water market participants.

► Recommendation 2

Incorporate key obligations as part of an enforceable mandatory code for water market intermediaries

The mandatory code should apply to all parties that provide intermediary services, including irrigation infrastructure operators, and include obligations to:

- act in the best interests of a client, when providing certain services typically provided only by brokers
- provide the following information in writing to a client at the outset of each engagement:
 - the services being provided by the intermediary
 - the obligations owed to the client by the intermediary
 - the fees/commissions to be charged by the intermediary
- inform the client in a timely manner of any reasons for a trade approval authority rejecting or delaying the processing of an application
- implement a complaints handling process, including obligations to keep records relating to complaints or resolution of complaints
- hold written authorities to submit trades for approval on behalf of clients
- hold written authorities to act as an agent on behalf of clients, when providing certain services typically provided only by brokers
- act in accordance with client instructions, when providing certain services typically provided only by brokers
- communicate all buy and sell offers to clients in relation to the proposed trade, when providing certain services typically provided only by brokers
- disclose to the client when receiving multiple fees/commissions in relation to a single trade, when providing certain services typically provided only by brokers, excluding trades matched through an exchange platform
- disclose to the client when an intermediary or a related entity has a personal interest in the trade, and that the water rights they have a personal interest in are to be transferred to/from the intermediary's or related entity's trading water account (that is, not the intermediary's broking water account which is used to hold client water rights). The intermediary must provide an opportunity for the client to get independent advice and the client must return written consent before proceeding with the trade
- disclose to the client when water rights are to be transferred to/from the intermediary's broking water account which holds client water rights

- comply with client water rights management and accounting obligations (under statutory trust accounting framework for broking water accounts which hold client water rights)
- comply with client funds management and accounting obligations (under statutory trust accounting framework for client funds)
- hold professional indemnity insurance
- keep records of client instructions, trade details (including strike date) and client details for the period of time (five years) required under Australian Tax Law
- disclose which method the intermediary is using to allocate successfully transferred volumes following an intervalley trade opening (for example, in chronological order or pro rata).

Table 9.1 below outlines the services provided by intermediaries, and identifies the recommended obligations on an intermediary based on the services provided by the intermediary, rather than according to a classification into 'water broker' or 'exchange platform'. The ACCC considers this will allow intermediaries to be flexible with the services they provide, and also may remove confusion where intermediaries provide both typical brokerage service and also exchange platform services.

To assist with understanding, the type of intermediary that commonly provides the service is included in the table, but this is intended as a guide only, as it is intended that the type of service (rather than the type of intermediary) corresponds to the particular obligations.

Table 9.1: Table of water market intermediary services and corresponding obligations proposed under the mandatory code.

Type of water market intermediary that usually provides these services	Service	Obligation
Brokers and Exchange platforms	Information Services (collecting, cleaning, and aggregating market relevant information and disseminating to market participants)	<ul style="list-style-type: none"> ▪ Obligation to provide the following information in writing to a client at the outset of each engagement: <ul style="list-style-type: none"> – the services being provided by the intermediary – the obligations owed to the client by the intermediary – the fees/commissions to be charged by the intermediary. ▪ Obligation to disclose to the client when an intermediary or a related entity has a personal interest in the trade, and that the water rights they have a personal interest in are to be transferred to/from the intermediary's or related entity's trading water account (that is, not the intermediary's broking water account which is used to hold client water rights). The intermediary must provide an opportunity for the client to get independent advice and the client must return written consent before proceeding with the trade. ▪ Obligation to disclose to the client when water rights are to be transferred to/from the intermediary's broking water account which holds client water rights. ▪ Obligation to implement a complaints handling process, including obligations to keep records relating to complaints or resolution of complaints.
	Preparing and submitting documents for approval of trades of water rights (contracts, and approval authority forms)	<ul style="list-style-type: none"> ▪ Obligation to hold professional indemnity insurance. ▪ Obligation to inform the client of any reasons for an approval authority rejecting or delaying the processing of an application. ▪ Obligation to hold written authorities to submit trades for approval on behalf of clients. ▪ Obligation to keep records of client instructions, trade details (including strike date) and client details for the period of time (five years) required under Australian Tax Law.
	Settlement services (Holding client funds or client water rights in the intermediary's accounts to facilitate transfer of funds or rights between sellers and buyers)	<ul style="list-style-type: none"> ▪ Obligation to comply with client funds management and accounting obligations (under statutory trust accounting framework for client funds). ▪ Obligation to comply with client water rights management and accounting obligations (under statutory trust accounting framework for broking water accounts which hold client water rights). ▪ Obligation to disclose which method the intermediary is using to allocate successfully transferred volumes following an IVT opening (for example, in chronological order or pro rata).
Brokers	Advisory services (Investigating trading opportunities, assisting potential buyers and sellers to assess the market, form price expectations, and make decisions in the market)	<ul style="list-style-type: none"> ▪ Obligation to act in the best interests of a client. ▪ Obligation to disclose to the client when receiving multiple fees/commissions in relation to a single trade. ▪ Obligation to communicate all buy and sell offers to clients in relation to the proposed trade.
	Conveying offers on behalf of clients or entering into agreements to trade on behalf of a client	<ul style="list-style-type: none"> ▪ Obligation to act in accordance with client instructions. ▪ Obligation to hold written authorities to act as an agent on behalf of clients.

9.10 Conduct prohibitions that should be included in the proposed new legislation

To identify what protections are needed, the ACCC analysed several unusual or suspicious market transactions (see chapters 5 to 7).

9.10.1 Avoid duplicating existing misleading and deceptive conduct prohibitions

As noted above, the prohibition of misleading and deceptive conduct is generally considered to be a norm for market regulation. However, the proposed new legislation should not duplicate provisions that already exist. For example, section 18 of the ACL already applies to misleading and deceptive conduct. A failure by an intermediary to tell a customer that the intermediary is buying or selling water on their own behalf could amount to misleading or deceptive conduct.⁵²³ In addition, the Criminal Code Act 1995 contains offences of general relevance to Commonwealth administration. Of relevance are offences under section 137.1 – ‘False or misleading information’ and section 137.2 – ‘False or misleading documents’.⁵²⁴ The Attorney-General’s Guide to Framing Commonwealth Offences, Infringement Notices and Enforcement Powers states that these provisions should be utilised, where possible, instead of creating a new offence. Also, in addition, for water products that are financial products, section 1041H of the Corporations Act provides, ‘A person must not, in this jurisdiction, engage in conduct, in relation to a financial product or a financial service that is misleading or deceptive or is likely to mislead or deceive’. To avoid duplication and complexity on the statute book, the inclusion of a prohibition on misleading or deceptive conduct in the new conduct and integrity regulation is not recommended.

9.10.2 Prohibit market manipulation

During the inquiry, many stakeholders alleged that investor behaviour had resulted in materially higher water allocation prices.⁵²⁵ Some stakeholders raised concerns that investors are buying water allocations and withholding water from the water markets to artificially drive prices higher. Over the course of this inquiry, market data has been analysed and evidence of actual misconduct has not been found (see chapter 7). However, there is a strong perception that market manipulation has occurred, and opportunities for, and risks of, market manipulation do exist. There is a case for the introduction of a prohibition on market manipulation.

Broadly, market manipulation is conduct which has resulted in a price that does not reflect genuine forces of supply and demand.⁵²⁶ It generally includes creating or maintaining an artificial price.⁵²⁷ In *Director of Public Prosecutions (Cth) v JM*⁵²⁸ the High Court held that an ‘artificial price’ for the purposes of s 1041A of the Corporations Act is a ‘price that results from a transaction in which one party has the sole or dominant purpose of setting or maintaining the price at a particular level [and does not reflect] the forces of genuine supply and demand in an open, informed and efficient market.’ Thus, the focus is on the effect of the manipulative conduct in relation to the affected product rather than on the intention

523 *Water trading—a guide to your fair trading rights when using brokers and exchanges*, Canberra, 2011, at <https://www.accc.gov.au/system/files/Water%20trading%20-%20a%20guide%20to%20your%20rights.pdf>, viewed 12 June 2020.

524 These provisions should be utilised, where possible, instead of creating a new offence: see ‘The Guide to Framing Commonwealth Offences, Infringement Notices and Enforcement Powers’ Attorney-General’s Department, p. 14. Of particular relevance are offences under section 137.1 – False or misleading information and Section 137.2 – False or misleading documents and section. These provisions have particular requirements which must be followed for them to be able to be invoked. These include that a warning be given about the operation of the offence [section 137.1(4)].

525 Murray River Group of Councils, *Submission to Murray-Darling Basin Inquiry Issues Paper*, 30 January 2020, p. 4; Select Harvests Limited, *Submission to Murray-Darling Basin Inquiry Issues Paper*, 16 April 2020, p. 2; ACCC Murray-Darling Basin inquiry, Southern Basin public forums.

526 *Director of Public Prosecutions (Cth) v JM* (2013) 298 ALR 615 is the most recent High Court authority. See also Beach J’s decision in *ASIC v Westpac* [2018] FCA 751, concerning allegations of cross-market manipulation – i.e. conduct in one market creating an artificial price in another. *North v Marra* (1981) 148 CLR 42, 59; *Fame v Jeffries* (1998) 28 ACSR 58, 62.

527 *ibid.*

528 *ibid.*

of the trader or the person involved.⁵²⁹ Section 1041A of the Corporations Act provides a useful example in the context of financial products and markets.

Box 9.1: 1041A of the Corporations Act – Market manipulation

A person must not take part in, or carry out (whether directly or indirectly and whether in this jurisdiction or elsewhere):

(a) a transaction that has or is likely to have; or

(b) 2 or more transactions that have or are likely to have;

the effect of:

(c) creating an artificial price for trading in financial products on a financial market operated in this jurisdiction; or

(d) maintaining at a level that is artificial (whether or not it was previously artificial) a price for trading in financial products on a financial market operated in this jurisdiction.

Note 1: Failure to comply with this section is an offence (see subsection 1311(1)).

Note 2: This section is also a civil penalty provision (see section 1317E). For relief from liability to a civil penalty relating to this section, see section 1317S.

The Corporations Act includes additional protections such as s1041B ‘False trading and market rigging—creating a false or misleading appearance of active trading’. Such a provision could be included in the new integrity and conduct regulation, if a need is identified. Regardless of the method, behaviour or intention, the harm that should be prevented by the new regulation is the creation of an artificial price. Various methods of price manipulation, such as squeezing, ramping and spoofing, are discussed in chapter 6. The manipulation provision for the new market and integrity legislation should be tailored for water markets.

As noted earlier in this chapter, in order to identify market misconduct such as manipulation, centralised legislation is needed. It would not be possible to address risks of market manipulation by looking only within a single trading zone or Basin State. The proposed Water Markets Agency would need to be able to carry out investigations and enforcement activity across state borders. There would be no point legislating a prohibition on market manipulation unless it could be enforced.

9.10.3 Broaden existing price reporting obligations

Inaccurate and incomplete price recording on trade forms is perhaps the most significant issue limiting information publication by the registers and by other sources relying on register data (see chapter 11). While sellers of water access rights are subject to trading rule 12.48 of the Basin Plan Water Trading Rules, requiring them to disclose price to the approval authorities, there is no subsequent obligation on the states to collect this information, and enforcement of this rule by MDBA (who is responsible for Basin Plan compliance) has proved challenging. Moreover, rule 12.48 only applies to trade of water access rights, meaning there is no obligation to report prices for trades of irrigation rights or water delivery rights.

Exchange platforms now often facilitate trade within, into, out of, and outside irrigation networks. This means that market participants are often directly comparing buy and sell offers, and historical price data, for temporary irrigation right trades alongside allocation trades. Thus, price information for temporary irrigation right trade should have equal importance as price information for water allocation trades.

⁵²⁹ Among the major amendments made to the Corporations Act by the Financial Services Reform Act 2001 was the removal, on the part of the prosecution, of the explicit requirement of proving the existence of intent from the wording of the market manipulation and other related provisions before imputing any liability.

Further, given that trade to or from an IIO's network involves both irrigation rights and water access rights, a failure to capture price information for irrigation rights may also lead to an absence of price reporting for water access rights. For example, if an IIO aggregates multiple internal parcels of water (temporary irrigation rights) in order to conduct a single larger water allocation trade outside of its network, the IIO may be unable to correctly report the price associated with the allocation trade when applying to the Basin State for approval.

In view of these matters, there is a need to establish a clear and comprehensive trade processing and market reporting framework governing all entities which process trades—including brokers who provide matching services, exchanges, IIOs and Basin State approval authorities, and all transactions of tradeable water rights.

The ACCC considers Basin Plan water trading rule 12.48 should be revised to require prices to be reported for all transactions of tradeable water rights, including irrigation rights and water delivery rights, and not just water access rights. The obligations under rule 12.48 should rest with the individual or entity disposing of the right, or, the individual or entity that submits a trade for approval or registers a trade, on behalf of the person disposing of the right.

The ACCC acknowledges this expansion of price reporting requirements to apply to all tradeable water rights would require irrigation infrastructure operators to routinely collect price information. The ACCC's analysis of data provided by medium and large IIOs across the Basin indicates that most of these IIOs already have the systems in place to collect price information; although collection rates differ markedly in practice (see Appendix G).

9.10.4 Prohibit insider trading

The Basin Plan Water Trading Rules include restrictions on trade in situations when certain government water announcements are not generally available to market participants.⁵³⁰ Improvements to policies and practices currently adopted by governments to comply with this water announcement rule should be made. This is needed to address claims that important information, such as allocation policies, are inadequately communicated to the irrigators and traders who rely on these to make business decisions.⁵³¹

The 'water announcements rule' in the Basin Plan Water Trading Rules is often referred to as an insider trading rule. However, it is not an insider trading prohibition of the kind that exists for financial markets. Irrigators have broader concerns about insider trading in Basin water markets that are not addressed by the Basin Plan Water Trading Rules. For example, allegations of brokers securing deals for related parties by using other clients' information, and people with access to information about upcoming amendments to IIO policies, before that information is made public, and using that knowledge to gain an unfair advantage in the market (See chapter 8).

The so-called insider trading prohibition in the Basin Plan Water Trading Rules should be broadened and strengthened to apply not only to 'water announcements' (e.g. government announcements about allocations, carryover and trading restrictions) but also to the use of any material information prior to it being made public in order to gain unfair advantage in the market. This strengthened prohibition should be removed from the Basin Plan Water Trading Rules, and incorporated in the new water market conduct and integrity legislation that can be enforced across jurisdictions.

⁵³⁰ Sections 12.49 to 12.52 of the Basin Plan 2012.

⁵³¹ Deloitte, 'Reasonable Assurance Audit—Trade Price Audit', prepared for MDBA, 29 May 2019.

► **Recommendation 3**

Prohibit price manipulation, broaden price reporting and broaden and strengthen insider trading obligations

Existing price reporting obligations and insider trading prohibitions should be removed from the Basin Plan Water Trading Rules and incorporated into the new water market conduct and integrity legislation.

The price reporting obligations should be broadened to require prices to be reported for all transactions of tradeable water rights, including irrigation rights and water delivery rights – not only water access rights. Trade approval authorities (including irrigation infrastructure operators) should be required to collect, record and transmit this information.

The insider trading prohibition should be broadened and strengthened to apply to the use of any material information prior to it being made public in order to gain an unfair advantage in the market – not only to ‘water announcements’ (for example, government announcements about allocations, carryover and trading restrictions).

The proposed new conduct and integrity legislation should include a prohibition on price manipulation.

The price reporting obligations, insider trading prohibition and market manipulation prohibition should be enforced by a single Basin-wide regulator – recommended to be the Water Markets Agency (see recommendation 26).

Implementing this recommendation will address challenges in enforcing prohibitions against misconduct that arise under current laws, and address regulatory gaps.

9.11 Some concepts from the financial services and markets regulation are not able to be mirrored for water markets

The interim report sought feedback from stakeholders on a range of regulatory provisions that exist in financial services and markets regulation. That feedback has informed consideration of whether similar provisions should be introduced for Basin water markets. While the following provisions were considered as part of this process, they are not recommended.

9.11.1 Best execution obligation and systematic pre-trade transparency

The best execution obligation in rule 3.8.1 of the *ASIC Market Integrity Rules (Securities Markets) 2017* requires market participants handling and executing an order for a client to take reasonable steps to obtain the best outcome for their client. Best execution promotes client protection by requiring market participants (including financial brokers) not to place their own interests ahead of those of their clients. This obligation requires market participants (including financial brokers) to transmit orders to the platforms offering the best outcome. Generally, in financial markets, the best execution obligation can be discharged only by trading on a pre-trade transparent order book of a licenced market/exchange. So in financial markets there is a link between the best execution obligation and pre-trade transparency requirements for exchanges.

There is currently no requirement for systematic pre-trade transparency in Basin water markets, nor would it be possible to impose such a requirement because there are many trades negotiated without the use of platforms or brokers. While the use of exchange platforms may increase over time, many traders are family farms who see value in maintaining simpler or less formal entry points into water markets.

A best execution obligation of the kind that is in the *ASIC Market Integrity Rules (Securities Markets) 2017* would not be workable and is not recommended for Basin water markets. Instead, obligations for intermediaries to act in their clients' best interests and to manage conflicts of interest are recommended as a more effective means of protecting clients' interests.

9.11.2 Compensation/fidelity funds and capitalisation requirements

Mandatory contributions to a compensation fund would be burdensome on intermediaries and a need for such a requirement has not been established. A capitalisation requirement could drive out smaller firms or inhibit their entry into the market, or encourage consolidation of firms in an effort to raise the necessary capital and therefore reduce competition in the market. It could also cause firms to increase their fees and commissions, to raise the necessary capital.

9.11.3 Obligation to maintain competence of staff

A requirement to maintain competence of staff exists for AFS licensees under s. 912A(1)(f) of the Corporations Act. A mandatory requirement to maintain staff competence in water markets would impose a disproportionate burden for intermediaries. However, the ACCC encourages the industry to develop their own accreditation and competency standards, noting that several intermediaries already do this.⁵³² In addition, the new code for intermediaries would promote best practice standards for all practitioners.

9.12 Which water products are financial products regulated by ASIC?

As noted at section 9.2 of this chapter, ASIC is responsible for the regulation of financial services and markets under the *Corporations Act 2001*. This regime is limited to financial products and services as defined in the Corporations Act. Financial products includes a broad range of financial instruments including derivatives.

The definition of derivative in s 761D of the Corporations Act is very broad. As observed by Giles JA in *International Litigation Partners Pte Ltd v Chameleon Mining NL*⁵³³:

The definition of 'derivative' is extraordinarily wide, one which could catch many arrangements not ordinarily thought of as derivatives .. Given this deliberate drafting, there is little warrant for reading down the definition in the exclusory s761D(1). It was intended to be wide, overwidth was to be controlled by subsequent exclusions, including by regulation.

As a result of the breadth of that expression, prior to 2014 there was some uncertainty as to whether tradeable water rights could be categorised as 'derivatives'⁵³⁴ and therefore be 'financial products' for the purposes of the ASIC Act and Corporations Act.⁵³⁵ The application of financial regulation was contemplated as a result of the potential characterisation of water rights as derivatives. That is, 'the

⁵³² Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

⁵³³ *International Litigation Partners Pte Ltd v Chameleon Mining NL*: [2011] NSWCA 50 at [66], [72].

⁵³⁴ Under subsection 761D(1) of the Corporations Act, a 'derivative' is an arrangement under which at some agreed future time a party to the arrangement must provide consideration of a particular kind to the other party. The amount of consideration must be derived from the value of something else, including for example, an asset, a commodity, an index, or a rate (for example, interest rate). The future time must not be less than 3 business days for a foreign exchange contract (reg 7.1.04(1)(a) of the *Corporations Regulations 2001*) and one business day for all other arrangements (reg 7.1.04(1)(b) of the *Corporations Regulations 2001*). The Corporations Act provides that certain arrangements are excluded from the meaning of derivative, such as the obligation to buy or sell tangible property: s. 761D(3)(a).

⁵³⁵ Water rights are unlikely to meet the general definition of a financial product under section 763A of the Corporations Act. However, paragraph 764A(1)(c) of the Corporations Act specifies that a 'derivative' is a financial product. It has been noted that, if not excluded from the definition of a derivative, tradeable water rights may be categorised as derivatives and included within the definition of financial product under paragraph 764A(1)(c): see Explanatory Statement at <https://treasury.gov.au/consultation/draft-amendments-on-regulation-of-water-market-trading>. A 'derivative' is one of a wider classes of things that fall within the legislative concept of a 'financial product' for the purposes of chapter 7 of the Corporations Act: see *Derivatives Report*, Corporations and Markets Advisory Committee. Note: If a product falls under the definition of both a security and a derivative, it will be regulated as a security: s. 761D(3)(c) of the Corporations Act.

value of water rights may be derived from the value of some other thing, that being the water that is subject to the water right and that the water rights are intangible property'.⁵³⁶

9.12.1 The 2014 'carve out' for basic tradeable water rights clarified this legal uncertainty

Regulations made under the Corporations Act and the ASIC Act can declare anything not to be a derivative.⁵³⁷ In 2014, the *Australian Securities and Investments Commission Regulations 2001* and the *Corporations Regulations 2001* were amended by the *Corporations Amendment (Water Trading Exemptions) Regulation 2014* to address the legal uncertainty as to whether tradeable water rights could fall within the definition of a derivative.

The *Corporations Amendment (Water Trading Exemptions) Regulation 2014* expressly excludes basic tradeable water rights, and certain arrangements to buy and sell them, from the definition of 'derivative' under the ASIC Act⁵³⁸ and Corporations Act. This means that water entitlements, allocations, delivery rights, irrigation rights, forward contracts and leases are not financial products. As a consequence, the provisions in the Corporations Act and the ASIC Act relating to financial services and markets do not apply to these tradeable water rights.⁵³⁹

The exclusion of basic water rights from the definition of derivative reflects the approach recommended by the Companies and Markets Advisory Committee (CAMAC) in its Derivatives Report. The CAMAC report at para 4.6.4 noted that one way to deal with peripheral areas is through the powers to enact regulations declaring something not to be a derivative. This is the approach adopted in the regulation which currently exempts certain types of water rights from the definition of derivative.⁵⁴⁰

However, options and futures contracts in respect of tradeable water rights are not included in the carve-out and are considered to be derivatives for the purposes of the Corporations Act and the ASIC Act.⁵⁴¹ To be a derivative contract, an option contract would need to allow for all three prescribed methods of settlement, with the purchaser being given the right to elect the method at the time of settlement. That is, under the terms of the contract, the purchaser can elect to use either cash-settlement, set-off, or physical-settlement.⁵⁴² That is why some form of water index or contractual method for determining price would be needed. CSIRO is developing a methodology for calculating the spot price (or index) for a particular water trading zone. CSIRO noted that it is conceivable that its methodology could be incorporated into options contracts as the method for calculating the spot price (index) for the options-expiry date, and the difference between the spot price and the options strike price to be used for arranging cash-settlement.

Water option contracts that give the purchaser the right to settle by physical-settlement only are not derivatives. Options of this kind are being traded in the Basin. These physically-settled options help irrigators better manage their water and risk. For example, an irrigator could enter into a contract for an option to buy a certain volume of allocation at a predetermined future time and price, to guard against potential low allocation announcements in the future and/or spot price rises. H2OX has developed contracts and procedures to implement such options in conjunction with potential suppliers and buyers of these products. H2OX is not the supplier or buyer of these options. Rather, it brokers arrangements between counterparties, administers the collateral and manages the delivery of allocation at the

536 ASIC, *Submission to Murray-Darling Basin water inquiry interim report*, 4 December 2020, p. 2.

537 Paragraph 12BAA(8)(p) of the ASIC Act provides that the regulations may prescribe that a facility, interest or other thing is not a financial product for the purposes of Part 2, Division 2 of the ASIC Act. Under subsection 761D(2) of the Corporations Act, the regulations may declare anything to be a derivative. Under para 761D(3)(d) of the Corporations Act, the regulations may declare anything *not to be* a derivative.

538 Regulation 2BC of the *Australian Securities and Investments Commission Regulations 2001* and subregulation 7.1.04(8) of the *Corporations Regulations 2001*.

539 Explanatory Statement for the *Corporations Amendment (Water Trading Exemptions) Regulation 2013*.

540 ASIC, *Submission to Murray-Darling Basin water inquiry interim report*, 4 December 2020, p. 2.

541 Explanatory Statement for the *Corporations Amendment (Water Trading Exemptions) Regulation 2013*.

542 Subsection 761(3)(d) of the Corporations Act and subregulation 7.1.04(8) of the Corporations Regulations 2001 provide that an arrangement is not a derivative if it does not permit the seller's obligations to be wholly settled by cash, or by set off between the seller and the buyer, as an alternative to [physical] transfer of ownership of the tradeable water rights or replacement water rights.

exercise date.⁵⁴³ The options for water that H2OX has developed are physically-settled and the contract does not allow for them to be wholly cash-settled or set-off.⁵⁴⁴

9.12.2 Some stakeholders are unaware of the implications for bona fide water options and futures under the financial regulation framework

Water options and futures that are derivatives are subject to financial markets and services regulation under the *Corporations Act 2001* (Corporations Act)⁵⁴⁵, and the ASIC Act.⁵⁴⁶ Under chapter 7 of the Corporations Act, ASIC's regulatory work comprises three main elements: disclosure requirements, market integrity enforcement and licensing powers.

Key aspects of financial markets and services regulation under the Corporations Act are:

- the licensing regimes for financial services⁵⁴⁷ and markets⁵⁴⁸ under the Corporations Act
- the market integrity rules under Corporations Act: *ASIC Market Integrity Rules (Securities Markets) 2017* (Securities Markets rules) and the *ASIC Market Integrity Rules (Futures Markets) 2017* (Futures Markets rules)⁵⁴⁹
- the obligations and requirements set out in chapter 7 of the Corporations Act.⁵⁵⁰ For example, Part 7.10 of chapter 7 of the Corporations Act deals with market misconduct relating to financial products and financial services
- the disclosure rules that apply under the Corporations Act when a financial product is issued.⁵⁵¹

To the extent that an intermediary advises clients on futures contracts and options contracts that are derivatives, they would require an AFSL.

It is also possible that exchange platforms could potentially operate a 'financial market' and therefore be required to hold an 'Australian market licence' under section 791A of the Corporations Act. Exchanges that currently hold Australian market licences, such as ASX24 and ChiX, could potentially trade water derivatives, if demand for such products arose in the future.⁵⁵² Water futures are not currently traded on either platform. Futures contracts can also be traded over the counter (OTC). The ACCC is not aware of anyone currently dealing in OTC water futures in the Murray-Darling Basin. The 2009 Survey of the OTC derivatives market in Australia noted that participation in OTC markets is usually limited to more sophisticated counterparties, such as wholesale clients.⁵⁵³

543 H2OX, 2018, h2ox.com/water-products/options/, viewed 5 Feb 2020.

544 *ibid.*

545 Section 764A(1)(c) of the Corporations Act provides that a derivative is a 'financial product'.

546 Section 12BAA(7) of the ASIC Act provides that a derivative is a 'financial product' for the purposes of Part 2, Div 2 of the ASIC Act (consumer protection provisions). For example, s12DA of the ASIC Act deals with misleading or deceptive conduct in relation to financial services. Section 131A of the *Competition and Consumer Act 2010* (CCA) excludes 'financial products and services' from the operation of the ACCC's Australian Consumer Law (ACL).

547 Section 911A of the Corporations Act.

548 Section 791A of the Corporations Act.

549 Part 7.2A of the Corporations Act enables ASIC to make market integrity rules dealing with the activities or conduct of: (a) licensed markets; (b) persons in relation to licensed markets; and (c) persons in relation to financial products traded on licensed markets.

550 The obligations for market operators are set out in Pts 7.2 and 7.2A of the Corporations Act.

551 Section 1013C Corporations Act, Section 761E(5) Corporations Act.

552 <https://asic.gov.au/regulatory-resources/markets/market-structure/licensed-and-exempt-markets/licensed-domestic-financial-markets-operating-in-australia/>.

553 A joint report by the Australian Prudential Regulation Authority, Australian Securities and Investments Commission and Reserve Bank of Australia, *Survey of the OTC derivatives market in Australia*, May 2009 https://download.asic.gov.au/media/1343174/REP158_SurveyOfTheDerivatives.pdf, viewed 23 June 2020.

9.13 Calls for restrictions on investors

At public forums and in submissions, some stakeholders argued for regulatory intervention in the form of restrictions on investment and foreign ownership of water rights.⁵⁵⁴

9.13.1 Foreign investment—harmful behaviours should be regulated rather than classes of market participants excluded

Under the *Foreign Acquisitions and Takeovers Act 1975*, the Treasurer is responsible for making decisions on individual foreign investment proposals and is advised by the Foreign Investment Review Board (FIRB). Generally, foreign investment proposals are subject to monetary and control screening threshold tests. If these threshold tests are met, then FIRB examines the foreign investment proposal and advises on national interest implications by applying the 'national interest test'. 'The Australian Government's policy stance on foreign investment recognises that foreign investment brings many benefits. For this reason, foreign investment proposals are assessed against the national interest on a case-by-case basis. This flexible approach is preferred to hard and fast rules. Rigid laws that prohibit a class of investments too often also stop valuable investments'.⁵⁵⁵

Foreign investment in rural water rights is generally not separately subject to the FIRB screening and assessment processes. However, foreign investment in rural water rights can be considered by the FIRB if the acquisition forms part of an agricultural land or agribusiness acquisition that is subject to FIRB screening. The FIRB may consider a range of factors when examining foreign investment proposals for agricultural land and agribusiness, including the effect of the proposal on the quality and availability of Australia's agricultural resources (including water), land access and use, agricultural production and productivity, Australia's capacity to remain a reliable supplier of agricultural production, both to the Australian community and our trading partners, biodiversity, and employment and prosperity in Australia's local and regional communities.⁵⁵⁶

In their submission to the interim report, NSW Farmers' said 'A gigalitre (GL) or investment (\$) threshold would be beneficial to provide an opportunity to review foreign investment in Australian water resources, similar to the threshold test for the acquisition of Australian agricultural land'.⁵⁵⁷ As noted above, the Treasurer is responsible for making decisions on, and changes to, foreign investment policy. In addition, the Senate Economics Committee is currently conducting its Review of foreign investment proposals against the national interest test and thereport is required by 30 June 2021. The terms of reference for this review include consideration of the extent to which the risk that foreign investment proposals are being used for money laundering is examined. The then Interim Inspector-General of Murray-Darling Basin Water Resources asserted that the current rules for foreign investment in water leave the door open to criminal activity, including money laundering.⁵⁵⁸ Such money laundering risks and foreign investment more generally are matters for the Government and Senate Committees rather than the ACCC.

Register of Foreign Owned Water Entitlements

The Australian Government has legislated for mandatory reporting by foreign entities of water owned and traded, so as to gain a better understanding of the level of foreign ownership and market activity. The Commissioner of Taxation, through the Australian Tax Office, maintains a Register of Foreign Owned Water Entitlements under the *Register of Foreign Ownership of Water or Agricultural Land Act 2015* (Cth).

554 ACCC Murray-Darling Basin inquiry, Renmark and Shepparton public forums.

555 Treasurer, last updated 24 April 2020, Australia's foreign investment policy, <https://firb.gov.au/index.php/guidance-resources/policy-documents>, viewed 10 December 2020.

556 Explanatory Memorandum for the Register of Foreign Ownership of Agricultural Land Amendment (Water) Bill 2016, www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bld=r5735, viewed 23 June 2020, p. 36.

557 NSW Farmers' Association, *Submission to Murray-Darling Basin water inquiry interim report*, 4 December 2020, p. 8.

558 'Stock and Land', 'Foreign investment laws leave water open to money laundering', 11 May 2020, www.stockandland.com.au/story/6750564/foreign-investment-laws-leave-water-open-to-money-laundering/, viewed 23 June 2020.

The Treasurer publishes an annual report of data derived from the Register. The Treasurer's most recent report from the Register, published in March 2019, presents data in aggregate form for the northern Basin and separately in aggregate form for the southern Basin.⁵⁵⁹ There are statutory restrictions on the publication of 'protected information' collected by the ATO. The Treasurer's report states:

The ATO is required to report on data from the Register in aggregated format only. Consistent with the principles applied in Australia's broader foreign investment regime, the details of investors are not made publicly available. The taxation law also restricts the release of information that could identify, or be used to identify, an individual or entity.⁵⁶⁰

No information from the Register is released about individual owners or the water holdings of state-owned enterprises. Nor is data released at a catchment-specific level. Transparency is also hindered by the fact that the requirement to register water acquisitions is a self-reporting requirement. Although there are enforcement provisions in the legislation, no penalties for non-compliance have been issued to date.⁵⁶¹

The Register of Foreign Owned Water Entitlements is subject to statutory review by the Productivity Commission.⁵⁶² On 4 December 2020, the Productivity Commission announced its inquiry into the Register. The inquiry will examine the effectiveness, costs and benefits of the Register. The terms of reference include to:

- assess whether the information provided in the Report delivers on the policy objectives of the scheme of increasing transparency of foreign ownership of water entitlements
- identify the direct and indirect costs and benefits associated with maintaining the Register and producing the Report
- identify the direct and indirect costs borne by foreign owners of water entitlements to ensure compliance with the Act.⁵⁶³

New Register of Foreign Owned Assets

On 8 December 2020, Parliament passed the Foreign Investment Reform (Protecting Australia's National Security) Bill 2020. The legislation establishes a new Register of Foreign Owned Assets which incorporates the existing Register of Foreign Ownership of Water Entitlements and Register of Foreign Ownership of Agricultural Land. The new Register of Foreign Ownership of Australian Assets will record all foreign interests acquired in Australian land; water entitlements and contractual water rights; and business acquisitions that require foreign investment approval, including acquisitions reviewed under the new national security test.⁵⁶⁴

Tax treatment of foreign investors

Tax requirements could differentiate between local and foreign owners in a way that produces an unfair competitive advantage for foreign investors. However, while there are certain tax concessions that are available to incentivise foreign investors, new limitations were imposed on these tax concessions for foreign pension funds and sovereign entities by the *Treasury Laws Amendment (Making Sure Foreign Investors Pay Their Fair Share of Tax in Australia and Other Measures) Act 2019* (Cth). This Act is intended to protect the integrity of Australia's corporate tax system by limiting access to tax concessions for foreign investors who convert active business income into passive income in order to avoid paying tax at the top corporate rate.⁵⁶⁵

559 Treasurer, Register of Foreign Ownership of Water Entitlements Report of registrations as at 30 June 2018, <https://firb.gov.au/about-firb/publications/register-foreign-ownership-water-entitlements-report-registrations-30-june>, viewed 23 June 2020.

560 *ibid.*

561 'Stock and Land', 'Foreign investment laws leave water open to money laundering', 11 May 2020, www.stockandland.com.au/story/6750564/foreign-investment-laws-leave-water-open-to-money-laundering/, viewed 23 June 2020.

562 Section 34A of the *Register of Foreign Ownership of Water or Agricultural Land Act 2015* (Cth).

563 See terms of reference at <https://www.pc.gov.au/inquiries/current/foreign-water-entitlements>.

564 Foreign Investment Reform (Protecting Australia's National Security) Bill 2020, EM, p. 10.

565 Treasury Laws Amendment (Making Sure Foreign Investors Pay Their Fair Share of Tax in Australia and Other Measures) Bill 2019, www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bld=r6192, viewed 23 June 2020.

9.13.2 Domestic investment – many of the important benefits of water markets cannot be realised without the participation of investors

The ability to purchase water rights without agricultural land has led to water being purchased for financial investment rather than agricultural production. Retired farmers are also retaining their water entitlements for investment purposes to fund their retirement, rather than selling them on retirement.

Some stakeholders suggested that restrictions on access to the water market by non-irrigators is the appropriate response to deflate water prices, while others advocated that the purchase of water allocations should be limited to those who hold a water use licence or water use registration. In terms of investors' use of carryover, some stakeholders suggested the appropriate solution is to tie carryover rights to delivery share or water use licences rather than entitlements.⁵⁶⁶ Another suggestion from stakeholders was a proposal for a 'single trade rule for temporary water'. This would mean that 'every megalitre of allocated water is only able to be traded once before it is used for agriculture, environment or critical human needs.'⁵⁶⁷ These stakeholders advised that this would prevent market participants increasing the price of water by buying and selling water.

Under the Basin Plan Water Trading Rules, restrictions based on classes of water market participants, or the purpose for which the water will be used, are not permitted.⁵⁶⁸ Even if such restrictions were permitted, the introduction of rigid laws that prohibit a class of market participants, such as investors, from participating in the market would preclude valuable financial investment. Investors provide irrigators with access to capital, increase water market liquidity, and provide a range of water products that help irrigators to manage water supply risks, such as forward contracts and carryover parking. It has been noted that leases from retired farmers to irrigators can be beneficial to the next generation irrigation community.⁵⁶⁹

Concerns about the conduct of investors should be addressed through the proposed conduct and integrity legislation, rather than by excluding these participants from the market.

9.13.3 Traders should be required to include on registration forms a unique common identifier.

The ability to identify market participants, and trace and follow transactions, is a foundational issue for market confidence. In the absence of an ability to trace transactions, regulators such as the new WMA, Basin States and the ATO would be very limited in their capacity to enforce regulation. The identifier could be an ABN, ACN, or a new identifier issued by the Water Markets Agency.

The use of a unique identifier could assist the ATO. Revenue from water ownership is derived from temporary allocation trading and capital appreciation. The ATO website states:

Water rights, such as licences and water allocations, are capital gains tax (CGT) assets. The permanent trade of a water right is a disposal of a CGT asset. A temporary trade of a water right is also a CGT event.. Whether there are general income tax consequences as a result of trading a water right depends on your particular circumstances.⁵⁷⁰

Some irrigators include allocations in their cost of goods purchased for income tax calculations within a particular year. Some brokers keep records of client transactions for several years and provide them to clients' tax accountants, on request by clients. However, the lack of a requirement to record an ABN or ACN on registration documents inhibits the ability to cross-check the cost base of a CGT asset and the cost of goods purchased for income tax purposes. Illegal tax avoidance is possible if a buyer declares a high price to the ATO and the seller understates the income. Again if the price has not been logged with

566 Bega Cheese Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020 p. 7; and ACCC Murray-Darling Basin inquiry, Shepparton public forum.

567 Jodie Hay, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020.

568 Section 12.07-12.08 of the Basin Plan.

569 'The Land', 'Connecting generations to stop water being traded downstream', 27 March 2020, <https://www.theland.com.au/story/6700316/keeping-irrigation-water-in-the-district/>, viewed 23 June 2020.

570 Australian Tax Office, *Water and carbon sequestration rights—Tradeable water rights*, <https://www.ato.gov.au/Business/Primary-producers/Livestock-and-other-assets/Water-and-carbon-sequestration-rights/>, viewed 23 June 2020.

the trade, and an ABN or ACN is not recorded, then there is no way to be sure that the information is accurate. The ACCC analysed data regarding the percentage of water entitlements with either an ABN or ACN listed for the owner. In Victoria, only 4% of entitlements have either an ABN or ACN listed for the owner. In South Australia it is 18%.⁵⁷¹

► **Recommendation 4**

Require identifiers on trade forms

Traders should be required to include a unique common identifier on trade forms. This could be their ABN, ACN and/or the unique identifier issued to them by the centralised regulator.

The ability to identify market participants, and trace and follow transactions, is a foundational issue for protecting market integrity and maintaining market confidence. This will improve the regulator's ability to detect misbehaviour and enforce against it.

⁵⁷¹ See Data Quality Appendix (DQA) to this report.

04

Trade processing and water market information

This part includes three chapters on issues relating to trade services for Murray–Darling Basin water markets, transaction costs and information transparency, as well as the ACCC’s recommendations to address issues identified.

Chapter 10 discusses the roles and functions of public and private trade service providers, including brokers, exchange platforms, trade approval authorities and registers, and information service providers. It considers the evolution of trade services over time, noting both recent improvements and current shortcomings. Chapter 10 also examines the transaction costs associated with water trading, considering the impact of regulatory approval processes for individual trade applications and the cost of intermediaries on individual trading decisions.

Chapter 11 examines information transparency in Basin water markets. It identifies the information necessary for water market traders to make decisions that are in their best interests. It then analyses the current state of transparency, and identifies underlying issues that contribute to poor transparency. Finally, it presents the ACCC’s assessment of the changes needed to improve transparency.

Chapter 12 presents a suite of recommendations to address the issues identified in chapters 10 and 11, which the ACCC considers will improve water trade services and increase water market transparency.

10. Trade services and transaction costs

Key findings

- Water markets in the Basin are complex, with a great variety of product types available to trade⁵⁷² and a range of fees market participants must consider when making trading decisions.
- Trade services – advising, matching, clearing, settlement, registration and information – are provided by a range of private and public entities with diverse technological capabilities.
- While the diversity in the supply of trade services provides flexibility and competition, a lack of standardisation undermines market confidence, integrity and transparency.
- Intermediaries are continuing to develop innovative products and services, but trade approval authorities are failing to keep up and this is leading to poor market outcomes.
- Irrigators within irrigation infrastructure operator (IIO) networks face different trade processing and transaction costs that may require more complex decision making.
- Differences in Basin State trade approval authorities' technological capabilities are causing an uneven playing field in the Southern Connected Basin. This is particularly an issue for trading through the Barmah Choke, where holders of Victorian water rights benefit from the technological advantages of the Victorian Water Register compared to the New South Wales administrative system.
- Much of the digital infrastructure supporting trade services is inadequate and substantial benefits would flow from significant investment. Private and public trade service providers are making ongoing investments in improvements, but these are not consistently applied across the Basin and do not go far enough to provide the framework necessary to reduce transaction costs and improve information flows and quality to achieve whole-of-market efficiency.
- The main problems are outdated and disconnected information technology (IT) infrastructure for trade services, differences in underlying legislative frameworks, legislative gaps, and different approaches by private trade service providers leading to varying information quality, timeliness and transparency. Each of these issues needs to be addressed; but they need to be addressed collectively, not independently.
- Three key areas that need reform are: (1) reducing transaction costs by improving ease of trading, (2) improving the quality of information and (3) improving the flow of information between entities involved in Basin water markets and water management.

10.1 Trade services: what services are provided, by whom and why?

In the Murray–Darling Basin, a range of different entities provide trade-related services, and in some cases roles overlap. The trade-related services covered in this chapter are:

- **Advisory services:** assisting potential buyers and sellers to assess the market, form price expectations, and make decisions in the market
- **Information services:** collecting, cleaning, aggregating and disseminating market-relevant information
- **Matching services:** connecting buyers and sellers
- **Clearing services:** ensuring buyer and seller honour contract obligations, and assessing and approving trade applications

⁵⁷² Trade includes a transfer (that is, a trade that does not involve the payment of consideration).

- **Settlement services:** facilitating the actual transfer of payment from buyers to sellers, and transfer of title from sellers to buyers and updating water accounts and/or registers to reflect approved transactions
- **Registration services:** recording ownership and trades on state based registers established under water management legislation. Settlement for some trades does not take place until registration
- **Water accounts:** recording water credits and debits, including from trades. This function is linked to register systems.

Table 10.1 provides an overview of which entities provide which services in Basin water markets. Competition (markets) exists for some of these services (such as advisory, matching and information services), while others are provided by natural monopolies such as trade approval authorities and registries.

Clearing and registration services, performed by Basin State trade approval authorities, registries and irrigation infrastructure operators (IIOs), are not subject to competition through market mechanisms, although Basin State trade approval authorities are subject to economic regulation as natural monopolies.⁵⁷³

Table 10.1: Services performed by different trade service providers in Basin water markets

	Advisory services	Matching services	Clearing services	Settlement services	Registration services	Information services
Brokers and agents	Always	Always	Partly ^a	Sometimes – financial only	Never	Sometimes
Exchange platforms	Sometimes	Always	Contractual obligations ^a	Sometimes – financial only	Never	Sometimes
IIOs	Sometimes	Sometimes	Checks water accts and trading rules, sometimes contractual obligations	Title, and sometimes financial	Always	Sometimes
Basin State approval authorities	Never	Never	Checks water accts and trading rules ^a	Partly – title only	Never	Sometimes
Registries	Never	Never	Never	Always – title only ^b	Always	Always
Information providers	Never	Never	Never	Never	Never	Always

Source: ACCC analysis of broker and exchange websites, as well as state water management legislation and the *Water Act 2007* (Cth).

Notes: (a) Clearing is split across exchanges and trade approval authorities.

(b) There is not a separate settlement service which coordinates title and financial transfers. In water, for financial settlement to take place the Registrar must notify the intermediary holding the buyer funds that the trade has been approved, settled and registered and that the money can be released to the seller.

10.1.1 Trade services help reduce transaction costs for traders

Water markets provide market participants with the flexibility to buy and sell water, provided they can find a trading partner, have sufficient information available to understand the value of the water they are trading, and have a way of ensuring the trade is actually completed.

Trade services help with all of these things. For example, matching services reduce the costs of searching for a trading partner; advisory and information services help buyers and sellers form price

⁵⁷³ Trade approval charges levied by Basin State trade approval authorities are regulated as water planning and management charges under Basin State law, and also by the Water Charge Rules which are enforced by the ACCC. See <https://www.accc.gov.au/regulated-infrastructure/water/water-charge-rules>. Under the NSW regulatory framework, IPART sets WaterNSW's allocation trade charges. While IIOs are also subject to the Water Charge Rules, there is no direct regulation of IIO charges for trade approval services.

expectations; clearing, settlement and registry services all ensure the trade is completed correctly, and in line with trading rules.⁵⁷⁴

While some trade services (for example, some information services) are freely available, generally trade service providers recover their costs through fees or charges paid by market participants. Further, some public costs incurred in undertaking broader water planning and management activities also benefit market participants by providing an underlying foundation that participants rely on. This includes activities like metering water usage, river operations, and the planning and administration of water rights and trading frameworks. These broader costs are generally recovered through charges on tradeable water right holders, or may in part be funded via governments from consolidated revenue.

Thus, both private and public transaction costs are incurred in providing the different services required to support a competitive, stable and enduring market.

However, if transaction costs are too high, the economic benefits delivered by water markets can be eroded and market participation can decrease. Transaction costs can also vary for different market participants, contributing to an uneven distribution of the net benefits and increasing the variability of buy and sell offers in water markets.

10.1.2 Advisory services range from general market information to tailored trading advice

Many market participants engage brokers to provide advisory services to better understand the water market. As discussed in section 8.2, many water market intermediaries provide advisory services to their clients which assist buyers and sellers to decide when and where they want to trade, and to form price expectations.

Brokers and exchange platforms which provide advisory services draw on a range of information sources – for example, climate and water availability data published on government websites, industry forecasts, and historical trade data from Basin State registers and IIO websites.

As advisory services are usually coupled with matching services, the advisor may also have access to data from previous trades which they have facilitated, and add value by analysing raw data from other sources in order to gain actionable insights. When this occurs, advisory service providers may *create* information asymmetries between brokers and traders. This is discussed in more detail in section 8.8.

10.1.3 Only intermediaries provide information on buy and sell offers but information on approved trades is more widely available

Many brokers and exchange platforms publish (or provide for access by members) historical information on price, trading patterns, products and volumes traded on their platform or for trades they facilitated.⁵⁷⁵ Because this information is not standardised in any way, and suffers from quality issues (discussed further in section 11.3), market confidence has been impacted by fragmented information and the resulting difficulty in obtaining a true and complete view of market price and market depth.⁵⁷⁶

Basin States also publish information from water registers on approved trades of water access rights within their jurisdiction. However, each state publishes this information slightly differently, and this is explored further in chapter 11.

Basin-wide information services like those provided by Waterflow and the Bureau of Meteorology (BOM) Water Market Information Dashboard (discussed in section 11.3.4) provide general information

574 Allen Consulting Group, 'Transaction costs of water markets and environmental policy instruments', *Report to the Productivity Commission*, 2006, p. 11; Department of Agriculture, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 11; A Loch, SA Wheeler and C Settre, 'Private transaction costs of water trade in the Murray-Darling Basin', *Ecological Economics*, vol. 146, 2018, p. 561; Ricegrowers' Association of Australia, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 5.

575 ACCC, *Water market intermediaries – industry developments and practices*, 2010, https://www.accc.gov.au/system/files/Water%20market%20intermediaries%20-%20industry%20developments%20and%20practices_0.pdf, viewed 6 May 2020, p. 9.

576 Goulburn Murray Irrigation District (GMID) Water Leadership, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 10.

to a wide variety of stakeholders, beyond just market participants, such as the general public, policymakers and researchers. These services seek to bring together information from disparate sources but are not regarded as *intermediaries* because they do not actively facilitate trade.

While the BOM collates historical trade data from the Basin State registers and some IIOs⁵⁷⁷, it does not collect information from intermediaries. Waterflow does collect this information for some intermediaries and presents additional analysis on current buy and sell offers. Waterflow publishes information on buy and sell offers in close to real time, retrieving data from intermediaries it has agreements with as frequently as every ten minutes, and it is continuing to expand the number of intermediaries it collects information from.⁵⁷⁸ It also relies on the BOM dashboard for historical trade data.⁵⁷⁹

10.1.4 Intermediaries provide a variety of matching services via bulletin boards, online platforms and automated matching services

Services for matching buyers and sellers are key to well-functioning markets as they assist both buyers and sellers to find the best opportunities to trade. During the transition to formal water markets in the Basin through unbundling of land and establishment of trading rules, intermediaries emerged to facilitate trade in the newly formed markets.⁵⁸⁰

There are now multiple exchange platforms and brokers who offer matching services in the Basin (see appendix B). These services include automated matching on exchange platforms using algorithms, auction style listings, 'buy-it-now' listings, and manual matching by brokers. Manual matching can take place, for example, when a broker has one client who wants to buy and another who wants to sell and the trade could either be lodged directly to the trade approval authority by the broker, or via an exchange platform. Box 10.1 provides an overview of different types of matching services available.

Some IIOs⁵⁸¹ also operate exchange platforms to facilitate trade within, into and out of their networks. These platforms can be used directly by water right holders, or they can be used by brokers on behalf of their clients. Some other IIOs offer brokerage or bulletin board style matching services for their members, and many offer aggregation services aimed at reducing the transaction costs incurred by members trading into and out of the network.

577 Under the *Water Act 2007* (Cth), the BOM is required to collect and publish information a variety of water information, including water markets data from the Basin State trade approval authorities and Central Irrigation Trust, Coleambally Irrigation Co-operative Limited, Murray Irrigation Limited and Murrumbidgee Irrigation Limited.

578 Waterflow, FAQ, 2019, <https://www.waterflow.io/faq>, viewed 15 December 2020.

579 Available at: <https://www.waterflow.io/>.

580 ACCC, *Water market intermediaries – industry developments and practices*, 2010, https://www.accc.gov.au/system/files/Water%20market%20intermediaries%20-%20industry%20developments%20and%20practices_0.pdf, viewed 6 May 2020, p. 2.

581 Some IIOs have exchange platforms which are managed and run by a separate and independent company.

Box 10.1: Water market intermediaries provide a variety of matching services

The different types of matching services provided by Basin water market intermediaries can be distinguished according to the level of transparency provided to market participants, and the degree of discretion or ability to negotiate a trade. For the purposes of this report, several different types of matching are defined (table 10.2).

Table 10.2: Types of matching

Description	Trading benefits and costs	Level of transparency
Facilitated by intermediaries		
Broker-negotiated, outside of platform Trades negotiated and lodged with trade approval authorities via a broker, without the involvement or use of an exchange platform	<ul style="list-style-type: none"> High level of discretion/negotiation. Principal incurs broker commission costs and relies on broker to find trading partner. Broker lodges trade approval application form(s). 	Limited transparency for other market participants: <ul style="list-style-type: none"> buy and sell offers may have been publicly advertised (e.g. on a broker's bulletin board), but are not necessarily completed trades appear in Basin State / IIO registry data and possibly on broker's own website.
Negotiated by a broker or individual off platform, lodged via platform. Also referred to as an 'off-platform' trade Trades negotiated via a broker without the involvement or use of an exchange platform, but lodged for approval via an exchange platform	<ul style="list-style-type: none"> High level of discretion/negotiation. Principal incurs broker commission costs and relies on broker to find trading partner. Broker outsources lodgement of trade approval form(s) to exchange platform. 	Moderate transparency for other market participants: <ul style="list-style-type: none"> buy and sell offers may have been publicly advertised (e.g. on a broker's bulletin board), but are not necessarily completed trades appear in Basin State / IIO registry data and also on the exchange platform (and possibly broker's own website).
Matched on-platform Traders matched and lodged for approval via an exchange platform. Covers different kinds of on-platform matching, including automated matching via algorithm, 'buy-it-now' (i.e. buyer selects advertised parcel), automated exchange pools, platform-based auctions	<ul style="list-style-type: none"> Lower level of discretion/negotiation: buyers generally take what's on offer or are matched via a rule-based or mathematical process that is known beforehand to market participants. Principal incurs exchange platform commission costs. Exchange platform lodges trade approval form(s). May also be used by brokers to save on search costs (time) and outsource lodgement of trade approval form(s). 	Moderate-high transparency for other market participants: <ul style="list-style-type: none"> buy and sell offers are visible on platform completed trades appear in Basin State/IIO registry data and also on the exchange platform (although may not be able to link platform and registry data) level of transparency may depend on exact matching method.
Other		
Principal-negotiated, outside of platform Trades negotiated and lodged for approval without the involvement of any water market intermediary.	<ul style="list-style-type: none"> High level of discretion/negotiation. Principal incurs search costs (time). Principal lodges trade approval form(s). 	Very low transparency for other market participants: <ul style="list-style-type: none"> buy and sell offers unlikely to have been publicly advertised completed trades likely only appear in Basin State/IIO registry data.

Intermediaries hold significant volumes of market-sensitive information

As brokers and exchange platforms are involved in the matching of buyers and sellers, they also become the holders of valuable information on the willingness to pay, parties of trade, date of contract, volume traded, and sometimes the reason for trade. There is no interoperability between water exchange platforms, and there is no current requirement to disclose the extent to which the same parcels of water are listed on multiple exchanges. Stakeholders have expressed concern that market-sensitive information is dispersed across a number of brokers and exchange platforms in the Basin. There is also concern that the products and services offered vary across the exchange platforms and are not standardised, and that dispersal of buy and sell offers across multiple sites (and some not even online at all) makes it difficult to accurately gauge market depth.⁵⁸²

In response to this concern, some stakeholders had called for a central exchange or an 'ASX for water' to increase transparency and better understand market depth.⁵⁸³ However, there have also been concerns that this could increase costs and require additional regulation⁵⁸⁴, and some stakeholders' positions have changed.⁵⁸⁵

As noted in box 10.1 above, exchange platforms not only provide matching services, but also provide services for trade approval form lodgement. As such, many trades which appear to originate from an exchange platform have actually been negotiated off-platform⁵⁸⁶ (table 10.3) and indicates the market depth offered on exchange platforms is less than what may be suggested from trades published by the exchange platforms. For exchange platforms that publish information on trades that are pending approval by the Basin State trade approval authorities, this practice increases the amount of timely data available to the market.⁵⁸⁷

582 See for example, Murrumbidgee Valley Food and Fibre, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 2, which states that 'totally transparent water trading platform and water register that follows the same rules and principles as other property, share and business ownerships in Australia urgently needs implementation as already outlined in the NWI and the *Water Act 2007*'.

583 For example, Victorian Farmers Federation, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 11.

584 Australian Water Brokers Association, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 4.

585 Such as, Victorian Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 11.

586 As discussed in section 6.2, an on-platform trade is one where buy and sell orders are matched on the exchange platform, either automatically or selected by the customers without negotiation, while an off-platform trade is one where the trade was negotiated directly by parties or through a broker and then placed on the platform for processing and settlement.

587 As discussed in sections D.2.5 and D.2.7 of appendix D, the time taken by trade approval authorities to process trades and for intermediaries to lodge trades after buy and sell offers have been matches delays the timely publication of trading data and water market participants must undertake additional research to understand the 'current' state of the market.

Table 10.3: Proportion of trades lodged by exchange platforms where buyer and seller were matched on-platform, within the Southern Connected Basin

Water Year	Exchange Platform A	Exchange Platform B ^a	Exchange Platform C ^b	Exchange Platform D ^c	Exchange Platform E	Total (inclusive of IIO exchange platform)	Total (exclusive of IIO exchange platform)
2017-18	28%	100%	49%	100%	100%	70%	61%
2018-19	27%	100%	67%	100%	100%	77%	73%
2019-20YTD	30%	100%	66%	100%	100%	74%	70%

Source: ACCC analysis of s. 95ZK responses.

Notes: Table shows proportion of trades lodged (i.e. submitted for approval) by an exchange platform that were also matched on-platform. For example, in 2018-19, 27% of trades lodged by Exchange Platform A were also matched on Exchange Platform A. Includes trades within IIOs. Limited to trades ACCC classified as on-platform or off-platform and that could be matched to Basin State and IIO trade data. 2019-20YTD = 2019-20 year to 30 November 2019.

(a) While this IIO-based exchange platform matches trades within its network, it is available to water market participants outside of the IIO (who must pay the Basin State application fee for trading water into or out of the IIO's bulk licence).

(b) As this exchange platform did not record how buy and sell orders were matched, on-platform trades were assumed to be those where the buy order, sell order and trade were submitted to the platform quasi simultaneously (within five seconds).

(c) Includes trades where strike date was not provided.

For trades matched on-platform, many are between buyers and sellers within the same trading zone (table 10.4). This suggests interzone trade is currently not readily facilitated by exchange platforms without off-platform negotiations.

Table 10.4: Proportion of trades matched on-platform where buyer and seller are in different trading zones within the Southern Connected Basin

Water Year	Exchange Platform A	Exchange Platform B ^a	Exchange Platform C ^b	Exchange Platform D ^c	Exchange Platform E	Total (inclusive of IIO exchange platform)	Total (exclusive of IIO exchange platform)
2017-18	33%	0%	37%	61%	10%	24%	37%
2018-19	36%	0%	42%	70%	26%	34%	43%
2019-20YTD	21%	0%	30%	59%	8%	24%	29%

Source: ACCC analysis of s. 95ZK responses.

Notes: Table shows proportion of trades that were matched on-platform where the buyer and seller were in different trading zones. For example, in 2018-19, 36% of trades matched on Exchange Platform A had buyer and seller in different trading zones. Excludes any trades not matched on-platform. Includes trades within IIOs. 2019-20YTD = 2019-20 year to 30 November 2019.

(a) While this IIO-based exchange platform matches trades within its network, it is available to water market participants outside of the IIO (who must pay the Basin State application fee for trading water into or out of the IIO's bulk licence). The trading zone of these external participants was not available in the data provided by the exchange platform to the ACCC.

(b) As this exchange platform did not record how buy and sell orders were matched, on-platform trades were assumed to be those where the buy order, sell order and trade were submitted to the platform quasi simultaneously (within five seconds).

(c) Includes trades where strike date was not provided.

10.1.5 Trades are processed, recorded and registered across multiple water registers and water management systems

Basin States and IIOs generally use water management systems to monitor and record water credits, use and ownership through water accounts. In contrast, a 'water register' (or system of multiple registers) maintains a record of ownership (similar to a lands title register) and a record of trades between water rights holders. The two processes are closely intertwined, and information recorded in system one will affect the records of the other. Basin States have implemented a variety of systems to enable these processes.

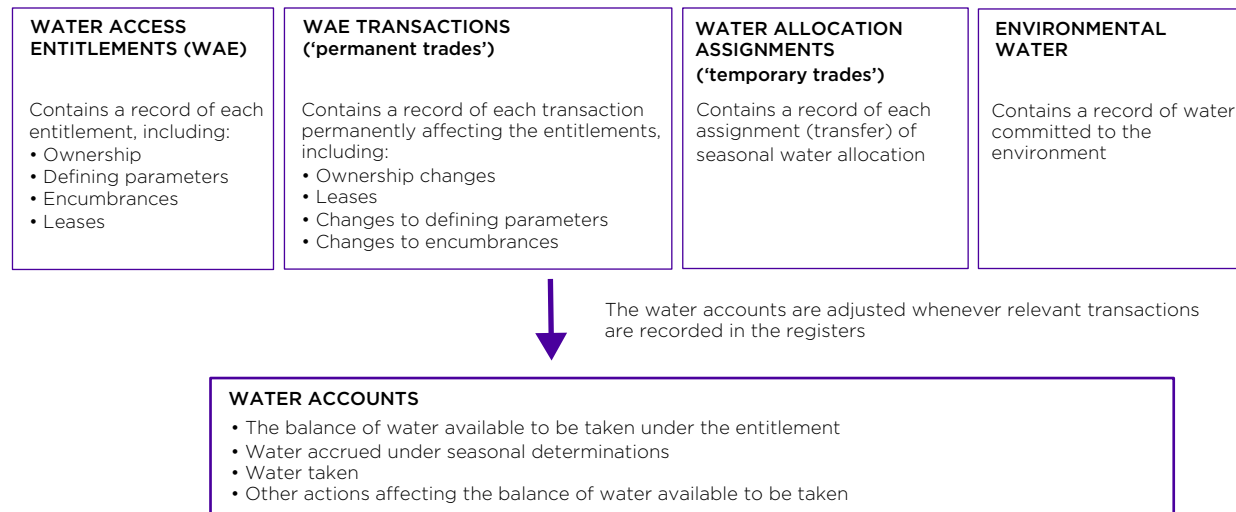
What the National Water Initiative and Water Act envisaged for water registers

The former National Water Commission's (NWC) *Compatibility of Water Registers* report considered the conceptual model set out in figure 10.1 below would encompass all components of a registry system, but that in practice it was up to states whether they chose to have one 'register' which captured all of these separate components, or kept them as separate registers with the appropriate linkages.⁵⁸⁸ The report was clear that accounts are not considered to be a 'register' for the purposes of the National Water Initiative (NWI), but are closely linked to the register system.

Water accounts show the actual amount of water available for use or trade by an individual, and can be considered like a bank account with credits and debits. The information recorded in the registers often affects the water accounts. Changes in entitlement ownership or location parameters may require establishment of new accounts or changes to entitlements linked to accounts. Water allocation trades are however given effect by adjusting the accounts and not by registration.

The NWC considered the importance of linkages between registers and water accounts so that changes are made within a tight timeframe (one working day is recommended) and the information kept in the separate systems remain synchronised.⁵⁸⁹

Figure 10.1: Components of a water register system



Source: National Water Commission, *Compatibility of Water Registers Report*, 2005, p. 3.

Basin State water registers are established under state-based water management legislation. Their primary purpose is to maintain accurate and current records about ownership and interests in water rights, and a clear record of all transactions relating to them (with transactions either in the same register as ownership or a separate linked register).⁵⁹⁰ While the record of the transaction may sit within

588 National Water Commission, *Compatibility of Water Registers Report*, 2005, p. 5.

589 National Water Commission, *Compatibility of Water Registers Report*, 2005, p. 5.

590 For example, South Australia's register: <https://www.environment.sa.gov.au/topics/water/water-markets-and-trade/water-register>, viewed 1 December 2020.

the register, the transaction itself must also be reflected in water accounts within water management systems in order to determine account volumes available for use, trade and carryover.

The ACCC requested data from the Basin States and medium and large IIOs on water accounts (including all credits and debits), allocation trades, and entitlement trades. This data was provided to the ACCC in various different structures, some of which reflect the differences in systems used to record accounts and register trades and ownership (see appendix G for analysis on the quality of these datasets).

The differences between the registers and the water management systems also have implications for transparency.

Generally, the register provisions in the relevant state legislation will require that the following be recorded on the register in relation to each water entitlement:

- name and contact details of holder(s)
- water resource which entitlement relates to
- date of issue and (if relevant) expiration
- date of any variation
- date of any transfer
- date of surrender or cancellation
- information prescribed by regulation.

However, Victoria also requires water consumption to be recorded as part of their water register. The retail register records usage of allocation available to consumptive and environmental entitlements, and interacts with the wholesale water register, which records bulk usage (water diverted from a waterway to an irrigation district). Standardised data sharing protocols exist between the Victorian Water Corporations and the Victorian Water Register (VWR) in order for the Water Corporations to meet their obligations to update the VWR with water account information.

Although IIOs have a role in approving trade applications, and managing their members' or customers' accounts, they are not required to maintain registers under the relevant state water management legislation. The ACCC understands that maintaining a separate register would be burdensome, particularly for smaller IIOs, and may not necessarily offer any real benefits to either their members or broader market transparency. CICL summarised this issue in their submission:

CICL also has concern that the ACCC is mandating registers should be separate from water management systems. If there is to be investment in designing new systems the investment should deliver efficiency and robust systems that minimise the potential for human error. IIOs core business is the supply of irrigation (and in some cases drainage services) to their customers. Our water management systems and water allocation account management are inextricably linked. Our systems need to be automatically linked or a single system.⁵⁹¹

As such, the ACCC now considers that improvements to IIO systems will achieve greater benefits and enable improvements necessary to reduce transaction costs, increase information flows and improve transparency (see section 10.3.3).

Unlike the other states, New South Wales sets up Water Allocation Accounts in its legislation.⁵⁹² These Water Allocation Accounts must record credits and debits, and allocation assignments that are given effect when the details are entered into the account and not when recorded in the assignment division of the register.

591 Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 14.

592 *Water Management Act 2000* (NSW), s. 85.

Trade approval, clearing, settlement, registration and information services are provided by multiple agencies

Each state's water management legislation sets out that the role of trade approval authorities is to undertake the trade clearing process, which involves assessing the trade application against criteria set out in the relevant Act (which can then refer to various other documents). In most states, legislation will provide that certain trades (particularly entitlement trades) do not take effect until they are *registered* – thus, registration is a separate but related process to trade approval (see table 10.5). In some states, trades will take effect when a water account is updated⁵⁹³ or will take effect from the date of the assignment.⁵⁹⁴

In New South Wales and South Australia, IIOs act as trade approval authorities for both temporary and permanent trade of irrigation rights, and also for trade of water delivery rights within their networks.

Table 10.5: Responsibilities of trade approval authorities and registries in the Basin

	Trade approvals (Allocations)	Register (Allocations)	Trade approvals (Entitlements)	Register (Entitlements)
Qld – Sunwater schemes	Sunwater	Not required in Act, do not have register	DRDMW (not all require approval)	Titles Registry
Qld – DRDMW schemes	DRDMW	Not required in Act, do not have register	DRDMW (not all require approval)	Titles Registry
ACT	- ^a	- ^a	EPSDD	EPSDD
NSW	WaterNSW (unless within an IIO)	WaterNSW (unless within an IIO)	WaterNSW (not all require consent)	NSW LRS
NSW – IIOs	IIO	Register not required in Act	IIO	Register not required in Act
Victoria	Water Corporations (Water Corporations responsible, but partner with DELWP for VWR online approvals)	Water Corporations (Water Corporations responsible, but have data sharing protocol in place with VWR)	Water Corporations for approval, Registrar for registration	VWR (Registrar is responsible, but partner with Water Corporations)
SA	DEW (unless within an IIO)	DEW	DEW (unless within an IIO)	DEW
SA – IIOs	IIO	Register not required in Act	IIO	Register not required in Act

Notes: DEW: Department for Environment and Water; DRDMW: Department of Regional Development, Manufacturing and Water⁵⁹⁵; EPSDD: Environment, Planning and Sustainable Development Directorate; LRS: Land Registry Services; VWR: Victorian Water Register.
(a) ACT currently has no temporary trades, and therefore no temporary trade approval function or register of temporary trades.

There are also different processes set up in legislation for approvals, consents, notifications and registrations. The differences in the types of dealings specified in the state legislation impact transaction costs. For example, if a water holder needs to conduct two dealings (one to divide the entitlement and then another to transfer a divided part of an entitlement) rather than being able to transfer part of an entitlement in one dealing, they may face higher transaction costs.⁵⁹⁶

The types of dealings specified in the state legislation or on trade forms also impact the data that is available to market participants. For example, by not specifying separate dealings for same-party or related-party transfers, trade data quality is reduced by being unable to differentiate trade types and the true depth of water markets.

593 SA and NSW for allocation assignment.

594 Victoria for allocation assignments.

595 Formerly the Department of Natural Resources, Mines and Energy.

596 The impact of this on IIO transformation transaction times is shown in section D.2.4 of appendix D.

10.2 The evolution of trade services in the Southern Connected Basin

10.2.1 NWI objectives and principles for trade services

The National Water Initiative (NWI) envisaged a nationally-compatible system of trade services and trade services infrastructure, despite a state-based approach to public trade services.

The *Water Act 2007* (Cth) specifies the following objectives and principles for water market and trading arrangements for the Murray–Darling Basin, which are drawn from NWI commitments. The objectives⁵⁹⁷ are:

- (a) to facilitate the operation of efficient water markets and the opportunities for trading, within and between Basin States, where water resources are physically shared or hydrologic connections and water supply considerations will permit water trading
- (b) to minimise transaction cost on water trades, including through good information flows in the market and compatible entitlement, registry, regulatory and other arrangements across jurisdictions
- (c) to enable the appropriate mix of water products to develop based on water access entitlements which can be traded either in whole or in part, and either temporarily or permanently, or through lease arrangements or other trading options that may evolve over time
- (d) to recognise and protect the needs of the environment
- (e) to provide appropriate protection of third-party interest.

Relevant principles include:

- (3) All trades should be recorded on a water register. Registers will be compatible, publicly accessible and reliable, recording information on a whole of catchment basis, consistent with the National Water Initiative.
- (15) Institutional, legislative and administrative arrangements will be introduced to improve the efficiency and scope of water trade and to remove barriers that may affect potential trade.

These excerpts show compatibility between the state systems and registers was and is an objective of the NWI and the Water Act, to reduce transaction costs and provide good information flows to the market. Options for reform should strive to fulfil these objectives, which cannot be achieved by states implementing reform in isolation of each other but require a more prescriptive and guiding framework to achieve these aims on a whole-of-Basin level.

10.2.2 Previous attempts to harmonise and improve trade processes and transparency have only delivered limited improvements

The National Water Market System (NWMS) and Common Registry Solutions (CRS) projects did not deliver Basin-wide improvements

The NWMS program sought to achieve the NWI objectives of improved water information flows through the delivery of a national water market website and a registry system that would support the water market. It aimed to fill a gap through the establishment of a CRS, which would contain both water rights holder and resource level accounting capabilities. The NWMS work program also included data and data quality management activities, a support regime for its ongoing operation and enhancements to existing water registry systems in Victoria and Queensland.

The provision of this national water market registry system was the goal of the CRS project, which aimed to ensure states had:

⁵⁹⁷ *Water Act 2007* (Cth) Schedule 3, s. 3.

- registers that recorded property rights and supported water accounting and resource management activities
- processes that improved transaction times for trades and dealings
- interoperability between registers to improve the efficiency of interstate trade.

The CRS was planned to be fully integrated with operational systems and also provide a platform for automating information aggregation and dissemination of information. However, the project was far more complex than anticipated, and was unable to be delivered due to high cost of standardising the states' registers. The NWMS project was terminated in 2014 without the delivery of any accounting system.

Nonetheless, the NWMS project did deliver the improvements in trade processing and registers seen today, such as the Victorian enhancements where investments of \$5.1 million in funding from the Australian Government⁵⁹⁸ and \$4.6 million of Victorian funds⁵⁹⁹ enabled electronic lodgement and automated processing of allocation trade applications on the VWR (further discussed in appendix C). Victoria was only able to meet the Council of Australian Governments (COAG) service standard for interstate trade in 2011-12 following these enhancements to its water register.⁶⁰⁰

COAG service standards need reform if public trade services are to improve

Prior to the introduction of service standards for allocation and entitlement trade, there was an inconsistent approach where not all trade approval authorities had service standards, and those that did varied by scope. For example, in 2007 the typical time for regulatory approvals for entitlement trades in New South Wales could take up to 6 months while those in Victoria took 4 to 6 weeks.⁶⁰¹

COAG⁶⁰² service standards for processing times⁶⁰³ that were introduced in July 2009 provided states with a benchmark. Most states have been able to achieve the service standards for entitlement and allocation trade since 2010-11.⁶⁰⁴ However, approval times did not significantly improve for New South Wales or South Australia. The allocation trade approval times continue to differ due to the innovations implemented by some trade approval authorities while others continue to rely on paper-based processing.

While Victoria's allocation trade approvals are assessed by an automated online processing system, which has provided same-day approvals for most intrastate trade applications within the Southern Connected Basin since 2016-17, the other Basin States rely on slower more manual processes (see section D.2.1 in appendix D). New South Wales has achieved next business day approval times for most approved intrastate allocation trades in the Southern Connected Basin since 2017-18, while South Australia has approved 90% of its allocation trades within 4 to 6 business days since 2013-14.

Despite calls from the Productivity Commission and the ACCC that the service standards be tightened⁶⁰⁵ and reviewed⁶⁰⁶, there has been no change to service standards since 1 July 2009. The

598 COAG, 'Implementation Plan for Enhancements to Victorian Water Register Systems', *National Partnership Agreement on Water for the Future*, 2010; COAG, 'Implementation Plan for Enhancements to Victorian Water Register Systems (Stage 2)', *National Partnership Agreement on Water for the Future*, 2012.

599 Department of Environment, Land, Water and Planning (Victoria), *Enhancing the Victorian Water Register*, 2019, <https://www.water.vic.gov.au/planning/environmental-contributions/third-tranche-of-the-environmental-contribution/water-entitlements-and-market-reform/enhancing-the-victorian-water-register>, viewed 8 May 2020; Victorian Auditor-General's Report, *Administration and Effectiveness of the Environmental Contribution Levy*, 2014, p. 28.

600 Aither, '10-year evaluation of the Environmental Contribution', *A report prepared for the Victorian Department of Environment, Land, Water and Planning*, 2015, p. 84.

601 Allen Consulting Group, op. cit., p. 17.

602 On 29 May 2020, National Cabinet agreed to the formation of the National Federation Reform Council (NFRC) and the cessation of the Council of Australian Governments (COAG).

603 As discussed in section D.2.1 of appendix D, Basin States agreed to process at least 90 per cent of entitlement trades that have reached approval stage within 20 business days. For allocation trades, at least 90 per cent of intrastate trades need to be processed within 5 business days (10 for South Australia) and at least 90 per cent of interstate allocation trades within 10 business days (20 for South Australia).

604 Loch, Wheeler and Settre, op. cit., p. 569.

605 Productivity Commission, *National water reform*, Report no. 87, 2017, p. 128.

606 ACCC, *Water trading rules – Final advice*, 2010, p. 122.

standards are also only aspirational with no consequences for trade approval authorities that fail to meet them.

Consequently, market participants continue to call for harmonised and faster trade approval processes⁶⁰⁷ with many pointing to current inconsistencies in approval times between states.⁶⁰⁸ Extended processing times from trade approval authorities also delay the timely publication of trading data associated with the trade (see section D.2.5 in appendix D), which increases the transaction costs for market participants as they must undertake additional research to better understand the 'current' state of the water market.

Basin States' trade approval fees vary with each state's use of technology, the processes for facilitating trade and the size of their cost-recovery base

Under the NWI, the Commonwealth and states agreed to cost recover the administration and water resources management of the Basin, including the water accounting systems that facilitate water trading.⁶⁰⁹ Each Basin State is responsible for its spending and cost recovery, where fees charged to water users and traders should be closely linked to the state's costs of the activities.⁶¹⁰

This means water registry, accounting and management costs should be recovered from entitlement holders via entitlement fees while trading costs and specific trade-related registry functions should be recovered from traders via trade approval fees. While trade approval application fees have not materially changed since 2015–16, fees do vary by state depending on the costs incurred to facilitate water trading, how efficiently trade approval services are delivered, and the number of trades that costs can be recovered from.⁶¹¹

As each Basin State has developed its own trading rules and systems, some provide trade approval and registry services more efficiently than others. For example, Victoria has online and paper-based allocation trade submission options where fees for in-person submissions are almost twice that for online. This cost differential reflects the reduced labour costs associated with the automated online processing system, and the ACCC considers this also encourages the online submission of trades. In contrast, South Australia's high fees reflect its current reliance on labour to manage its paper-based system⁶¹² and smaller number of trades (see section 10.4.1).

10.2.3 Unbundling and reform of trading rules created an approval role for IIOs

All water trades incur transaction costs from a trade approval authority or similar entity. Water allocation trades outside of IIO areas require approval from the relevant state government authority (or authorities when trading interstate) while irrigation right trades that occur wholly within an IIO's area will require approval from that IIO. Trades between a trader within an IIO area and a trader outside of the same IIO will incur transaction costs from both the state trade approval authority and the IIO. This trade approval role for IIOs arose from the reforms which unbundled water from land.

607 Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 11; SunRice Group and Ricegrowers' Association of Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 6, 30.

608 Almond Board of Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; Australian Water Brokers Association, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 November 2020, p. 3; Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 12; Select Harvests, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 8–9.

609 Council of Australian Governments, *Intergovernmental Agreement on a National Water Initiative*, 2004, paragraphs 64 and 67(i).

610 *Water Act 2007* (Cth), Schedule 1 – Murray-Darling Basin Agreement, Schedule 2, s. 4(3).

611 See section C.1.3 in appendix C.

612 However, South Australia is modernising its water registry and is expected to improve its future trade processing capability.

While the IIOs need to maintain water management systems to keep track of water usage and availability, they have not been required to maintain a register under the NWI. Further, some IIOs place greater importance on water accounts rather than trade registers:

Members in our IIO have online visibility of all their water holdings and usage. It would not be practical, efficient or effective, to separate the components of IIO irrigators water holdings and usage into separate “registers”; entitlement, annual allocation, private carryover and usage are all very interrelated.⁶¹³

Trade within IIOs offers many benefits for members, such as lower fees and in some cases faster matching and approval times. For example, Murray Irrigation runs an exchange platform with automatic matching (see appendix B) and does not charge its members fees for internal trades (see appendix C). However, the IIOs’ approval role does increase transaction costs and introduce fragmentation when water is traded into and out of irrigation networks.

Irrigators within IIOs face different trade processing and transaction costs

Water traders within irrigation districts in New South Wales and South Australia are also impacted by additional trading rules and fees set by IIOs, which vary widely between networks (see section C.2 in appendix C). While some IIOs charge less for temporary trades within their network than the intrastate allocation trade fee, this is not always the case. Additionally, trading water into and out of the IIO’s network can incur more significant costs, and also attract Basin State trade approval authority fees, while permanent trading or leasing of irrigation rights outside of the IIO district requires the irrigation right first be transformed into a water entitlement. Decision making becomes complex for traders in IIO networks where temporary trades outside of the network can incur IIO and Basin State fees that are greater than the IIO’s fee to permanently trade the water right within the network.

10.2.4 Private and public trade service providers have invested in improvements, but not all market participants benefit

Public investments in developing the COAG service standards, improving consistency of trading rules and IIO fees, and introducing automatic lodgement facilities have all contributed to reducing monetary and non-monetary private transaction costs.⁶¹⁴ For example, Victorian and Commonwealth co-investments in the Victorian Water Register (see section 10.2.2) have contributed to market participants’ high regard of the Victorian approvals process when compared to other states.⁶¹⁵

Victoria’s automated trade approval system gives intermediaries an opportunity to check the feasibility of trades in real-time and settle intrastate trades within hours. This functionality is further enhanced by the provision of the ‘Broker API’, where intermediaries can develop their own digital infrastructure for automated lodgement of trade applications. Figure 10.2 shows Exchange Platform C, which predominantly facilitates intrastate trade in Victoria, used this application programming interface (API)⁶¹⁶ in 2018–19 to record 100% trade approval rates⁶¹⁷ and faster trade lodgement times than other intermediaries, even when only Victorian trade approval applications are considered.

Figure 10.2 also shows intermediaries tend to lodge Victorian trade applications the soonest after a trade has been matched⁶¹⁸, followed by New South Wales, then South Australia. This could be due to the ease of using the electronic lodgement facilities or if there is a limited trading window. For example, as there are no limits on the trade of water within and into South Australia then there is less incentive for

613 Renmark Irrigation Trust, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

614 Loch, Wheeler and Settre, op. cit., p. 571.

615 AWBA, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 22; Victorian Farmers Federation, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, pp. 5, 9, 12, 15 and 20.

616 APIs are a set of tools for building software that interacts with other software.

617 ACCC analysis based on Victorian Government’s response to voluntary information request.

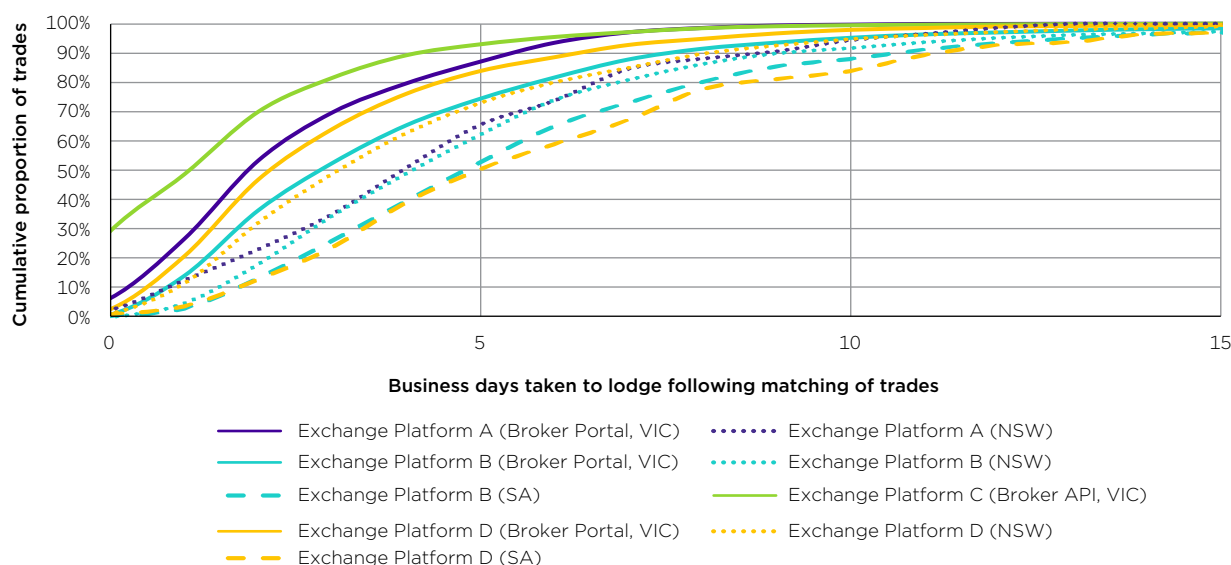
618 The ACCC acknowledges that some trades were for water products such as forwards, carryover or contractual leases. In the case of forwards and contractual leases, the trade applications may not be lodged until closer to the time of delivery as agreed between the buyer and seller, while carryover trades may not be lodged until the end of the water season.

the timely lodgement of trades. Trades into and out of IIOs, which is not a process that affects Victorian intrastate trade, also contribute to extended trade lodgement times.⁶¹⁹

In the case of interstate trades with Victoria, brokers must first lodge the trade through the Broker Portal or API to generate the ‘application form’ that must also be included in the application to New South Wales or South Australia⁶²⁰ as per the Murray–Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010.

Other factors that can affect the time between when a trade is matched and when it is lodged include the time taken for an intermediary to issue a buyer an invoice and when that invoice is paid.

Figure 10.2: Number of business days taken for exchange platforms to lodge Southern Connected Basin trades with Basin State trade approval authorities from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests and s. 95ZK responses.

Notes: Includes zero dollar trades. Time lags exclude weekends and public holidays (based on the jurisdiction of the trade approval authority).

While the use of Victoria’s automated trade approval system to deliver fast approvals is currently limited to intrastate trades due to the current limitations of the interstate trade process (discussed further in 10.3.3), technological development in trade application lodgement facilities may encourage intermediaries to compete on trade processing times.

For example, Waterexchange has also invested in electronic trade application portals to improve their interactions with private and public trade approval authorities (some IIOs and Sunwater), but very few IIOs were able to provide the necessary data for the ACCC to assess the benefits of this investment in terms of lodgement times.⁶²¹

The ACCC recognises the overall trajectory is that trade processing times have decreased and will likely continue to do so. However, there are still some outliers and trade approval fees still can differ significantly.

619 ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests and s. 95ZK responses. See also section D.2.2 in appendix D for a comparison of IIO’s trade processing times compared to WaterNSW’s trade approval lags for intrastate trade.

620 Department of Environment, Land, Water and Planning (Victoria) 2021, <https://waterregister.vic.gov.au/water-trading/my-water/broker-instructions>, viewed 2 February 2021.

621 While table G.4 (in appendix G) shows some IIOs’ trading datasets were missing fields, for some IIOs information is also stored in separate systems that could not be integrated with the supplied trading data in time for more complete data to be provided to the inquiry. Additionally, IIOs are not required to meet any service standards for temporary trade.

South Australia is in the process of introducing its new \$14.7 million Water Management Solution system⁶²², which is expected to decrease trade processing fees, enable the electronic lodgement of trades and automated approval assessments, and better integrate with the interstate trading interoperability protocol. Given South Australia has the highest trade approval fee in the southern connected Basin (\$277 for the 2020–21 water year⁶²³) this initiative is expected to go some way towards meeting stakeholders' calls for more harmonised or equal allocation trade approval fees in the southern Basin.

Differences in Basin States' trade approval processes can also create an uneven playing field when there are limited trading opportunities and trade approval authorities process trades using a 'first come, first served' queuing system⁶²⁴ where market participants compete to be 'at the head of the queue'.

In the case of the Barmah Choke, this queue-based approach can favour those with water rights in Victoria compared to New South Wales (see section 10.3.4) and create incentives for electronic lodgement of trades through intervalley and interstate trade limits.

The Victorian Water Register offers online lodgement facilities for both intermediaries and individual traders. Intermediaries who have applied for authorisation are able to lodge forms via the Broker Portal/API. My Water allows holders of Victorian water rights to register for a My Water account which provides them with electronic access to the Victorian Water Register to see their accounts and trade allocation.⁶²⁵

Uneven playing fields can also occur within a state. Kilter Rural submitted that not all features available through Victoria's Broker Portal/API are also available through My Water, disadvantaging My Water users.⁶²⁶ For example, Victorian water rights holders who wish to trade interstate must engage a broker if electronic lodgement is required; without a broker, the tradeable water rights holder can only trade interstate by lodging a paper form with their water corporation (see section D.3.2 of appendix D).

The organic digitisation and digitalisation of trade services and data flows shows that public and private entities are responding to demand for improved information and trade services. However, it inevitably means that some areas are developing faster than others and that multiple entities are solving similar problems in different ways. While these individual investments may reduce trade processing times and costs for some water market participants, the approach also points to an increasingly complex network of unharmonised data flows and digital infrastructure, which introduce inequalities in some circumstances and that will be unlikely to deliver the 'whole-of-market' transparency stakeholders are calling for.

10.3 Current shortcomings and concerns about trade processes

Significant efforts have been made by governments in cooperation with other stakeholders to pursue NWI objectives and develop an effective and efficient market system. However, while there has been some success, many objectives have not been met in full, and fragmented roles and responsibilities and inconsistent approaches to numerous market related issues across the Basin remain. The following sections look mostly at processes for water allocation trades and temporary irrigation right trades, but also touch on entitlement trades and broader frameworks.

While there are some clear differences in both structural set up of trade approval authorities and registers, as well as information collection and publication across the states, the Basin States have agreed to certain levels of transparency and processing standards in relation to water trading in the course of water reform processes over the last 15 years.

622 Department for Environment and Water (South Australia) 2019, <https://www.environment.sa.gov.au/licences-and-permits/water-licence-and-permit-forms/new-state-water-register/frequently-asked-questions>, viewed 9 June 2020.

623 Department for Environment and Water, South Australia, *Fees, Charges and penalties*, <https://www.environment.sa.gov.au/topics/water/water-markets-and-trade/fees-and-charges>, viewed 5 November 2020.

624 See section 14.1.6 in chapter 14.

625 Victorian Water Register, n.d., <https://waterregister.vic.gov.au/water-trading/my-water>, viewed 20 February 2021.

626 Kilter Rural, *Submission to the Murray Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

If these trade-related services are not provided efficiently, or actually create problems for market participants, they will impact the overall efficiency of the market. This can happen via several avenues:

- Trade-related services are a crucial source of market data and information. If they fail to provide high quality information to the market in a timely manner, prices may not incorporate information on certain market-relevant factors (that is, there are externalities which are not 'priced in'), leading to inefficient allocation of water resources. Further, market participants may take action to 'fill in the gaps' themselves, but where they are acting on incomplete or poor quality data, may make ill-informed decisions on water market participation and related investment.
- Trade-related services may also provide information to the market in a way which generates information asymmetries (one market participant has access to information which another does not), which can allow certain participants to capture proportionally more gains from trade. This has distributional impacts on market participants. Information asymmetries can also create space for market misconduct, such as insider trading, to occur.
- If trade-related services are inefficiently provided, and costs are recovered from market participants, transaction costs can erode gains from trade and potentially form a barrier to entry for some participants.
- If trade-related services are provided in a way which offers advantage to some users over others, this can also inadvertently allow certain participants to capture proportionally more of the gains from trade. As this chapter discusses, water markets are becoming increasingly technologically sophisticated, but technological progress is markedly uneven. This context gives rise to the question of whether trade-related services are being provided in a way which allows technologically sophisticated users to benefit at the expense of other users.

Where private markets do not deliver the 'right' level of information and advisory services due to externalities, or provide them in ways which create information asymmetries, there may be a rationale for governments to play a role in providing advisory and information services. However, public service providers are generally limited by their legislative frameworks, which can be slow to change and continuously trying to 'catch up' to the needs of market participants.

10.3.1 Trade processes continue to be provided differently by the states as a result of differing legislative, market architecture and system underpinnings

There continue to be differences in states' water rights frameworks, trade frameworks, trade processing systems and registers, despite major reforms and commitments to better facilitate efficient water markets. Previous attempts at harmonising processes, such as developing a single interstate trade form, have also encountered challenges due to the differences in terminology used across the states.

While the need for changes to improve approval and registry processes have long been recognised, there remains no overarching mandatory driver for this change due to the voluntary and high-level nature of commitments.

For example, there is no clear requirement that states revise terminology to be consistent, no requirement that trade forms must clearly identify trade type, and no clear compliance and monitoring role placed on state agencies to ensure price reporting by sellers is accurate. The ACCC does however note that the some states have been working together to improve price reporting by making changes to water allocation trading forms such as requiring sellers to disclose a reason for trade.

To better understand the cause and extent of these differences, the ACCC has undertaken a targeted review of Basin State water management law to examine provisions underpinning these frameworks (see appendix E).

Changes to state water management law were required to give effect to unbundling (see section 2.3.1). Each state however did this differently, and at different times. As a result of this, there are more than 150 classes of water entitlements in the Basin, and the specification of unbundled rights differs

substantially from state to state.⁶²⁷ This has created a situation where there continues to be differences in terminology between the states, differences in the rights of water entitlement holders and differences in fees and application processes when undertaking a dealing that changes their rights. The differences can give rise to stakeholder confusion about the nature of rights being traded. For example, Queensland legislation uses the term ‘Water Allocation’ to refer to a permanent or ongoing entitlement, while all other states (as well as the Commonwealth legislation) use this term to refer to the specific volume of water allocated against a water access entitlement in a particular period (per water year).

The consequence of these differences is that slightly different rights are afforded to individuals and the resulting trading processes also differ.

There remain gaps in what information Basin State and IIO trade approval authorities have authority to collect and verify

The ACCC has identified that data items such as product type and ‘strike date’ should be captured and then publicly reported by the registers (see section 11.3.4). The ACCC notes that Victoria and New South Wales have made progress in this area. This could be achieved within current frameworks, as legislation generally provides for trade forms to be changed over time (and the forms themselves sit outside legislation). However, past issues with price reporting demonstrate the challenges with simply just adding a new field to a form. It can take years to implement, require changes to information technology (IT) systems (to be able to store updated/new data), and the quality of the data may not be sufficient. Moreover, data quality cannot be guaranteed; for example, it could be incorrect due to human error, or may be intentionally false or misleading. This creates the need to verify data provided.

Data collection from market participants in the Basin States already has a legislative basis, where each state requires participants to lodge an approved form determined by the Minister or their delegate.⁶²⁸ Each state also has a legislative provision outlining that it is an offence to provide false and misleading information. These provisions together provide the legal basis for the applicant being required to properly complete and execute a form for a trade application to be processed. However, trade approval authorities generally lack the basis and authority to question what has been provided on the form, and to seek verification. Thus, the current situation is that government approval authorities have the authority to collect information, but face difficulties in verifying it.

Further, while the states do have this legislative basis available to them, IIOs do not. Any trading forms they create do not need to be completed by irrigators as per a legislative requirement. The approach in state legislation could be expanded to IIOs to provide them with the authority to collect information.

States have different processes for trade approval and registration that result in different trade forms and datasets

Despite having a legislative basis available to require trade forms to be fully completed by traders, there are still differences in the underlying states’ entitlement and trading frameworks causing these forms to differ across the states. These differences are summarised in table 10.6 below.

627 MDBA, *Water markets and trade*, 2019, <https://www.mdba.gov.au/managing-water/water-markets-and-trade>, viewed 6 May 2020.

628 *Landscape South Australia Act 2019*, s. 125(5)(a); *Water Act 1989* (Victoria), ss. 33AW, 48PA.

Table 10.6: Differences in water rights terminology and dealing types across the states

	Queensland	ACT	New South Wales	Victoria	South Australia
Water Access Entitlement	Water Allocation	Water Access Entitlement	Water Access Licence	Water Share	Water licence
Entitlement dealing types (includes water access entitlement trade and permanent trade of irrigation right)	Transfers, leases, subdivisions and amalgamations	Permanent or limited period transfer	Transfer, term transfer, conversions, subdivision and consolidation, assignment of rights under access licence Within IIOs, irrigation rights and delivery rights trade	Transfers of ownership, limited term transfers, standing directions, divisions and consolidations	Transfers of whole licence (absolute or limited time), transfer of entitlement, surrender and variation Within IIOs, irrigation rights and delivery rights trade.
Temporary trade types (includes water allocation trade and temporary trade of irrigation right)	Seasonal water assignment	-	Water allocation assignment Within IIOs, irrigation rights and delivery rights trade	Assignment of water allocation	Allocation transfers Within IIOs, irrigation rights and delivery rights trade
Who is considered an applicant for allocation trade?	Seller only	-	Buyer and seller	Seller only	Seller only
Secondary market products	No mention in Act	No mention in Act	No mention in Act	No mention in Act	No mention in Act

Source: ACCC analysis.

The key findings from the comparative analysis of states' trading frameworks (see appendix E for further details) are:

- The number and types of 'dealings' for tradeable water rights varies substantially across states, and is rarely referred to in the same terms.
- Trades can take effect differently⁶²⁹, which varies the risk taken on by parties (for instance, until recently in South Australia, permanent trades took effect as soon as approved – now applicants can choose whether the trade takes effect on approval or when registered on the Water Register).
- Trade assessment processes are also different, and while most require assessment of trading rules and available account balance, some include additional considerations (such as public interest in South Australia). There are various different trade approval authorities and structures.
- Trade assessment frameworks and trading rules can be spread across legislation, regulations, orders, and plans or protocols specific to particular water management areas, making it difficult for traders to fully grasp all the requirements of trade processes, and to understand how processes differ across geographic areas and according to the rights traded. Victoria makes trading rules available in one place.
- Trade administrative processes also differ; sometimes as a result of the underlying framework. For example, because both buyer and seller are considered applicants in the New South Wales legislation, the signatures of both parties are required for allocation trade.
- Trade registration is often performed by a separate entity to trade approval. For example, in Victoria the trade approval role for water share transfers is delegated to the Water Corporations, while the registration on the Victorian Water Register is the responsibility of the Registrar.⁶³⁰

⁶²⁹ National Water Commission, *Compatibility of Water Registers Report*, 2005, p. 15.

⁶³⁰ *Water Act 1989* (Vic), s. 84C(2A).

- Water products such as forwards and options are given effect by trade approval authorities via the same process as a standard water allocation trade. While the states are free to add an additional field to the approved form asking for reason for trade, there is no legislative driver to collect this information as the trade is processed under the same administrative and legal framework.

10.3.2 Trade services are failing to keep up with market innovations

As water markets have evolved, participants have developed new water products and services under existing water access entitlement frameworks, that help irrigators better manage their water and risk.

Key examples are:

- Aggregation services to move water through IVTs: As discussed in section 8.10.1, brokers provide aggregation services for clients to help them move and trade water through IVTs and also into and out of IIO networks.⁶³¹ The transfers required to enable this service is not appropriately captured in Basin State trade forms, even with the recent reason for trade reforms (see section 11.2.2). These trades are usually lodged and recorded as a zero dollar trade.
- New products: Carryover parking, forwards, contractual leases, options.⁶³²

Trade services that process, approve and record these trade types have not kept pace with these innovations. While Basin State trade approval authorities have started to capture information regarding the type of water product traded, this only applies to some of these products; as of February 2021, reforms to capture 'trade type' are limited to 'traditional' spot market trades, contractual leases, forwards and carryover parking, and only New South Wales has to date started making this data publicly available. This means that it will likely be some time before market participants have access to good quality data on different type of trades – with even longer lags for new products or services for which information is not yet captured – making price discovery difficult. This lack of information about newer products and services also likely impedes their uptake.

10.3.3 Much of the digital infrastructure supporting trade services is inadequate and needs investment

Basin States' diverse technological capabilities slow interstate trade and limit opportunities for timely and centralised publication of information

Interstate entitlement trading and allocation trading in the Southern Connected Basin is governed by Schedule D of the Murray-Darling Basin Agreement and its accompanying protocols. The Murray-Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010⁶³³ outlines a five step process which the states have agreed the approval authorities will follow in processing interstate allocation trades in the Southern Connected Basin.

At the first step, the protocol requires that forms be submitted to the destination state and to the origin state. To facilitate this, the states have developed an interoperability⁶³⁴ protocol, which sets up File Transfer Protocols (FTP) to update each other on the assessment status of interstate trade applications. Victoria has submitted that it is supportive of improving automation of interstate interoperability.⁶³⁵ However, Basin States will need to improve the consistency of their currently diverse trade approval systems (table 10.7) to achieve this while ensuring all market participants benefit regardless of where their water rights are held.

631 Some IIOs also provide aggregation services for their customers when trading into and out of the IIO's network.

632 As discussed in section 9.12.2 in chapter 9, bona fide options have not yet been developed for Basin water markets; the options that are currently traded are physically-settled only.

633 *Murray-Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010*. Available at: <https://www.legislation.gov.au/Details/F2010L02473>.

634 This term is used by the Southern Connected Basin States to describe their file sharing arrangement for supporting interstate trade.

635 Victorian Government, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

Table 10.7: Basin State trade approval authorities' technological capabilities

Basin State	Features and issues
Victoria Highly digitised and automated, high interoperability with MDBA and some other Victorian systems.	<ul style="list-style-type: none"> ▪ All information received on paper-based or online application forms is stored digitally.⁶³⁶ ▪ Digitised trading rules allow for automated intrastate trade approvals, with only paper-based applications received by the Water Corporations requiring manual assessments – or online lodged application which meet a certain exception that requires manual intervention. ▪ Recent reason for trade reforms capture trade transfer type and only allow zero dollar trades to be processed under limited circumstances.⁶³⁶ ▪ Trades undertaken by environmental water holders are tracked through accounts. ▪ Communicates with the MDBA automatically through an API interface for trade through the Barmah Choke. ▪ Communicates with New South Wales and South Australia through a file sharing arrangement for interstate trades. ▪ Has two-way information flows with Victorian water corporations' systems, which have their own systems to manage billing and other information (such as meter reads). ▪ Also communicates with interfaces for land parcel and bore information. ▪ Water share trades are not digitally supported, and require separate lodgement with the relevant water corporation for approval and then lodgement with the Registrar for registration.
New South Wales (WaterNSW) Partially digitised with no automation, no interoperability with MDBA.	<ul style="list-style-type: none"> ▪ Trades are manually input by WaterNSW staff using information provided on trade forms. ▪ Trade restrictions and system rules have been added into the Water Accounting System to prevent trades being processed where a rule would be breached. ▪ WaterNSW staff manually check water access licence details to determine application of the Variable Usage Charge⁶³⁷, and can manually apply the applicable trading rules and assessment framework. Application outcomes are provided manually with the aid of templates. ▪ Recent reason for trade reforms capture trade transfer type, including environmental water, and only allow zero dollar trades to be processed under limited circumstances.⁶³⁸ ▪ Communicates with the MDBA through an online portal for trade through the Barmah Choke. Trade details must be manually entered into the portal. ▪ Communicates with South Australia and Victoria through a file sharing arrangement for interstate trades. ▪ Trade, water use and other information is shared with Qld as needed to facilitate and manage trade under the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008. ▪ Trade participants must separately lodge registration forms with NSW Land Registry Services (NSW LRS) following receipt of WaterNSW approval for entitlement trade, and records on NSW LRS register may not distinguish when entitlements are sold wet or dry, impacting the quality of pricing data.

636 Department of Environment, Land, Water and Planning (Victoria), *Increasing transparency of allocation trading*, 2020, <https://waterregister.vic.gov.au/images/documents/Reason-for-trade-fact-sheet.pdf>, viewed 29 January 2021.

637 This charge is applied to all allocation trades where the destination water access licence does not hold a New South Wales works approval, and so also applies to non-water users such as investors and certain categories of water users such as environmental water holders.

638 WaterNSW, *Application to Assign Surface Water Allocation*, 2020, <https://iwas.waternsw.com.au/InteropFormPDF/InteropPDFServlet?formName=surface>, viewed 29 January 2021.

Basin State	Features and issues
South Australia Current system is partially digitised with no automation and no interoperability. Future system will be highly digitised, with automation.	<ul style="list-style-type: none"> Trades are manually input by DEW staff using information provided on trade forms. DEW staff manually check water volumes on licence, and apply the applicable trading rules and assessment framework, and the application outcome is then decided offline before being entered into the system. Applicants are advised of the outcome of their application by letter. Trade form currently requires a reason to be supplied for zero dollar trades only, but will be reviewed following its system upgrade.⁶³⁹ Communicates with New South Wales and Victoria through a file sharing arrangement for interstate trades. Electronic records of relevant licences, authorisations and permits for water trade and water use are also digitally stored in the system, along with meter readings and the billing engine. Future upgrade to the Water Management Solutions (WMS) will enable online lodgement and access to a Customer Portal. Interstate trade processing will continue to be undertaken using the existing file sharing arrangement. The new customer portal will also allow customers to consolidate multiple licensing instruments.
Queensland (Sunwater) Limited digitisation with no automation or interoperability. Trade forms are retained for record-keeping purposes.	<ul style="list-style-type: none"> Application forms and supporting documents are stored in a document management system. Where incomplete trade forms with minor omissions are submitted, Sunwater staff may assist trading parties by requesting and accepting omitted information required to complete forms. Trades can be submitted in paper form, electronically and through the Waterexchange platform. Trades are assessed manually. Trade participants must separately lodge registration for permanent trades after approval from Sunwater is sought (if required). Limited digitalisation to fulfil reporting requirements (such as to the Bureau of Meteorology). There is no information sharing requirement between Sunwater and DNMRE or Queensland's Titles Office.
Queensland (DRDMW) Partially digitised with no automation and no interoperability.	<ul style="list-style-type: none"> Trades are manually input by DRDMW staff using information provided on trade forms. DRDMW staff manually check availability of water to trade. Applicants are advised of the outcome of their application by letter. Trade form currently requires a reason to be selected for non-environmental zero dollar trades. Information is held digitally in DRDMW's water accounting system and the Queensland Titles Office. Data can be extracted from each system and shared for internal and external reporting purposes. Trade participants must separately lodge registration for permanent trades after approval from DRDMW is sought (if required). Trade, water use and other information is shared with New South Wales as needed to facilitate and manage trade under the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008. No automated communication between each of the systems involved in temporary and permanent trade.^b DRDMW is currently investigating technology and digital solutions to improve access to water information.

Notes: (a) Victorian water corporations can receive trade application forms in person, where the information received is manually input and digitally stored in the Victorian Water Register. Technical information received as part of take and use licence transfers is stored in water corporations' own systems.

(b) There is no information sharing requirement between the DRDMW's water accounting system and service providers' systems.

⁶³⁹ Department for Environment and Water (SA), *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

Most IIO systems and data focus on members' account balances

IIOs vary greatly in regard to the number of members or customers they have, as well as their technological systems, infrastructure and processes. Some IIOs' finance, water management and water trading systems are highly interoperable, but many IIOs use specialist software only for water management and finance, and manage trade through Microsoft Excel spreadsheets. Some IIOs continue to rely on paper-based systems for trade. This should not be taken to imply that any IIO's IT system is not fit-for-purpose for water management within its network. However, in the context of enabling more seamless data transfers and more consistent data quality across different entities, this assessment seeks to evaluate the likely level of change that could be needed to improve whole-of-basin information transparency.⁶⁴⁰

Based on information voluntarily supplied by IIOs to the inquiry, the ACCC considers each IIO's technological solution for how they record Irrigation Rights and Water Delivery Rights, and their trade is broadly correlated with the number of trades they approve. IIOs with more trading activity may have invested in technology to reduce the administrative burden of processing trades manually and/or encourage trade. For example, investments in interoperable systems can also facilitate shorter irrigation right trade approval times (see figure D.12 in appendix D).

Based on the data IIOs' were able to produce from their systems⁶⁴¹, some IIOs' current IT systems seem to limit IIOs' ability to produce trading datasets suitable for sharing more broadly for informational or analytical purposes.

The four largest NSW and SA IIOs (Murray, Murrumbidgee, Coleambally and Central Irrigation Trust) are already required to supply BOM with trading data, and they and others also provide data to the ACCC to perform its water monitoring function. The IIOs have been fulfilling these requirements and have systems set up to provide this data.⁶⁴² The IIOs providing data to BOM are likely best placed to produce high-quality trading data suitable for broader use given the technology investments they have already made, and may only need to make small changes to how they administer and manage trades to improve the quality of the data.

For example, price and the date a trading application is received are not recorded for most IIO trades (see table G.4 in appendix G) despite other transaction information already being recorded such as the date the trade was approved, trade volumes and customer identifiers.

640 Refer to the recommendations in chapter 12 which explore ways that existing arrangements could be leveraged to improve whole-of-basin information transparency.

641 The assessment of the data produced from these systems is limited to what was provided to the inquiry within limited timeframes, and may not fully reflect the complete reporting capabilities of these systems.

642 Bureau of Meteorology, *Persons and Classes of Persons*, 2019, http://www.bom.gov.au/water/regulations/schedules/document/Persons_and_Classes_of_Persons.pdf, viewed 8 February 2021.

The fragmented approval process contributes to a range of issues:

- Trade processing can be slow as multiple trade forms must be lodged, each with different informational requirements and methods of lodgement.
- Transparency is reduced as extended processing times limit the provision of timely information to the market, and increase the information asymmetry that favours the exchanges and brokers involved in the trade.
- Transparency is reduced for regulators and trade approval authorities due to the fragmented information systems. In the example, only the exchange platform, and perhaps the IIO depending on the IIO's trade records system and whether a broker water account is used to transfer water into, will hold information on who the buyer and seller are. The New South Wales approval authority will only see a trade from the IIO to an unnamed Victorian buyer while the Victorian approval authority will only see a trade from an unnamed New South Wales seller to the private diverter.

Interoperability for interstate trade in the Southern Connected Basin should be broadened to achieve greater benefits

The ACCC considers that the arrangements in the Southern Connected Basin to share information between the relevant state trade approval authorities for interstate trade are working as intended, along with arrangements to transfer information on interstate intervalley trades, or trades through the Barmah Choke between Victoria and the Murray-Darling Basin Authority (MDBA). However, these information sharing arrangements only apply to a small proportion of trades and are only a small component of the trading experience.

For example, while the interstate trade interoperability protocol facilitates information sharing between trade approval authorities in the Southern Connected Basin, traders are still required to submit applications in both states, and separately pay fees in each state. Intrastate traders only need to submit one form and pay fees once. Further, the information shared only facilitates the approval (or rejection) of a trade and the Basin State trade approval authorities and registers will have incomplete records of interstate buyer or seller names and may have inconsistent records on price and trade types (where this information is recorded in the register).

As discussed in the previous section, these incomplete records make it more difficult for regulators to have a complete picture of trade in the Basin.

Poor information flows contribute to data quality issues

Basin State and IIO trade approval functions have evolved into a complex mix of multiple paper-based and electronic systems that have resulted in poor quality whole-of-market data. Information captured and stored by some entities needs to be entered manually into another entity's information capture and storage system. Such poor data practices risk the introduction of errors each time the information is manually entered, and the accuracy of supplied data becomes increasingly difficult to assess and verify as it becomes increasingly disconnected from its point of generation.

The current trading environment involves Basin States approval authorities, IIOs and intermediaries with very few automated data flows. Manual data entry can introduce referential integrity issues through typographical errors or where the wrong reference key is entered for a trade across multiple trade approval authorities, such as for interstate trades. Inconsistencies can also occur where data needs to be translated for different environments, such as where South Australia uses kilolitre (kL) volumes on its trade forms while New South Wales and Victoria use megalitres (ML).

The ACCC considers improved information flows between entities, and only requiring information to be entered once will greatly improve the quality of data generated and used for processing trade. The current mix of automated and manual information flows also contributes to inconsistent processing times and trade administration costs, and limits access to timely information (see section D.2.7 of appendix D).

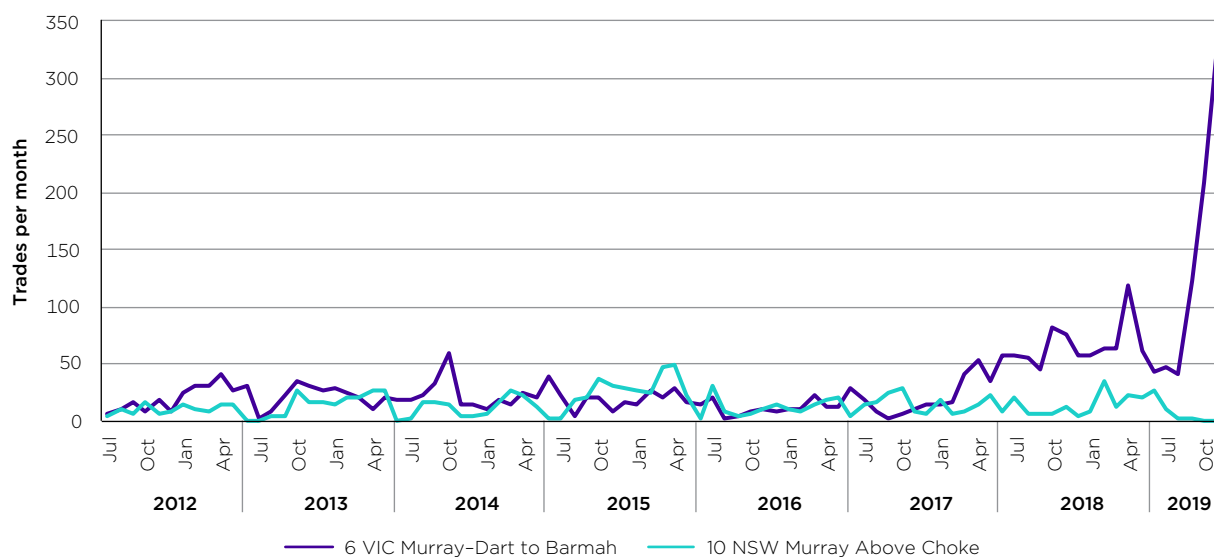
Mechanisms for access to trading opportunities differ between states, creating an uneven playing field

The diverging technological capabilities of Basin State trade approval authorities can also introduce asymmetries in the market where some traders may have better access to trading opportunities over others. One example of this is trade through the Barmah Choke between zones 6 and 10 (VIC Murray – Dart to Barmah and NSW Murray Above Choke) and zones 7 and 11 (VIC Murray – Barmah to SA and NSW Murray Below Choke), where a trade restriction is in place to protect water delivery to existing entitlement holders and for environmental reasons (section 14.1.2).

While the trading rules for the Barmah Choke are the same regardless of whether trade occurs from the New South Wales or Victorian trading zones upstream of the choke (see section 3.2.1), there is technological difference that appears to be giving Victorian water rights holders an advantage when there is the opportunity to trade. Since mid-2018, holders of Victorian water rights have been more successful in applying for trade through the Barmah Choke than those that hold New South Wales water rights (figure 10.4 and figure D.21 in appendix D).

This advantage rises from differences in how the two trade approval authorities seek advice from the MDBA on whether to approve (or refuse) a trade.⁶⁴³ Interstate trade between Victoria and New South Wales requires approval from both states and so the same process is applied to all trade applications. However, the MDBA co-developed an API with Victoria to automate the provision of advice on trade through the Barmah Choke⁶⁴⁴ that only Victoria's automated trade services can support. The ACCC considers the co-develop of this automated approval process has given Victorian water rights holders this competitive advantage.

Figure 10.4: Number of approved trades through the Barmah Choke for holders of upstream water rights in Victoria (zone 6) and NSW (zone 10) from July 2012 to November 2019



Source: ACCC analysis based on NSW and Victorian governments' response to voluntary information requests.

Notes: Includes zero dollar trades.

643 Murray-Darling Basin Agreement (Schedule D – Permissible Transfers between Trading Zones) Protocol 2010 (Cth), ss. 8, 10.

644 Datacom, 2018, *Serverless water trading – Murray Darling Basin Authority Barmah Choke API*, <https://www.datacomgroup.net/Case-Studies/Software/Murray-Darling-Basin-Authority-Barmah-Choke-API.aspx>, viewed 8 December 2020.

10.4 Transaction costs of allocation trade are low in general, but could be reduced

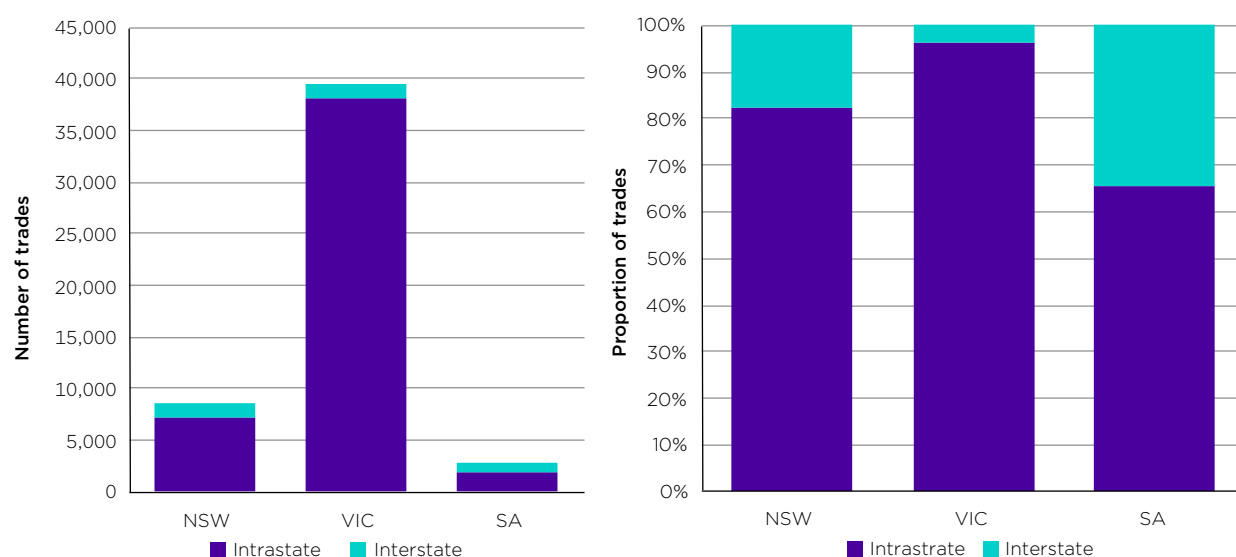
10.4.1 Market participants prefer to trade intrastate rather than interstate

Each of the Basin States in the Southern Connected Basin has a very different makeup of intrastate, interstate and total allocation trades. Figure 10.5 shows that during 1 July 2017 to 30 November 2019:

- Victorian water trade buyers undertook almost 40,000 allocation trades, where 96 per cent were for water sourced intrastate.
- New South Wales buyers executed almost 9,000 trades, less than a quarter of Victoria's total number of trades, but only 83 per cent of trades were for water sourced intrastate.⁶⁴⁵
- South Australian buyers had the smallest number of trades and the smallest proportion of trades where water was sourced intrastate (65 per cent).⁶⁴⁶

These trading volumes also show Victoria is able to cost-recover from a significantly greater number of trades than New South Wales and South Australia.⁶⁴⁷ South Australia also has a labour-intensive trade processing system that, when combined with its lower number of trades, contributes to trade application fees almost six times those in Victoria and New South Wales (see section C.1 in appendix C).

Figure 10.5: Number (left) and relative proportion (right) of intrastate and interstate trades for buyers from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Includes zero dollar trades. Data has been updated since the interim report.

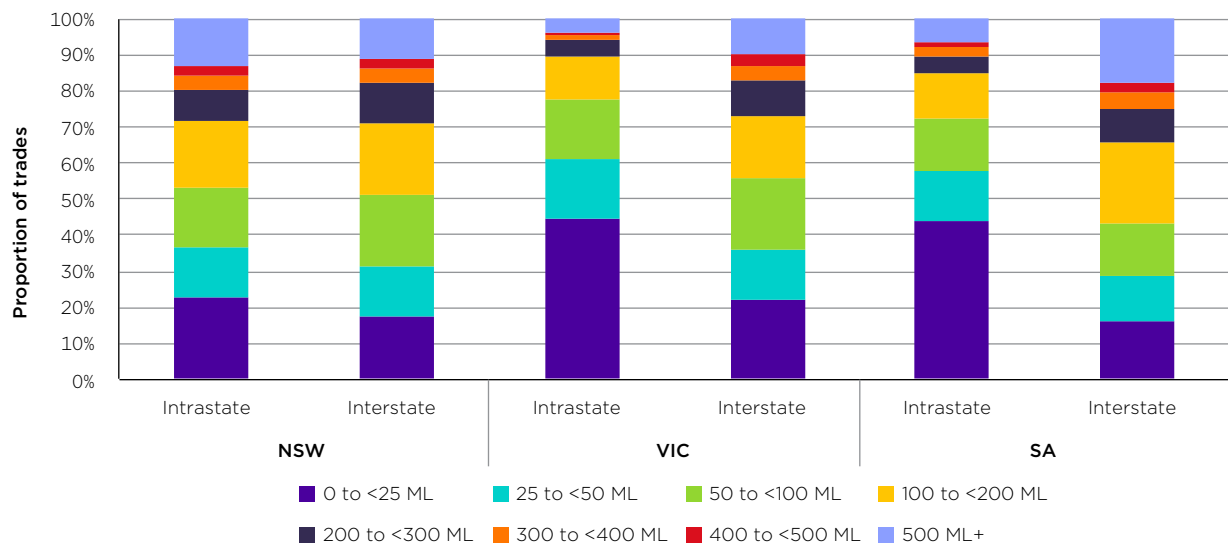
Interstate trade is characterised by larger volume trades than for intrastate trades (figure 10.6). This may be due to a combination of transaction costs such as higher trade approval fees, longer processing times, intervalley transfer limits and difficulties finding interstate trading partners. These in combination likely make small volume interstate trades uneconomic.

⁶⁴⁵ However, there were over 22,000 temporary trades within Coleambally, Murrumbidgee, Murray, West Corugan and Western Murray from 1 July 2017 to 30 November 2019, which increases the proportion of trades for water sourced from intrastate to 95%. Source: ACCC analysis based on IIOs' responses to voluntary information requests and s. 95ZK notices.

⁶⁴⁶ Trade within IIOs is also a significant proportion of trading activity within South Australia, where there were over 6,000 temporary trades within Central Irrigation Trust and Renmark from 1 July 2017 to 30 November 2019. This increases the proportion of trades for water sourced from intrastate to 89%. Source: ACCC analysis based on IIOs' responses to voluntary information requests.

⁶⁴⁷ This observation is maintained even when trades within IIOs are included.

Figure 10.6: Relative proportion of intrastate and interstate trades by water volume per trade for buyers from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

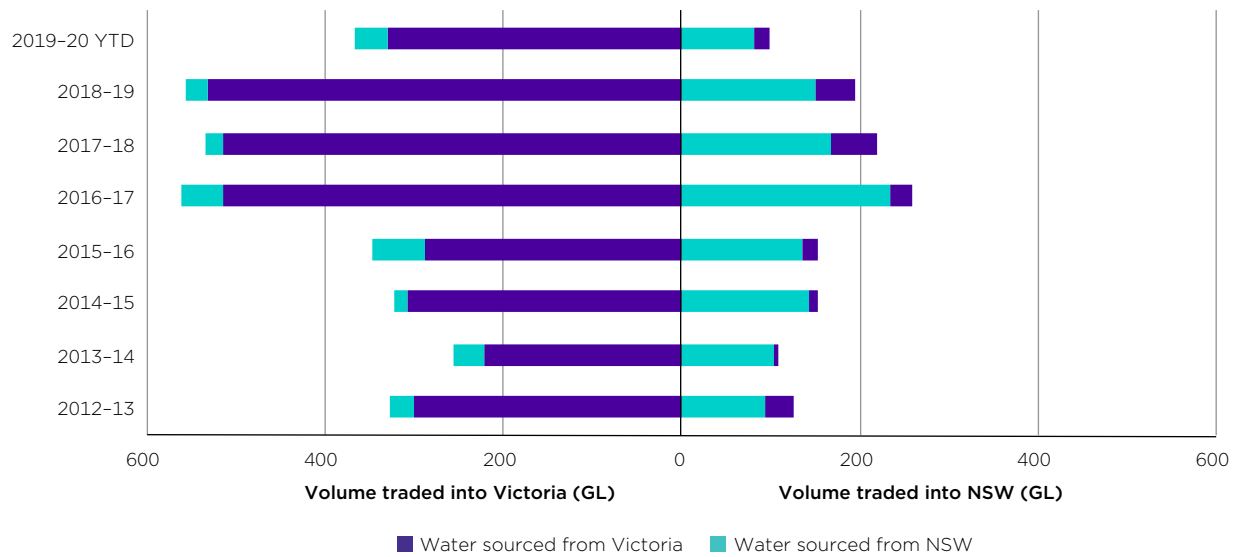
Notes: Includes zero dollar trades. Data has been updated since the interim report.

Trade between the New South Wales Murray and Victorian Murray trading zones below the Barmah Choke (zones 7 and 11) is not limited by any physical capacity constraints. The only barriers that exist between these two trading zones are the New South Wales to Victoria spill-risk trade limit⁶⁴⁸ and the interstate trading process.

Using these zones as an example, figure 10.7 shows buyers prefer intrastate trading rather than interstate trading, with significantly more trading occurring in Victoria than New South Wales. The preference for intrastate trading over interstate trading could be due to the greater trade approval fees incurred for interstate trading, the longer approval times or costs associated with finding trading partners. This clearly shows that state borders present a barrier to trading that reduces competitive neutrality of hydrologically indistinguishable water sources and contributes to the fragmentation of water markets.

⁶⁴⁸ Figure 3.17 in chapter 3 shows the New South Wales to Victoria spill-risk trade limit has generally not been binding in recent years.

Figure 10.7: Allocation trade in the New South Wales and Victorian Murray trading zones below the Barmah Choke, by source and year



Source: ACCC analysis based on NSW and Victorian governments' responses to voluntary information requests.
 Notes: Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019. Data has been updated since the interim report.

10.4.2 The structure of IIOs' trading fees encourage more localised trading

Trades within, into and out of IIOs follow a similar pattern to the Basin States, with most irrigators in IIOs showing a preference for internal trades (figure 10.8).

Figure 10.8: Relative proportion of trades within, into and out of IIOs for buyers in IIO networks from 1 July 2016 to 30 November 2019

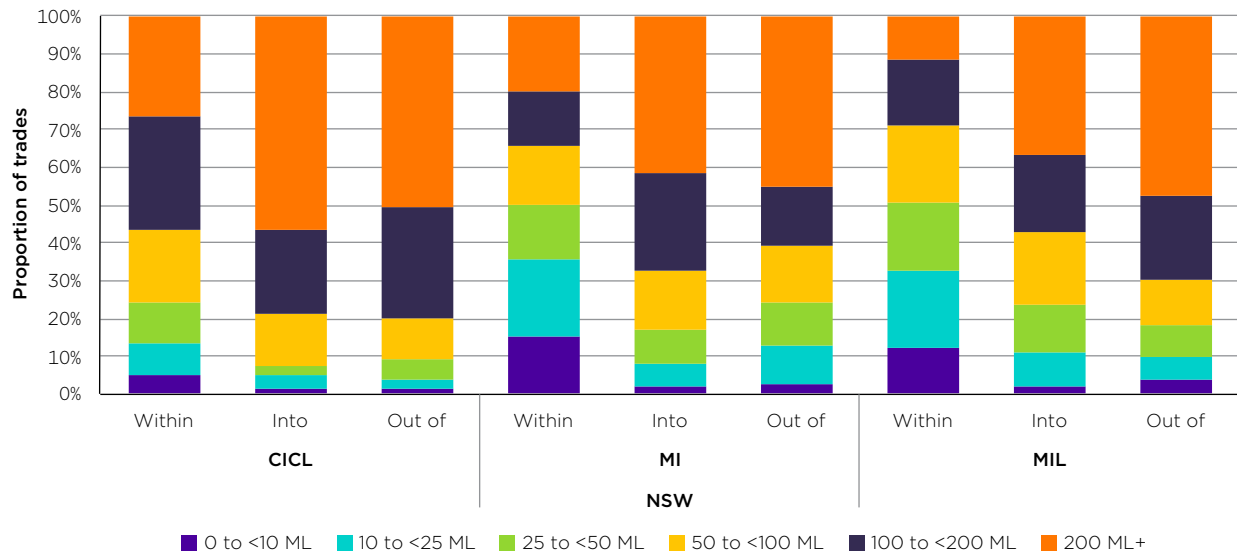


Source: ACCC analysis based on IIOs' responses to voluntary information requests and s. 95Zk responses.
 Notes: Includes zero dollar trades.

As outlined in section C.2 (in appendix C), some IIOs charge less for internal temporary irrigation right trades (trades within the IIO's network) than the fees for intrastate allocation trade. However, external temporary trades (into and out of IIOs' networks) attract higher fees and also incur Basin State trade approval fees. These greater monetary costs as well as the need to submit multiple trade forms can suppress the number of trades into and out of IIO networks and encourage larger volume transactions.

Figure 10.9 shows the impact of this for trade within, into and out of the CIT, MI and MIL networks although it is observed across all the IIOs analysed (see figure D.8 in appendix D).

Figure 10.9: Relative proportion of trades by water volume per trade within, into and out of the Coleambally, Murrumbidgee and Murray IIO networks from 1 July 2016 to 30 November 2019



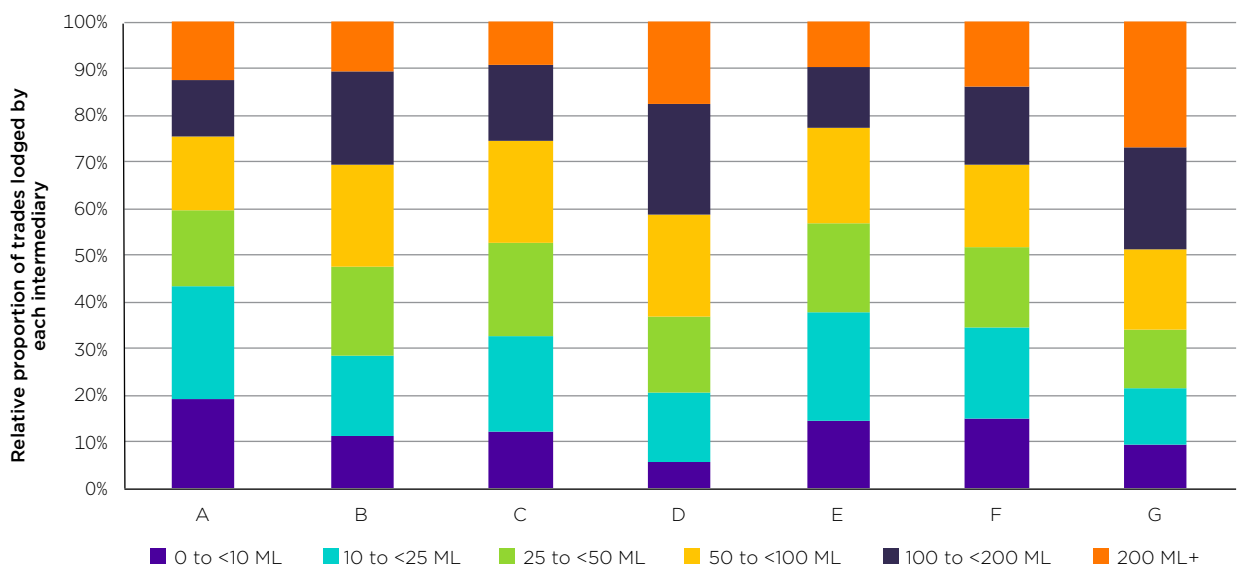
Source: ACCC analysis based on IIOs' responses to voluntary information requests.

Notes: Includes zero dollar trades.

10.4.3 Volumes traded via intermediaries suggest the costs of intermediary services are relatively low

Figure 10.10 shows the distribution of water volumes traded through brokers and exchange platforms in Victoria are closer to the water volumes traded within IIOs than those traded into or out of IIO networks. This suggests the transaction costs incurred for intermediaries services are low, and are not impeding the trade of small volumes where Basin State trade approval fees are low.

Figure 10.10: Relative proportion of trades lodged by intermediaries by water volume per trade in Victoria from 1 July 2012 to 30 November 2019



Source: ACCC analysis based on Victorian Government response to voluntary information request.

Notes: Includes zero dollar trades. Letters A through G represent different intermediaries.

10.4.4 The costs of trading differ and increase complexity of decision making for market participants

Transaction costs can differ in water trading within the Basin for various reasons, primarily driven by the various products and markets which exist. For example, the cost of trading water within a zone to a known buyer (neighbour to neighbour) or a trade within an IIO in New South Wales or South Australia (perhaps facilitated by the IIO by 'pooling' or aggregating small volumes), differs substantially to the transaction costs associated with trading water between zones (particularly when there are trade restrictions).

The case study below outlines the transaction costs associated with a trade between a hypothetical irrigator location within an IIO in New South Wales (Murray Irrigation) and an interstate buyer in Victoria (served by Goulburn-Murray Water), and also considers how the transaction costs vary with only small changes to the scenario.

Box 10.2: Case study

Transaction costs for a temporary trade within an IIO network to an interstate buyer

Assume a seller and buyer have engaged brokers that are both registered users of Waterexchange. Fees for using the exchange are absorbed by the brokers.

1. The seller's broker charges 2 per cent of the value of the trade for its services while the buyer's broker charges \$2 per ML with a \$75 minimum.⁶⁴⁹
2. The brokers have negotiated for the buyer to be responsible for all IIO and Basin State trade approval authority fees.
 - a. Murray Irrigation's \$85 charge for a temporary trade with an external trader is charged to the seller's Murray Irrigation account but this charge is ultimately passed through to the buyer.
 - b. Waterexchange is charged \$49.94 for lodging a trade approval form with WaterNSW (where New South Wales is the origin state) and \$47.50 for submitting the trade to the Victorian Water Register for approval (Victoria is the destination state). WaterNSW also charges Murray Irrigation the \$390 variable usage charge for interstate allocation trade (\$1.95/ML for the Murray). These costs are also passed through to the buyer.
3. For a 200ML trade at \$600/ML (that is, a trade value of \$120,000):
 - a. The seller is charged \$2,400 in brokerage fees and receives \$117,600 for the trade. Monetary transaction costs are 2 per cent of the trade value.
 - b. The buyer is charged \$400 in brokerage fees and \$572.44 in trade authority approval fees (total fees of \$972.44) and pays \$120,972.44 for the trade. Monetary transaction costs are 0.8 per cent of the trade value.
4. An interstate trade can take WaterNSW and the Victorian Water Register up to 10 business days to process. As Waterexchange is responsible for the lodgement of both trade forms the approvals could occur concurrently.

Table 10.8 summarises the brokerage fees and the trade authority fees (trade approval fee and variable usage charge) for this scenario, and also shows how the transaction costs can vary with broker selection and the locations of the trading zones.

⁶⁴⁹ Refer to section C.3 in appendix C for an overview of broker and exchange trading fees.

Table 10.8: Summary of transaction costs

Scenario	Seller's costs		Buyer's costs		
	Brokerage (\$)	Total fees as % of trade value	Brokerage (\$)	Trade authority fees (\$)	Total fees as % of trade value
Base case (NSW to Victoria)	2,400	2.0	400	572.44	0.8
Buyer and seller swap brokers	400	0.3	2,400	572.44	2.0
Destination zone in SA ^a (NSW to SA)	2,400	2.0	400	783.94	1.0
Origin zone in Victoria ^b (Victoria to Victoria)	2,400	2.0	400	47.50	0.4
Trade is for a smaller trade volume of 50ML	250	2.0	75	321.94	3.4
Notes:	(a) If the buyer was in South Australia, the transaction may have taken twice as long to process (20 business days). (b) If the seller was in Victoria, the transaction may have taken up to five days to process (as an intrastate trade), halving the trade approval time.				

10.4.5 Individuals' experiences of trade approval process can vary significantly

Trade approval authority fees vary significantly between states, and market participants would prefer a more consistent approach across states.⁶⁵⁰ However, trade approval authority fees are set on a basis of cost recovery under the National Water Initiative.⁶⁵¹ The variation in fees highlights the fragmented nature of water resources management in the Murray–Darling Basin, where each state has developed its own trading rules and systems (as discussed in appendix E) and some provide trade approval and registry services more efficiently than others.

The number of water trades in each state also varies, which affects trade approval fees as some states are able to recover costs from a significantly greater number of trades than others (see section 10.4.1). For example, in addition to fixed trade approval fees, New South Wales also applies a variable usage charge on interstate allocations. While Marsden Jacob Associates previously found this charge decreases the value of New South Wales water sold to traders in Victoria and South Australia⁶⁵², a more recent study suggested the variable usage charge was not material in decision-making⁶⁵³ and did not impact efficient trade.⁶⁵⁴ Instead, intervalley transfer constraints were considered to have a larger influence on the water market in particular trading zones.⁶⁵⁵

While entitlement trading times have become more consistent across the Basin States, trading times for allocation trades continue to differ due to the innovations implemented by some trade approval authorities while others continue to rely on paper-based processing.⁶⁵⁶ Victorian investment in telemetry and automation⁶⁵⁷ mean intrastate allocation trades in Victoria can be submitted online for near-instantaneous approval. Conversely, the paper-based allocation trade process and quarterly meter

650 Australian Water Brokers Association, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, pp. 3, 22; Ricegrowers' Association of Australia, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 10; WEX Water Pty Ltd, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

651 Council of Australian Governments, *Intergovernmental Agreement on a National Water Initiative*, 2004, paragraphs 64 and 67(i).

652 Marden Jacob Associates, 'The impact of infrastructure charge structures on water trade in the Murray–Darling Basin', *Report prepared for Australian Competition and Consumer Commission*, 2015, p. 15.

653 Aither, 'Review of water trading: The impact of IPART's regulatory framework on water trading markets', *A final report prepared for IPART*, 2018, p. 30.

654 IPART, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

655 Aither, op. cit., p. 28.

656 SunRice, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 13.

657 Victorian Government, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

reads⁶⁵⁸ contribute to extended trade approval processing times of up to 10 business days in South Australia.⁶⁵⁹

Water traders within irrigation districts in New South Wales and South Australia are also impacted by additional trading rules and charges set by IIOs. There is also a view that IIOs negatively impact water markets due to delays processing the transfers of water entitlements and water allocations.⁶⁶⁰ However, the ACCC found IIOs' processing of temporary irrigation right trades was highly variable. While few IIOs were able to include the date a trade application was received in the data provided to the ACCC, trade approval times for those that were able to ranged from same-day approvals of sell offers on an IIO's exchange platform to another IIO approving at least 90 per cent of approved trades within 14.5 business days (see section D.2.2 in appendix D). The ACCC recognises that IIOs are not required to meet any service standards for processing trades.

While transaction costs for water allocation trades from irrigation districts decreased from 2009–10 to 2016–17 due to reductions in both Basin State agencies' and IIOs' water trade fees, decreased transaction costs were not observed for water entitlement trades, likely due to the complex nature of entitlement transfer assessments⁶⁶¹ such as when there are changes to the water source or water management area associated with the entitlement.⁶⁶² However there is also an incentive for an IIO to charge high fees for permanent trade out of their network to recover costs invested by the IIO in maintaining its irrigation infrastructure without greatly impacting the costs recovered from other irrigators who remain on the IIO's network.

10.5 Stakeholder feedback on trade processes and transaction costs

Stakeholders were generally supportive of the options presented in the interim report to improve the consistency of trade processes and reduce transaction costs across the Basin State trade approval authorities.⁶⁶³

Submissions from the South Australian and Queensland departments responsible for trade processing pointed to some of the changes already underway. The Department for Environment and Water (SA) pointed to its current work of reforming its ageing water licensing systems with automation, which they expect will improve intrastate and interstate water trade processing and reduce transaction costs.⁶⁶⁴ The then Department of Natural Resources, Mines and Energy (Qld)⁶⁶⁵ outlined the steps it had taken to support better water utilisation via water markets including establishing market information hotlines and protocols for releasing unallocated water, and is working on the digitisation of trade rules and automation of processes to reduce transaction costs.⁶⁶⁶

While some stakeholders acknowledged recent improvements to Basin State trade approval authorities' information capture processes, such as the 'reason for trade' reforms⁶⁶⁷, others noted that there

658 Department for Water and Environment (SA), *Metering Improvement Plan*, 2019, p. 17; Victorian Government, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

659 Australian Water Brokers Association, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 3; WEX Water Pty Ltd, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

660 Riparian Capital Partners, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 10.

661 Loch, Wheeler and Settre, op. cit., p. 571.

662 Allen Consulting Group, op. cit., p. 23.

663 Coleambally Irrigation Co-operative Limited, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 11; National Farmers Federation, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 15; New South Wales Government, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

664 Department for Environment and Water (SA), *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

665 Since 12 November 2020, the Department of Regional Development, Manufacturing and Water has had responsibility for water in Queensland.

666 Department of Natural Resources, Mines and Energy (Queensland), *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, pp. 2–3.

667 Coleambally Irrigation Co-operative Limited, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 11; H2OX, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 6; Lachlan Valley Water Inc, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

continues to be significant variation across the Basin.⁶⁶⁸ Consequently, there was strong support for the harmonisation of trade approval application forms⁶⁶⁹, processing timelines⁶⁷⁰ and fees⁶⁷¹. Select Harvest also pointed to the range of costs that affect their trading decisions, such as the variable usage charge for interstate trade out of New South Wales, water authority and broker administration fees, trade approval and storage fees, and commissions.⁶⁷²

There was also support for implementing technological solutions to improve trade approval processes. Stakeholders continued to call for trade approval applications to be automated or processed in near-real time⁶⁷³, and many supported the ACCC's preliminary view to implement a digital protocol.⁶⁷⁴

Waterexchange considered that a digital protocol to enhance interoperability between the various entities was the best option for improving water markets trade processing, submitting that the digital interoperability they have implemented with a number of IIOs has provided faster trade processing times and real time reporting and approval of trades.⁶⁷⁵

The Victorian Government submitted that it preferred a distributed model as this is likely to be more resilient than a centralised system, and would allow for state specific systems.⁶⁷⁶ Other stakeholders also supported Basin States' continuing to have their own systems and conventions⁶⁷⁷, whereas Murray Irrigation supported the consolidation or harmonisation of roles or institutions to streamline and save administration costs.⁶⁷⁸

Further stakeholder feedback on other options raised in the interim report are presented in section 12.8.

10.5.1 Demand for improved trade approval processes is motivated by a desire for more timely water market information

Improvements to trade processing to improve the quality and timeliness of core market data, and the reporting of real-time approvals were also widely supported.⁶⁷⁹ The NSW Irrigators Council (NSWIC) submitted that options for reforming aimed at improving information transparency should be focused on improving quality, timeliness and accessibility of information.⁶⁸⁰

668 Almond Board of Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; Murray Valley Private Diverters, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; Select Harvest Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

669 H2OX, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; Public Interest Advocacy Centre, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 13.

670 Leeton Shire Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; SunRice Group and Ricegrowers' Association of Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 30.

671 H2OX, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; Murray Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; National Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 17.

672 Select Harvest Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

673 Murray Irrigation Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7. NSW Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 18.

674 Kilter Rural, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; Lachlan Valley Water Inc, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; National Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8; WaterExchange, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

675 WaterExchange, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

676 Victorian Government, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

677 Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 11,12; National Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7; NSW Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 22; Victorian Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 13,15.

678 Murray Irrigation Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7.

679 Almond Board of Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; Australian Water Brokers Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 7-8; Murray River Group of Councils, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3; NSW Farmers Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 4 December 2020, p. 8.

680 NSW Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 18.

There were also calls for information to be made available on trades in process, provided there was sufficient clarity on when a trade was pending approval.⁶⁸¹

H2OX supported an automated flow of information from exchange to registers, stating it would greatly improve accuracy of data and also timeliness of data.⁶⁸² H2OX consider that the benefits would substantially outweigh the minor costs involved. Almond Board Australia similarly submitted that while costs were a concern, this would be offset by the time and effort currently invested analysing inaccurate or incomplete information.⁶⁸³

10.6 ACCC's assessment of trade services: What needs to change and why does it need to change?

10.6.1 Diversity in the supply of matching and advisory services lacks standardisation and undermines market confidence

There is considerable competition in the supply of information, advisory and matching services. There are however some conduct concerns, which are explored in greater depth in chapter 8.

The ACCC considers that where key functions of water markets exist or take place in digital spaces, such as online exchanges or trading platforms, these platforms need to be able to digitally connect and directly receive information from trade approval authorities and registers, and vice versa. Similarly, where trade takes place in a more 'manual' way – for example, in a small rural community using face-to-face negotiations and paper trading forms – traders still need to be able to submit trade applications for approval, and (at a minimum) receive notification of the outcome of their application.

This is also recognised by Waterexchange which, despite being one of the intermediaries that continues to innovate, recognise the benefits of retaining some elements of the markets' current operations, particularly for those that only trade on limited occasions:

It is our strong view that the silent majority of these irrigators are satisfied with the current operation of the water markets. In our experience most irrigators have a trusted relationship with their Water Broker and only have a need to buy or sell relatively few times in a given water year, for which the transaction(s) typically runs smoothly.⁶⁸⁴

10.6.2 Increased automation offers opportunities to reduce transaction costs

The Victorian Water Register's same day approval for the majority of intrastate trades, regardless of the day of submission⁶⁸⁵, demonstrates the benefits of automating trade approval and water registry processes. However, improved integration between states is required to extend these benefits to interstate trade. The performance of the Victorian Water Register has demonstrated the benefits of Victorian and Australian governments' investments, and should encourage other Basin States to modernise their systems and registers, and learn from the Victorian experience.

Increased digital linkages between the states' systems and water registers could deliver better outcomes for others with an interest in water market information, such as the Bureau of Meteorology. A consistent approach to trade approval with increased automation and better links between the states' systems and registers would reduce approval times and improve users' experiences of trade approval services, particularly for those who trade interstate. Such improvements will go some way towards increasing the breadth and depth of water markets.

681 Cotton Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; National Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 17.

682 H2OX, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5.

683 Almond Board of Australia, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

684 Waterexchange, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 1.

685 See section D.2.1 of appendix D.

There also needs to be better integration between the trade approval authorities, registries and the brokers and exchange platforms where trades are negotiated and deals are struck. Investments to reduce lags between the time a deal is struck and when that trade data becomes available to market participants will help create a transparent market and reduce some transaction costs.

However, without Basin-wide reform of trade services some water market participants will continue to experience significantly greater transaction costs than others. Irrigators in particular IIOs who wish to undertake allocation trading outside of their irrigation district are charged trade fees by their IIO and Basin State trade approval authority, while irrigators who seek to transform their irrigation right into an entitlement right in New South Wales may experience far longer approval and registry times than their South Australia counterparts due to New South Wales's fragmented administrative processes.

10.6.3 There is an opportunity to harmonise and improve market efficiency

The ACCC set out the legislative differences in terms of entitlement frameworks, trade processing and registers across the states in the interim report, and that these drive differences in trade processes. However, while the ACCC considers that it is important to understand these legislative differences across the states (explored further in appendix E), the causes of many trade processing and transaction costs issues are more strongly linked to legislative gaps, ageing and disconnected IT systems and incomplete data capture.

There are however some legislative differences which would benefit from harmonisation where possible.

The ACCC considers that while states continue to play a role in water management, options which deliver *harmonisation*, *co-ordination* and *translation* between the different jurisdictions are more suitable than options which deliver *centralisation*. In line with this, the ACCC's view is that a Digital Messaging Protocol and a Water Market Information Platform that brings together (but does not replace) diverse information sources, is the most appropriate pathway to improving trade services and minimising transaction costs across the Basin (see recommendations 7 and 10–12 in chapter 12).

This approach is also supported by stakeholders such as Coleambally Irrigation:

CICL supports increased communication effort to assist market participants navigate different states' terminology as opposed to asking one or more states to change their terminology, thereby potentially creating more confusion within a state.⁶⁸⁶

The ACCC considers that the following issues arise due to the current fragmented trade services environment:

- Interstate trades take longer to process and cost more to apply for than intrastate trades, and this may be decreasing trade across the Basin and decreasing market depth.
- The transaction cost experiences of traders differs across the states – with some experiencing advantages such as same-day approvals, lower fees and better access to opportunities to trade through IVTs.
- Automated approvals and trade feasibility checks are only available to some water market participants in Victoria.
- New South Wales traders need to obtain and pay for a zero-share water access licence (WAL) to trade, whereas those in South Australia and Victoria can set up allocation accounts without licences and without paying fees.
- Terminology and processing differences between states can encourage market participants to only seek trading partners in limited trading zones.
- Price is not required by most of the Basin States' Acts to be reported on trade forms. While states deal with this by making price a mandatory field on trade forms, they however face issues in terms

686 Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

of ability to verify price and (now recently) reason for trade, with only Victoria having audit functions through the Broker Portal/API.

10.6.4 Reduce transaction costs, improve the quality of information, and improve the flow of information

In summary, the ACCC found that trade processes and costs can be quite complex and vary considerably depending on the context of individual trades, although – with the exception of a few cases – trade approval fees are generally low and are not causing significant issues for market participants. Findings from other parts of this report indicate that market participants respond to differences in monetary and non-monetary transaction costs by taking actions such as using brokers to aggregate small parcels to reduce fees, and that it can be difficult to compare the costs of different parcels of water allocation (or other products offered) because of substantial differences in approval fees, broker or exchange platform fees or commissions, and different approaches as to which party (buyer or seller) bears these costs.

Three key elements that need reform in this space are to reduce transaction costs by improving ease of trading, improving the quality of information and improving the flow of information between current and future entities involved in Basin water markets and water management.

The ACCC considers that the improvements in trade processes identified in this chapter must be considered in conjunction with broader reform to realise the true extent of benefits. Chapter 12 presents the ACCC's recommendations to improve trade services, transaction costs and market transparency.

11. Transparency

Key points

- Good quality and timely water information is key to improving market confidence and enabling better-informed trading decisions across Basin water markets.
- While water market transparency is one of the objectives of the National Water Initiative, transparency concerns remain and, in some cases, have continued to increase.
- While there have been many improvements to water market transparency in recent years, past progress on transparency in Basin water markets has fallen short of delivering the information water market participants need.
- Water market data in the Basin is not meeting user needs because of the following issues:
 - gaps in data collection and validation, reducing data quality
 - a lack of user-driven solutions, resulting in websites and other information sources that some users find confusing
 - fragmented and dispersed information, driven by lack of data sharing arrangements
 - conflicting sources of data, undermining confidence
 - differing terminology across Basin States.
- There has also been a lack of transparency in relation to decision making across the Basin, and decisions such as allocation announcements need to be better communicated to market participants.
- While transparency issues in the Basin remain, there have been recent steps in the right direction. The ACCC is strongly supportive of the ongoing transparency and information improvements made by Basin States and the newly-funded Murray–Darling Basin Water Information Portal, which aims to bring together disparate sources of information.
- There is an opportunity to bring recent initiatives together and broaden the vision to better harness information to improve ease of trading, increase market understanding, inform river operations and help identify and quantify impacts of trade.
- In particular, there is an opportunity to rethink the vision for the Murray–Darling Basin Water Information Portal initiative. This initiative should be broadened to include harnessing data from private trade service providers, and address issues of data quality.
- Change is needed to improve information quality and information flows:
 - There need to be obligations on entities to collect, verify (where possible), store and share information.
 - There is a need to identify and set criteria for information that may be relevant to the market that, if met, require that information to be made available to the market.
 - There is a need, building on current projects, to design information publication in a way that provides the ‘whole picture’ and engages end users.

11.1 The information necessary for efficient markets

The efficient allocation of water resources using market mechanisms relies on water market participants having access to timely and relevant market information and making well-informed choices on how they engage with markets, so that price signals accurately capture all relevant information.⁶⁸⁷ In a transparent market, all traders would have access to timely and reliable market information that allows them to understand current market conditions, compare trading offers and make decisions that are in their best interests.

Trade services across the Murray–Darling Basin are provided by multiple public and private entities (see chapter 10), resulting in fragmented and inconsistent datasets that can favour market participants with the time and resources to invest in collating and understanding this information. This fragmentation can also facilitate the entrance of market intermediaries to provide advisory and information services to fill information gaps, which can result in smaller and newer market participants relying on them to form price expectations, provide advice and, facilitate and lodge trades.

Transparency of decision-making processes is also important, particularly where decisions can impact the supply between and within states and trading zones, and sometimes create arbitrage opportunities.

11.1.1 Different information users have different information needs

One of the challenges in improving information transparency is that different information users have different needs.

The ACCC gathered information from a range of sources to assess current information availability and different stakeholders' information needs.

The ACCC has examined information transparency in the Basin water markets by identifying the information necessary for water market traders to make decisions that properly reflect the value they place on water at a given point in time. This information would result in effective and efficient markets and improve productivity. Beyond this, the ACCC has also considered the information needs of other parties involved in water markets, such as regulators, river operators, approval authorities, policy-makers and market analysts.

The ACCC obtained information from the Basin States on their water trading websites to understand which websites market participants currently visit to view trading information. Website traffic data supplied by Commonwealth and Basin State agencies show the Victorian Water Register's allocation trade page was the most frequently visited, followed by the Bureau of Meteorology's Water Markets Dashboard and the Department of Agriculture, Water and Environment's market price information page (table 11.1). A comparison of the Victorian Water Register webpages shows over the October 2019 to September 2020 period information was most often sought for allocation trade.

⁶⁸⁷ According to standard economic theory, market mechanisms achieve efficiency by using price to equate marginal costs and benefits. If some information on costs or benefits is missing, then the market may misallocate resources compared to the full-information case.

Table 11.1: Government sources of water market information, webpage views and location of Australian visitors

Agency	Webpage	Page views ^a	Proportion of Australian visitors by Basin State				
			Qld	NSW	ACT	Vic	SA
Victorian Water Register	Allocation trading	22,860	3%	19%	2%	71%	4%
BOM	Water Markets Dashboard	14,729	18%	33%	7%	26%	10%
DAWE	Market price information	12,895	7%	27%	8%	30%	16%
Victorian Water Register	Water share trading	10,815	5%	18%	3%	69%	5%
NSW DPIE	Trade dashboard	3,650	3%	71%	4%	9%	1%
Victorian Water Register	Available water by owner type	2,801	4%	26%	7%	53%	9%
Sunwater	Water Trading	1,442	n/a	n/a	n/a	n/a	n/a
Victorian Water Register	Trade opportunities	609	3%	21%	6%	62%	7%
SA DEW (Water Connect)	Allocation trade charts	1,848	5%	18%	4%	16%	54%
SA DEW (Water Connect)	Entitlement trade charts	2,139	n/a	n/a	n/a	n/a	n/a
SA DEW	Useful sources	69	0%	16%	9%	16%	58%

Source: Government agency voluntary information requests.

Notes: (a) Page views for the period October 2019 to September 2020. Numbers may not up to 100% due to non-Basin State, overseas, or 'not set' location page visits. Data was supplied over different and inconsistent time frames, while most data was provided for the time period of October 2019 to September 2020, some data was supplied for only 8 months, while others were supplied for 62 months (July 2015 to October 2020), and as such the figures presented in this table are not directly comparable.

The ACCC also received feedback from stakeholders via submissions and consultation meetings on the data and information stakeholders considered they needed to trade or otherwise perform their role in water markets. For example, SunRice, submitted:

The level of transparency and disclosure of water market information is not currently sufficient to support a properly functioning market. SunRice understands from growers that there is only limited information available about how rights are created, what volumes are available, who is acquiring water, and how it is being used, consumed or traded. There is currently no water holdings / entitlements register or platform. In addition, the information that is available is difficult to access and understand, and is not always updated in real time. As a result, it provides limited useful insights or information for water users.⁶⁸⁸

Further stakeholder views on transparency and their information needs is presented in sections 11.3 to 11.5 below.

The Australian Dairy Industry Council conducted a survey in response to questions posed in the ACCC's interim report, such as what information users are relying on and found that:

Survey respondents flagged that they are accessing a wide range of information sources to effectively understand and use water markets and products. This information was largely sought through other farmers and peers, brokerage services, and freely accessible sources such as websites. The survey results, though not a statistically relevant sample, indicate that dairy farmers in the MDB highly value seasonal forecasts and water availability updates, as well as trading bids and offers for particular products.⁶⁸⁹

The ACCC also gathered evidence from past assessments of Basin water market stakeholders' information needs.

688 SunRice, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 7.

689 Australian Dairy Industry Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 14.

In 2014, BOM engaged Aither to conduct a study to scope opportunities to better meet user needs with water information products. This included consulting on awareness of BOM's products, to which Aither reported there was low awareness. It found there was very little awareness of the BOM's National Water Market System (NWMS) and Regional dashboards and even lower levels of use.

Aither assessed that most direct market participants were mainly getting water market information from private sector sources, but that there were concerns about fragmentation and gaps. Aither identified a number of ways to improve the user experience, such as by integrating trade data with water availability, and undertaking further user engagement to fully understand the costs and benefits of options and courses of actions listed by Aither (including making a new dashboard, maps, downloadable data, tabular reporting and apps).

The ACCC also drew on evidence from recent consultations by the Victorian Government, summarised in box 11.1, and a report undertaken by Marsden Jacob Associates, commissioned by MDBA (box 11.2).

Box 11.1: What kind of transparency do stakeholders want? Evidence from Victoria

Victoria's 'Closing the Loop – Water market transparency'⁶⁹⁰ report identified that stakeholders were concerned with transparency beyond just knowing who owns the water, and that transparency to them meant more than this. Some areas in which Victoria heard more transparency would be useful included:

- reasons for allocation trade, to enable identification of leases, forwards, carryover parking, same-party or related-party transfers, and trades that occur on the spot market
- river operations such as identifying who owns what water in dams and how much water is allocated to deliver water
- insights on irrigation demand and activity and how much is committed to use
- market concentration in both allocation and entitlements
- how much allocation is held by the environment, privately and by corporations
- the use of carryover over time to assess trends.

Stakeholders also wanted monitoring to ensure compliance against water laws, and better enforcement.

New South Wales is currently undertaking similar consultation to understand what information users want to be able to get out of the water register.⁶⁹¹ BOM is also conducting user needs analysis for its information portal projects, and also conducted user needs analysis in 2014. The user needs analysis conducted in 2014 was specifically for the early development of the BOM Water Markets Dashboard. The current user needs analysis for upcoming water information portal projects is far broader, covering water information such as rainfall, streamflow, soil moisture, water availability, water use as well as water trade.

690 Department of Environment, Land, Water and Planning (Victoria), *Closing the Loop report—Water Market transparency*, 2019, www.engage.vic.gov.au/download_file/23337/2913.

691 NSW Department of Planning, Industry and Environment, <https://www.industry.nsw.gov.au/water/licensing-trade/trade/have-your-say>, viewed 7 February 2021.

Box 11.2: Current market data requirements – evidence from a recent study

As part of its 2018-19 audit work program, in May 2019 the MDBA published a two-part audit of water trade price reporting (Price Reporting Audit). The MDBA then subsequently commissioned Marsden Jacobs Associates to undertake a scoping study on water market products, as a first step to delivering on the recommendations from the Price Reporting Audit.

Part of this scoping study comprised an assessment of the set of information needed for a ‘fully informed market’. The report found that the key requirements were:

- Date trade contracted
- Date trade application received by the Authority
- Date trade application approved by the Authority
- Water licence number of buyer and seller (or, for a lease, of lessee/lessor)
- Buyer/seller type (e.g. Water Corporation/irrigation infrastructure operator (IIO), Private, Environmental) (or, for a lease, lessee/lessor type)
- Entitlement class
- Origin and destination of water (e.g. to/from zones if interzone trade possible)
- Trade volume
- Price per megalitre (ML)
- Type of trade
- Arrangement start date and duration of arrangement (for a lease).

The study further noted that ‘[i]t is important to recognise there are a range of market users whom all require varying degrees of information in order to be classified as fully informed. The data requirements for an irrigator may be very different to those of water industry consultants. However, we believe that the above information could be captured and presented so that it provides benefits to all market participants, regardless of their market understanding.’

Source: Marsden Jacob Associates, March 2020, *Murray-Darling Basin Water Market Products Scoping Study*, report prepared for MBDA.

11.1.2 Water market participants should have equal access to key information for decision making

Based on consultation undertaken in this inquiry, its own analysis and examination of past relevant ‘user needs’ analysis, the ACCC considers that all water market participants should have equal access to the following water and water market information to make well-informed trading decisions:

- **Water supply and demand data** – supply data such as forecast water availability, expected allocations, and demand data such as weather conditions, and predicted demand from plantings
- **Pricing and other transactional data** – current and historical market prices for water product types across the Basin, and other de-identified transactional data such as volume, origin and destination trading zone(s), water access entitlement class (if relevant), trade type, and additional information for historical trades – strike date, reason for trade, submitted date, and approval date
- **Cost of trading** – trade approval fees and intermediary charges
- **Market depth** – how much water is currently for sale
- **Trading partners** – timely information on the buy and sell offers for a range of water product types across the Basin

- **Product types** – the types of market products available and the advantages and costs associated with each
- **Market rules and processes** – market rules, allocation announcements and policy changes, and unbiased information on opportunities to trade
- **Consultations** – information on when consultation processes for rule or policy changes are occurring and how stakeholders can be involved
- **Water accounting methods** – the processes applied by Basin States when accounting for losses and managing spill risk
- **Total amount of water for consumptive use** – how much water there is in the system available for use (total volume allocated to entitlements, plus aggregate volumes carried over from previous water years)
- **Information on whether and how trade has impacts or imposes costs on the system which are not directly reflected in prices** – for example, impacts on the environment, extent of conveyance losses and how they are accounted for, or impacts on the system’s capacity to deliver water to other water rights holders. This is important for traders who have preferences over outcomes such as environmental and social impacts. As in other sectors, many market participants are interested not only in price but in other unpriced aspects (often captured in notions of ‘ethical consumption’ or ‘social corporate responsibility’)
- **Transparency of relevant rule making and rule implementation** – such as decisions on allocation announcement timings or enforcement priorities, as well transparency on how the allocation and carryover policies and rules being enforced were originally devised.

While some of the above falls outside the scope of water market information, it is clear that market participants require information which allows them to understand the broader context in which markets operate and the impacts or outcomes associated with trading decisions (referred to in the interim report as ‘secondary information’).

The ACCC also recognises that there are additional transparency concerns relating to information that some consider should be disclosed during private dealings, for example, dealings between a broker and a client. Information asymmetries can exist between the diverse groups of trader types who are actively competing with each other in the water market (such as between investors and irrigators), and also between brokers and their clients in providing advisory services. This type of information need is considered in section 6.7.

While market participants need the information outlined above to be publicly available and accessible, regulators have different information needs. A whole-of-Basin regulator has been recommended in chapter 9 and, if adopted, the regulator will need access to information that enables it to properly monitor, verify and enforce any compliance obligations. The information needed for successful regulation of market participant conduct is considered in chapters 6 and 8. While some of this information is already collected by trade approval authorities, other information will need to be specified for collection and sharing with the regulator through new obligations (set out in chapters 9 and 12). The information needs of river operations and compliance agencies are also assessed in more detail at chapter 14, while some improvements to data collection and sharing in this regard are proposed at chapter 12.

11.2 Overview of water market information transparency: past reform and recent improvements

11.2.1 Past progress on transparency in Basin water markets has not delivered the information water market participants need

In 2004, under the NWI, states and territories committed to establishing water market and trading arrangements that facilitated intrastate and interstate trade and water resource accounting to support public and investor confidence in the amount of water being traded, extracted, recovered and managed.⁶⁹²

The states and territories also agreed under the NWI (and later formalised in the *Water Act 2007* (Cth)⁶⁹³) to have compatible water registers for entitlements and trades (both entitlement and allocation) on a whole-of-Basin or catchment basis⁶⁹⁴ that would go some way to minimising transaction costs through 'good information flows'.⁶⁹⁵ While the information to be supplied by the Basin States to the MDBA to maintain the water entitlement transfer register was prescribed⁶⁹⁶, no guidance was provided for trading information or how registers should capture the trading of different types of water products. The Water Act sets out the objectives and principles, but does not create obligations on Basin States or IIOs to publish specific information from their registers. The state water management acts also do not specify what information from a register must be made available, but do generally require registers to be available for public inspection.⁶⁹⁷

Under the NWI, water registers were envisaged to accommodate the trading of entitlements in whole or in part, temporarily or permanently, through lease arrangements or any other water product that may evolve.⁶⁹⁸ These commitments were formalised in the *Water Act 2007* (Cth).

The lack of a commitment to develop a coordinated approach has resulted in the states maintaining different register arrangements, both as internal systems and in what and how they publish information. The differences in their systems have given rise to lags in interstate trading relative to intrastate trade, despite the Murray-Darling Southern Connected Basin (Southern Connected Basin) States' file sharing arrangement (interstate trade interoperability protocol).⁶⁹⁹

Further, until recently, there had been little progress in developing agreed approaches for adapting water trade administration processes and water registers in line with developments such as the introduction of new water products. Despite NWI commitments to enable new products, trade administration processes and registers have not adapted alongside these new products, with the result that uptake of new products is being hampered by insufficient information and a lack of price discovery.

In particular, most new water products such as forwards, contractual leases and carryover parking are executed through the allocation trade framework: from the Basin State's perspective, they are indistinguishable from standard allocation trades. These data quality issues persist when this data is then forwarded to the BOM for collation, as these other product types remain mixed in with allocation trade data and are not separately identifiable.

When data is forwarded on to BOM for collation and publication there is no requirement for different trade types to be labelled differently either by the seller when completing the trade form, or by the authority when entering the trade into the system.⁷⁰⁰ These outcomes arise due to the fact that contracts underpinning new products are entered into without the involvement of trade approval

692 *Intergovernmental Agreement on a National Water Initiative*, paragraphs 58(i) and 80.

693 *Water Act 2007* (Cth), Schedule 3 – Basin water market and trading objectives and principles, ss. 4(3).

694 *Intergovernmental Agreement on a National Water Initiative*, paragraph 59.

695 *ibid*, paragraph 58(ii).

696 *Water Act 2007* (Cth) Schedule 1 – Murray-Darling Basin Agreement, Schedule D, s. 16.

697 See Appendix E for further details.

698 *Intergovernmental Agreement on a National Water Initiative*, paragraph 58(iii).

699 See section 10.3.3 in chapter 10 and D.2.1 in appendix D.

700 Bureau of Meteorology, *Explanatory Notes for Water Regulations Metadata and Contextual Information Category 6: Information about water rights, allocation and trades, subcategories 6a, 6b, 6c, 6d, 6e, 6f and 6g*, 2016, p. 23.

authorities; for example, the trade approval authority does not approve the forward contract, but rather the allocation trades that take place under those contracts.

New South Wales and Victoria have both now updated their trade forms (online only for Victoria) to record the reason for trade, which will go some way to correct this transparency issue. Initiatives are also now focusing on linkages and data sharing arrangements, which is a step in the right direction at not only improving the presentation of data to end-users, but also looking to address gaps and disconnects.

In terms of broader water information (beyond core water market transactional data), the quality of information continues to suffer from differences across the states and also dispersion across multiple websites within a state. Concerns in relation to the transparency of this information are explored at section 11.5 below, and have been increasing due to a number of factors – such as changing demand profiles, and increased carryover – resulting in irrigators wanting to understand how water management decisions are made given their impact on water availability.

Information on buy and sell offers (current market offers) is currently left to the market and is dispersed across a number of websites. Waterflow has been a significant improvement in this regard, as a repository which brings together historical trade data, with storage volumes and also current bids and offers (see case study in box 11.5).

11.2.2 Ongoing initiatives and consultations by Basin States are improving the transparency of water registers

Transparency consultation – asking water users what information they need and how they want to access information

Both Victoria and New South Wales have conducted consultation processes to better understand the type of information transparency water users need. New South Wales conducted consultation in 2018, after implementing its ‘Water Reform Action Plan’, a key commitment of which was to ensure greater transparency. The New South Wales Department of Planning, Industry and Environment (DPIE) has developed the WaterInsights portal since then as a measure to improve access to information. New South Wales’s recent discussion paper focuses on ways improve engagement with the water registers, and is seeking to understand water users’ informational needs.⁷⁰¹ The outcome of this engagement may influence the direction and development of the latest water information tools and information published from the water register.

In Victoria, a 10-year strategy outlines DELWP’s actions to improve users’ experiences with the Victorian Water Register. The strategy notes the Victorian Water Register has progressed from a single, standalone system to a partnership across seven Victorian government and water sector organisations and is a collection of several interdependent systems.⁷⁰² According to the strategy:

This includes improving consistency, accuracy and completeness, as well as the opportunity to deliver new insights via integration with related data (such as climate or agricultural production).⁷⁰³

The strategy recognises the changing needs and expectations of Victorian Water Register users, where increased population and climate change are increasing pressure on water resources. This pressure is recognised as a critical driver for improving the register so that water resources can be managed effectively and efficiently.

The 10-year strategy outlines that legislative amendments will be considered to ‘streamline the transfer process and enable transactions to be lodged and processed electronically’.⁷⁰⁴

701 Department of Industry, <https://www.industry.nsw.gov.au/water/licensing-trade/trade/have-your-say>, viewed 19 January 2021.

702 Department of Environment, Land, Water and Planning (Victoria), *Victorian Water Register 10 Year Strategy 2019–2028*, 2019, www.waterregister.vic.gov.au/10-year-strategy, viewed 26 June 2020.

703 *ibid.*

704 *ibid.*, p. 6.

The strategy also recognises that improving access to data and information will assist water users in knowing when and how to engage in water markets and support better decisions, and identifies ‘providing an interface that can be navigated easily and quickly, and processes that are clear and efficient’ as a desired outcome.⁷⁰⁵

‘Reason for trade’ and ‘strike date’ reforms – New South Wales and Victoria

New South Wales has updated its allocation trade form to require traders to provide ‘strike date’ and a reason for trade, and will only accept zero dollar trades for limited trade reasons. Victoria has implemented similar changes, albeit only for its online forms (which covered 85% of trades by number and 61% by volume in 2018–19⁷⁰⁶). South Australia, as part of its broader Water Management Solutions system project, is currently investigating ways to implement similar changes to its online forms.

New South Wales has also started collecting information on broker facilitated trades (as listed as a proposed recommendation in the ACCC’s interim report), and environmental water holder trades. Victoria already collects information on lodging party.

Recent reforms by New South Wales and Victoria have sought to improve some aspects of data quality, but do not resolve data-entry errors or data accuracy issues

While the ACCC strongly supports the updates to trade approval forms⁷⁰⁷, these improvements also highlight the importance of flexibility in the future. The changes aim to achieve better trade type categorisation and to capture the true date on which trade occurred (strike date), which should also result in better price reporting and more accurate trade type identification in publication. However, the list of trade types may not continue to suit the evolving market, and this may result in more use of the ‘other’ category than intended.

One example of this is the phenomenon of ‘aggregation’ or ‘pooling’ type trades, which entail a number of trades aggregating smaller parcels of water allocation onto a particular licence or account, ahead of a single larger trade (possibly also with subsequent trades to disaggregate). Such trades generally take place using IIO or broker licences or accounts to aggregate. The ACCC understands that these trades are undertaken primarily as a way to reduce transaction costs and also in some cases to facilitate IVT transfers (because a single application for a large volume of intervalley trade may have a greater chance of success than multiple smaller trades, given current ‘first in, first served’ IVT administration rules). For example, SA IIO Renmark Irrigation Trust (RIT) submitted that they conduct these trade types on behalf of members to minimise irrigators trading costs.⁷⁰⁸

This trade type would only be captured under ‘other’ and the state register would not have visibility of volumes, reasons for trade or prices of the individual parcels, increasing the proportion of zero dollar trades (as explored in appendix G).

Therefore, flexibility in capturing trade data as market activity evolves is key. The ACCC understands the concerns regarding the missing ‘reason for trade’ data have been long-held and have undermined confidence in register and BOM data. This data gap is also particularly relevant to the ACCC’s findings that IIO and register data is disjointed and fragmented (see section 11.3.4), and is relevant to recommendations in chapter 12 regarding better harnessing existing information and sharing this data.

These trade form reforms alone will also not introduce an ability to verify information provided, nor reduce data-entry errors (see section 12.4.3 for recommendations related to improving data validation). CICL submitted that it supports efforts to automate the flow of price information and the clearer definition of the type of trade as has recently been required by New South Wales. However, CICL stated that without cost information, the true value of introducing automation to enable price verification is not known.⁷⁰⁹

705 *ibid*, p. 6.

706 ACCC analysis based on Victorian Government’s response to voluntary information request.

707 See: <https://waterregister.vic.gov.au/about/news/327-introduction-of-reason-for-trade-for-online-allocation-trades> and <https://www.watnsw.com.au/customer-service/ordering-trading-and-pricing/trading/faqs-water-trading>.

708 Renmark Irrigation Trust, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 5.

709 Coleambally Irrigation Co-operative Limited, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 12.

Publishing more detail from registers – New South Wales, Victoria and BOM

Victoria has now commenced publishing information on the largest entitlement holders.⁷¹⁰ New South Wales has started publishing the newly added ‘reason for trade’ variable for New South Wales allocation trades.⁷¹¹ BOM has started publishing water entitlements on issue with identifiers.⁷¹²

Water portal Tableau products – WaterNSW and Victorian Water Register

DELWP has released the ‘Water Market Watch’ app to allow water users to access Victorian Water Register information across a range of digital devices⁷¹³, providing users with information on ‘Seasonal Determinations, Water Market Prices, Trading Limits and Spill declarations’ and the ability to set up customised notifications and alerts.⁷¹⁴

DELWP has also begun releasing more information in response to its 2019 transparency consultation process. This includes three new dashboards which show available water by owner type, allocation trade scatter plot, and trade opportunity and limits insights.⁷¹⁵ The allocation trades dashboard visualises insights on approved allocation trades in table and chart format. The allocation trades dashboards only includes what DELWP consider to be ‘commercial’ trades, which are defined as non-zero dollar trades. The available water dashboard extends the functionality of ‘available by owner type’ information to each trading zone rather than simply being available at the water source level. The trade opportunities dashboard adds detailed information on intervalley trade opportunities in the current year and provides insights on the way these opportunities have changed over time and what factors have influenced them.

In New South Wales, WaterNSW has added the ‘Water Insights Portal’ to its webpage, which is intended to provide users with ‘timely information in a visual manner to help you make informed water planning decisions’.⁷¹⁶ This includes a dashboard which consolidates key water resource information, allows users to access real-time information on surface water (including major rivers), major dam levels, dam inflows and groundwater and WaterLive, a mobile phone app. The latter allows users to access real-time data of interest to them and setup push notifications for when new, relevant data is added to WaterNSW’s ‘Real-Time Water system’, in addition to featuring interactive maps and multiple app-customisability options.

These new dashboards, while providing useful insights, are limited in functionality in terms of allowing for bulk data downloads. The differences in the NSW and Victorian dashboards are in some ways driven by the user-needs consultation approaches to developing the products, and aim to service local informational needs. MDBA noted this in their submission to the interim report, in which MDBA stated ‘many aspects of water use and trade are necessarily localised as compared to a truly mobile product, so reform should be pursued at a local scale’.⁷¹⁷

Modernising South Australia’s trade approvals and water licensing system

South Australia recently consulted on legislative changes to support the introduction of its new Water Management Solution system. This \$14.7 million project, jointly funded by the Australian and South Australian Governments, is expected to decrease trade processing fees and enable the electronic lodgement of trades, automated approval assessments, increased data capture (such as reason for trade and strike date) and better integration with the interstate trading interoperability protocol. Given South Australia has the highest trade approval fee in the Southern Connected Basin (\$277 per

710 Victoria Water Register, <https://waterregister.vic.gov.au/water-trading/market-insights/large-water-owners>, viewed 4 February 2021.

711 WaterNSW, <https://waterregister.watarnsw.com.au/water-register-frame>, viewed 4 February 2021.

712 Bureau of Meteorology, <http://www.bom.gov.au/water/dashboards/#/water-markets/mdb/at>, viewed 4 February 2021.

713 Department of Environment, Land, Water and Planning (Victoria), *Water market app now available*, 2019, www.water.vic.gov.au/media-releases/2019/water-market-app-now-available, viewed 26 June 2020.

714 Department of Environment, Land, Water and Planning (Victoria), *Water Market Watch App*, 2019, www.waterregister.vic.gov.au/water-trading/water-market-watch-app, viewed 26 June 2020.

715 Department of Environment, Land, Water and Planning (Victoria), www.waterregister.vic.gov.au/about/news/318-new-market-insights-to-increase-transparency, viewed 26 June 2020.

716 WaterNSW, *Customer Newsletter*, 2019, www.watarnsw.com.au/_data/assets/pdf_file/0006/148749/Regulated-Newsletter-September-2019.pdf, viewed 26 June 2020.

717 Murray Darling Basin Authority, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

application for the 2020–21 water year⁷¹⁸) this initiative is expected to go some way towards meeting stakeholders' calls for more harmonised or equal allocation trade approval fees in the Southern Basin.

Queensland's Rural Water Management Program (RWMP) is evolving into overarching Rural Water Futures

The Queensland Government's submission to the interim report outlined the transformational change the Rural Water Futures program (which has evolved from the RWMP) will deliver to the management, measurement and reporting of rural water in Queensland – including delivering water information transparency.⁷¹⁹

11.2.3 Commonwealth initiatives are coming together to centralise some water information

DAWE, MDBA and BOM projects

There have been a number of recent initiatives and projects aimed at improving transparency across the Basin. Firstly, BOM started publishing Water Reporting Summaries for Basin Catchments on a fortnightly basis.⁷²⁰ These summaries were the first phase of the larger project to deliver more detailed water reports in the Basin at a near real-time frequency. Secondly, the *Northern Basin Information Portal* is due for completion in three years' time and will consist of modelling, remote sensing and installation of gauges, and a Northern Basin portal with public and compliance-officer levels of access. Thirdly, DAWE were working on an *information platform* 'to provide a one-stop shop for water storage, in-stream flows and trade information' which was set to deliver its first release by Quarter 3 in 2021, and leveraged the BOM *Near Real-time Water Reporting* project.⁷²¹

On 14 December 2020, a joint media release from The Hon Keith Pitt MP, the Minister for Resources, Water and Northern Australia; The Hon Melinda Pavey MP, NSW Minister for Water, Property and House; The Hon Glenn Butch MP, Queensland Minister for Regional Development and Manufacturing and Minister for Water announced several projects to improve Murray–Darling Basin water information. The media release noted that the projects will receive a total of \$35 million funding, a portion of which is allocated to delivering a water information portal. The funding is from the Australian Government in response to the Water Compliance Review and the agreed actions under the Murray–Darling Basin Compliance Compact.⁷²²

The announcement stated that BOM 'is playing an integral role in building a new water information website that will provide information users want, in the way they want it.'⁷²³ Given the level of overlap of some ongoing projects outlined above, a collaboration with MDBA, DAWE, BOM, Geoscience Australia, New South Wales and Queensland has been formed to create a *Murray–Darling Basin Water Information Portal*, which is being led by BOM and is scheduled to be completed by late-2023 but with early versions rolling out from mid-2021.

The information available through the *Murray–Darling Basin Water Information Portal* will benefit from data sharing agreements currently being negotiated with the states, and improvements in hydrometric networks and river reach modelling to come from the recently commenced Hydrometric Networks and Remote Sensing Funding Program.

718 Department for Environment and Water South Australia, <https://www.environment.sa.gov.au/topics/water/water-markets-and-trade/fees-and-charges>, viewed 5 November 2020.

719 Qld Department of Natural Resources, Mines and Energy, *Submission to Murray–Darling Basin water inquiry interim report*, September 2020, p. 2.

720 Bureau of Meteorology, *Water Reporting Summaries for MDB Catchments*, 2020, www.bom.gov.au/water/nrtwreporting/, viewed 26 June 2020.

721 Department of Agriculture, Water and the Environment 2020, *Murray–Darling Communities Investment Package*, p.5, <https://www.agriculture.gov.au/sites/default/files/documents/murray-darling-communities-investment-package.pdf>, viewed 26 October 2020.

722 Pitt, K (Minister for Minister for Resources, Water and Northern Australia), <https://minister.awe.gov.au/pitt/media-release/mdb-water-information>, viewed 4 February 2021.

723 Pitt, K (Minister for Minister for Resources, Water and Northern Australia), <https://minister.awe.gov.au/pitt/media-release/mdb-water-information>, viewed 4 February 2021.

The combined Near Real-Time Water Reporting and Northern Basin Water Information Portal projects provide the BOM with \$9 million to develop the *Murray-Darling Basin Water Information Portal*. As outlined above, the \$35 million announcement also includes a number of other initiatives.

This centralised portal will integrate various pieces of information to provide users with a full picture of conditions on a catchment basis. The portal will also receive more timely feeds of data from the relevant entities through the data sharing and API arrangements. BOM have indicated that the approach intends to be collaborative to begin with and data standards and requirements may then be formalised with amendments to the Water Regulations once all data needs are known.

Waterflow

Marsden Jacob Associates (Marsden Jacob) received a grant through the Business Research and Innovation Initiative (BRII) to investigate the potential to develop a viable water market information platform.⁷²⁴ The BRII challenge was to improve the transparency and reliability of water market information.

Through their scoping work, Marsden Jacob discovered that there was strong demand for a service that aggregates and analyses water market information and presents this information in an easier to understand and customisable way.⁷²⁵ Marsden Jacob found in their interviews that many market participants made trading decisions that were not always well informed, because the information available was time consuming and challenging to cleanse and analyse.⁷²⁶

Marsden Jacob developed the proposal for Waterflow, an app which collects and presents water market information from various sources in one place. The app was launched in 2019 and collates market information, including buy and sell offers from selected broker websites, and makes them available in one place. The app also offers market commentary and intends to 'save water participants many hours researching water prices, availability and rule considerations'.⁷²⁷ In April 2020, Waterflow added Ruralco Water Brokers to its buy and sell listings, bringing the total number of participating broker firms to seven.⁷²⁸

Waterflow is a relatively new product, and has been well received so far by market participants, and CICL submitted that:

Waterflow is an easy to use platform which allows market participants to tailor the information to their trading zone. This is an important advance which removes some of the complexity for participants. Waterflow needs more exchanges to participate in the platform to be effective. Other private exchanges are all useful data sources. Anecdotal feedback from our members is they value WaterMart because of its transparency and all transactions are listed.⁷²⁹

724 Australian Government, 2020, www.business.gov.au/grants-and-programs/business-research-and-innovation-initiative/customer-stories/mja-waterflow, viewed 22 June 2020.

725 Marsden Jacob Associates, *Water Market Information Platform Feasibility Report*, 2017.

726 *ibid.*

727 Australian Government, 2020, www.business.gov.au/grants-and-programs/business-research-and-innovation-initiative/customer-stories/mja-waterflow, viewed 22 June 2020.

728 Participating brokers are: RuralCo, Waterpool, National Water Brokers, Wilks Water, H2OX, Key Water, and Elders. See Waterflow, 2020, Twitter, www.twitter.com/WaterflowAU/status/1247410821866516481, viewed 22 June 2020.

729 Coleambally Irrigation Co-operative Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 15.

11.2.4 Ongoing initiatives to improve transparency of water management, compliance and enforcement decisions

MDBA is publishing more information on river operations

MDBA recently published the Annual Summary of River Operations and the Independent River Operations Review Group, which is the first time this report has been made available publicly.

In response to the interim report, the MDBA submitted that '(s)ignificant work has been done by the Basin states and the Commonwealth over the last few years to improve compliance in water take and increase trust and confidence that users are following the rules.'⁷³⁰

States agreed to the Murray–Darling Basin Compliance Compact which aims to restore confidence through improved transparency (and other measures)

In December 2018, the Australian, New South Wales, Victorian, Queensland, South Australian and Australian Capital Territory governments agreed to the Basin Compliance Compact (the Compact). The Compact is a collaborative, joint commitment, with an overarching objective to 'restore public confidence in water resource management in the Basin by providing transparency and accountability of surface and groundwater management and regulation, and a consistent approach to compliance and enforcement practices by governments across the Basin'.⁷³¹ This demonstrates Basin States and Commonwealth governments conceive transparency to be fundamentally linked to accountability and to effective enforcement and compliance.

The Compact commits the states to publish a work program to improve transparency and for the program to be fully implemented by 2025.⁷³² The MDBA must also prepare annual reports to Council of Australian Governments⁷³³ and the Basin Ministerial Council on the progress of Compact commitments.⁷³⁴

The MDBA's 2019 Assurance Report⁷³⁵ demonstrates that while some progress on agreed milestones has been achieved, not all key commitments have been met and some aspects are lagging behind agreed schedules.⁷³⁶ For example, the report notes the following concerns in relation to transparency commitments:

- Queensland made significant progress since the previous report but missed some water information transparency and metering commitments that were due in 2019.⁷³⁷
- South Australia had not published its water information transparency improvement program (including any relevant exemptions).⁷³⁸
- Scoping for a Basin-wide system that provides publicly accessible and real time advice on environmental watering was due in September 2018 but was not complete. The lack of progress on this priority action was highlighted in the 2018 Independent Assurance Committee report, which noted an 'apparent lack of collective commitment from some states and the [Australian Government] Department of Agriculture and Water Resources to this item' and called for a re-commitment to this Basin-wide system. While the MDBA noted some progress was made in the form of a signed funding agreement, but that 'the funding agreement does not extend to implementing the projects',

730 Murray Darling Basin Authority, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

731 Australian Government, *Murray–Darling Basin Compliance Compact*, 2018, www.mdba.gov.au/sites/default/files/pubs/Basin-Compliance-Compact-12-December-2018.pdf, viewed 25 June 2020, p. 1.

732 *ibid*, p. 3.

733 On 29 May 2020, National Cabinet agreed to the formation of the National Federation Reform Council (NFRC) and the cessation of the Council of Australian Governments (COAG).

734 Murray Darling Basin Authority, 2019, www.mdba.gov.au/node/5066, viewed 22 June 2020.

735 Murray Darling Basin Authority, *Murray–Darling Basin Compliance Compact Assurance Report 2019*, 2019. As at February 2021, the most recent report available is the 2019 report.

736 *ibid*, p. 4.

737 *ibid*, p. 5.

738 *ibid*, pp.5–6.

and that '[t]he Australian Government Minister for Water may or may not decide to contribute to implementation, once the project plans are complete'.⁷³⁹

Overall, the MDBA stated that: 'Should these [key commitments not yet met] not be completed in 2020, the key objectives of the Compact are at risk of not being achieved, particularly with respect to transparency and accountability of water management.'⁷⁴⁰

The MDBA's evaluation shows that despite renewed in-principle agreements on the importance of improving transparency, practical progress and sufficient compliance still lags behind intent, and funding arrangements to deliver transparency commitments are not secure.

The ACCC also received submissions in response to the interim report from each Basin State, and has conducted in depth analysis on recent improvements in communications on carryover levels, allocation policies and other decision making. The ACCC has identified ways to further enhance this transparency, which are detailed in chapters 14 and 15.

11.3 Lack of access to a 'complete picture' impacts market confidence

In the interim report, the ACCC reported that stakeholders consider there is inadequate accessible and high quality information on historic (approved) trades, and current buy and sell offers (this type of information was referred to as 'primary information' in the interim report). This view prevails despite the extensive work outlined above in relation to efforts to improve the delivery of information to users in the Basin.

This section outlines further feedback received on the broader water information which stakeholders consider is necessary to participate in water markets (some information was previously categorised as secondary information in the interim report), and the ACCC's view on these concerns.

11.3.1 Stakeholders find government water market information websites confusing and of poor quality

Stakeholders consider the current Basin State and BOM water market information websites are confusing and do not provide access to good quality data in the form that they need. Concerns and ACCC views are summarised in table 11.2.

⁷³⁹ *ibid*, pp.40–41.

⁷⁴⁰ Murray Darling Basin Authority, *Murray-Darling Basin Compliance Compact Assurance Report 2019*, 2019. As at February 2021, the most recent report available is the 2019 report.

Table 11.2: Overview of main stakeholder concerns and ACCC's response

Example of stakeholder types raising concern	Stakeholder concern/view	ACCC response
Irrigators Investors	<p>Poor quality and lack of timeliness of publicly available register information (due to trade approval authority processing lags) leads to difficulties in understanding prevailing market prices and assess trading opportunities.⁷⁴¹</p> <p>Aware Water support increased transparency in the water market – particularly in relation to timely, accurate and comprehensive price and volume data.⁷⁴²</p>	<p>The ACCC recognises that there are initiatives in place to reduce the lag, even in terms of timelier reporting to BOM.</p> <p>SA and Qld are also upgrading their systems to improve processing timeliness.</p> <p>The ACCC has made some recommendations in this regard in chapter 12.</p>
Irrigators Environmental water holders	Inconsistencies in collection and dissemination of core market information across Basin States leads to additional costs to understand prevailing market prices and assess trading opportunities across states. ⁷⁴³	The ACCC recognises the large non-price transactional costs which individual irrigators can face when participating in water markets. The ACCC supports the recent improvements to try to reduce these, and considers that the recommendations outlined in chapter 12 will work to further reduce these costs.
Irrigators Environmental water holders	Inability to distinguish 'new products' in Basin State trading data leads to difficulties in understanding prevailing market prices (especially prices for 'new products') and assessing trading opportunities. ⁷⁴⁴	<p>The ACCC recognises the work being progressed by states to fix this issue by identifying different types of trades on trade forms.</p> <p>The ACCC has made some further recommendations in this regard in chapter 12.</p>
Irrigators	<p>Significant proportion of zero dollar trades leads to difficulties in understanding prevailing market prices and assessing trading opportunities.⁷⁴⁵</p> <p>Improving information is a reform priority. The most effective way of improving information would be to make a trade approval conditional on price disclosure ('no price, no trade'). A single web information portal would be an access point to data held by state registers.⁷⁴⁶</p>	<p>The ACCC recognises the work being progressed by some states to fix this issue by requiring parties to disclose a reason for trade so that they can publish different types of trades.</p> <p>There however remain issues in terms of the ability to verify trade reason and price. The ACCC has made some recommendations in this regard in chapter 12.</p>
Brokers	Lack of information on ownership and trade within IIOs leads to difficulties in understanding prevailing market prices and assess trading opportunities. ⁷⁴⁷	<p>The ACCC considers that it is necessary for there to be greater transparency on trade activity within IIO networks, particularly given the high levels of trade activity in some networks.</p> <p>The ACCC has made some recommendations in this regard in chapter 12.</p>

⁷⁴¹ Citrus Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

⁷⁴² Aware Water, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

⁷⁴³ Webster Limited, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 4.

⁷⁴⁴ National Irrigators' Council, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 7; Commonwealth Environmental Water Holder, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

⁷⁴⁵ New South Wales Irrigators' Council, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 7; Commonwealth Environmental Water Holder, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

⁷⁴⁶ Chris Guest, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

⁷⁴⁷ Australian Water Brokers Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 4; Webster Limited, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 4.

Example of stakeholder types raising concern	Stakeholder concern/view	ACCC response
Other	Reform progress has been too slow and little has changed ⁷⁴⁸ , and that this is continuing to give some participants an edge over others. ⁷⁴⁹	<p>The ACCC considers that the previous attempts to improve information transparency in basin markets have been met with many challenges and complexities.</p> <p>The ACCC has made some recommendations in this regard in chapter 12.</p>

Overall, stakeholders consider reporting on historical trades is inaccurate, incomplete, untimely and dispersed across multiple state websites and presented in different ways. This has led to stakeholders, such as GoFARM, indicating support for the options proposed in the interim report:

There needs to be standardisation of Basin State registers, including the implementation of standards for trade processes and reporting requirements and reporting of contracts for leases, forwards and carryover parking to registers. This could be achieved through greater interoperability between Basin State registers or the creation of a single water market information platform for publishing water availability and trade information. An information portal that links state registers and IIO trade data in real time would be beneficial and a relatively low-cost solution to provide whole of market information across the southern MDB compared to some of the other options presented in the interim report.⁷⁵⁰

Some participants note that ‘water allocation markets are very dynamic – historical price information is not so useful to inform daily decisions when competing and changing in-season crop demands, anticipated rainfall, evaporation, and anticipated temperatures are impacting actual demand and supply for irrigation water.’⁷⁵¹ This emphasises the need for broader information to be available and not to solely focus transparency efforts on improving register data.

Zero dollar trades and unverified price reporting continue to be an issue and price reporting obligations are not working as intended. The MDBA audit has prompted Basin States to adopt changes to facilitate users disclosing price information more easily, such as providing for a reason for trade, details of the MDBA’s audit are detailed below in box 11.3.

748 Lin Crase, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

749 Chris Guest, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

750 GoFARM, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

751 Argyle Capital Partners, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

Box 11.3: MDBA price audit findings, recommendations and response

Background

The MDBA has a broad audit function and undertakes audits as part of its annual work program, or in response to specific incidences.⁷⁵²

The MDBA price audit comprised two parts. The first part assessed the ability of the approval authorities to collect, record and publish price information reported to them. The second part looked at whether water traders were complying with section 12.48 of the Basin Plan Water Trading Rules (BPWTR) and accurately reporting price to the approval authorities in their trading forms. Price reporting obligations are relatively new, commencing in 2014 when the BPWTR came into effect. To conduct part 2, an independent assurance on compliance was undertaken by Deloitte by selecting a random sample of trades from each of the states.

The MBDA released the findings of the price audit in May 2019.

MDBA price audit findings

Part 1 of the audit found that ‘no Basin State has robust arrangements in place to ensure comprehensive, accurate price information’.⁷⁵³ The audit also found that no Basin States required evidence to support prices reported.⁷⁵⁴

State-specific findings also included identifying some discrepancies between what was recorded on trade forms and what was on public water registers and published by BOM.⁷⁵⁵ The audit also found that, at the time, Queensland did not include price as a field on temporary trade forms.⁷⁵⁶

Part 2 of the audit found that there was some confusion around the existence or purpose of s. 12.48 and a lack of price controls meant that blank prices were accepted and inappropriately processed as zero dollar trades.⁷⁵⁷ Part 2 also found that overall 50% of trades sampled were not compliant with s. 12.48.⁷⁵⁸

Marsden Jacobs also conducted a scoping study for MDBA on secondary market products in 2020, which found secondary products suffer from transparency issues and weaken market price transparency.⁷⁵⁹

752 Murray-Darling Basin Authority, 2020, <https://www.mdba.gov.au/publications/mdba-reports/audit-assurance>, viewed 22 June 2020.

753 Murray-Darling Basin Authority, *Water Trade Price Reporting under Basin Plan, Part 1: Basin State processes and procedures for collecting water trade price information*, 2019, p. 2.

754 *ibid.*, p. 3.

755 *ibid.*, p. 7.

756 *ibid.*, p. 14.

757 Deloitte, *Water Trade Price Reporting under Basin Plan, Part 2: Independent assurance report of individual trades*, 2019, p. 2.

758 *ibid.*

759 Murray-Darling Basin Authority, <https://www.mdba.gov.au/publications/independent-reports/murray-darling-basin-water-market-products-scoping-study>, viewed 7 February 2021.

MDBA price audit recommendations

Part 1 of the audit included Basin-wide recommendations that all state trade forms include compulsory price fields, registry systems should require a reason to be provided for a zero dollar trade, price validation processes be implemented that are consistent across the states, and the states work with BOM to ensure quality data is provided for improved reporting by BOM.⁷⁶⁰

Part 2 of the audit recommended that price reporting should be made mandatory on all trade application forms, and that support should be given to both brokers and individual traders through trading sessions, information guides and reporting templates.⁷⁶¹ Part 2 also recommended pursuing online portal lodgements as a way to reduce manual data entry errors, and double handling of trade information.⁷⁶²

MDBA response to recommendations

In October 2019 the MDBA responded to its Water Trade Price Audit Report outlining the ways it intends to work with Basin State counterparts to improve information collected and reported by state registries. The MDBA stated that it will work with Basin State counterparts to undertake a gap analysis of information requested at the time that transactions are recorded in state registries and will then work towards developing a standard set of data fields which could be captured by the states and presented as more comprehensive water market information. The MDBA also noted in its response that it 'will also explore longer term options to develop and implement a common Basin-wide Compliance Framework for trade information'.

The MDBA is now progressing its response to improve monitoring, validation and compliance, as well as water trade information and reporting (see also box 11.2 above).⁷⁶³ The MDBA has committed to work with Basin States to undertake a gap analysis of information requested at the time transactions are recorded in registries. The MDBA also committed to develop a standard set of fields which can be captured on the registers and presented to the market.⁷⁶⁴ Furthermore, the MDBA acknowledged the inefficiencies of multiple systems, and committed to working with the states and BOM to harmonise registers and explore longer term options to develop and implement a single Basin-wide information system.⁷⁶⁵

The *Water Act 2007* (Cth) gave BOM a new water information role, with a requirement to produce annual water accounts.⁷⁶⁶ The Act requires entities specified in the regulations to provide information to the BOM. The Act also gives BOM discretionary power to publish information on water access rights, trades or leases of water access entitlements and irrigation right and water allocation announcements and allocation trades.⁷⁶⁷ BOM uses the discretionary power to publish the Water Markets Dashboard, but unlike the annual water accounts, BOM is not legally obliged to publish this information.

The *Improving Water Information* program was the first attempt to centralise the collation and publication of Australian water information⁷⁶⁸ and required standardisation of the terms and definitions that different states had developed for water entitlements, allocations and trades.⁷⁶⁹

760 Murray Darling Basin Authority, *Water Trade Price Reporting under Basin Plan, Part 1: Basin State processes and procedures for collecting water trade price information*, 2019, p. 5.

761 Deloitte, *Water Trade Price Reporting under Basin Plan, Part 2: Independent assurance report of individual trades*, 2019, p. 4.

762 *ibid*, p. 4.

763 MDBA, *Water Trade Price Reporting Audit: Management Response*, 2019, p. 7.

764 *ibid*, p. 2.

765 *ibid*, p. 3.

766 *Water Act 2007* (Cth) Part 7, ss. 118–135; *Water Regulations 2008* (Cth) Part 7, ss. 7.01–7.11.

767 *Water Act 2007* (Cth) Part 7, s. 123(1)

768 Bureau of Meteorology, 'Advances in water information made by the Bureau of Meteorology from 2007 to 2010', *Improving Water Information Program Progress Report*, 2010, p. 5.

769 R Vertessy, 'Water Information Services for Australians', *Australian Journal of Water Resources*, vol. 16, no. 2, 2013, p. 99.

BOM's role in water market information is one part of its role in terms of delivering water information. BOM's Water Information Program looks to publish information that can answer the following questions:

- How much water is available today, relative to the past?
- How is the water in our rivers and aquifers changing?
- What is the water availability outlook?
- Who is entitled to use water and how much are they using?
- How is the rate and pattern of water use changing?
- **How much water is being traded and for what price? (water market information)**
- How much water is being allocated to the environment?
- How much water is being lost to evaporation and leakage?
- How is climate change impacting on our water resources?

In terms of its role in relation to water trade information, regulations made under the *Water Act 2007* (Cth) requires Basin States and some IIOs to provide information to BOM. BOM consolidates this information and provides a dashboard showing the volume of water traded and volume weighted average prices. Users are also able to download transaction data from the dashboard. The dashboard was one outcome from the National Water Market System, the same initiative which looked to create a common register.

BOM has used its power under the *Water Act 2007* (Cth) to specify the manner and form in which some data is to be provided by entities under the Water Regulations. However BOM has not used its power to issue broader compulsory information standards in relation to water market data.

Current criticisms of BOM's data are mostly related to the accuracy of the data which BOM receives from the trade forms lodged with the states and consequently flows through to BOM's data quality.⁷⁷⁰ Aither's work in 2014 indicated low levels of awareness of BOM's water products, and while significant improvements have been made since then, the website analytics do demonstrate that further engagement and user reach is necessary (see table 11.1 above). For those that are aware of the products, the ACCC has heard concerns such as '(t)he BOM dashboard is hard to navigate and it is not clear how the data is cleansed to remove the same trade being reported through the different registers.'⁷⁷¹

11.3.2 Stakeholders find it difficult to assess market depth and current market price

Stakeholders consider current price and market depth is not well known as buy and sell offers are dispersed across multiple exchange platforms and broker websites. Concerns and ACCC views are summarised in table 11.3.

770 Almond Board of Australia, *Submission to Murray-Darling Basin water inquiry issues paper*, 5 March 2020, p. 7; Commonwealth Environmental Water Holder, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 5.

771 Coleambally Irrigation Co-operative Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 15.

Table 11.3: Overview of main stakeholder concerns and ACCC's response

Example of stakeholder types raising concern	Stakeholder concern / view	ACCC response
Irrigators Irrigation infrastructure operators (IIOs) Government bodies	Market information such as price is dispersed, presented in different formats and is difficult to access ⁷⁷² , which leads to difficulties in determining market depth and the full extent of trading opportunities, and creates an 'un-level playing field' because some participants have a comparative advantage in making use of fragmented information. ⁷⁷³	While the ACCC acknowledges that this continues to be a concern, the Waterflow website is beginning to fill this gap. As more brokers sign on to Waterflow and update their websites regularly, Waterflow will be in a position to provide more complete data.
Exchange platforms	The two key drivers of market transparency and efficiency, which are price and liquidity discovery, are very difficult to determine currently. A key issue in the current water market is that there is no single exchange that lets every participant see every buy and sell order in real time, in one place. ⁷⁷⁴	The ACCC considers increased connections between exchange platforms and brokers, and with the proposed Backbone Platform and presenting information on the Water Market Information Portal ⁷⁷⁵ , will help to bring together information so that current market price and market liquidity is easier to determine.
Industry bodies	If a grower uses more than one broker, their water parcel could potentially be listed on many broker websites, therefore giving a false sense of 'supply' to the market. ⁷⁷⁶	The ACCC also understands that assessing market depth even on the one exchange platform can be difficult when parcels are listed in zones where they can be delivered rather than where originate (however, a unique identifier could make identifying these parcels possible).

The ACCC heard that traders look to the large exchange platforms (H2OX and Waterexchange), and to Basin State registry data, to inform their price expectations, but lean more heavily on the exchange platforms because of issues with the registry data (especially timeliness and inability to distinguish different types of allocation trade). Reliance on brokers and exchange platforms for relevant market data is a concern for some participants. The ACCC considers that this concern is related to the lack of regulation which currently applies to brokers and exchange platforms, explored in chapter 8 with recommended regulatory response in chapter 9.

While exchange platforms and brokers do provide market information either publicly or to their members, there is no obligation on them to do so. There is also no overarching obligation that applies to all trades and all brokers in relation to record keeping. This has created a situation in which the information published by exchange platforms and brokers differs in format and timeliness, and can be difficult to navigate.

Exchange platforms also present bids and offers in different ways, for instance, Waterexchange presents water for sale by its destination, meaning the same parcel is listed under multiple zones (identifiable by parcel number). This is also true for some Basin State dashboards. For instance, the Victorian Water Register's 'Allocation trading' webpage generally reports trade as being within a zone, into a zone or out of a zone; users need to scroll to the bottom of the page and undertake a bulk download of historical trade data to access information on origin and destination zones associated

⁷⁷² For example, Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 8; Department of Agriculture, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 11; Murrumbidgee Irrigation, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 3; Numerous irrigator submissions, such as AJ and MH Spiers, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 1.

⁷⁷³ New South Wales Irrigators' Council, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p.7; Fruit Growers Victoria Ltd, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 2.

⁷⁷⁴ H2OX, *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 5.

⁷⁷⁵ Refer to chapter 12.

⁷⁷⁶ Citrus Australia, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, p. 9.

with individual trades.⁷⁷⁷ In contrast, WaterNSW's website provides more easily accessible data on both origin and destination per transaction, and also publishes Water Access Licence (WAL) numbers associated with transactions, allowing data users a greater ability to track water allocation movements over time. However, WaterNSW's website does not provide information by trading zone, and provides it only by water source.

Box 11.4: Are transaction costs included in water price information sources?

The Bureau of Meteorology (BOM) maintains the Water Markets Dashboard, which collates volume and price data for water entitlements and allocations.⁷⁷⁸ This information is reported to BOM by trade approval authorities and some IIOs under the *Water Act 2007* (Cth) and Water Regulations 2008 (Cth).

Trade approval authorities and some IIOs are required to supply BOM with the gross and net sale price for each trade, where the gross price is 'the transfer price as agreed between legal entities inclusive of all applicable transaction costs' while the net sale price is exclusive of these transaction costs.⁷⁷⁹ BOM considers transaction costs to include:

search, negotiation and enforcement costs including, but not limited to, all government water transfer fees and charges applicable to water trade, conveyance charges and professional service fees (such as accountants, brokers, lawyers).⁷⁸⁰

However, BOM only report the net price as trade approval authorities and IIOs only request a single dollar value per trade. While trade approval authorities and IIOs may also be able to supply their approval fees to BOM, any additional transaction fees incurred by the water market participants to facilitate the trade would not be captured and the additional transaction cost information would be incomplete. Further, trade approval authorities' forms are inconsistent. For allocation trades, WaterNSW requests a value per volume (\$/ML)⁷⁸¹ while the Victorian Water Register requests a total sale value⁷⁸², where transaction costs may be inadvertently included.

Additionally, the prices reported in trade approval applications can be erroneous or intentionally left blank, and none of the authorities require trade applications to provide evidence to support the entered trade price.⁷⁸³ Without consulting the traders, there is no clarity on which fees have and have not been included in the reported trade price.

While there is no legal requirement to provide information, intermediaries now compete with registers to supply the emerging information services market. These providers include brokers and exchange platforms who use the data generated from their advisory and matching services, sometimes supplemented with publicly available registry data, to provide information to the market.

Exchange platforms and brokers are the key source of buy and sell offer data. As part of their matching and information services, water brokers and exchange platforms often list their current buy and sell offers publicly or privately to members on the platform. For example, Waterfind provides a real-time

777 Victorian Water Register, n.d., *Allocation Trading*, <https://waterregister.vic.gov.au/water-trading/allocation-trading>, viewed 2 February 2021. The webpage, however, does not make clear that more detailed information on trading zones is available via this feature, with the result that some users may not be aware that this information is available.

778 Bureau of Meteorology, 2020, <http://www.bom.gov.au/water/dashboards/#/water-markets/mdb/at>, viewed 20 May 2020.

779 Bureau of Meteorology, *Explanatory Notes for Water Regulations Metadata and Contextual Information Category 6: Information about water rights, allocation and trades, subcategories 6a, 6b, 6c, 6d, 6e, 6f and 6g*, 2016, pp. 19 and 26.

780 Bureau of Meteorology, n.d., *Australian Water Information Dictionary*, <http://www.bom.gov.au/water/awid/id-544.shtml>, viewed 24 February 2021.

781 WaterNSW, *Application to Assign Surface Water Allocation*, 2015, <https://www.waternsw.com.au/customer-service/service-and-help/forms>, viewed 20 May 2020.

782 Department of Environment, Land, Water and Planning (Victoria), 2018, https://waterregister.vic.gov.au/component/waterregister_reports/report/view?type=F4&rid=WS_039, viewed 20 May 2020.

783 MDBA, *Water Trade Price Reporting under the Basin plan Part 1: Basin State processes and procedures for collecting water trade price information*, 2019, p. 11.

water market for allocation and entitlement trades but this is limited to its members and not publicly available. Additionally, many IIOs also operate their own exchange platforms.⁷⁸⁴

Box 11.5: A snapshot of water information in Murrumbidgee – with and without using Waterflow

Looking at price and other related data without using Waterflow

The BOM's new fortnightly near-real time statements provide a snapshot of climate and forecasts information. This fortnightly statement also provides information on approved trades.

Then to obtain current price information, it is necessary (to gain a full understanding) to look at the public websites of (for example) H2OX, Key Water, Waterpool, Waterexchange, Wilks Water and Elders, all of which are either water market exchange platforms or brokers who publish offers via an online bulletin board service.

Waterexchange lists buy and sell offers inclusive and exclusive of trade approval authority processing fees, but does not specify brokerage fees as this can vary.






Looking at price and other related data with Waterflow

Waterflow⁷⁸⁵ aggregates and disseminates water information from a variety of sources. While many of the larger water market intermediaries now supply data to Waterflow, exchange platforms and brokers have no obligation to supply their buy and sell offer data. Waterflow relies on the BOM Water Markets Dashboard⁷⁸⁶ for recent trade data, and this information therefore suffers from quality and timeliness issues.

Information such as allocation announcements and storage levels is provided by Waterflow.

Waterflow consolidates all sell offers in the market for the zone chosen, and presents this in an easy to compare view.

Figure 11.1: Listings displayed by Waterflow for zone 11 on 10 December 2020

CURRENT LISTINGS			
> 	BEST PRICE \$210 / ML	MATCHED LISTINGS 17	MATCHED VOLUME 2,321 ML
> 	BEST PRICE \$220 / ML	MATCHED LISTINGS 4	MATCHED VOLUME 500 ML
> 	BEST PRICE \$260 / ML	MATCHED LISTINGS 4	MATCHED VOLUME 1,580 ML
> 	BEST PRICE \$270 / ML	MATCHED LISTINGS 2	MATCHED VOLUME 650 ML
> 	BEST PRICE \$300 / ML	MATCHED LISTINGS 1	MATCHED VOLUME 500 ML

Source: www.waterflow.io

784 Some IIOs have exchange platforms which are managed and run by a separate and independent company.

785 Marsden Jacob Associates, 2020, <https://www.waterflow.io/>, viewed 26 October 2020.

786 Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/dashboards/#/water-markets/mdb/at>, viewed 7 February 2021.

11.3.3 Stakeholders consider access to good quality water supply and demand information needs to be improved

Some stakeholders consider that better supply and demand information (including allocation announcements and IVT openings) is what is really needed to help market participants. For example, Argyle Capital Partners stated that ‘we suggest there is greater benefit to market participants through the provision of information in relation to:

- regional water supply including forecast supply (water allocation announcements) under different rainfall conditions; the volume of water allocations announced year to date; the volumes of water allocation used/applied year to date; the volume of supplementary water pumped/taken; the carryover volumes accessed year to date; conveyance volumes and constraints from region to region (zone to zone); and
- regional water demand including the relative returns for various competing crop enterprises; the relative scale (planted area and maturity profile) of various crop enterprises (annual and permanent); their resulting aggregate irrigation requirements year on year etc.⁷⁸⁷

Australian Dairy Industry Council’s survey of members also strongly indicates the importance of this type of information:

DA Survey Question: What information do you use to effectively understand and use water markets and products? (Choose all that apply)		
Answer Choices	Responses	
	Percentage	Number
Seasonal forecasts/updates on water availability and allocations	93.4%	57
Pricing in terms of current bids and offers for water market products	78.7%	48
Trade and carryover rules	49.2%	30
Production planning and water budgets	39.3%	24
Historical trading information including water market products and price	34.4%	21
Information on different water products and how they work	26.2%	16
Carryover limits for each valley	26.2%	16
Other (please specify)	0%	0
Total respondents for this question: 61		

Source: Australian Dairy Industry Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 15.

One factor that can diminish predictability in a market is inconsistent or unexpected timing of announcements or decisions in the market. Select Harvests Limited submitted that:

As an irrigator, SHV is required to continuously monitor seasonal conditions, trading opportunities and government announcements, to ensure we can trade water to our farms for consumptive use when required.⁷⁸⁸

Another submission articulated the impact of unpredictability and uncertainty around government announcements, and the timing of these. Marianne Graham submitted that:

‘By far and away, the largest non-transparent factor in the market are the unexpected announcements and non-transparency of the [Murray-Darling Basin Authority (MDBA)], Water NSW, NSW DPIE and Victorian Water Authorities decision.’⁷⁸⁹

787 Argyle Capital Partners, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

788 Select Harvests Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

789 Marianne Graham, *Submission to Murray-Darling Basin water inquiry interim report*, 4 December 2020, p. 1.

Under section 12.49 of the Murray–Darling Basin Plan, public announcements that are of a decision that relates to actions Commonwealth or Basin State agencies are undertaking and can be reasonably expected to have a material effect on the price or value of water access rights, are considered to be ‘water announcements’. Under section 12.50, water announcements must be made generally available. However, the requirements are not meeting stakeholders’ needs and transparency concerns remain.

For example, while the MDBA’s River Murray Weekly Report on 18 November 2020 flagged that an IVT call out would occur,⁷⁹⁰ stakeholders who had relied on the MDBA’s annual outlook were caught unaware and attributed this to a significant price increase.⁷⁹¹ The ACCC considers there is an opportunity to more explicitly highlight and draw attention to announcements that will have direct and possibly significant market impacts.

11.3.4 Confidence in current market data has been affected by quality issues

Insufficient access to comprehensive, consistent and accurate market data can create information asymmetries, which can reduce market efficiency (see appendix G for detailed discussion on data quality issues in register data). The key findings are outlined below.

Improvements in Basin State register data is needed to meet user needs

The ACCC has found that there is plenty of information capture in current water trading processes, and there are attempts to bring data together (BOM’s role), however the multiplicity of systems has resulted in poor quality and incomplete whole-of-market data. The lack of quality and timeliness of register data is undermining its usefulness for market participants, with participants often reporting that they will instead refer to exchange platform websites to see recently completed trades.

Each Basin State currently publishes information from their water registers, in line with the National Water Initiative (NWI) principles and objectives. While each state (except Queensland) has provisions in state water management legislation to both maintain and make available a public register which records water allocation trades, very little is specified in terms of what is recorded, how it is verified, time in which it must be made public, what must be made public and how it must be made public. This has led to each state developing different trading forms, recording information differently and publishing different information.

While detailed trade information is mostly available for both entitlement and allocation trades (noting that no water allocation trade (called seasonal water assignment) information is available in Queensland, and only share component trading is available in New South Wales), the datasets and user interfaces are inconsistent. The datasets also do not accurately report on price or product type (noting recent improvements in some states may soon make product data available). Furthermore, lags between trade agreement date and publication date can contribute to price dispersion and can create concerns about misconduct thus reducing market confidence.

The key issues are (see appendix G for further information on key data quality issues):

- Conflicting definitions of a water allocation trade and a water allocation transfer, making it difficult to compare across sources.
- Zero dollar/missing price trades due to inadequate trade forms (for example, less than 30% of IIO trades overall recorded a price, and over 30% of all trades (by number of trades) in the Southern Connected Basin were reported as zero dollar trades between water years 2012–13 and 2018–19).
- Trades within IIOs in New South Wales and South Australia are not captured on state registers, but they contribute a significant proportion of trade activity (between 1 July 2016 and 30 November 2019, the number of internal trades (including transfers) of temporary irrigation right was higher than the number of water allocation trades within New South Wales and South Australia, as recorded on the state registers)

790 Murray Darling Basin Authority, *Weekly Report 18 November 2020*, 2020.

791 Marianne Graham, *Submission to Murray–Darling Basin water inquiry interim report*, 4 December 2020, p. 1.

- Inability to distinguish commercial allocation trades, related or same party trades and other water products (the ACCC undertook trade categorisation analysis, see appendix G)
- Inability to distinguish broker facilitated (or broker as principal) trades, as lodgement pathway and authorised agent is not captured consistently
- Inability to see the strike date for approved trades, as this has been not captured on trade forms
- Lack of timeliness – resulting from lags between ‘strike date’, form lodgement and approval and then eventual publication (see appendix D, figure D.20 which shows that lodgement lags have a significant impact on price dispersion ratios)
- Diverse user interface with different reporting limitations and differing presentations of data across the states making it difficult to engage with what data is presented (for example, Victoria’s Water Register interface is very different to WaterNSW’s)
- Inability to ‘match’ trades on registers with bids and offers on exchange platforms (lack of common identifiers for transactions)
- Inconsistencies in what data on ownership is available (For example, the NSW LRS water title register allows for individuals to search the register by name, but this service is only available in person.)
- Inability to see full picture of interstate and inter-zone trade (with some register interfaces just showing movements in and out of zones, without showing origins and destinations per trade without downloading the data)
- While trading zones are used by some Basin States, New South Wales only provides information by ‘water source’, meaning data is published for the ‘New South Wales Murray Regulated River Water Source’ and it is not possible to identify the trading zones
- Different cleansing methodologies are applied to the data which can be difficult to identify
- For a potential regulator, issues also include the inability to identify individuals across states, or sometimes even within a state. A person may open multiple accounts or own multiple water rights under slightly different names. The lack of a requirement to record ABN or ACN, or other unique identifiers means that it is not then possible to identify individuals. Given there is no requirement to provide an ABN or ACN, the ACCC’s analysis of Basin State data indicates very low levels of recording – at just 4% of entitlements in Victoria recording with an ABN or ACN for the owner, and 18% in South Australia.⁷⁹² Corporations are required to provide their ACN in some instances. It is also not possible to identify related parties.

There is a need to implement ways for trade approval authorities and regulators to verify information. While the ACCC recognises that providing false and misleading information is prohibited through state based legislative mechanisms, there is a need to facilitate better data validation and verification – particularly to detect data entry errors.

There are some obvious necessary improvements, in relation to both information collection and information publication – for example, by requiring the reason for trade to be disclosed in trading forms, and ensuring that the list of reasons adequately covers evolving water market products and can respond dynamically.

The ACCC considers the centralisation of this information, with other water information, necessary to improve transparency (recommendation 12).

Water market information currently presented on BOM’s Water Markets Dashboard does not meet user needs

The ACCC found that both the quality of data that BOM receives from states and IIOs requires improvements, so too does the BOM user-interface and presentation of information.

For example, entitlement trade data include a mix of entitlement ownership transfers, changes to entitlement water volumes, IIO transformations (although the ‘core’ water right holder hasn’t changed) and some leases. The allocation trades data also consists of a variety of water product types, with

⁷⁹² See appendix G to this report.

forwards, options, transfers between a single owner's licences, shorter-term leases, and trades for environmental flows all included. These issues are not unique to BOM and stem from the same issues existing in Basin State registers.

BOM's data also suffers from quality issues in relation to price information not being subject to validation or verification, resulting in many zero dollar trades (although some legitimate non-commercial transfers) and outliers. BOM conducts data cleansing and publishes this methodology, however this methodology for both cleansing and calculating median price differs to that of other information providers. The ACCC also heard concerns that it was sometimes unclear what cleansing has been applied to data published by BOM, and the ACCC also considered that this information could be presented in a more accessible way.⁷⁹³ For example, BOM now removes allocation trades where the price is reported to be below \$5/ML or above \$10,000/ML.

The *Water Act 2007* (Cth) provides authority to the Director of Meteorology to issue mandatory National Water Information Standards, by legislative instrument.⁷⁹⁴ Once standards are issued, persons specified in the Water Regulations as required to provide BOM with information must do so in compliance with any applicable National Water Information Standards.⁷⁹⁵ The provision allows for standards to be issued in relation to collecting water information, water monitoring and measurement, through to water accounting.

However BOM has not used these provisions to create such mandatory standards but has instead taken a collaborative and voluntary approach with the states and IIOs in order to promote information standards and guidelines, and the BOM highlights the challenges in collecting data from many organisations all of which have their own documentation and business need requirements.

In summary, BOM has very few levers to improve data quality and timeliness, particularly in relation to missing data (such as strike date or price) and is reliant on the trade approval authorities collecting better quality data and being able to provide it to BOM in a more timely and automated manner. The provisions in the *Water Act* do also specify that in developing any standards, BOM must consult with the States in preparing the standards. The ACCC considers that such a consultative approach must be undertaken in developing any new provisions relating to standards as well.

The BOM is also conducting user needs analysis to inform the development of the information portal.

Better publicly available information on trade within IIOs is needed

There is currently a gap in available information on the trading activities within IIOs, and as discussed in chapter 10, some substantial trade activity occurs within these networks. Although, as described above, some IIOs report information to BOM, this current arrangement is not delivering good quality, timely or accessible information for the following reasons:

- Not all IIOs are required to provide data to BOM.
- Data is only required to be provided to BOM on a weekly basis.
- BOM's website makes it difficult to assess internal IIO trades.
- Price information is often missing.

793 Information is presented in the Help FAQ section of the Water Information Dashboard – see: <http://www.bom.gov.au/water/dashboards/#/common/help/faq>

794 Section 130, Part 7, *Water Act 2007* (Cth)

795 Section 126(b), Part 7, *Water Act 2007* (Cth).

Differing legislation and systems, as well as gaps in the current frameworks are a significant driver of transparency issues in relation to historical trade data

The ACCC considered the benefits in increasing ‘harmonisation across the Basin States’ registers through consistent terminology and data structures’ in the interim report, and sought feedback on the impacts of this preliminary recommendation. The MDBA submitted that:

The MDBA strongly agrees that more work is needed to improve the quality and availability of market data, and fully supports the ACCC’s preliminary options for improvement. In particular, the MDBA strongly supports the ACCC’s option to establish a trade processing and market reporting framework. However, there are some significant barriers to progress in this area and further incentives and legislative mandates may be needed to drive improvement under such a framework.

For example, under section 12.48 of the Basin Plan the obligation to report the price of a trade is on the seller. There is no requirement for Basin states to ensure that they accurately collect and record this information and there are limited levers for the MDBA to influence improvement in this area. The development of a trade processing and market reporting framework would need to be supported by a review of the legislated reporting obligations, to ensure reporting requirements match the data sought under the framework (i.e. reporting of irrigation and water delivery rights as well as water access rights) and the responsibility for data collection and reporting is clear and appropriate.⁷⁹⁶

Aither, New South Wales Government and WaterNSW have noted concern in relation to the costs, and particularly were concerned about ‘repeating unsuccessful past multi-jurisdictional efforts’.⁷⁹⁷

MFFA agreed with the ACCC’s findings in the interim report that current trade application forms and approval processes are strongly linked to the underlying legislation which defines tradeable water rights in each jurisdiction, and that legislation can act as a constraint to respond to stakeholders’ calls for improved water market information and transparency.⁷⁹⁸

Commonwealth Scientific and Industrial Research Organisation (CSIRO) have submitted that the best way forward in this respect is to make minor changes to existing terminology so that it can be translated (harmonised) more easily. This will also enable the states to maintain their own language where possible.⁷⁹⁹

Exchange platform and broker information is dispersed, with no central place to view all bids and offers

Information on buy and sell offers is failing to meet user needs. The ACCC has found the main issues regarding information on buyer and seller offers are:

- dispersion of offers across multiple platforms, while some are not published at all⁸⁰⁰
- a lack of regulation for brokers and exchanges means there are no obligations on brokers and exchanges to publish information and stakeholders may not trust information on these websites and consider they may not represent the ‘whole picture’⁸⁰¹
- Waterflow is relatively new in this space, and is still establishing itself as a known and trusted source – and is limited by the information published by other entities
- a lack of linkage between exchange and broker bids and offer data and Basin State register data means that it is difficult to trace how buy and sell offers ‘turn into’ actual approved trades.

796 Murray–Darling Basin Authority, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 10.

797 Aither, *Review of the Interim Report of the ACCC Water Market Inquiry*, 2020, p. 27.

798 Bureau of Meteorology, 2020, <http://www.bom.gov.au/water/awid/id-544.shtml>, viewed 8 May 2020.

799 Commonwealth Scientific and Industrial Research Organisation, *Submission to the Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

800 Peer-to-peer trading, or trading through some brokers will not appear online as ‘bids’ or ‘offers’.

801 The Robinvale Table Grape Growers Advocacy Group, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 5, and Almond Board of Australia, *Submission to Murray–Darling Basin water inquiry issues paper*, 5 March 2020, p. 16.

Allocation and IVT opening announcements can sometimes be unpredictable and insufficiently transparent, impacting prices

While the Basin Plan Water Trading Rules require water announcements to be made generally available, this requirement is not meeting users' needs. There has been concern that announcements are not predictable, and the underlying reasoning is not transparent – this is explored further in section 15.1.5.

For example, the recent 'interim Murrumbidgee allocation' neatly reflects the trade-off between flexibility and certainty. New South Wales DPIE demonstrated flexibility by allocating additional water to users a week earlier than it would have otherwise done, allowing users to use or trade that water earlier. However, the unanticipated deviation from the previously accepted schedule of announcements may have undermined some business decisions already made by water users, such as those who suffered as a result of potential price decreases from this announcement.

This example shows that flexibility in market architecture arrangements may inadvertently favour better resourced market participants such as dedicated traders over irrigators, who may be less likely to have access to market information at all times.

11.4 Some concerns about investors and brokers are related to information deficiencies

The ACCC also heard general concerns about misconduct, some of which have been fuelled by a lack of transparency and information deficiencies, as set out in section 6.3.

The ACCC found that many transactions which may appear suspicious upon first inspection were easily explained once the transaction type was known. Other transactions were misinterpreted as occurring on the same days due to differences between the trade approval date which appears on the register and the date the transaction occurred which is not public.

This supports the needs for the trade type and strike date to be collected by trade approval authorities and to be published on registers. This will increase confidence in trading activities, and increase the quality of register data.

Sections 8.6.3 and 6.3 explore these issues further.

11.4.1 Stakeholders are concerned about perceived information asymmetries

Stakeholders have concerns that intermediaries and large market participants benefit from information asymmetries. Concerns and ACCC views are summarised in table 11.4.

Table 11.4: Overview of main stakeholder concerns and ACCC's response

Water technology companies	Concern that intermediaries have access to greater information and that there are information asymmetries in the market. ⁸⁰²	<p>The ACCC considers that the role of intermediaries does generate rich transaction data which may not be available to others. The ACCC considers that the roles intermediaries play in the market offers many benefits, but that regulation is required to manage potential conflicts.</p> <p>The ACCC considers that improvements to market information (as recommended in chapter 12) will go towards addressing concerns arising from information advantage.</p> <p>Chapter 8 also proposes a general obligation to act in the best interests of the client and to disclose conflicts.</p> <p>Chapter 9 also recommends broadening the insider trading prohibition which address intermediaries taking advantage of some information asymmetries.</p>
Government bodies Researchers	Water market education is needed to assist participants make better use of information available and increase water literacy. ⁸⁰³	<p>While the ACCC considers that the primary issues are related to information quality and accessibility, there is also a role to improve water market education to enable better use of available resources. Such initiatives have been taking place recently, and include the initiatives by PIRSA⁸⁰⁴ in SA, and AgVic has also run water market seminars.</p> <p>The ACCC has also recommended a Water Market Education Program (see recommendation 13).</p>

A combination of factors (such as increased demand below the Choke increasing prices) has given rise to increasing concern that larger traders have access to information (and also technical ability) which enables them to take advantage of IVT openings. However, brokers have been playing a role in facilitating smaller parcels of water moving through the IVT constraints by aggregating parcels to increase chances of trade approval in the 'first in, first served' system (explored in section 8.10 of chapter 8).

11.4.2 Some stakeholders consider water ownership and trade details should be made public to improve confidence and expose misconduct

Lack of transparency of water trading has given rise to some stakeholders considering that the best solution to this is to create a national register of water ownership, which includes publishing names of individual water rights holders. There have also been Bills debated in New South Wales Parliament in this regard.⁸⁰⁵ Victoria has recently commenced publishing details for large water entitlement holders – to date, only the names of companies, since Victorian legislation currently prohibits the release of personally identifiable information.⁸⁰⁶

802 Civic Ledger, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 1.

803 Dr Lana Hartwig and Professor Sue Jackson, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8; Murray Darling Association, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12; Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

804 Department of Primary Industries and Regions, https://www.pir.sa.gov.au/primary_industry/industry_support/water_market_literacy_program, viewed 4 February 2021.

805 For example see: Water Management Amendment (Water Rights Transparency) Bill 2020, <https://www.parliament.nsw.gov.au/bills/Pages/bill-details.aspx?pk=3751>.

806 Department of Environment, Land, Water and Planning (Victoria), *Water Market Transparency – Options paper*, 2019.

The ACCC understands there have been calls for a national water register which publicly discloses the names and other identifying details (such as addresses, ABNs, ACNs) of entitlement holders. Also, some stakeholders have called for the names and other identifying details of significant traders to be made public.⁸⁰⁷

This issue has been topical for some time, with differing views – such as the Matthews Report concluding that:

...as water generally is a community-owned resource, members of the public have a right to satisfy themselves that it is being used in compliance with the law. The overall objective of publishing water management information and data in a transparent way that is accessible to the public is to improve compliance effectiveness and public confidence in the regulation of our water resources. Ken Matthews concludes that full transparency would add considerably to a more compliant culture among water users.⁸⁰⁸

In contrast, some stakeholders have expressed significant concern about personally identifiable details being made public. For example, CICL submitted that:

CICL... has concluded increased transparency of ownership is not relevant to improving the operation of the water market. As the ACCC has identified, it is behaviours if harmful that require regulation, not ownership.⁸⁰⁹

11.4.3 Information deficiencies need to be addressed to support effective market conduct regulation

Publishing ownership and trade details will not support efficient markets

The ACCC has found that it is not necessary to publish identifiable information in relation to water ownership or trading activities in order for market participants to understand trends in trading activity and trading opportunities. The ACCC's view is that investment to provide this kind of information is not likely to materially assist stakeholders to make trading decisions, and there are other transparency improvements which should be pursued first. The reasons for this are:

- Publication of identity details in many, if not most, cases is insufficient to classify a person or entity into classes of interest to stakeholders. For example, consider a trader name of 'Smith holding Ltd.' – in this case, the holder name provides no information on whether this entity is an irrigator or other water user. This may lead to unintentional or deliberate misuse of published information ('misinformation').
- Stakeholders may respond strategically to publication of entitlement details by taking action to 'mask' their identity (such as transferring entitlement holdings into the name of related parties with less identifiable names) – this outcome would work directly against the objective of improving transparency.
- The introduction of a Market Regulator and Market Conduct Rules (as recommended in chapter 9) will ensure that market monitoring, which includes access to names and trading activities, is conducted to detect any market issues.

Moreover, the ACCC considers that publication of identity details may have several drawbacks or unintended negative consequences:

- Publication may be inconsistent with personal privacy laws, particularly when relating to information on individuals.
- Publication may allow certain service providers with avenues to inappropriately approach individuals to pressure them to engage in trade.

807 ibid.

808 NSW Government, *NSW Water Reform Action Plan Transparency measures consultation paper*, 2020, p. 2.

809 Coleambally Irrigation Co-operative Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 17.

- Publication may allow inappropriate targeting of individuals or entities who are perceived to be engaging in inappropriate conduct, even where the conduct is lawful.

The ACCC continues to consider that a better approach is to balance transparency and privacy concerns by improving the quality, timeliness and accessibility of *de-identified* trade data, and at the same time to address concerns about misconduct or scope to 'take advantage' more directly (as recommended in chapter 9).

Addressing information deficiencies will work to improve market confidence and efficiency

Data consistency is required to support the proposed whole-of-Basin regulator. While there is currently no whole-of-Basin regulator, Basin States and the MDBA would have difficulty in using the existing information framework to investigate conduct of traders, both on exchange platforms and in trading forms to the Basin States.

The ACCC has faced challenges in piecing together a cohesive picture of trade to investigate misconduct, as outlined in chapter 6 and in appendix G.

The ACCC outlined some of these challenges in the interim report, and Citrus Australia submitted that 'the lengths the ACCC have had to go to obtain sufficient information to investigate stakeholder concerns are a testament for the need to improve collection, coordination and transparency of data.'⁸¹⁰

11.5 Insufficient transparency of decision making and how rules are made and applied contributes to uncertainty

Stakeholders expressed concerns about the difficulties they face in understanding how decisions are made, and how rules are applied. This particularly relates to allocation and carryover policies, although the concerns extend more generally.

Concerns and ACCC views are summarised in table 11.5 and table 11.6 below.⁸¹¹

11.5.1 Stakeholders consider government decision making in the Basin is not transparent

Some stakeholders have expressed some concern that although there are requirements to make decisions 'generally available', these decisions are having significant undesirable market impacts, which one stakeholder summarised as:

If you are looking at the factors that create instability and issue in markets I don't believe you can leave out the non-transparency of the Govt entities which have a huge effect on prices in the market and recently are very unexpected.⁸¹²

⁸¹⁰ Citrus Australia, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

⁸¹¹ Some of the information types in these tables were categorised as 'secondary information' in the interim report.

⁸¹² Marianne Graham, *Submission to Murray–Darling Basin water inquiry interim report*, 4 December 2020, p. 1.

Table 11.5: Overview of main stakeholder concerns and ACCC's response

Example of stakeholder types raising concern	Stakeholder concern / view	ACCC response
Irrigators IIOs Exchange platforms	Lack of transparency of allocation decisions and later announcements leads to difficulties in planning water use and trading strategies, and can increase water prices. ⁸¹³	The ACCC considers that while the states are meeting their requirements to make allocation determinations generally available, there are still concerns that the underlying policies do not allow individuals to predict or accurately anticipate these announcements, particularly due to a lack of clarity over how discretion is being applied by water managers.
Investors	There is a need to increase transparency and communication of water allocation and river operation decisions. ⁸¹⁴	The ACCC agrees there is scope for improvements to the transparency of allocation decisions and how river operations decisions are balancing conflicting objectives.
IIOs	Policy changes should only occur if the need is strongly demonstrated as being in the interests of good water stewardship within the MDB and there is a rigorous cost-benefit assessment. ⁸¹⁵	The ACCC is aware of the significant costs and disruption that will be caused by pursuing more substantial policy reforms, as well as the presence of 'reform fatigue' among many market participants. For this reason, the ACCC recommendations in chapter 16 focus on 'no regrets' changes, supported by further work to improve the evidence base on issues before pursuing major reforms.
Irrigators	Current and past decisions about trading rules do not adequately or transparently take into account how trade and use of traded water affects volumes in storage, river operations and conveyance losses. This concern about trading rule decision making also spurs a general concern about third party impacts of trade, affecting attitudes towards trading in general. ⁸¹⁶ Lack of transparency in how conveyance losses are calculated and where financial liability for losses should accrue. ⁸¹⁷	The ACCC considers that there are information gaps in this regard. Without the deployment of improved technologies and modelling to better capture this information, this issue will remain. Proactive steps to investigate and publicise findings on the factors influencing entitlement reliability will help improve market confidence.
Irrigators	Current and past decisions about access to carryover do not adequately or transparently take into account how carryover affects entitlement reliability or timing or allocations to entitlement holders. This affects water markets by creating uncertainty about supply and demand. This concern also leads to perceptions of unfairness, affecting attitudes towards water markets and water policy in general. ⁸¹⁸	The ACCC has found that carryover use can potentially impact entitlement reliability through affecting spill risk, forfeitures and evaporation losses. While spill risk impacts appear relatively well managed, and forfeiture impacts are relatively small, the ACCC does recommends that Basin State governments cost evaporation losses to individuals to control for third party impacts.

813 Australian Grape and Wine Incorporated, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 7; Water Find Pty Ltd, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 6; Deborah Arthur, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 1.

814 Aware Water Group Pty Ltd, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

815 Renmark Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7.

816 Murrumbidgee Valley Food and Fibre Association, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 4.

817 Riverina and Murray Joint Organisation, *Submission to Murray-Darling Basin water inquiry issues paper*, 5 March 2020, p. 6.

818 Marieann Westerhoff, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 1; Robert Caldwell, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 1.

11.5.2 Stakeholders consider that trading rules, allocation and carryover policies are too complex, too dispersed and not transparent

The ACCC heard concerns that important information, such as allocation policies and river operations policy, which can significantly impact water pricing, are inadequately communicated to the irrigators and traders who rely on these to make business decisions.⁸¹⁹

Table 11.6: Overview of main stakeholder concerns and ACCC's response

Example of stakeholder types raising concern	Stakeholder concern / view	ACCC response
Irrigators	There is inadequate information 'for the public to understand market operations, what is driving policy change/or external influences on market directions.' ⁸²⁰	The ACCC considers that the lack of transparency relating to allocation policies and announcements allows for distrust to arise, and in some instances misconceptions to prevail. Chapter 16 recommends that the states commit to improved transparency of the inputs, assumptions and administrative decision making involved in determining allocation announcements.
Irrigators Councils	Concerns that information about market architecture, including carryover and allocation policies, and trade and intervalley trade (IVT) rules is difficult to find, lacks clarity and is complex, making it difficult to make informed trading and water use decisions, and to assess current and likely future conditions based on currently available information. ⁸²¹ Concerns that IVT rules are opaque ⁸²² and access to opportunities is unequal (lack of a 'level playing field'). ⁸²³	The ACCC has observed that many policies have developed over time and often in response to water management issues that differ between areas in the Basin, creating complexity and many differing rules. The ACCC has considered this complexity in light of other market architecture and governance changes, and considered that the first step for market architecture reform is to better communicate policies and increase transparency of policy documents (both how the documents came about (decision-making) and transparency of what the policy means in a practical sense).
Irrigators	Concerns that insufficient information on water in storage is available to make credible assessments of current and likely future conditions; in particular, that insufficient information is provided on the volume of carryover in storage, making it difficult to predict likely allocations using only aggregate storage data (e.g. dam levels). ⁸²⁴	The ACCC has observed that aggregate (see recommendation 15) storage data (e.g. dam levels) is an insufficient basis for predicting future allocations, but that Basin States have generally made insufficient effort to refocus attention on other relevant data points, such as storage inflows. The ACCC considers Basin States could provide better information to help users understand how existing volumes in storage, and past and expected future inflows, relate to future allocations.

819 Murrumbidgee Valley Food and Fibre Association, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

820 Murray Valley Private Diverters, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

821 Almond Board of Australia, *Submission to Murray–Darling Basin water inquiry issues paper*, 5 March 2020, p. 18.

822 Fruit Growers Victoria Ltd, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 3; Almond Board of Australia, *Submission to Murray–Darling Basin water inquiry issues paper*, 5 March 2020, p. 18; Leeton Shire Council, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

823 New South Wales Irrigators' Council, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 2; Barossa Infrastructure Limited, *Submission to the Murray–Darling Basin water inquiry issues paper*, 30 January 2020, pp. 3–4.

824 The Australian Farming Services, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 2.

11.5.3 Confidence in decision making has been impacted by lack of transparency

There are multiple factors which are currently impacting on the transparency of decision making in the Basin. Primarily, it is driven by the fragmented governance arrangements and insufficient provision of easy-to-access and easy-to-understand information. Improvements in relation to governance are addressed in chapter 17, and some specific recommendations in part 5 of this report.

The MDBA commented on how it is improving transparency:

Work has been started to improve the transparency of the information including improving the quality and relevance to users of the information routinely published on the MDBA's river operations activities, and examining how to improve the information that it is required to publish about water access rights, based on previous advice provided by the ACCC.⁸²⁵

The ACCC considers the centralisation of this information, as well as transparency of actual governance arrangements (clarity of who does what), with other water information, necessary to improve transparency (recommendation 12).

Difficulty in accessing and understanding different trading rules may be a factor explaining preferences for intrazone trade

The ACCC found a preference among traders for intrazone trading (see appendix D). While this preference may reflect the lower transaction costs of intrazone trading (ease of finding trading partner, lower trade approval application fees and shorter trade processing times), it may also be the case that this preference arises from the relative ease of only needing to understand the trade rules that apply to a limited number of zones.

The ACCC considers that making information on trading rules more consistent and accessible may assist market participants to make better informed trading decisions and make better use of interzone trade opportunities.

Allocation announcements and other decisions need to be better communicated to the market

The ACCC found that some information about allocations, managing extreme events and delivery risks and issues are not well communicated to the market. Additionally, over time, the relationship between dam volumes and allocation determinations in New South Wales has changed, likely due in part to the impacts of carryover and changes in state shares. This has contributed to views that there has been a change in how allocations are made, which heightens the importance of improved transparency of how these decisions are made.

While the ACCC heard concerns about New South Wales's allocation policy and that changes had been made to it, the ACCC could not identify any changes to the actual policy. These misconceptions and understandings about allocation policies are inhibiting market confidence and contributing to distrust of water management agencies more generally (see section 15.1 for more detail). There is a need for improved transparency around decision making and the inputs and calculations involved in these decisions.

Information on entitlement reliability, allocations and carryover policies needs to be improved and available in one place

The ACCC acknowledges that stakeholders' stated difficulty in understanding carryover arrangements partly reflects the wide range of carryover policies in place for Basin water resources, and that different arrangements are necessary to some degree because of the underlying hydrological differences, storage characteristics, the make-up of entitlements on issue, and allocation policies for the relevant water resources. However, the basis for carryover policy settings (and implicitly, the differences between carryover policies) does not always appear to be well-explained to relevant entitlement holders.

825 Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

Stakeholders' experiences also reflect that information about carryover arrangements has not always been provided in a consistent way across the Basin. Victoria and South Australia both have easy to find information on their carryover policies.⁸²⁶ New South Wales also recently consolidated its water accounting rules summary which lists carryover and account limits.⁸²⁷

The ACCC also observes that, due to carryover and other influences, dam levels are no longer as reliable as a proxy for allocation levels (see section 15.1.6). Where there are changes in policies that change water system operation, Basin States need to highlight this to stakeholders. Without this information, it is more difficult for market participants to manage their risks and confidently plan their water trading and use strategies.

More generally, the ACCC considers that a lack of easy-to-find information about all policies, including carryover arrangements and its impacts on storages and markets, leads to confusion and reduces water holders' confidence to participate in the market. This reduction in confidence and reluctance to participate in the market prevents water being traded to its most economically efficient use and inhibits the opportunity to improve welfare. The ACCC considers centralisation of information in more detail below at 11.7, and provides further details on the recommendation in chapter 12. Section 13.4.4 considers the inconsistencies in policies and requirements across the Basin in more detail. As noted in section 14.1.8, the ACCC considers Basin States should work to improve understanding of how entitlement reliability, allocations and carryover policies work.

It is not possible to track and trace water from allocation to use

Water trading does not always involve one single transaction between a buyer and seller. This is because of the many trading zones and markets that exist within the basin, and the level of risk that participants are willing to engage in differs, so some traders will aggregate and move water to zones where there is demand. This has given rise to aggregation services being offered by intermediaries to reduce transaction costs for traders and increase the likelihood of a parcel of water being traded through IVTs where there are limited trading opportunities. Some IIOs also offer pooling services to reduce transaction costs. However, this practice further complicates understanding where water was originally allocated and where it is eventually used.

For a regulator to assess the 'life-time' of a megalitre of water within the basin, it would need to be 'tagged' from allocation and tracked through each subsequent trade or transfer, or carry over until it is eventually used.

Section 13.5.1 explores the various reasons why tracking water can help to create data that is fit for purpose in measuring water market impacts. Insufficient data showing where and when traded water is being used, and the lack of connection between bulk and retail water accounting, make it harder to definitively determine the role of trade in contributing to issues observed in water markets.

11.6 Looking forward: change is needed to improve information quality and flows

The ACCC's view on informational needs of market participants is outlined at section 11.1.2 above. This section sets out specific aspects that are needed to deliver this information in a timely, consistent and easily accessible way, while also ensuring the information is of high quality.

Chapter 12 then sets out a detailed recommended reform package for information transparency and trade services improvements to meet these needs.

826 Department of Environment, Water, Land and Planning (Victoria), n.d., <https://waterregister.vic.gov.au/water-entitlements/carryover/carryover-rules>, viewed 7 February 2021; Department for Environment and Water (South Australia), n.d., <https://www.environment.sa.gov.au/topics/river-murray-new/information-for-industry/south-australian-private-carryover>, viewed 7 February 2021.

827 NSW Department of Planning, Industry and Environment, <https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/accounting-rules-summary-dashboard>, viewed 4 February 2021.

11.6.1 Standards for data collection need to be implemented

While transparency concerns in some sense are connected to improving the publication/dissemination of information, in other cases the real need is to introduce data collection and sharing standards to improve data quality. A key example is price of water trades, whereby the information is sometimes not collected, resulting in issues in publication.

The introduction of water market data standards might build on existing legislative provisions, for instance the National Water Information Standards provisions in the *Water Act 2007* (Cth) could be updated. Alternatively, it could involve a single body (for example, the recommended Water Markets Agency) ensuring compliance with comprehensive and mandatory data requirement standards, which could be in the form of a code or primary legislation. The standard can extend to the way in which information is collected, and BOM is already working with Basin States to harmonise terminologies for more consistent reporting of water market information as part of the development of the Murray-Darling Basin Water Information Portal.

Australian Government and Basin States governments should review terminology to identify where it can be harmonised or standardised, and where barriers to the collection of information can be removed or reduced (such as any lack of authority to collect certain information).

The current data issues which flow from this mismatched language and processes is well described by BOM, that 'the variety of methodologies and practices employed in collecting, managing and transferring this data means that it is difficult for other data customers to determine the fitness for purpose of the data and any derived information. The Bureau's role as the national water information provider has highlighted the difficulties in producing national information from data collected in different ways and without reference to agreed or commonly applied standards and guidelines.'⁸²⁸

Examples of completed and implemented standards and guidelines in water information are:

- National Industry Guidelines for hydrometric monitoring⁸²⁹
- the National Industry Guideline for water quality metadata⁸³⁰ (non-mandatory Australian industry recommended practice)
- the Water Accounting Standards 1 and 2.⁸³¹

The Bureau has exercised some of its powers in relation to water market data and has issued a Water Data Transfer Format, which specifies that certain data providers are required to provide specified water information to the Bureau in XML format.⁸³²

Setting up the correct mandate for information collection also requires funding, as outlined by NSW Irrigators' Council who submitted:

IIOs have expressed that they don't have the powers nor capacity to verify information provided by customers/brokers. The onus of accuracy in information provided to IIOs must rest on the customer providing the information.⁸³³

The pathway forward for reducing reporting burden, increasing information flows, and developing standards and a mandate to collect and verify information is explored in chapter 12. Part 5 of this report also includes relevant recommendations in terms of collecting more data, such as recommendation 17 which outlines the ACCC's view on the need to strengthen existing commitments to better metering and measurement of water take across the Basin. In addition, recommendation 15 outlines the need to fill some gaps in relation to decision-making transparency.

828 Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/standards/aboutStds.shtml>, viewed 21 December 2020.

829 Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/standards/niGuidelinesHyd.shtml>, viewed 21 December 2020.

830 Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/standards/niGuidelineWQmetadata.shtml>, viewed 21 December 2020.

831 Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/standards/wasb/awas.shtml>, viewed 21 December 2020.

832 Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/regulations/dataDelivery/overview/wdtdFormat.shtml>, viewed 21 December 2020.

833 NSW Irrigators' Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 20.

11.6.2 Standard reporting from registers needs to be developed

While the method for publication is discussed below, and further in chapter 12, there are some key variables from register data that should be collected and published in a standardised manner by each Basin State going forward:

- product type (for example lease, forward, option)
- strike date
- match type (was it negotiated, was it automatically matched on a platform)
- lodging party type (was it lodged by a broker, off-market)
- lodging party name and broker company (not to be published).

Additionally, bids and offers, and trade within IIOs, must be more transparent and able to be shared to link to register data. Standards for providing this information should also be made (see chapter 12).

The ACCC considers mandatory service standards for data publication should be introduced, and could build on the existing COAG service standards for trade processing. The publication standards should include timeframes (either real-time from trade approval or near-real-time) and also include a standardised publication format, where possible (extending to market information, beyond the current Australian Water Account Standards).⁸³⁴ These standards could also include publication of other information, beyond only historical approved trades. This is discussed further as part of the recommendations package in chapter 12. The recommendation package aims to deliver the right level of data quality and transparency needed for information users such as irrigators, policy makers and regulators.

11.6.3 Transparency obligations on intermediaries are needed

The ACCC has recommended (recommendation 1) that intermediaries should have obligations to report specified and standard information in the specified format to a central repository (see discussion of the proposed Backbone Platform in chapter 12). This obligation should include data on bids and offers from exchange platforms (including platforms run by irrigation infrastructure operators (IIOs)), and trade data from Basin State and IIO approval authorities.

The ACCC considers this data reporting by intermediaries could best be achieved by using 'compliant by design' software which packages and transmits the intermediaries' data into the required format as specified by a Digital Messaging Protocol (see chapter 12 for further detail).

As discussed in chapter 9, the ACCC also recommends that to address the enforcement challenges with price reporting obligations, the obligation should be relocated from the Basin Plan water trading rules to the new centralised integrity and conduct regulation, and be enforced by a new basin-wide regulator, or existing centralised regulator (see chapter 16 for more information about governance options).

There is also a need to place obligations on intermediaries to disclose certain information to their clients, to reduce information asymmetries. Such obligations are explored in chapter 9. This covers information that is not necessary to be published, but must be provided to clients

11.6.4 More information on governance processes, decision making and rule making should be made available

There has been increasing scepticism and concern expressed by some stakeholders in relation to river operator decisions and the trade-offs river operators make to manage delivering water. Stakeholders want to know more about how these trade-off decisions are made. Section 17.4.4 deals with these with recommendations to improve the transparency of decision making and rule making processes.

In relation to IIOs, the ACCC recommends (in chapter 9) that people with access to information about upcoming amendments to IIO policies, before that information is made public, should be prohibited

⁸³⁴ Bureau of Meteorology, n.d., <http://www.bom.gov.au/water/standards/wasb/awas.shtml>, viewed 7 February 2021.

from using that knowledge to gain an unfair advantage in the market. The ACCC also recommends that the IIOs should generally increase transparency of such decisions and reasons for decisions.

The ACCC also considers that information on water announcements needs to be better communicated to the market, and has recommended that such information be made available on the Water Market Information Platform.

11.6.5 More information should be available to regulators and River Operators

Currently, no market participant, regulator or policy maker has access to the complete picture of water trading or water movement. The ACCC considers that the proposed market regulator should also be given access to comprehensive and identified⁸³⁵ data feeds on water market activity for surveillance and reporting purposes. This will enable the regulator to monitor the market, analyse trade data across the Basin, and detect any misconduct.

Chapter 14 details what further information should be made available to better support river operations. Information on water storages, levels of carryover, and available water also need to be more transparent. Measures to achieve this are discussed in chapter 14 (in terms of content) and chapter 12 (in terms of the mechanism, being the Water Market Information Platform).

11.6.6 Accessible and good quality data must be coupled with improved water market consultation and education

While the ACCC found that the primary need is to build resources to make information more accessible, there is also need to engage in meaningful consultation and increase water market education. This will ensure that the water information recommendations (chapter 12) are able to deliver the greatest benefit to users, and reduce existing asymmetries where larger players are likely to make better use of existing information. Recommendation 13 outlines a proposed water market education program.

11.6.7 A materiality trigger is needed to determine what information needs to be published

The Basin Plan Water Trading Rules specify that a water announcement must be made generally available and is defined as:

- (a) an allocation announcement;
- (b) a carryover announcement; or
- (c) a public announcement by an agency of the Commonwealth or of a Basin State that:
 - (i) is of a decision that relates to actions that the agency is undertaking, or may or will undertake; and
 - (ii) can reasonably be expected, if made generally available, to have a material effect on the price or value of water access rights.

An announcement is considered to have a 'material effect on the price or value of water access rights' if the announcement is reasonably likely to influence persons who commonly acquire water access rights in deciding whether or not to acquire or dispose of such rights.⁸³⁶

The ACCC considers there is the need to expand the scope of this requirement to cover 'market moving' announcements more generally, including announcements made by non-government entities.

The ACCC notes this rule only covers a limited set of decisions or announcements that are likely to have a material effect on water markets; the scope is limited to announcements by government agencies, and does not cover decisions which are not intended to be announced (even though the impacts of

835 In this context, an 'identified data feed' is one which contains personally identifiable information, such as the names of traders.

836 Basin Plan, 2012 (Cth), s12.49.

an unannounced decision could still have ramifications for water markets⁸³⁷). It is also limited to water access rights; meaning it does not apply to other types of tradeable water rights, such as water delivery rights and irrigation rights.

There is no consistent framework to release information from the water registers in the Basin States. While the *Water Act 2007* (Cth) and state water management acts set out broad objectives and principles for water registers and water information, the only obligation in the *Water Act 2007* (Cth) is placed on BOM to publish the Annual Water Account.⁸³⁸ BOM is then also given the discretion to publish more regular reports on water information.

The *Water Act 2007* (Cth) does not contain any standards on what information and how frequently the states should publish water register data. The state water management acts, while setting out broad principles for water registers, lack a requirement to publish regular and timely data. Most states only have a requirement to make water registers available for public inspection⁸³⁹, without setting how this is to be made available or what information is to be presented. New South Wales also currently includes an ability for the Minister to 'restrict access to information in the Access Register or any part of the Register'.⁸⁴⁰ Victoria's Water Act includes a purpose provision which outlines the register has a specific information and transparency role, where it is to provide 'records and information about ownership and use of water-related entitlements'.⁸⁴¹ New South Wales Water Minister Melinda Pavey proposed some amendments to the Water Register provisions in the *Water Management Act 2000* (NSW) in 2020, but these were voted down in the Legislative Council. If enacted, these amendments would have required 'public access to information in Access Register' and information 'to be made available through an electronic search facility on a publicly accessible website'.⁸⁴²

Therefore, the ACCC considers the framework discussed above provides a basis from which to develop a similar threshold test in relation to publication of all water information (including water register data), not just decisions. That is, in considering what information or data needs to be made available, the relevant test should also be whether publication of the information is likely to reasonably influence decisions to acquire or dispose of tradeable water rights.

While such a trigger is necessary, the ACCC considers that there is already substantial information available in relation to water markets. As such, the main recommendations in this regard are to improve the ways in which current information is captured to improve quality and to fill some small gaps, and primarily to improve the publication of data by creating more accessible data.

11.6.8 A 'single point' is needed to make information available to the market

There is a need to create a central point of publication for all water information, and for this central point to be accessible, standardised and provide high quality and timely data and information. The first step is understanding user needs and removing lags from trade data. The ACCC is supportive of BOM's current approach to consultation, and understands BOM is now consulting with a broad range of water information users to understand the varying needs and how the new portal can cater to these.

Governments and industry need to build on current efforts to improve the quality, timeliness and accessibility of information relevant to the water market. This should include more effective ways to involve and consult with IIOs and frontline operators.⁸⁴³

837 Example of such decisions include decisions about how much water in storage to hold as reserves, which affects allocations to entitlement holders and therefore may impact both supply and demand for tradeable water rights; or river operations decisions which affect deliverability, spill risk, or intervalley trade account balances.

838 *Water Act 2007* (Cth), s. 122(1).

839 For example, s. 241(4) of the *Landscape South Australia Act 2019* (SA) and s. 71J(1) of the *Water Management Act 2000* (NSW).

840 *Water Management Act 2000* (NSW), s. 71J(3)(b).

841 *Water Act 1989* (Vic), s. 84B(a).

842 NSW Legislative Assembly, Constitution Amendment (Water Accountability and Transparency) Bill 2020, First print, Proposed amendments.

843 Coleambally Irrigation Co-operative Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

The ACCC considers that MDBA's submission to the interim report succinctly summarises the information issues and the balancing act in deciding what and how information should be published:

Increasing access to information is important to support water holders to make the best use of their water assets. However, there are disparities in water holders' capacity to use the information available. Complex information favours those who can access the expertise needed to analyse information and take advantage of opportunities. Improvements to information need to be guided by users in terms of the type of information, level of detail, and access channels that suit their needs. Improvements should be complemented by education activities to ensure improved decision making. Dissemination of information also needs to be managed to ensure equal access and avoid creating opportunities for arbitrage.⁸⁴⁴

Along with these responses and continuing concerns, many submissions also supported the preliminary findings and recommendations on transparency and the need to harmonise and coordinate data collection and reporting.⁸⁴⁵

Water markets have evolved beyond the original National Water Initiative (NWI) commitments and current data collection and sharing processes are not sufficient. The ACCC's view is that water markets are now reaching the point where both opportunity and necessity to deliver more transparency are aligning:

- governments have largely settled key aspects of setting the 'cap' aspect of the 'cap-and-trade' system: even though the 'gap' is not yet 'fully bridged', and differing views remain on the final portion of water recovery, many water resource plans have been accredited by the MDBA and there is less need for states to focus on the 'cap' aspect, leaving more room to focus on the 'trade' aspect
- new digital tools are reducing the costs of information provision and allowing for user-centric delivery models
- climatic changes and changes to demand profiles mean users need a 'complete picture' of water availability, allocations, delivery risk, spill risk, price and climate forecasts outlook
- water markets have matured to the point of developing products which do not neatly fit into the simple 'allocation/entitlement trade' paradigm envisaged under NWI commitments.

844 Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

845 Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5.

12. Recommendations to improve trade processes, transaction costs and information

Key points

- Trade-related services are crucial to water market operations, but they currently adversely impact transaction costs and transparency.
- Market participants have variable access to information to make trading decisions, experience inconsistent transaction costs and have inequitable access to trading opportunities. This hinders the efficiency of water markets.
- Trade approval processes and the accuracy and availability of water market data need to be improved, simplified and standardised across states and trading zones, particularly within the Southern Connected Basin. Minimum standards and agreed processes need to be consistent and mandated, not aspirational or voluntary.
- Improved integration is needed between private exchange platforms, trade approval authorities, and water registers, along with better integration of irrigation infrastructure operator (IIO) registers with broader water accounting, trade processing, and information frameworks.
- Water market information needs to be available in one place, be easily understood, be made available quickly, and presented in a way users can easily customise. There needs to be greater use of innovative digital technologies to deliver water market information in 'user-centric' ways.

The ACCC recommends a suite of actions to address these issues. These actions build on and extend various current initiatives by governments and private trade service providers.

The key recommended actions are:

- Trade approval processes and digital systems should be upgraded to ensure a 'level playing field' for traders in the Southern Connected Basin.
- Reshape and harness current initiatives, such as the Murray-Darling Basin Water Information Portal, to prepare to transition towards broader change.
- Implement Water Market Data Standards, to improve the quality and sharing of information across the Basin.
- Invest in three key pieces of digital infrastructure
 - a Digital Messaging Protocol, which will use software and code to share the information required in the Water Market Data Standards
 - a digital platform (referred to as a Backbone Platform in this report) to act as a central hub that will facilitate digital connections between trade service providers, river operators and water market regulators
 - a public-facing central information portal to make disparate information and data accessible in one place.
- Implement a Basin-wide water market education program to give market participants a better understanding of water products and trading rules.
- Implement digital tools to track water allocations to support regulatory oversight and potential policy options to better manage interzone trade and delivery issues.

While governments have a key role leading and resourcing these recommendations, this package should be designed and implemented in close collaboration with private trade service providers such as brokers, exchange platforms and IIOs. Water market participants also need to be consulted in an ongoing, meaningful way to ensure all initiatives are developed in a manner that is fit for purpose and meets their needs.

12.1 Water markets need increased digitalisation of trade services, improved data quality and improved data flows

The ACCC's findings on trade services, transaction costs and information transparency – presented in detail in chapters 10 and 11 – are that while the current state of trade-related services are enabling the market to function, significant improvements are needed. Core market information such as price and 'strike date' are siloed, and there is insufficient integrity within datasets and ability to link datasets to enable effective monitoring of market activity (also explored in subsection 5.5.1 in chapter 5). Although there are significant recent and ongoing initiatives to address these market deficiencies, the Basin States and other trade service providers are generally not making best use of the available technologies, meaning that trade applications, trade data and water accounting data are created and stored in outdated, disconnected systems.

This chapter provides the ACCC's recommendations on how to improve trade services and leverage digital technologies to secure the necessary improvements to enhance the *quality* and *flow* of water market information, and to streamline trade approval processes to reduce costs and increase consistency and transparency for market participants.

The digital transformation of trade services is already underway. The ACCC considers now is the opportune time to shape how the digital transformation of trade services can benefit more market participants, and improve market efficiency by allowing the market to function better. At the same time, this transformation should facilitate the data flows needed to provide necessary oversight of the market and improve river operations to generate improvements in market architecture (discussed at 14.2.3 in chapter 14).

Further, the need to create data feeds for the proposed market regulator (see chapter 9) offers the opportunity to leverage that change to develop new, multipurpose digital infrastructure to support a variety of trade services. While transformational change will not be without costs, the ACCC considers the overall net benefit in delivering market efficiency is likely to be substantial. The market architecture recommendations (discussed in chapter 16) also propose significant enhancements to data collection, storage and sharing; in fact, the first step in implementing broader structural changes to the market architecture is to improve the information basis and data flows which underpin market architecture and river operations decision making. For example, water usage is not currently metered in the same way across the Basin, and there is a need to move to more timely, consistent and accurate metering to better understand usage.

12.2 Water markets are already on a path of increased digitalisation

Australian and Basin State governments have recently made a number of announcements regarding new digital tools and projects to increase transparency, complementing initiatives and improvements already underway by industry and Basin State government agencies (see section 11.2). The current trajectory points to an increasingly complex network of unharmonised data flows and digital infrastructure, which will be challenging for regulators to navigate, can introduce uneven playing fields in some circumstances and will be unlikely to deliver the 'whole-of-market' transparency stakeholders are calling for.

Private water market participants are also taking their own initiative to increase and improve digital connections for trade in the Basin. This includes an exchange platform's use of the Victorian Broker API⁸⁴⁶ and Waterexchange's custom-built digital connections to some IIOs and Sunwater. While this digitalisation of trade services and data flows shows that public and private entities are responding

846 The Victorian Water Register's application programming interface (API) allows a user to 'build [their] own computer system to directly link via an API to the Victorian Water Register – this may be useful for brokers and exchanges who do a large number of trades. This API gives [the user] the same facilities as the Broker Portal and is subject to the same Agreement.' See <https://waterregister.vic.gov.au/water-trading/my-water>, viewed 6 February 2021.

to demand for improved information and trade services, it also inevitably means that some areas are developing faster than others, and that multiple entities are solving similar problems in different ways.

Technological advancement in trade services is not all that has occurred; there have also been advances in institutional frameworks for data sharing. In particular, the Bureau of Meteorology has been developing bilateral and multi-lateral data sharing arrangements as part of its hydrometric sensing project (see section 11.2.3). While these arrangements currently focus on the Northern Basin, and in several cases are highly tailored to a specific project or initiative, they lay a foundation that can be built on to improve data sharing for water markets and water management more generally.

The existing digital connections and initiatives underway demonstrate that trade processes are already on a path to digitalisation. These technological and institutional innovations are gradually improving water data and data flows, but in a piecemeal way. Without structured reform, the ACCC considers trade service providers – both public and private – will continue to form many-to-many information and data-sharing relationships. This may ultimately lead to higher barriers to entry for new participants into the trade service sector (intermediaries or information services) as new entrants will be required to establish multiple connections in order to conduct trades or aggregate data for customers. The plethora of different custom-built technologies may also be difficult for water market participants to navigate, making it harder for them to compare trade service providers and inhibiting their ability to make optimal trading decisions. The ACCC considers there is an opportunity to reshape this trajectory before these types of linkages become too bespoke and result in these kinds of issues or barriers.

12.2.1 A vision for where trade services could go with the proposed recommendations

The ACCC has evaluated the current state of digital transformation processes and projects currently underway in Basin water markets to assess the potential benefits of options to improve trade services and transparency. The recommendations presented in this chapter seek to address the identified shortcomings by introducing:

- Water Market Data Standards: comprehensive data and technical standards to achieve standardised and comprehensive data collection and data-sharing
- a Digital Messaging Protocol: ‘compliant by design’⁸⁴⁷ software for trade service providers to comply with standards and make efficient connections between entities
- digital infrastructure to achieve interoperability to improve the access, use and performance of trade services: in particular, a Backbone Platform to act as a central hub for trade services and a central data repository, and a public-facing Water Market Information Platform.

In addition to these central recommendations, a number of other complementary actions are recommended.

These recommendations are discussed in detail in the following sections.

Table 12.1 compares the current state of trade services, the likely future trajectory in the absence of recommended changes, and the anticipated future state if the proposed recommendations are adopted.

847 Meaning software that packages and sends data for regulatory purposes. This means that data holders are not required to manually intervene in data production and can send data directly from systems.

Table 12.1: Digital infrastructure for Basin water markets: current status and future trajectories

Current status	Likely status quo future trajectory	Anticipated future trajectory with proposed recommendations
<p>Traders look across multiple websites to find the current market price and get a sense of the current market depth. Traders also have limited or no ability to identify where a parcel of water is advertised via multiple intermediaries.</p> <p>Additionally, there are many off-platform bids and offers which traders will never see and are not digitally recorded.</p>	<p>Websites like Waterflow bring together bids and offers into a format similar to Realestate.com.au. Waterflow is continuing to have more brokers sign up, increasing its coverage. However, some data quality issues will persist as not all bids and offers are published on websites, and there is no obligation to update websites. Waterflow scrapes the websites of these brokers and exchange platforms, and some brokers present things differently such that Waterflow needs to 'translate' information. Most of these translations are now automated.</p> <p>Government initiatives to improve information transparency will make historical trade data easier to access, but still do not integrate data from private service providers such as exchange platforms, and do not adequately address data quality issues.</p>	<p>The proposed data standards and digital infrastructure will enable data quality checking and validation in 'real-time'. For example, water product type and price information will be fed directly from the exchange platforms and brokers' systems into trade forms, reducing errors and increasing consistency. The proposed Backbone Platform infrastructure will also be a central hub for translating information, meaning that regardless of the trade type or region, the brokers and exchange platforms will feed the necessary data into the Backbone Platform and the platform will then determine what information to send where. Housing this functionality within the Backbone Platform means that it can also assist in reducing the conflicts of interest that have been reported about IIOs, as only the information that the IIO requires to approve the trade and update accounts will be sent from the platform to the IIO.</p> <p>The proposed Digital Messaging Protocol will ensure that all bids and offers lodged via exchange platforms, trades and trade reports are passed to the proposed market regulator (the Water Markets Agency, recommendation 26) via the Backbone Platform, meaning exchange platforms do not need to separately report to the regulator ('only once' principle for data flows).</p>
<p>Traders submit a mix of paper and electronic application forms for allocation trades.</p> <p>Some jurisdictions do not have electronic lodgement facilities.</p>	<p>Online form lodgement is enabled in Victoria through the My Water portal. South Australia is also moving to online lodgement with their water management system enhancements, due to come online from mid-2021.</p> <p>NSW is still some way behind in moving to online allocation trade lodgement.</p>	<p>The proposed Backbone Platform will build on existing online lodgement facilities and will broaden them for all states and IIOs. It will allow for traders to only need one form for interstate trade and trades in and out of IIOs. The Backbone Platform will support the direct translation of information from brokers' and exchange platforms' data feeds to complete the form, and to translate the inputs from the form into the specific information required for each state. This will remove the need for states to standardise data requirements and terminology. Paper-based trades can continue to be supported using existing Basin States processes, where data would instead be input to the new Backbone Platform system.</p>
<p>Exchange platforms and brokers lodge either online or paper forms to trade approval authorities.⁸⁴⁸</p>	<p>Exchange platforms, such as Waterexchange, are continuing to look at ways to improve connections to trade approval authorities to reduce manual processing steps and create more competitive services. However, these connections are customised and unique; and do not provide for a scalable solution.</p>	<p>Exchange platforms and brokers will directly connect to the proposed Backbone Platform, which then connects to all trade approval authorities' systems and water registers. This will require exchange platforms and brokers to only build connections to one piece of digital infrastructure.</p> <p>This type of digital environment will also help to allow for competition to emerge, as new entrants will only need to establish one connection in order to conduct trades in all states and IIOs.</p>

⁸⁴⁸ The Victorian Water Register (VWR) does allow for some connections via either their API or Broker Portal. Waterexchange also has some connections with IIOs.

Current status	Likely status quo future trajectory	Anticipated future trajectory with proposed recommendations
Irrigation infrastructure operators (IIOs) are not required to keep water registers and do not publish information on individual trade transactions (although most publish aggregate trade data, for example via annual reports). Only some IIOs report trade data to the Bureau of Meteorology (BOM).	<p>Initiatives like the National Irrigation Corporations Water Entitlement Register (NICWER) in the past have attempted to bring greater transparency to activity within IIOs.</p> <p>Some IIOs have also noted this gap. However, a main barrier to improving transparency in this space is the funding required for implementation. Also, IIOs vary greatly in size and the amount of trading activity that occurs. Some IIOs noted there would be very little benefit in increasing transparency and digitalising, and that the costs would be significant and would need to be recovered from small customer bases.</p>	By moving all activities into the Digital Messaging Protocol and Backbone Platform, there are opportunities to improve the information collection and publication practices of IIOs.
Data and information from trade approval authorities and registers is translated 'in-house' before being sent to the BOM. The BOM then conducts some limited data cleaning and quality checks for each information provider, but does not undertake general data quality assurance procedures.	The addition of reason for trade on trade forms in NSW and Victoria will help to improve the quality of data received by the BOM, although the data for the Southern Connected Basin will be incomplete until SA also collects the same data. The coordination demonstrated by NSW and Victoria on the reason for trade changes also suggests there may be coordination when the data is supplied to BOM.	<p>The proposed Backbone Platform will retain both the untranslated and translated information from brokers and exchange platforms.</p> <p>The trade approval authorities and registries will be able to check data sent to them from the brokers and exchange platforms in an easier way by using the Backbone Platform to validate data sent from these entities.</p> <p>Built-in quality checks can also be made to the Backbone Platform's central data repository, which is where all information from the registers and trade approval authorities is stored before de-identified and select information is then automatically sent to the proposed public-facing Water Market Information Platform.</p> <p>Increased digitalisation will also reduce data entry errors and improve data quality from this perspective as well.</p>
There is currently no whole-of-market regulator, therefore it is not necessary to have a single detailed dataset with common identifiers.	The ACCC is recommending a market regulator (the proposed Water Markets Agency) that will have powers to monitor and investigate misconduct. This role will not be supported by the current set-up of trading data.	The Water Market Data Standards (including the technical transmission requirements of the Digital Messaging Protocol), software and Backbone Platform will support the market regulator by providing more timely (potentially near real-time), detailed, accurate and comprehensive data on trading activities. This will be achieved by establishing the data feeds directly from exchange platforms, brokers, trade approval authorities, IIOs, and registers into the Backbone Platform data repository.

12.3 Learning from previous attempts to consolidate and centralise water market data and trade processing

The ACCC has considered the feedback from stakeholders in response to the interim report, conducted research on current state systems and legislation, and considered past attempts to improve trade processes across the Basin States. One important finding is that Basin States have implemented extensive improvements to not only their registers, but also their water management systems and water information systems. While there is still some way to go, the starting point for this reform package is significantly different to that experienced in 2008 when the Common Registry Solutions project began (see box 12.1). There have also been significant technological developments in that time, with Australia deploying some high-tech Regulatory Technology (RegTech⁸⁴⁹) solutions. Some of these RegTech solutions have been adopted in water, such as DELWP's use of telemetry and sensors and software for remote water monitoring to provide real-time data to improve compliance.⁸⁵⁰

The Productivity Commission's information paper on RegTech draws out some important points regarding the use of technology in regulatory settings, and the expectations of customers, individuals and businesses that technology will improve and simplify regulatory compliance. The ACCC considers that many of the recommended changes in this chapter can be built into software to deliver 'compliance by design', whereby reporting is packaged up in the required format by the software, reducing the burden on trade service providers.

The Productivity Commission's report also notes the *Modernising Business Registers (MBR) Program* to create 'a contemporary digital registry platform, allowing other registers and information (such as the new Director Identification Number) to be added to the platform over time.'⁸⁵¹ This has particular relevance to the ACCC's proposed package being flexible and adaptable, and to include the ability to record unique customer identifiers.

849 'RegTech' is a concept which refers to using information technology to enhance regulatory processes. It first arose in the financial sector, with innovations such as digitisation of manual reporting processes, and has since expanded to many sectors across the economy.

850 Productivity Commission, *Regulatory Technology Information Paper*, 2020, p. 10.

851 *ibid.*, p. 12.

Box 12.1: National Water Markets System and Common Registry Solutions initiatives: What went wrong and what can be learnt from this?

In 2008, COAG endorsed the development of a National Water Market System (NWMS) to improve the efficiency and effectiveness of water markets by increasing the transparency of market information, reducing transaction costs and improving interoperability of state registers where water can be traded interstate. As part of the Water for the Future initiative, the Australian Government committed to investing \$56 million into a National Water Market System in late 2009. Funding was however ceased in 2014, and it is estimated that during this time more than \$30 million was invested into the project.

The NWMS was to encompass both a national information portal and a common register to replace existing water registers in New South Wales, South Australia, Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory. Improvements were also planned for Victoria and Queensland to enable seamless data transfer between the different systems and provide more timely information to the market.

While the Common Registry Solutions (CRS) initiative was not realised, the information portal progressed and the NWMS website was launched in late 2010. This portal was handed over to BOM.

What went wrong and what can we learn from this?

The NWMS was due to be completed in June 2012, but was terminated before it was finished in 2014. Precisely what progress was made in the CRS component of the NWMS is not well understood or publicly documented.

What is known is that when the design phase of the project was finalised, it became apparent that the remaining budget would not be sufficient to finalise the project – leading the project to be discontinued.

There were however significant enhancements made to the registers as part of this program.

The experience of the NWMS/CRS suggests:

- while there was considerable cooperation between the states to develop the CRS, the states were not willing to persist with the initiative once the Australian Government ceased funding the initiative (and correspondingly discontinued its leadership and co-ordination role)
- the amount of change required on the state systems to adopt a CRS was extensive
- some benefits from NWMS persist today; such as significant register enhancements and a better understanding of commonality between the state processes
- recommending the implementation of a single register system is not likely to receive traction given this past attempt demonstrates the benefits do not outweigh the complexities and costs, and it is not as simple as lifting all state registers and combining into one register.

Past efforts by governments to improve trade processing have largely focussed on setting up or improving arrangements for interstate trade, without modifying broader trade processing and working with existing system limitations. Key milestones have been the development of interoperability protocols in the Southern Connected Basin and NSW-Queensland Border Rivers, and the recent collaborative initiative to develop consistent 'reasons for trade' categories for allocation trades. Past efforts by industry have focussed on developing brokers and exchange platforms (online intermediary portals facilitating automated trading) to more seamlessly interact with trade approval authority information technology (IT) systems (notably, the development of IIO approval portals undertaken by Waterexchange).

Previous efforts to improve transparency have often focused on bringing together disparate data sources, rather than improving data quality by modifying and improving data collection processes. The centralised information projects currently being developed by the Bureau of Meteorology (BOM) and the Department of Agriculture, Water and Environment (DAWE) indicate the Australian Government recognises the need for centralised information services. However, none of these projects individually

meet the market's need for cohesive, timely and better quality bid, offer and 'approved trade' information. These projects fail to adequately address issues with trade data inputs (such as trade forms with different mandatory fields, different terminology and varying quality checks) and the provision of timely data (for example, one prominent broker does not update published trade opportunities and there is a lack of mandatory service standards on Basin State trade approval authorities).

12.4 A pathway for improving trade services and water market data

The ACCC recommends ten key actions (recommendations 5 to 14), which together set out a pathway for the reform and digital transformation of water trade services, to improve service provision, data quality, and data flows in water markets. The recommended package seeks to leverage technological innovations to provide the ability to deliver increased transparency, reduced transaction costs, and increased potential to monitor trading activity (improve market integrity) through decentralised or 'distributed' solutions. The key feature of this approach is that the protocol would not entail any necessary centralisation of trade-related services, and therefore competition for these services would remain.

The sequencing of individual recommendations is discussed as relevant in the body of this chapter.

12.4.1 Reshape current initiatives to prepare to transition towards broader change

Systems and processes need to be updated to provide a 'level playing field' for market participants

As set out in chapters 10 and 11, water market participants have different experiences with trade processes and transparency depending on which state they own and trade water in, and whether they hold water rights within an IIO.

Currently, market participants in Victoria have an advantage because Victoria has invested in (i) online lodgement portals (ii) automation of trade processing and (iii) Application Programming Interfaces (APIs) to interface with MDBA systems for trade across the Choke. Victoria and South Australia also allow market participants to automatically and costlessly open up a new account if needed for trade, whereas a new entrant into the NSW market has to go through a costly and time consuming process to obtain a zero-share water access licence (WAL). This means that NSW market participants generally miss out on opportunities to trade through the Choke, and sometimes have incentive to move their water through Victoria, simply to take advantage of Victoria's systems. Also, NSW and SA systems both incentivise market participants to use aggregator services when trading interzone (and also Victoria to a lesser extent, due to the Goulburn IVT access being allocated on a 'first come, first served' basis).

The ACCC's view is that these different systems form an uneven playing field for traders, and it should be the responsibility of governments to fix this. The ACCC considers the following actions would deliver the greatest benefit in levelling the playing field:

- NSW should build functionality to submit trade applications online.
- NSW should allow market participants to costlessly and quickly open water allocation accounts – whether this is a 'zero share WAL' as currently is the case, or something more like a Victorian ABA or a South Australian allocation account.
- NSW should build API access with MDBA for automating approval of trades through the Barmah Choke, drawing as relevant on Victoria's example.
- Victoria, NSW, SA and MDBA should collaboratively invest funds and resources to build a 'trading rules engine' (machine readable trading rules developed from simplified legislative instruments) to facilitate automation for all allocation trade in the Southern Connected Basin and should update the interoperability protocols (this could be based on Victoria's existing trading rules engine, or could be part of the more general upgrade recommended in recommendation 11).

The ACCC also recognises that these issues may become less relevant over time if longer-term solutions to reforming IVT access mechanisms are adopted (see recommendation 22 on this point).

► **Recommendation 5**

Implement technical and procedural solutions to provide consistency for interzone trade

New South Wales, Victoria, South Australia and the MDBA should work collaboratively to upgrade trade processing systems and interoperability protocols to ensure these systems provide consistency for market participants wanting to access interzone trade opportunities. In principle, this should happen as part of enhancements that move all states towards the longer-term goals outlined in recommendations 10 and 11.

This will help ensure that market participants in some states are not disadvantaged relative to participants in other states when accessing interzone trade opportunities, particularly when opportunities are limited due to trade restrictions such as the Barmah Choke trade restriction and the Goulburn and Murrumbidgee intervalley trade limits. It will also help ensure traders face more consistent and neutral incentives when deciding whether or not to use aggregator services/brokers when trading interzone.

Reshape current information portal initiatives to be ready to implement the broader vision for digital infrastructure

As outlined above and in chapter 11, there are currently several initiatives underway to improve information transparency. A number of these entail some kind of online information portal.

As detailed below, the ACCC recommends these initiatives be consolidated and efforts to date should be leveraged to refocus towards delivering a single Water Market Information Portal. However, this does not mean simply ceasing work on existing initiatives (a lesson learned from the NWMS experience); rather, these initiatives need to be re-envisioned in light of the ‘end goal’ of delivering the ‘single point of truth’ that stakeholders have repeatedly called for.

In light of this, the ACCC recommends some specific actions for governments engaged in current portal initiatives (recommendation 6). These actions can be implemented now, in advance of more significant change to deliver the single Water Market Information Portal and other more significant technological change.

► Recommendation 6

Reshape current information portal initiatives

Australian and Basin State governments should work collaboratively to substantially improve existing information portal initiatives to improve information availability and prepare to transition towards the proposed digital infrastructure for water markets, particularly the proposed Water Market Information Platform (see recommendation 12).

This will ensure that benefits of existing initiatives are leveraged and that water market transparency continues to improve during the transition to the proposed new legal framework and digital infrastructure for water markets.

Priority actions are:

- New South Wales to publish water access licence (WAL) and water trade data for the NSW Murray Regulated River water source in a manner that clearly identifies which zone(s) are associated with the WAL or trade (as applicable).
- South Australia to implement collection and publication of 'reason for trade' and 'strike date' data from trade application forms, in line with actions already undertaken or committed to by New South Wales and Victoria.
- The Bureau of Meteorology to incorporate into its water market information dashboard data from New South Wales, Victoria and South Australia on 'reasons for trade' and 'strike date' as soon as practicable.
- Australian government agencies to map existing and 'in development' data sharing agreements relevant to water market data or related information such as rainfall, inflows and storage levels, river flow data, water allocations, intervalley trade limits, environmental watering.
- All information portals which display price data to document and make available easily accessible metadata on how price series are calculated, including explaining any data cleaning processes undertaken prior to derivation of aggregate or average price series.

12.4.2 Implement underpinning legislation, Water Market Data Standards and guidance

The ACCC's view is that technological change and improvements to trade services need to be underpinned by a coherent legal framework, which sets out the obligations and powers of the relevant parties in relation to the collection, recording, cleaning and transmission of water market data and information in the Basin.

Once this framework is in place, standards then need to be set, to specify details such as what data needs to be collected, stored, and shared; by whom; and in what format. Further, there may be a need to issue guidance or establish 'best practice' to complement the standards and to ensure sufficient flexibility.

The ACCC therefore recommends creation of obligations and standards for water market data, via three components:

1. obligations/mandates specified in legislation, covering
 - a. requirements for trade service providers to collect and share certain information
 - b. compliance/enforcement functions in relation to water market data and information obligations
 - c. governance roles and functions for the recommended new digital infrastructure described in recommendations 10 to 12 below
2. Water Market Data Standards, covering key elements on how water market data and information is collected, stored and shared

3. voluntary industry guidance on best practice and consultation with digital service providers to understand what can be delivered.

Decisions on exactly how to formulate these components should be made in consultation with trade service providers and market participants, and in view of the need to provide sufficient and high quality data to the proposed market regulator for it to undertake its functions efficiently and effectively.

These are explored in greater depth below.

A legislative mandate is needed to improve data collection, transmission and reporting

A legislative obligation to conform to standards is crucial to the success of the implementation of the proposed new digital technologies for water markets (see recommendations 10 to 12), and will ensure that the stepping stones such as 'reason for trade' are implemented consistently across the states and across IIOs.

The ACCC also notes that the *Water Act 2007* (Cth) already provides for the Bureau of Meteorology (BOM) to issue mandatory National Water Information Standards (see box 12.2). These arrangements provide that the standards are enforceable, and allocate the enforcement role to the Minister.

While it is open to governments to use these existing routes to implement the recommended Water Market Data Standards, the ACCC notes that to date BOM has not sought to make use of the National Water Information Standards provisions in relation to water market data (while there are standards for other water information, discussed in chapter 11).⁸⁵²

Legislative obligations and authorisations need to apply to trade service providers, so that they are equipped with the authority to fulfil their obligations under the standards. This is particularly important for public trade service providers, so as to not create a situation where standards require actions that conflict with public entities' roles and powers.

Given the recommended creation of a Water Markets Agency, the ACCC considers it may be more appropriate to (re)assign responsibility for developing the Water Market Standards to that entity, rather than to have BOM issue the standards under its existing powers. Assuming the Water Markets Agency were to take on this role, BOM could continue to have a role as an implementation partner with the Water Markets Agency, particularly to leverage BOM's existing experience with Basin State arrangements.

Finally, the ACCC notes that under the *Water Act 2007* (Cth) there is no explicit requirement to consult with trade service providers and water market participants in the development of National Water Information Standards (although the Director of Meteorology may undertake any consultation considered appropriate); the ACCC considers that such consultation is fundamental to the effectiveness of data standards for water markets and should be explicitly required.

This legislative mandate is required to achieve interoperability, as the requirements to adhere to the standards will also include connection and data transmission requirements (the Digital Messaging Protocol).

There also need to be clear compliance and enforcement functions in relation to water market data and information obligations. The ACCC recommends these functions also be assigned to the proposed Water Markets Agency.

852 Bureau of Meteorology, n.d., *Water Data Collection Standards*, <http://www.bom.gov.au/water/standards/aboutStds.shtml>, viewed 26 January 2021.

Box 12.2: National Water Information Standards under the Water Act 2007

The *Water Act 2007* (Cth) provides for the issuing of National Water Information Standards by legislative instrument.

The standards may cover any of the following aspects:

- a. collecting water information
- b. measuring water
- c. monitoring water
- d. analysing water
- e. transmitting water information
- f. accessing water information
- g. retaining and storing water information
- h. reporting water information
- i. water accounting
- j. any other matter relating to water information that is specified in the regulations.

For the purposes of these standards, 'water information' is defined as 'any raw data, or any value added information product, that relates to: (i) the availability, distribution, quantity, quality, use, trading or cost of water; or (ii) water access rights, water delivery rights or irrigation rights'; or any metadata relating to data of a kind referred to above.

The Act allocates the role of issuing National Water Information Standards to the Director of Meteorology, and also requires the Director to consult with Basin States in preparing any National Water Information Standards. The Director may delegate any or all of these functions to an SES employee or equivalent.

The role of enforcing the standards (via the issuing of compliance notices) is allocated to the Minister, or an authorised person appointed by the Minister.

Source: *Water Act 2007* (Cth), ss. 120(e), 130, 132, 133, 134.

Review water management law to harmonise or standardise terminology where possible

The first step towards developing Water Market Data Standards is to understand the current inconsistencies in water market data, and identify whether these arise from differences in state based legislation.

The ACCC's analysis of water management law – set out in chapter 10 and detailed in appendix E – shows there are substantial differences in the definitions of property rights set out in each Basin State's water management law. Each State also uses its own terminology; some of this is due to real differences in underlying property rights structures (for example, the NSW concept of 'share component' has no exact equivalent in other states); but sometimes differences in terminology are more a product of history. Given the underlying differences in the property rights frameworks, the ACCC does not consider that completely standardised terminology across the Basin is an appropriate next step, and may create more difficulty for those engaging in trade. However, harmonising approaches and terminology, drawing on National Water Initiative (NWI) language and concepts where relevant, remains a useful longer-term goal.

There are also some differences in the way that water allocation trades are described in legislation (see table 10.6), which gives rise to differences in approaches and terminology. For example, both a seller and buyer are considered applicants for an allocation trade in New South Wales, but this is not the case in other states.

The current data issues which flow from mismatched terminology and processes are well described by BOM, which stated that ‘the variety of methodologies and practices employed in collecting, managing and transferring this data means that it is difficult for other data customers to determine the fitness for purpose of the data and any derived information. The BOM’s role as the national water information provider has highlighted the difficulties in producing national information from data collected in different ways and without reference to agreed or commonly applied standards and guidelines.’⁸⁵³

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) also acknowledged this issue of different ‘languages’ and ‘traditions’, and submitted that the best way forward in this respect is to make minor changes to existing terminology so that it can be translated (harmonised) more easily. This will also enable the states to maintain their own language where possible.⁸⁵⁴

The ACCC agrees with the perspective of CSIRO, and considers Australian and Basin State governments should review terminology in Basin State and Commonwealth water management law to identify where it can be harmonised or standardised, ahead of implementing the proposed Water Market Data Standards. Any roadblocks limiting the collection of information (such as any lack of authority to collect information) should be also identified, and removed or amended if possible.

Implement Water Market Data Standards

The ACCC recommends the introduction of mandatory Water Market Data Standards to provide a consistent framework underpinning the collection, storage, transmission and publication of water market data and related information.

The scope of the standards should extend, at a minimum, to transaction-level trade records, but could also apply to related aspects such as the keeping of water accounts and water registers.

The standards should specify what information is to be collected, and should draw on existing efforts across the Basin to standardise data collection. For example, the development of the standards should build on the work to capture ‘reason for trade’. The data standards would specify exactly how each trade approval authority should then collect, store, transmit and publish that data item.

Introduce Basin-wide common party and transaction identifiers

Recommendation 4 in chapter 9 recommends that traders be required to include on trade application forms a unique party identifier issued to them.

Complementing this recommendation, the data standards should set out technical requirements underpinning the issuing and use of these Basin-wide common party identifiers, for example, how these identifiers should be used to record ownership of accounts and trading parties (with the obligations to use such identifiers set in the underlying legislation, see chapter 9). The standards should similarly provide for the use of Basin-wide single transaction identifiers to uniquely identify all trades of tradeable water rights.

The Digital Transformation Agency (DTA) has also announced the Digital Identity system, which will offer ways to better verify identity, and this initiative could be leveraged by the proposed water markets Backbone Platform or Digital Messaging Protocol in the future.⁸⁵⁵

Introduce standards for information sharing and to enable interoperability

High-level requirements for data sharing and interoperability should be set in the Water Market Data Standards, leaving the technical specifics to the Digital Messaging Protocol (see section 12.4.3). The standards should include that the transmission of data must be in a specified format.

The Australian and Basin State governments should look to other industries which have taken similar steps to increase digital connectivity between many dispersed market players in order to facilitate data transfer and sharing.

853 Bureau of Meteorology, <http://www.bom.gov.au/water/standards/aboutStds.shtml>, viewed 4 February 2021.

854 Commonwealth Scientific and Industrial Research Organisation, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

855 Digital Transformation Agency, <https://www.dta.gov.au/our-projects/digital-identity/digital-identity-system>, viewed 4 February 2021.

Standards should be scalable/expandable to cover as much of the trading and water accounting system as is desirable

The data standards could cover water accounting aspects that underpin trade, but which are not purely trade-related, such as how water allocation accounts should be kept (for example, specifying agreed credit and debit transaction types and guidance on how different transaction types should appear in water accounts).

The ACCC has conducted several sector case studies to provide examples of how data standards have been approached in other sectors (see box 12.3 in section 12.6, and see appendix F). These case studies show that there are several successful models for developing and implementing data standards, but that a feature of all successful models is close collaboration between government and industry in standards development.

► **Recommendation 7**

Implement Water Market Data Standards to provide a clear and fit-for-purpose framework for water market data and water trade services

Australian and Basin State governments should establish mandatory Water Market Data Standards governing the collection, storage, transmission and publication of water market data and related information by trade service providers.

This will deliver a robust and consistent legal framework to bring about improved data quality and water market data flows, leading to improved transparency for water market participants and enhanced interoperability between trade service providers.

Key recommended actions are:

- Develop Water Market Data Standards to provide a consistent framework underpinning the collection, storage, transmission and publication of water market data and related information (noting that technical specifications such as for data transmission will be implemented via the proposed Digital Messaging Protocol and proposed Backbone Platform – see recommendations 10 and 11).
- Trade service providers such as brokers, exchange platforms, irrigation infrastructure operators and Basin State trade approval authorities and register operators should have clear obligations to provide data as specified in legislation and to comply with the proposed Water Market Data Standards (see recommendation 1).
- Establish a centralised Water Market Data Standards compliance and enforcement role to ensure compliance with the standards once they are established. It is recommended the Water Markets Agency (see recommendation 26) should have this role.
- The Water Market Data Standards should specify the form, and process for issuing and use, of Basin-wide common party identifiers for tradeable water rights holders, and Basin-wide single transaction identifiers to be used to uniquely identify all trades of tradeable water rights.
- Harmonise or standardise terminology in water management law, where possible, as part of changes to legal frameworks to implement the proposed Water Market Data Standards.

Development of Water Market Data Standards should be undertaken collaboratively by government, trade service providers and water user representatives (such as irrigator groups, environmental water holders and traditional owner groups), and should be based on meaningful ‘user needs’ consultation with water market participants.

Introduce comprehensive service standards for trade processing and data publishing

The ACCC's view is that existing COAG service standards should be updated to be commensurate with improved technology and trade application processes.

As identified in section 10.2.2, there has been no change to trade approval service standards since 1 July 2009. Despite processing improvements and past recommendations from the ACCC and Productivity Commission to tighten service standards, trade approval times continue to fail to meet the expectations of market participants.

The service standards should also include publication standards (publication standards are covered by the Water Market Data Standards recommended above). The publication standards should include timeframes (either real-time from trade approval or near-real-time) and also include standardised publication formats, where possible.

► Recommendation 8

Implement mandatory trade approval service standards

Australian and Basin State governments should implement consistent mandatory service standards that apply to all trade approval authorities, including irrigation infrastructure operators.

This will help ensure that trade approvals are undertaken in a consistent and timely manner.

Implement rules and processes for water announcements

As identified in section 11.6.2, there is no comprehensive framework for how market-sensitive information is released. The Basin Plan Water Trading Rules do require persons making 'water announcements' to ensure they are 'generally available'⁸⁵⁶, but the definition of what constitutes a 'water announcement' is quite narrow, and there is no consistent process for how announcements should become generally available.

The ACCC considers that the creation of the proposed Water Market Information Platform offers the opportunity to introduce a consistent process, whereby all market-relevant announcements are published on the platform. This should apply to all announcements which meet the current definition of 'water announcements' under the Basin Plan, but should also be broadened to cover other decisions and announcements, including those made by non-government entities.

The existing threshold test in the Basin Plan rule is that the announcement 'can reasonably be expected, if made generally available, to have a material effect on the price or value of water access rights', where 'material effect' means the announcement is reasonably likely to influence persons who commonly acquire water access rights in deciding whether or not to acquire or dispose of such rights.'⁸⁵⁷ The ACCC considers this threshold test remains appropriate, except that it should be extended to apply to all tradeable water rights, not only water access rights.

The ACCC therefore recommends that governments implement rules and processes for water announcements, based on the existing rules in the Basin Plan, but broadened to cover market-sensitive announcements and decisions more generally.

856 Basin Plan 2012 (Cth), s. 12.50.

857 Basin Plan 2012 (Cth), s. 12.49.

► Recommendation 9

Implement rules and processes for water announcements

Australian and Basin State governments should implement rules and processes for water announcements, which apply, at a minimum, to all governments or government agencies, and all trade service providers. This should build on existing relevant provisions in the Basin Plan Water Trading Rules (note that recommendation 3 proposes relocating these rules into the proposed new conduct and integrity legislation).

Agencies or organisations making water announcements should be required to provide them to the proposed Water Market Information Platform in a timely manner (see recommendation 12). The current materiality criterion applying to water announcements – that the announcement ‘can reasonably be expected, if made generally available, to have a material effect on the price or value of water access rights’⁸⁵⁸ – should be retained, but broadened to apply to all tradeable water rights.

The recommended processes for making water market announcements could be integrated into the proposed centralised legislation (see recommendation 1).

This will ensure that information which could materially affect the price or value of water access rights will be accessible by all market participants from a single source, at a specified time.

12.4.3 Implement new digital infrastructure to support improved trading, data flows and data quality

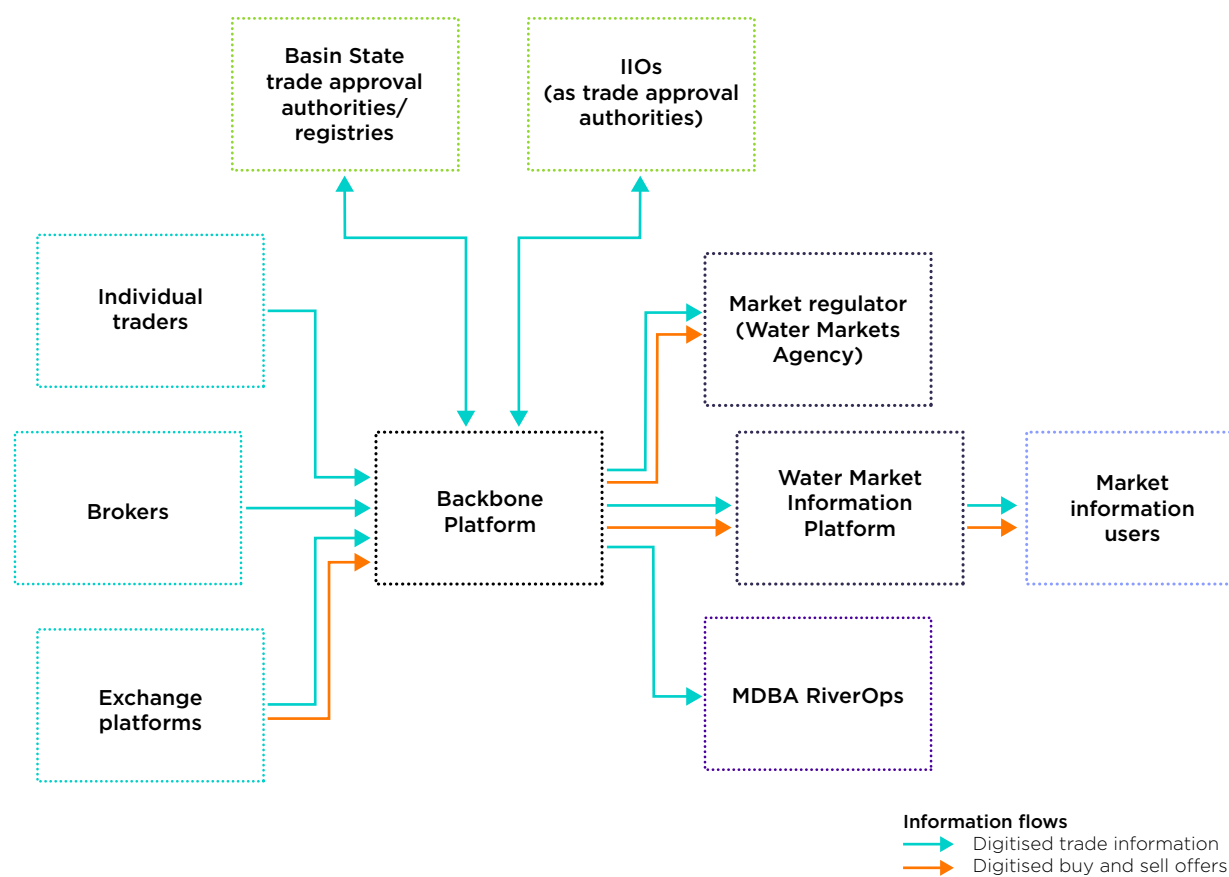
The ACCC recommends three new pieces of digital infrastructure be established for Basin water markets:

1. a Digital Messaging Protocol to enable the transmission of data as specified in the Water Market Data Standards (recommendation 10)
2. a Backbone Platform for trade lodgement and trade data repository should be implemented across intermediaries, trade approval authorities, IIOs and registers as a model for interoperability (recommendation 11)
3. a public-facing Water Market Information Platform (recommendation 12).

Figure 12.1 provides a schematic of how these three pieces of digital infrastructure could fit together. The ACCC notes, however, that the design and implementation needs to be determined by government in collaboration with trade service providers, and in consultation with market participants.

858 Basin Plan 2012 (Cth), s. 12.49(2)(c)(ii).

Figure 12.1: Proposed trading and information sharing arrangements in Basin water markets with the Backbone Platform and Digital Messaging Protocol



Source: ACCC analysis.

Implement a Digital Messaging Protocol for water markets

The ACCC considers that after the introduction of the Water Market Data Standards, which sets high-level standards and requirements for data transmission and interoperability, there will then be a need to develop messaging standards and specifications for the transfer of information, and to develop the software and code which executes these standards and specifications. This is encompassed in the notion of a 'Digital Messaging Protocol'. The Digital Messaging Protocol will deliver:

- enhanced interoperability between Basin State systems and registers, by providing automated digital connections (that is, machine-to-machine connections) and the ability to directly interface between the proposed digital platform (Backbone Platform), irrigation infrastructure operators, private exchange platforms and Basin State trade approval authority systems and water registers
- the ability to securely transmit data and trade applications between trade service providers
- the ability to automatically execute instructions, and automate collection, cleaning and publishing of water market data.

Digital messaging protocols are in use throughout the economy. For example, the internet employs a range of protocols to operate, and industry-specific protocols have been developed, such as the Electronic Data Interchange (EDI) protocol developed for Australia's wool industry (see case study F3 in appendix F). Broadly speaking, digital messaging protocols involve establishing a common digital language and set of rules (code) for use in digital processing and data transmission. They are a building block to facilitate machine-to-machine interfaces, and help ensure that many different systems can integrate seamlessly.

The ACCC recommends that a mandatory Digital Messaging Protocol should be introduced for water markets, to implement data collection, management and transfer processes that are consistent with mandated standards, and which is able to be deployed across government and non-government

water trade service providers. This should entail the creation of data feeds into a data repository (whether centralised or distributed in form; this point could be decided in consultation with industry and IT experts).

The protocol would allow for some autonomy to be retained by different entities: for example, IIOs could have autonomy over trade within their own networks, so long as their processes deliver the information as specified in the protocol for use by other stakeholders. The ACCC recommends the proposed Water Markets Agency be assigned the role of overall responsibility for the Digital Messaging Protocol, which would include working with governments and trade service providers to develop an agreed governance framework that sets out what level of autonomy and responsibility each entity has in developing particular aspects. The proposed Water Markets Agency should also be assigned a compliance and enforcement role in relation to the protocol once it is implemented.

The protocol would also deliver high quality and timely data to the regulator, thereby reducing costs for the market regulator in exercising its monitoring functions, compared to the status quo. For example, the Digital Messaging Protocol could gather data from exchange platforms and registers, store it in the central data repository of the Backbone Platform, and provide a single (near-)real-time information feed or secure access to the repository for the market regulator.

The protocol will enable information to be entered only once (the 'once only' principle); information would then be stored and shared consistently with the relevant entities (for example, trade approval authorities, regulators), with clearly-specified rules to 'translate' between individual systems as needed.

Principles for designing the Digital Messaging Protocol

Recognising that considerable collaborative effort would be required to construct the protocol and then ensure entities' systems are correctly using the protocol and are compliant with the underlying Water Market Data Standards, the ACCC's view is that the following principles for an open Digital Messaging Protocol for water market administration could form a useful basis:

- The protocol should bring increased automation of trade approvals by allowing transmission of *instructions* for processing trades as well as data contained in trade applications
 - Processing for some trades may still require human intervention, but trade approval authorities should aim to agree on a set of circumstances in which trade approvals can be automated (that is, agreeing if the specified conditions are met, then trade applications can be automatically processed; otherwise trade application processing requires human intervention).
 - Work should be done to simplify trading rules ahead of this implementation.
- The protocol should be 'open' in the sense that it should allow third parties to build additional services 'on top'⁸⁵⁹
 - Exchange platforms and brokers should be able to make use of the protocol to develop new services or product offerings for clients.
 - Given all information will be captured in one place (that is, in the data repository of the Backbone Platform), the Digital Messaging Protocol should facilitate APIs or other automated interfaces which allow third parties to develop information services which draw on the information generated by the protocol and stored in the Backbone Platform.
- The protocol should allow for increased product diversity and be adaptable to changes
 - For example, the protocol should be able to handle various trade types and specify the different pathways, approvals, required documentation and registration.
- The protocol should be formulated using a nested governance approach, which allows different users to control different levels of the protocol.

⁸⁵⁹ For example, the ASX is investing in Digital Asset and their Digital Asset Modelling Language (DAML) to develop a distributed ledger technology (DLT) platform which will allow fintechs to develop overlays that will interact its CHES Replacement.

- The protocol should be flexible and accommodate future changes to the regulatory environment for water markets
 - For example, the protocol could include specification of data flows to trusted parties (for example, regulators) and include in-built audit functions.
- The protocol should be certifiable, in the sense that it should be possible to certify that an individual entity's IT systems or processes are compliant with or are correctly using the protocol.

Digital and system enhancements are needed to transition towards implementing new technologies for water trading and trade-related services

Trade approval authorities should invest further in electronic lodgement and assessment facilities, and digitally codify trading rules (that is, translate the rules into code so they can be applied by computers – sometimes referred to as 'rules as code'). Trade approval authorities should also invest in real-time tools to help tradeable water rights holders check the feasibility of their proposed trades. Victoria already has tools in place, such as the 'Trade Limits and Opportunity' interactive and dynamic map that enables a user to enter trading zones and volumes to see if the trade is allowed, and whether any limits apply.⁸⁶⁰ The Victorian Broker Portal also enables brokers to run 'feasibility checks,' with customer's consent, to check the allocation account balance and trading rules to see if a proposed trade would be approved. These tools should be adopted by other Basin States (and ideally also the larger IIOs).

These enhancements will enable allocation trades to be processed automatically (in most instances) and will help to reduce transaction costs in the longer term, resulting in greater benefits as trade activity increases (particularly more complex interzone or interstate trade). Without this type of investment, continual improvement in data flows and data quality will be stifled. The ACCC notes there has been general acknowledgement that water management (including trade) needs to become more digital, although concerns remain about funding for smaller entities, such as some IIOs.

The Queensland government has indicated it is exploring a number of technology and digital solutions, and submitted that it is investigating ways to:

translate trade rules in draft water plans into digital processes and workflows so they can be automated and efficiently implemented before plans are finalised.⁸⁶¹

IIOs should update their IT systems to support new reporting requirements, and collect and share the same type of trade information that government trade approval authorities provide (particularly trade prices). The software should be 'compliant by design', and the ACCC recommends using an approach similar to the Single Touch Payroll approach (used to streamline businesses' tax reporting obligations, see case study F1, appendix F). In this approach, the employers' data collection and processing do not change at all, but the recording and packaging in the 'back end' by the digital service provider is done in line with the standards set by the Australian Taxation Office (ATO). Harnessing the use of software in this way was also recognised by the Productivity Commission in their RegTech information paper:

Increasingly, businesses are using software that not only meets the internal needs of the business but is also capable of providing the necessary information to fulfil regulatory obligations or to demonstrate compliance through automation. While it is rational that businesses and regulators would work to ensure the interoperability of their processes to minimise undue compliance burdens, this necessitates deliberate action – aligning the timing of data collection and reporting, data definitions and software, for example. Furthermore, this action can take some years and represent a substantial investment by regulators and businesses, with the scope and timing of the benefits often uncertain.⁸⁶²

Key steps for implementing the Digital Messaging Protocol

Key recommended first steps are:

⁸⁶⁰ Victoria Water Register, <https://waterregister.vic.gov.au/TradingRules2019/>, viewed 7 February 2021.

⁸⁶¹ Queensland Department of Natural Resources, Mines and Energy, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

⁸⁶² Productivity Commission, *Regulatory Technology Information Paper*, 2020, p. 20.

- Map digital information flows which already exist in Basin water markets. The ACCC recommends Australian and Basin State governments, in consultation with trade service providers, undertake an exercise to map and understand all digital information flows which already exist in the Basin water markets. For example, the Victorian Water Register already allows for connection via application programming interfaces (APIs) to allow different trade service providers to digitally connect through 'machine-to-machine' connections. The specifications or software designs used for these APIs could form a useful starting point for developing technical specifications for the Digital Messaging Protocol.
- Fully implement current reforms such as adding 'reason for trade' to (online) trade application forms across all Basin States, to ensure that all necessary information is captured in trade forms, ready to be shared.

Building on these foundations:

- Prepare to establish (further) digital links between trade matching services (for example, exchange platforms), trade approval authorities and the proposed Backbone Platform by documenting IT system architectures.

Under the leadership of the proposed Water Markets Agency:

- Develop the Digital Messaging Protocol, using a collaborative or co-design approach with water trade service providers and IT providers.
- Private trade service providers such as brokers, exchange platforms, IIOs and information service providers implement system changes needed to comply with the Water Market Data Standards and to collect, store and transmit water market data and related information using the Digital Messaging Protocol.

► **Recommendation 10**

Adopt a comprehensive Digital Messaging Protocol for the capture, storage and transfer of water market data and trade applications

Australian and Basin State governments should work collaboratively with trade service providers to establish and implement a mandatory Digital Messaging Protocol for water trade and water market data, which will enable:

- enhanced interoperability between Basin State registers, by providing automated digital connections (that is, machine-to-machine connections) and the ability to establish a direct digital interface between the proposed digital platform (Backbone Platform), and irrigation infrastructure operators, private exchange platforms and Basin State trade approval authority systems and water registers
- the ability to securely transmit data and trade applications between trade service providers
- the ability to automatically execute instructions, and automate collection, cleaning and publishing of water market data.

It is recommended that the proposed Water Markets Agency (see recommendation 26) play a lead role in developing the Digital Messaging Protocol, and should be assigned the role of enforcing adoption of the protocol (once established), as required by legislation. The proposed Water Markets Agency should also be assigned the responsibility of developing appropriate governance arrangements for the Digital Messaging Protocol.

When fully implemented, the Digital Messaging Protocol should give effect to the relevant requirements of the proposed Water Market Data Standards (see recommendation 7).

The Digital Messaging Protocol should be implemented in conjunction with the proposed Backbone Platform and public-facing Water Market Information Platform (see recommendations 11 and 12).

The ACCC recommends Australian and Basin State governments consider subsidising some of the cost of in private service providers' system upgrades to assist with the transformational change needed to deliver digitised trading processes and digital infrastructure for water markets.

Implement a Backbone Platform to act as a central hub for trade services and water market data

The ACCC recommends the creation of a Backbone Platform for water market data and trade services to deliver a 'central hub' for trade lodgement and trade data repository, by connecting various trade service providers. This connection is specified and managed by the use of the Water Market Data Standards and Digital Messaging Protocol.

The Backbone Platform is not intended to operate as an exchange platform or to replace the role of existing trade approval authorities, although the proposed single lodgement portal and 'trading rules engine' could assist trade approval authorities to undertake their roles in a more timely and consistent manner.

Components of the Backbone Platform

The ACCC considers the Backbone Platform should comprise the following components as a minimum:

- a secure digital repository of water market data and related information that can be drawn on for a variety of purposes, with appropriate controls to protect personally identifiable and commercially sensitive data
- digital connections between the platform and trade service providers, river operators and water market regulators, using the Digital Messaging Protocol, and automated data feeds to the public-facing Water Market Information Platform, which also enable

- data validation and verification checks, for example, data feeds provided by intermediaries and registers automatically through the Digital Messaging Protocol to the platform should be subject to automated quality control
- APIs to extract data from the digital repository of water market data for the proposed Water Markets Agency.

The following additional functionalities should also be incorporated, potentially in a second stage:

- a single portal for lodgement of allocation trade applications for the Southern Connected Basin
- a harmonised 'trading rules engine' capable of automatically assessing the feasibility of proposed trades against trading rules and other requirements for water allocation trades in the Southern Connected Basin.⁸⁶³

The use of in-built quality control mechanisms for trade form submission, once the single portal for lodgement is adopted, will support improved quality and completeness of water market information (for example, mechanisms whereby a user cannot submit a trade for approval without declaring a price and/or also providing supporting evidence at the time of lodgement).

Key steps for implementing the Backbone Platform

The following steps are recommended in preparation for transitioning towards the digital Backbone Platform:

- Consider the Australian Government's Digital Service Platforms Strategy, which outlines the key components in developing digital platforms to fully realise their benefits.⁸⁶⁴
- Implement legislative changes and new governance arrangements to enable effective leadership and coordination of these initiatives.
- Enable legislation to mandate access to data stored in the Backbone Platform for regulatory purposes. See recommendation 1 for details on this point.

The Backbone Platform will need to be operated by an independent entity with the mandate to access, store and transmit the relevant data. These roles could be assigned to an existing institution such as the Bureau of Meteorology, or could be embedded as a core function of the recommended new entity, the Water Markets Agency. In principle, the Backbone Platform and central public-facing Water Market Information Platform could be operated by different entities, as long as the required data feeds were established and appropriate relationships between the two operators were established and maintained. These platforms could also be operated by the same single entity.

The ACCC recommends the proposed Water Markets Agency be assigned the role of developing appropriate governance arrangements for the Backbone Platform, and deciding whether to operate the platform itself, or assign this role to another entity (while retaining oversight as part of its general oversight and regulatory roles).

Assuming a single portal for lodging trade applications is adopted, there would no longer be a need to complete different forms for different states. Interstate accounts could be checked much more quickly, and there could be seamless transfer of information and data via the protocol to a user-friendly Water Market Information Platform.

863 The ACCC acknowledges that it may not be possible to digitally code all trading rules, and therefore that there still may be a role for manual assessment of some trade applications, even if the proposed harmonised trading rules engine was fully implemented.

864 Digital Transformation Agency, <https://www.dta.gov.au/our-projects/digital-service-platforms-strategy/six-keys-success>, viewed 4 February 2021.

► **Recommendation 11**

Implement a digital platform ('Backbone Platform') to act as a single repository for water market data and a single hub for trade approvals

Australian and Basin State governments should work collaboratively with trade service providers to establish and implement a digital platform ('Backbone Platform') to underpin trade services and water market data.

It is recommended that the proposed Water Markets Agency (see recommendation 26) play a lead role in developing the Backbone Platform and operating it, or have oversight of its operation, once established. The proposed Water Markets Agency should also be assigned the responsibility of developing appropriate governance arrangements for the Backbone Platform.

Establishing the Backbone Platform will help streamline trade approvals and the collection and dissemination of water market data by providing a single hub through which water trade applications are made, and within which water market data is stored.

When fully implemented, the Backbone Platform should comprise:

- a secure digital repository for water market data and related information
- digital connections between the Backbone Platform and trade service providers, regulators, approval authorities river operators, and the public-facing Water Market Information Platform, with purpose- or entity-specific access controls
- single portal for lodging trade applications (Southern Connected Basin)
- harmonised 'trading rules engine' for assessing trade application against trading rules (Southern Connected Basin).

The Backbone Platform should be implemented in conjunction with the proposed Digital Messaging Protocol, public-facing Water Market Information Platform and in compliance with the proposed Water Market Data Standards (see recommendations 7, 10 and 12).

When implemented together, these technologies will form an underlying digital framework and common digital 'language' and processes, upon which different trade service providers can build their own digital infrastructure.

The Backbone Platform is not intended to operate as an exchange platform or to replace the role of existing trade approval authorities, although the proposed single lodgement portal and 'trading rules engine' could assist trade approval authorities to undertake their roles in a more timely and consistent manner.

Implement a Water Market Information Platform, building on existing initiatives and harnessing other proposed new technologies

As discussed in 11.2.3, the Australian Government (along with the Basin States) has already started to develop a centralised water information platform, and the project has been provided with significant funding. As such, the ACCC considers that the Water Market Information Platform should make use of the Digital Messaging Protocol to improve data quality of public information, by drawing on an aggregated feed of information for all bids and offers made on exchange platforms, as well as data on approved trades (sourced from registers and IIOs). The information presented on the Water Market Information Platform should be, where possible, information from the central data repository contained within the Backbone Platform, which has been standardised and quality checked. This will help to improve data quality and increase market participants' ability to assess information across zones and states more easily.

The MDBA's submission to the interim report highlighted the need to consider the information needs of all users, not just users in a particular area:

In connected markets, that cross state borders, the presentation of information needs to be carefully considered. In connected systems the presentation of information needs to consider all users in the system, not just users within the state. Without these considerations, increasing the availability of information will create further complexity and confusion, and increase knowledge disparity between users.⁸⁶⁵

The ACCC considers that the centralised information platform currently being pursued by DAWE should be broadened and enhanced following the short-term recommendation implementation, as well as the completion of the Digital Messaging Protocol and Backbone Platform. The ACCC has found that improving data quality for trade data, and increasing transparency of decision-making is equally as important as providing this information in a central place. The platform should therefore harness the many improvements that Basin States are making to their trade data and water information, to deliver the greatest benefit. This also presents an opportune time to coordinate and harmonise terminology where possible as data collection is being revised, and efforts to consolidate on the new platform are pursued.

The ACCC has gathered considerable evidence from stakeholder submissions, consultations, and user needs analysis undertaken by other government agencies to establish a baseline assessment of what information water market participants want and need. This is presented in chapter 11.

However, the ACCC acknowledges that this process could be further built on and expanded. The ACCC therefore recommends that the next step is to more definitively identify the set of informational requirements to be incorporated into relevant legislation, and the form in which this information should be stored and shared into standards, conventions and/or guidelines.

The ACCC emphasises that, in implementing the proposed platform, governments need to continue to consult with water market participants and industry to understand the different types of information required to participate in water markets, and how this information could be verified by regulators. This work needs to acknowledge that there are multiple user groups, including irrigators, environmental water holders, brokers and exchange platforms, IIOs, traditional owner groups, policy makers and regulators. Many of these information users are also information generators; therefore, many people and entities will need to be consulted on what they need, but also on what they can provide. There are also multiple information needs, meaning consultation needs to more explicitly map which pieces of information are needed for which purpose.

Scope of the Water Market Information Platform

At a minimum, the platform should make publicly available:

- water market data, appropriately de-identified, including

⁸⁶⁵ Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

- for all completed tradeable water right transactions, transaction data such as price (ideally net and gross of trade fees), volume, origin and destination trading zone(s), water access entitlement class (if relevant), trade category, strike date, submitted date, approval date
- current buy and sell offers (including relevant details so that current offers are comparable with historical transaction data) – this would utilise information provided via the Backbone Platform, with links back to broker or exchange platform websites so that users could take up these trading opportunities
- information on the cost of trading – trade approval fees and intermediary charges
- IVT account balances
- information on relevant government policies and decision-making, such as
 - information on market rules and processes – market rules, allocation announcements and policy changes, and unbiased information on opportunities to trade
 - notifications about market-relevant consultations – information on when consultation processes for rule or policy changes are occurring and how stakeholders can be involved
- water announcements (see also recommendation 9), which could include
 - allocation announcements
 - spill risk declarations or other announcements relating to carryover
 - notifications about market-relevant consultations – information on when consultation processes for rule or policy changes are occurring and how stakeholders can be involved.

The platform should also provide information on, or links to, the following:

- water supply and demand data – supply data such as forecast water availability, expected allocations, and demand data such as weather conditions, and predicted demand from plantings
- water accounting methods – the processes applied by Basin States when accounting for losses and managing spill risk
- educational resources (see also recommendation 13 on this point).

The platform should harness improved data quality and data flows made available by implementation of the proposed Water Market Data Standards, Digital Messaging Protocol and Backbone Platform. The platform should also be ‘open’ in the sense that it allows third parties to harness the information available on the platform to provide markets with ‘value added’ services and products, such as specialised reports, forecasts, integration with other data sources.

The ACCC’s findings support that the platform should be interactive, user-customisable, display high quality information and be developed based on identified user needs. Once the platform is established, user needs consultation should be ongoing, to ensure that the platform continues to meet users’ needs and expectations over time.

Key steps for implementing the Water Market Information Platform

The establishment of a central, public-facing Water Market Information Platform will require a series of obligations being placed on different entities to ensure comprehensive and high quality data is provided to the platform (covered by the Water Market Data Standards). Rules regarding the operation of the platform itself will also be needed; for example, to ensure that the platform is operated consistently with privacy laws and appropriate arrangements are in place to ensure there is no inappropriate accessing of data feeds prior to their being published on the platform. For example, there should be a requirement that any transaction records being made available on the platform should be suitably de-identified, and that water announcements or other information likely to influence the price of tradeable water rights need to be provided to, and published on, the platform within a suitable timeframe (see recommendation 9 on this point).

Permissions for data providers (for example, water market intermediaries and IIOs) could enable providers full access to data they provided (via the Backbone Platform and automatically sent to the public-facing platform), and more restricted access to data provided by others. Permissions for the proposed market regulator should enable the regulator to access identified records, and permissions

for River Operators should provide real time, de-identified data relevant to River Operations, suitably aggregated (for example, River Operators likely would require aggregated, not individual, usage data).

The Water Market Information Platform will need to be operated by an independent entity with the appropriate authority to publish data and control data feeds coming from the Backbone Platform. The ACCC recommends the proposed Water Markets Agency be assigned the role of developing appropriate governance arrangements for the Water Market Information Platform, and deciding whether to operate the platform itself, or assign this role to another entity (while retaining oversight as part of its general oversight and regulatory roles).

► Recommendation 12

Implement a public-facing Water Market Information Platform which harnesses improved data collection and quality

Australian and Basin State governments should build on centralised information platform initiatives already in place to improve the transparency of water market information. Industry and government should work collaboratively to implement a public-facing Water Market Information Platform.

This will ensure all the key information market participants need to make well-informed trading decisions is available from one location, is accurate and is up-to-date.

It is recommended that the proposed Water Markets Agency (see recommendation 26) play a lead role in developing the public-facing platform and operate it, or have oversight of its operation, once established. The proposed Water Markets Agency should also be assigned the responsibility of developing appropriate governance arrangements for the Water Market Information Platform.

At a minimum, the platform should make publicly available:

- water market data (in general, sourced via automated data feeds from the digital repository contained in the Backbone Platform)
- information on relevant government policies and decision-making (see recommendation 15 concerning improving transparency of policies and procedures)
- water announcements (see recommendation 9).

The Water Market Information Platform should be implemented in conjunction with the proposed Digital Messaging Protocol and the Backbone Platform (see recommendations 10 and 11).

12.4.4 Address some specific information issues with targeted solutions

Implement a Basin-wide Water Market Education Program

Chapter 4 identified that many stakeholders, particularly irrigators, find water markets complex, and some lack confidence in their own ability to make beneficial trade decisions.

While the implementation of the Water Market Information Platform will provide greater transparency, and other recommendations in this report will help simplify water markets for users to some degree, the ACCC considers there remains a need to equip water market participants to make best use of the information.

Therefore, the ACCC considers that the Australian Government should develop and implement a Water Market Education Program. Implementation of this program should comprise one of the functions of the proposed Water Markets Agency.

The program's objective should be to enable current and potential water market participants to understand the different water products on offer, the rules governing what products can be traded and where, and the factors they should consider when evaluating the prices they wish to receive or offer for different products.

Development of the program should involve stakeholder consultation to effectively address areas that irrigators think most important to their engagement with, and confidence in, water markets. More broadly, stakeholder engagement should inform both the development of educational resources, and the communication mediums for content delivery.

While the exact content of the program should be developed consultatively, the ACCC considers that broadly the program could cover:

- the basic functions and operation of water markets, including relevant regulatory bodies and dispute resolution avenues
- the water market products available to irrigators, including newer products, and how these products may meet irrigators needs
- how to access and use water markets, including accessing water market exchange platforms and trading
- deliverability and access to water through IIOs, including with reference to IVTs
- the function and operation of state registers
- changes to the water market, including in response to the recommendations made in this report.

Program content should be delivered in a manner that ensures ease of access; for example, via delivering online and 'in person' seminars, at times that take into account irrigators' own schedules and availability. Content delivery will be assisted by the involvement of IIOs, brokers, water exchange platforms, water information service providers and Basin State governments in content development and delivery.

Program resources should be kept up to date.

► Recommendation 13

Implement a Basin-wide Water Market Education Program

The Australian Government should develop a Basin-wide Water Market Education Program, in collaboration with irrigation infrastructure operators, brokers, water exchange platforms, water information service providers and Basin State governments.

This will assist current and potential market participants – especially irrigators – to better understand water products and trading rules, and to engage confidently in water trading.

Implement digital tools to track water allocations

Currently, it is not possible to trace water from its original point of allocation to its eventual use. This means that any policy, trading rule or water management option which relies on the ability to track how water moves in fine detail is difficult to implement in practice. Section 14.2.3 (in chapter 14) notes some of these issues in relation to river management and market architecture; section 8.6.3 (in chapter 8) notes some of these issues in relation to tracking movements of water allocation in trading activity, particularly when trades involve aggregated movement of water through brokers' or IIOs' accounts.

Given the foundational role that tracking allocations has for regulatory oversight and potential policy options to better manage interzone trade and delivery issues, the ACCC recommends that governments implement water allocation traceability when implementing the proposed Digital Messaging Protocol. This should provide the ability to track water allocations from the time they are first credited to the holder's account, through trades or carryover transactions, to when they are finally used or forfeited.⁸⁶⁶

⁸⁶⁶ The ACCC acknowledges that water allocations in unregulated systems operate somewhat differently to regulated systems: holders' accounts are not credited with a specific volume for use or trade, but rather holders may take water from the unregulated system, up to a maximum volume and in line with the conditions on their licence – for example, may extract a certain amount or at a certain rate, over a given time period, and subject to triggers such as flow levels. Thus, traceability mechanisms for unregulated systems may differ from mechanisms for regulated systems.

This functionality should be first considered in the Southern Connected Basin context, where there is a real need to improve understanding of how water moves through different accounts at both the bulk and retail levels. However, such functionality could also prove useful in other contexts, such as for better tracking of environmental watering activities in unregulated systems.

In essence, traceability involves implementing a system to identify a product or certain aspects of a product – for example, ownership and location – and trace changes to these over time and space. The experience of other sectors – particularly mechanisms for livestock traceability and supply chain traceability – shows that there are many ways to implement traceability (see case studies in appendix F). The ACCC recommends governments draw on experience in other sectors in developing traceability systems for water.

The ACCC also notes that if distributed ledger technology (Blockchain)⁸⁶⁷ is to be considered in this context, some thought should also be given to the potential for this technology to be deployed in other ways to improve water management and accounting, including water trade records. The Productivity Commission's report on RegTech notes that 'Blockchain technology could also be used to register physical asset transactions. For example, the Swedish Land Registry has begun small-scale official use of Blockchain to register land and property ownership (McMurren et al. 2018).'⁸⁶⁸ The ACCC also notes successful Blockchain 'WaterLedger' use case trials undertaken by Civic Ledger, in two relatively simple systems outside the Basin.⁸⁶⁹

► Recommendation 14

Implement lifetime traceability for water allocations

Australian and Basin State governments should implement lifetime traceability for water allocations when implementing the proposed Digital Messaging Protocol.

This will make it possible to trace water from its original point of allocation to its eventual use. This will facilitate implementation of policies, trading rules or water management options that rely on the ability to track how water moves in detail.

The governments should implement this in consultation with water market participants, river operators and infrastructure operators.

12.5 Stakeholders are generally supportive of this proposed package

In the interim report, the ACCC proposed the following groupings as short-term and medium-term options:

- Increase interoperability and harmonisation by continuing current work towards consistent terminology and data structures.
- Improve information provided to the Bureau of Meteorology.
- Trade forms should capture reason for trade or trade type, trade source, lodgement pathway and lodging party.
- Remove the ability for zero dollar trades to be approved or recorded unless certain conditions are met (as exception).
- Each Basin State should have a clear and standardised legislative mandate to keep a register to record all entitlement trades and all allocation trades.

867 Distributed Ledger Technology is defined as technological infrastructure and protocols that allows simultaneous access, validation, and record updating in an immutable manner across a network spread across multiple entities or locations.

868 Productivity Commission, *Regulatory Technology Information Paper*, 2020, p. 15.

869 Civic Ledger, 'Improving Water Markets and Trading Through New Digital Technologies – Mareeba-Dimulah Water Supply Scheme', *Pilot Research Project Report prepared for CRC for Developing Northern Australia*, 2020.

- Each state's water management law should clearly specify water market information roles for water registers.
- Irrigation infrastructure operators should be required to establish and maintain standardised registers and publish trade data.
- Standards for trade processes and reporting requirements should be implemented.
- Explore options and value in reporting contracts for leases, forwards, and carryover parking to registers and/or annotating allocation trades conducted under a contract.
- Different types of entitlement trades and allocation trades need to be better identified through a new and standardised 'dealings' framework.

The interim report also listed a number of major technological options as part of longer term reform. The ACCC presented this broad range of options in order to canvass feedback from stakeholders on options, and to better understand the limitation and benefits of these options for water users and governments.

Some stakeholders expressed their support for changes to trade processing being underpinned by clear and comprehensive mandates.⁸⁷⁰ Specifically, the Murray Valley Food and Fibre Association (MVFFA) submitted that each Basin State should have clear legislative mandates in regards to entitlement trade and allocation trade registers, standards and processes for trade approval applications, and recording and publishing trade data.⁸⁷¹ The MVFFA also suggested these requirements should apply to all entities engaged in processing trades, including exchange platforms and IIOs.

While stakeholders who provided submissions differed in exact views, overall there was general support for investment in digital trade services in a way that fostered more integration between different trade service providers, rather than replacing exchange platforms, trade approval authorities or registers with a single service provider. Some submitters, while supporting reform in principle, also raised concerns about costs.

Waterexchange noted that they supported the notion of increasing digital connections between exchange platforms and trade approval authorities, and noted that this is something that they already have in place with some IIOs and are pursuing implementing the Victorian Water Register Broker API. Waterexchange's submission to the Interim Report further noted:

[W]e concur that a digital protocol to enhance interoperability between various entities is the best option for the water markets. In this regard Waterexchange is already well advanced with existing digital interoperability in place with a number of IIO's and discussions underway with DELWP and others. This interoperability has provided benefits in respect of faster trade processing time together with live time reporting/approvals of trades which has delivered a more seamless customer experience.⁸⁷²

Kilter Rural stated that it 'supports continued implementation of technology solutions to increase market integrity through improved transparency and efficiency. Accurate and timely information providing visibility of market depth and price discovery should be readily available to all market participants. Also the development of secure transaction clearing services is important to manage counterparty risks.'⁸⁷³

Lachlan Valley Water submitted that it '[s]upports NSWIC [New South Wales Irrigators Council] position that single digital platform including availability and trade information would be useful rather than a central trading platform (which would result in high transaction costs and would remove the role for brokers).'⁸⁷⁴

870 Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

871 Murray Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

872 Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

873 Kilter Rural, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

874 Lachlan Valley Water Inc, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

Basin State governments, as outlined above, have been on a path of improving both trade services and transparency. In line with this, the ACCC has received support from the Basin States who have submitted the following in response to the interim report:

- The Queensland Government referred to its Rural Water Future program and its end-to-end transformation of how sustainable water management is delivered, which includes modernising trade and market facilitation by improvements such as automation, capturing and providing more timely information and digitally recording transactional information in a secure way that supports the market.⁸⁷⁵
- The NSW Government noted the actions already taken to improve trade rules, information and transparency, and supported the ACCC's recommendations to improve transparency particularly in relation to oversight of intermediaries.⁸⁷⁶
- The Victorian Government considered there is merit in exploring the use of digital technologies to improve transparency and is supportive of improving automation and tracking allocation trades.⁸⁷⁷ The Victorian Government also noted a preference for a distributed model as a more resilient system than a centralised one, and considered that a monopoly framework should be avoided. It also cautioned against the proposed change being too ambitious or unrealistic given previous failed attempts.
- The South Australian Government also supported the ACCC's potential recommendations, and considers the WMS program will deliver on many of the aspects identified by the ACCC.

The MDBA submitted that improvements to information should be guided by user needs and complemented by education activities to ensure improved decision making.⁸⁷⁸ The MDBA also submitted that it 'supports investment in the aggregation of data in systems and sources as an important aspect of the pathway forward however we caution that this alone is unlikely to be transformational against the backdrop of issues highlighted in the interim report. Solutions must continually be assessed against the problem to be solved and the outcome sought.'⁸⁷⁹ The ACCC agrees with this view, and recommends the creation of a Water Markets Education Program (see recommendation 13), and that the digital innovations recommended in this chapter are grounded in meaningful user needs analysis and consultation.

The MDBA further submitted that:

- The MDBA supports the ACCC's preliminary view to harmonise and coordinate trade processing and reporting. This would generate clear benefits in terms of reducing market complexity and improving market efficiency. A consistent framework would also be a sensible first step to harmonise trade market data across different water registries as a prerequisite for creating a single water market information platform.
- The suggestion to develop a trade processing and market data framework could facilitate this process. However, given the number of entities involved in processing trades, significant consultation would be needed to develop an effective framework, with sufficient buy-in from stakeholders. Legislative change may also be needed to ensure there are clear obligations to adhere to the framework.⁸⁸⁰

The ACCC's proposals regarding improvements to IIO registers and trade approval processes received more mixed responses from IIOs.⁸⁸¹ While many IIOs acknowledged the need to improve in principle, questions about funding and resources, and the potential implication for IIO customers' fees, were raised by some IIOs, particularly several smaller and member-owned entities. For example, Central Irrigation Trust (CIT) considered that a number of the short term incremental solutions raised in the Interim Report 'should be inexpensive to implement', but raised significant concerns about the costs of

875 Queensland Department of Natural Resources, Mines and Energy (now Queensland Department of Regional Development, Manufacturing and Water), *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

876 NSW Government, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

877 Victorian Government, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

878 Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

879 Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

880 Murray-Darling Basin Authority, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 10.

881 The ACCC received submissions from 5 IIOs.

structural change. CIT also strongly opposed significant changes to IIO registers, noting that existing CIT registers were developed to suit operational and customer needs, and anticipating that ‘the suggested changes would see significant cost associated with rewriting our registers to in our view marginally improve water market information. This cost would be paid for the members of our business with the benefit being water market participants most of whom are not our members.’⁸⁸²

In contrast, Coleambally Irrigation Cooperative Limited (CICL) supported ‘further work to identify the opportunities to improve interoperability between state registers, IIOs and exchanges.’⁸⁸³ CICL’s view was that:

[S]ignificant further work is required between and with the owners of the various systems to establish clearer options and costs for how to address the issues identified in this report, many of which are known issues. Further work must draw together policy, administration, information technology and communication accountabilities in organisations to deliver practical, affordable and effective solutions. In addition, governments need to learn how to constructively engage with IIOs and include IIOs in the development of practical implementation options. Solutions involving IIOs must not be developed in isolation from IIOs business’ models.⁸⁸⁴

Murray Irrigation Limited (MIL) stated that it supports the concept of ‘one information platform with real-time recording of trade data from all other exchange operators and transparency to support market operation...to develop this system governments should fund the implementation and maintenance of a trade portal with consistent, simple and cost free data links from IIO’s back to this portal.’⁸⁸⁵

The ACCC acknowledges these concerns and notes that – consistent with NWI principles for cost recovery – costs should be borne by beneficiaries or funded from consolidated revenue where a clear community service obligation is defined.⁸⁸⁶ See also discussion on this point at section 12.6 below.

Mr Damian Crowe expressed concern that the options raised in chapter 11 of the interim report were ‘a mixture of requirements, data architectures, strategies, technology platforms and solutions.’ Mr Crowe emphasised the importance of ‘building up layers of institutional knowledge’, and cautioned against narrowing down options too far before establishing the business requirements and evaluation criteria. Mr Crowe also identified that there are a wide range of models to deliver more integrated trade services and information flows.⁸⁸⁷ The ACCC agrees that further user needs analysis and consultation is an important foundational step to underpin further change. The ACCC has also crafted its recommendations for digital infrastructure for water markets in a way that allows for further business case analysis and project planning prior to implementation.

Dr Lana Hartwig and Ms Sue Jackson noted their concern that ‘some of the digital centralisation and streamlining options put forward on page 30 of the interim report might constrain the development of relationships with brokers; an outcome that could see some Aboriginal groups less likely to trade, or not trade at all. This would not only compromise this much needed income opportunity for Aboriginal entities, but also the water access opportunities that buyers benefit from via these trades.’⁸⁸⁸ The ACCC considers the package recommended below will retain broker and client relationships.

882 Central Irrigation Trust, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

883 Coleambally Irrigation Co-operative Limited, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p.2.

884 *ibid.*, p.2

885 Murray Irrigation Limited, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 5.

886 Council of Australian Governments, *Intergovernmental Agreement on a National Water Initiative*, 2004, paragraphs 64 and 67(i).

887 Damian Crowe, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, pp. 5–8.

888 Dr Lana Hartwig and Sue Jackson, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

12.6 Digital transformation of services for water trade: Implementation considerations

The ACCC recognises that transformative change is required to deliver the technological innovations outlined in recommendations 10 to 12. This will require collective effort and investment from governments and trade service providers.

The ACCC notes that many different sectors of the economy are currently undergoing or have recently undergone a process of increased digitalisation. The ACCC notes there is significant potential to learn from adoption of digital messaging protocols and related standards in other sectors. To start to bring together some of this experience, the ACCC conducted 5 sector case studies (see box 12.3 and appendix F). Lessons learned from this analysis helps water market participants and governments understand 'best practice' for technical aspects, and also provide insights into governance of the protocol development and implementation, as well as practical guidance on how different parties with a stake in the protocol can work together. The ACCC notes that conducting further case study or cross-sectoral comparison could be a useful tool to further understand how to implement the recommendations presented in this chapter.

Box 12.3: Implementing data standards, digital messaging protocols and centralised portals: lessons learned from other sectors

To effectively draw on learnings from other sectors that have undergone digitalisation and adopted data standards, the ACCC conducted five sectoral case studies. The full case study reports are available in appendix F.

The key ‘lessons learned’ are summarised here.

E-conveyancing

The states and territories have shifted to electronic conveyancing (e-conveyancing) at different stages, with some yet to roll out e-conveyancing.⁸⁸⁹ Five states have mandated the use of electronic conveyancing, such as NSW in July 2019, SA in August 2020.⁸⁹⁰

E-conveyancing demonstrates an example of developing interoperability.

Now that there are two players in the market, the next issue which has been debated at length is how to design a market in which competition can be encouraged. The issue requires establishing the regulatory framework, risk framework and the actual market model to support competition. This also means making a decision on the technical nature of the connections between Electronic Lodgement Network Operators (ELNOs), Electronic Lodgement Networks (ELNs) and the state registries (and other relevant entities) – and whether this should be done in a nationally standardised way, or on a state-by-state basis. This decision has not yet been made.

While the ACCC considers that the development of standards used by the Digital Messaging Protocol (at recommendation 12) should involve processes of co-design, collaboration and industry consultation, the process also needs to be mindful of differing levels of resourcing available to stakeholders and their ability to engage in such processes.

Additionally, e-conveyancing demonstrates some learnings from a multi-jurisdictional approach to develop a national standard, and the magnitude of the task in coordinating. The regulator involved in this coordination and development of a national approach must be appropriately resourced, and the ACCC has acknowledged the good work that ARNECC has achieved but that they remain somewhat hampered by funding constraints.⁸⁹¹

Duplication of costs has also been an issue for parties involved in e-conveyancing, with each new entrant establishing links to registries, banks and revenue offices, while the Enterprise Service Bus (ESB) approach (similar to the Backbone Platform proposed at recommendation 11) is designed to avoid this.

889 Tasmania and NT have not yet rolled out e-conveyancing.

890 See: <https://www.nswlrs.com.au/eConveyancing>, while the ACT has enacted e-conveyancing, it will not mandate the use of it and still allows for paper forms.

891 ACCC, *ACCC report on e-conveyancing*, 2019, p. 20.

Single Touch Payroll

Single Touch Payroll (STP) and Standard Business Reporting (SBR) more broadly demonstrate the potential to reduce regulatory burden and compliance costs for industry through the use of RegTech, and using digital solutions that are built into business software and essentially store information for regulatory purposes in the course of standard business operations (that is automated information collection). This means that data collection remains the same, but reporting is standardised. The SBR approach also aligns itself with the relevant international (ISO) standards where possible.

This is particularly relevant in the water space where the ACCC has identified that significant information is generated but the data capture, storage and sharing is not harnessing the full potential of the data. Currently there is also considerable double entry of information, whereby information manually recorded on a form is then also resubmitted on another form.

There are also considerable concerns about who will bear the cost of increased regulation, and there is a need to identify ways in which current information can be better harnessed rather than creating more reporting obligations and increasing compliance costs.

Also of particular relevance to the recommendation 10 regarding the implementation of a Digital Messaging Protocol, is the use of mandating standards by reference to an 'approved form' in the legislation. This could work effectively for water trade also by allowing for the technical requirements to be outside of the legislation, but the mandate to be within.

The STP program undertook significant consultation with industry in order to develop the framework for the Digital Service Providers, and has taken a staged implementation approach. These learnings can be applied in the water space, where any major RegTech change, such as the Digital Messaging Protocol, will require not only the mandate but also industry and Basin State buy-in and consultation.

The multiple opportunities to leverage the data collected and shared through STP also demonstrates the benefits that the Digital Messaging Protocol and near real-time data could provide in water markets.

Australia's National Livestock Identification System

The National Livestock Identification System (NLIS) is Australia's system for the identification and traceability of cattle, sheep and goats. The key components of this system are:

- Livestock identifiers: All livestock are identified by a visual or electronic eartag/device.
- Location identifiers: All physical locations are identified by means of a Property Identification Code (PIC).
- Transaction records: All livestock location data and movements are recorded in a central database.⁸⁹²
- Traceability standards, which provide a set of minimum standards for identifying livestock and recording livestock movements.
- Enforcement to ensure compliance.⁸⁹³

The NLIS is underpinned by state/territory legislation, which forms the regulatory framework for the system, and is endorsed by major producer, feedlot, agent, saleyard and processor bodies.

The NLIS is currently operated by the Integrity Systems Company (ISC) a wholly-owned subsidiary of Meat & Livestock Australia (MLA). ISC delivers a suite of integrity programs for Australia's red meat sector (including NLIS), and also provides promotional and educational services. The ISC is also responsible for developing and delivering the Digital Value Chain Strategy and Livestock Data Link, two ongoing initiatives to make better use of existing and new data, including data from the NLIS central database, and to conduct research and development to ensure the best digital tools and database management systems are used to strengthen red meat integrity systems over time.⁸⁹⁴ ISC and MLA have invested approximately \$65 million into the NLIS over the 12-year period between 2006 and 2017. Over that period, the annual operating cost of the NLIS was \$5.4 million, funded predominantly through red meat industry levies, with matching government research and development levy investment.⁸⁹⁵

892 NLIS, n.d., *How does the NLIS work?*, <https://www.integritysystems.com.au/identification--traceability/national-livestock-identification-system/>, viewed 19 November 2020.

893 Commonwealth of Australia, 2019, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

894 Integrity Systems Company, n.d., *About the Integrity Systems Company*, https://www.mla.com.au/globalassets/mla-corporate/meat-safety-and-traceability/documents/isc-factsheet_18_lr.pdf, viewed 19 November 2020.

895 Commonwealth of Australia, 2019, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

Centralisation of record-keeping has been a critical step for the NLIS, and was feasible in part because of limited state-level roles

The NLIS provides an example of a multi-party system where many actors report transactions (livestock movements) to a central record (the NLIS database), in order to provide a comprehensive, 'single point of truth' for livestock traceability. The central database is administered by a purpose-built, independent entity, the ISC.

Centralisation of the NLIS database was feasible in part because – unlike for water trade – states and territories do not have a role in approving transactions (in this case, livestock movements), and there is no centralisation of livestock management at the state/territory level. This meant that there was no strong driver to keep record-keeping at the state level; in fact, there were considerable benefits from adopting the more centralised approach, particularly given that livestock regularly crosses state borders, and the need to ensure a nationally-consistent approach to biosecurity risk management.

In contrast, water resources need to be managed at the trading zone, water source and Basin levels, and all trades need to be approved by the relevant approval authorities. This entails a much more active role for Basin State governments, and also for irrigation infrastructure operators. Also, given interstate trade currently forms only a very small proportion of water allocation trade, and a minute proportion of water access entitlement trade, the expected benefits from centralising records management and trade administration in the water context are likely to be lower than for the NLIS context. This suggests that while there may be benefits from centralising water market information and data, there is less of a strong driver to centralise the actual records management functions in the water context.

Staged implementation and differing requirements have caused complexities and confusion

The NLIS has differing requirements for different animal types, and across jurisdictions. Further, introduction of NLIS requirements has used a staged approach, across animal types, jurisdictions, and participants, which has made it harder for participants to understand their reporting obligations and to achieve compliance. The lesson learned from this experience is that a consistent approach should be pursued as the 'first-best' approach, with deviations from this being carefully considered. Applying this lesson to water markets suggests that requirements for collecting, storing, and transmitting water market information should be as consistent as possible across jurisdictions, types of trades, and water market participants.

Mandating requirements in legislation is a necessary but not sufficient component of the NLIS

The ISC, which operates the NLIS, identified that mandating requirements via legislation is 'not enough of a reason for participants to comply'; participants 'need a compelling reason to comply', and 'value propositions need to be established across all participant segments to encourage end-to-end compliance'.⁸⁹⁶ This experience highlights the need to ensure obligations provide clear benefits to data providers (in the water context, trade service providers), as well as the sector more generally.

⁸⁹⁶ Integrity Systems Company, *Submission to Senate Inquiry into the feasibility of a National Horse Traceability Register for all Horses*, 2019 <https://www.aph.gov.au/DocumentStore.ashx?id=e111eb50-fcb9-4baa-83cf-139a7ffde86f&subId=669772>, viewed 19 November 2020.

Data standards and digital information systems in the Australian wool industry

Australia's wool industry relies on a range of digital tools to ensure wool markets and related services operate efficiently and effectively, both within Australia and internationally. The key components of this digital infrastructure are:

- Electronic Data Interchange (EDI): industry-specific data standards and the Digital Messaging Protocol which implements this standard. The EDI standards form a central digital backbone which underpins both wool trading directly, and other digital tools such as the WoolQ information platform.
- WoolQ digital information portal, comprising: Market Dashboard, Market Auction, Market Bulletin Board, Market Order Book, and Market Administration components.
- 'E-specis': a recent innovation to replace paper-based forms with digital forms that are automatically saved and transmitted or made accessible to the different parties who need the data.

These tools also rely on a range of standards and guidelines developed by and for industry.

Digital tools developed for the wool industry are predominantly industry-led and managed, with relatively smaller and indirect roles for government. Wool industry participants – particularly key industry bodies such as AWEX, AWI, AWTa, Australian Wool Handlers (AWH) and the National Council of Wool Selling Brokers (NCWSB) – play the central role in developing digital tools and fostering adoption by individual wool industry participants.

Data standards can work in a voluntary context given the right conditions

Use of the EDI data standards and software is ubiquitous within the wool industry, even without their use being mandated via legislation or regulation. This shows that industry participants see value in the standardisation and ease-of-transacting that the EDI system brings.

One aspect driving industry to participate is that the wool supply chain is geographically diverse, but also more linear than in water markets, where irrigators (as well as other market participants) could enter on the supply side, demand side, or both. In the wool industry, there is a higher cost in using non-digital approaches (i.e. paper documentation) to facilitate transactions, both in terms of transmitting and verifying information, than would be the case for a market less geographically dispersed. There is also little incentive for certain participants to not participate out of an intent to maintain a small, localised market.

In contrast, in water markets, some market participants who are opposed to the geographical movement of water (e.g. out of an irrigation district or trading zone) may have incentive to opt out of reforms which encourage standardisation and lowering of transaction costs of trade. This means that, while there may be significant support for introducing data standards for water markets, a mandatory approach may be warranted to ensure that reforms have the appropriate coverage. However, not every aspect necessarily needs to be mandated – for example, there could be a high level mandatory requirement of participation, but the exact requirements for data provision (e.g. format, periodicity) could be specified in industry standards and/or guidelines.

Digital tools can build on each-other, underpinned by high quality, industry-accepted standards

This case study shows that it is not necessary to have a single digital technology to deliver all aspects of the digitalisation of trade services. It is possible to have an integrated ecosystem of technologies; however, in this approach, underlying data standards are crucial to ensure seamless interoperability between different technologies in the ecosystem.

The key learnings for the water context are that these underlying data standards should be developed first, and that interoperability and seamless interfacing between different digital tools should be a key design criterion for those tools. Ad hoc initiatives currently being developed in the water sector are being developed in isolation from each-other, and are unlikely to deliver this integrated outcome.

Reliance on single industry-wide digital tools can create additional risks that need to be well-managed

Core digital technologies in the wool industry were subject to a serious cyberattack in 2020. The incident showed that the technology provider was unprepared and had insufficiently robust security protections and risk management strategies, and as a consequence was slower than expected to respond to the incident.

The lesson learned for the water sector is that if water trade is going to move towards adopting industry-wide custom-built software (in line with ACCC recommendations), there will need to be a focus on building in security protections and risk management strategies from the outset. Examples of strategies that could be taken to help ensure secure and resilient technologies is to use distributed approaches or cloud-based services to make systems more robust; and to plan in advance for potential security incidents or other robustness threats.

In addition to building on lessons learned from other sectors, the ACCC also encourages this new investment to be built on existing partial efforts towards harmonisation and standardisation, for instance the existing interoperability protocol for processing interstate water allocation trades in the Southern Connected Basin (box 12.4) and the Victorian Water Corporation Integration Standard Interface Specification (box 12.5), the Water Regulations 2008 (Cth) which currently regulate provision of water trade information to the Bureau of Meteorology, and the NWI national terminology for tradeable water rights.

Box 12.4: Interoperability protocol for processing interstate water allocation trades in the Southern Connected Basin

- Interstate trading is currently managed through file sharing arrangements in the Southern Connected Basin.
- This file sharing arrangements between authorities in Victoria, New South Wales and South Australia means they are able to share the status of interstate application form with each other automatically.
- This is important for interstate trading as the destination state has no other way of checking that the origin allocation bank account has a sufficient allocation balance to fulfil the trade. Therefore, the applicants must apply in both states, and the origin state will assess the application and share a status of 'pre-approved' or 'refused' with the destination state via the file transfer process.

Box 12.5: Victorian Water Corporation Integration Standard Interface Specification

- As the water authorities are responsible for processing trade applications in Victoria, but are required to register this information, DELWP and the authorities have implemented file sharing arrangements to automate this process.
- The water register is the central repository where water entitlement and related information is stored and managed. To facilitate the day to day operations of each authority, an interface for information exchange between the water register and water corporations is available for each water corporation to use. This is referred to as the 'standard water corporation interface'.
- Data can be exchanged in two directions, either from the water corporation to the register, or from the register to the water corporation.
- The standard interface consists of 13 XML files which are generated by the water register for consumption by the water corporations.
- There is a scheduled data exchange process from the water register to the water corporations. Files relevant to the water corporation are stored in a folder on the water register hosted FTP server, which the water corporation then fetches from.
- The exchanges allow the water corporation to synchronise their back end systems with the water register. Water corporations also send information to the register on water usage, pending water orders and spill allocation information.

In relation to the Digital Messaging Protocol recommendation, CSIRO's submission to the interim report provides some useful guidance on how this could be implemented in a context of the Basin's many differences in 'language' and 'traditions' (box 12.6).

Box 12.6: Implementing a Digital Messaging Protocol in the complex Basin context: guidance from CSIRO

The ACCC [Interim] Report provides options for improving information flows and transparency in the Australian water market. The first two, 11.3.1 Open Digital Messaging Protocol and 11.3.2 Single water market information platform, focus on ensuring the information is compatible across the market, the former by sharing information between markets and the latter by centralising the information. The other options focus on the form of trading and the mechanisms and institutions required for trustworthy transactions.

Both a protocol and a platform can be seen as different points on a continuum. A protocol is needed for the right part of the digital ecosystem in order to provide a single platform.

Water trading registries are state based and have been developed to meet the needs of intra-state trades and to some extent can accommodate trades from interstate. Each state (and in some cases each region) have a local language (set of terms) and local traditions (rules) for water measurement and trading. The language and traditions are not necessarily aligned across state boundaries so it is not always possible to cleanly translate from what is meant in one state to another..

A common exchange format, if sufficiently rich, can identify how information can be translated from one state water language to another. Each state can preserve its own language. It can take significant effort to work through all the significant language changes required to realign the terms across the states. In the short term a protocol would need to support the transfer of terms in their local form for reporting as is. A protocol would also need to be extensible to support changing needs. The Bureau of Meteorology (the Bureau) publishes a glossary of terms across the national water market system that translates between state registries. This could be improved for the purposes of an efficient market because it was designed to support the Bureau's reporting requirements..

Once a protocol is in place, creating a single information platform is straight forward if the protocol has dealt with the mismatch in language. However the single platform is not a replacement for the state based registries and would reflect different local languages. Translation of traditions (rules) is harder as it is based on secondary trading information mentioned in the ACCC report. These are typically available in the form of legislation. In markets for financial products, Product Disclosure Statements (PDS), support the price information given to customers. Secondary water information could be treated the same way. The challenge is to provide the secondary information succinctly.

Source: CSIRO, submission to Interim Report, pp. 2–3.

Significant investment is required

The ACCC acknowledges that the implementation of these recommendations to deliver digital infrastructure for water trading is likely to require the commitment of significant funding. Our view is that transformational investment in Basin IT systems is necessary to support the operation of fair and efficient water markets and provide the necessary information flows.

The ACCC particularly notes the concerns raised by some irrigation infrastructure operators (IIOs) about the costs involved in upgrading IT systems (see section 12.5 above). As the improved transparency of IIO systems will benefit market participants within and outside of IIO networks, and contribute towards improving confidence in water markets more generally, the ACCC considers that costs of upgrades should not solely be recovered from IIOs' relatively small customer bases. For example, costs could be recovered from traders (whether inside or outside the IIO) via trade approval fees, and/or costs could be funded via governments from revenue in respect of a defined Community Service Obligation.

There will be some level of regulatory burden imposed on exchange platforms to establish the technological infrastructure to provide bid and offer data to the market regulator, and for IIOs to provide information from their registers and water management systems. The ACCC notes in particular that some IIOs still use paper-based records to administer water accounts and trading within their networks. The ACCC considers development of the Backbone Platform could entail an agreement

about transitioning from paper forms and manual processing. The ACCC considers that these transition periods are helpful in trialling and bringing all players on-board, and could even take a staged approach similar to that of Single Touch Payroll (STP) (see appendix F) whereby smaller businesses were given a later deadline to transition over to STP reporting.

The ACCC considers introducing a Digital Messaging Protocol with the oversight by a market regulator will help direct private investment in electronic infrastructure to linking with the protocol, which can enable data flows for a variety of purposes, rather than only linking to a single entity (the market regulator). The protocol would also standardise the inputs and outputs necessary for trade and compliance activities – that is, the information that trade approval authorities receive from individual traders, brokers and exchange platforms (inputs), and the information then sent to the central information platform and the market regulator (outputs). As such, the ACCC sees these recommendations as redirecting existing investments in bilateral and ad hoc digital interfaces and improvements, into more harmonised, intentional investment that has holistic coverage of the wide range of trade service providers. The ACCC recommends governments provide funding and leadership to assist private trade service providers in this transition.

In the case of IIOs, these investments could be in the form of the development of ‘off-the-shelf’ software for IIOs, which should be compliant with the Digital Messaging Protocol by design. Alternately, there could be individual investment to each IIO for IT system upgrades.

The ACCC notes that the Digital Messaging Protocol approach could also provide other benefits such as lowering the barriers for new entrants to the intermediary services and information provision markets. In the long-run, this should help encourage competition and facilitate new ways to extract value from current and future water market data and related information, which will help recoup the costs of these investments.

Access to digital infrastructure must be equitable, and some users may require additional support

Implementation of new digital infrastructure would need to take into account the potential for strategic misuse of the infrastructure by market participants. Experience with the Victorian Water Register broker portal and My Water portal shows that there is potential for sophisticated software to automate trade applications, which may advantage some market participants over others. The ACCC considers that this risk could be at least partly mitigated via use of standardised interfaces between the Backbone Platform, the Water Market Information Platform and different classes of users when implementing the Digital Messaging Protocol. For example, all exchange platforms would use the same interface for lodging trade applications with trade approval authorities via the Backbone Platform, to limit the incentive for individual exchange platforms to develop a customised interface to gain advantage. The ACCC also recommends in part 5 of this report that Basin States reform arrangements and administrative processes for interstate trade; reforms in this space should also help eliminate existing incentives for ‘rent seeking’ expenditure on technology or other tools to be ‘at the head of the queue’ for trade opportunities.

Another possible challenge is that there may be some resistance to a newer technological solution from some users. For example, while Victorian traders have been able to lodge their intrastate allocation trades wholly online for a smaller fee (\$47.50) than for the paper-based process (\$89.50) since December 2013⁸⁹⁷, 16% of intrastate trades during 2018–19 were submitted through the paper-based process.⁸⁹⁸ Therefore, increased digitalisation of trade processes may need to cater for different user preferences (for example, not rule out the option to submit trade forms in-person or on paper), and be coupled with education and guidance so that users feel comfortable using the technology.

Strong leadership and good governance is required to facilitate the substantial collaboration required to deliver digital infrastructure

A final challenge is that implementation of this distributed approach would require substantial collaboration between all parties – exchanges, IIOs, and Basin States. There is a need to establish clear governance frameworks for the protocol, and to address practical questions such as who is responsible

897 Water (Resource Management) Regulations Amendment Regulations 2013, S.R. No. 163/2013.

898 ACCC analysis of Victorian Government’s response to voluntary information request.

for which areas of the protocol, and how to ensure all actors implement the protocol as envisaged. Given the track record of collaborative initiatives in the water sector to date, there is a risk that instead of delivering a Basin-wide, streamlined and co-ordinated trade processing and data collection system, this initiative could instead result in deadlock and derail existing stand-alone initiatives to improve specific aspects. To mitigate this risk, the ACCC recommends that leadership of, and responsibility for, the implementation of the Digital Messaging Protocol, Backbone Platform, and Water Market Information Platform be placed with a single entity with a clear mandate to deliver this digital infrastructure, in collaboration governments and trade service providers. There also should be obligations on entities to provide information as required by legislation and the Water Market Data Standards.

The ACCC notes that the Digital Messaging Protocol will not in itself address stakeholder concerns on the variable fees charged by each state's trade approval authority or remedy discrepancies in processing times. While the protocol would deliver efficiencies in data entry through automation, trade processing would continue to be limited by the approaches implemented by each of the Basin States. However, the ACCC considers that implementing the Digital Messaging Protocol and Backbone Platform, upgrading approval authorities' systems, and introducing Water Market Data Standards and trade approval service standards should together work to standardise trade approval processes and technology, which should over time help trade approval fees to converge.

12.7 Centralisation versus harmonisation of trade services

The ACCC found that the separate state (and IIO) approval authorities and registers create challenges in conducting some interzone and interstate trades as processes are different and more time consuming, and Basin States have inconsistent trade processing fees (see section 10.4.4). However, only around 8% of allocation trade in the Southern Connected Basin occurs interstate, and approval times for interstate trade are three business days or less for 90% of interstate trades involving NSW, and four business days or less for 90% of trades involving SA and Victoria. The ACCC therefore considers that targeted investment to improve trade processing is a more proportionate and cost-effective measure to respond to stakeholders' concerns than consolidating state (and IIO) registers.

The ACCC does however recognise the importance of delivering user interfaces for trade that are as streamlined and harmonised as possible for market participants. The ACCC's analysis shows that key differences driving different state approaches are embedded in state legislation and regulation, or are the result of different processing systems and accounting arrangements.

On balance, the ACCC considers that the costs of centralising registers and trade approval services are unlikely to deliver the benefits sought by water market participants, and will not necessarily reduce the risks of discrepancies between different data systems compared to the status quo (because although certain aspects will be consolidated, others will become fragmented). The ACCC considers the key problems that most require addressing can be addressed through models that maintain the Basin States' registers and competition in broker and exchange platform services. Identifying this has enabled the ACCC to rule out the single register or single exchange as the ideal solution.

12.8 ACCC view on other options considered in the interim report

This section briefly sets out feedback received from stakeholders and the ACCC's views on other options for reform of trade services canvassed in the interim report, which have not been adopted as part of the ACCC's recommendations to improve trade services and water market data.

12.8.1 Feedback on other options explored in the interim report was mixed

The ACCC received various submissions with mixed views on the options for reform of trade services canvassed in the interim report. H2OX submitted that they did not consider it necessary for each state to have separate and distinct registers, and that a single register could provide all of the relevant

information.⁸⁹⁹ The NSW Government submitted that a consistent, basin-wide register of entitlements was one possible key step to improve trust in the market⁹⁰⁰, and the National Irrigators Council submitted it would be a good aspirational goal to seek to have states combine their registers in the long term.⁹⁰¹ However, the Victorian Farmers Federation (VFF) submitted that a single common register for all water accounting for both trade and delivery was not preferred⁹⁰², while the NSW Irrigators Council (NSWIC) considered a single common register could be developed through a single information portal and continue to enable Basin States to manage their registers.⁹⁰³

In response to the central exchange option, H2OX submitted that this would simplify price discovery and market depth discovery to create a level playing field for water market participants.⁹⁰⁴ However, irrigators and the Australian Water Brokers Association expressed concern that a central exchange would increase transaction costs.⁹⁰⁵ The NSW Irrigators Council also cited additional concerns that a single exchange platform would remove flexibility for peer-to-peer trade and have only one price for water in each market.⁹⁰⁶ The VFF submitted that the ability for buyers and sellers to strike 'off-market' deals is important to provide competition to brokers and exchanges.⁹⁰⁷

Responses on improving IIOs' trading processes and information transparency was also mixed. There was some support for more transparency on trading from IIOs⁹⁰⁸, while the IIOs ranged from cautiously supporting further consideration of interoperability between the IIOs, Basin State registers and exchange platforms⁹⁰⁹ to focussing on the cost of reform.⁹¹⁰

Specific suggestions included that IIOs be required to submit daily to the respective water registers all internal water trades⁹¹¹ or that they establish and maintain comparable registers for both temporary and permanent trades, within, out of and into their networks.⁹¹²

However, Lachlan Valley Water (LVW) noted that any proposal for IIOs to establish and maintain registers must include IIO consultation, and that there should not be costly requirements imposed on IIOs who already operate their own information systems.⁹¹³ This was echoed by Coleambally Irrigation, who submitted that IIOs need to be involved in reform discussions and not have regulation or technology imposed on them.⁹¹⁴ The issue of cost was also raised by the National Irrigators Council, which suggested resourcing and assistance needed to be provided to IIOs to implement consistent new arrangements.⁹¹⁵

899 H2OX, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

900 New South Wales Government, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

901 National Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 17.

902 Victorian Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 13.

903 NSW Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 22.

904 H2OX, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 9.

905 Australian Water Brokers Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8; Lachlan Valley Water Inc, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; NSW Farmers Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 4 December 2020, p. 11; NSW Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 18.

906 NSW Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 18.

907 Victorian Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 18.

908 Australian Water Brokers Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 7-8; GoFARM, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; WaterExchange, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

909 Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 1.

910 Renmark Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5.

911 Australian Water Brokers Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 7-8.

912 Murray Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

913 Lachlan Valley Water Inc, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

914 Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 11.

915 National Irrigators Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 17.

The VFF submitted that changes to existing entitlements or legislative ‘checks and balances’ should only be considered where there is a compelling benefit.⁹¹⁶ Central Irrigation Trust also was opposed to the legislative changes suggested in the interim report, and held the view that states should work together cooperatively with a goal of improving trade services and quality of information.⁹¹⁷

12.8.2 Single exchange platform for posting and matching trade offers

One option raised in the interim report was a single mandated exchange platform for trading. This approach would entail:

- creating a single mandatory online platform for matching buyers and sellers
- maintaining the separate state approval authorities and registers underneath.

The interim report outlined several variations on this ‘single exchange’ option, including:

- one exchange covering all types of trade, including both temporary and permanent products
- one exchange for temporary trade (water allocations and temporary trade of irrigation rights) and another for permanent trades (water access entitlements and permanent trade of irrigation right, including leases)
- one exchange per trade type (for example, one exchange for ‘spot’ trades, another for forward trades and another for carryover parking)
- the option of taking a similar approach to the National Electricity Market (NEM), entailing
 - a spot market in which supply and demand conditions determine prices in real time
 - instant and automatic matching through the central system
 - operator acts as principal in each trade
 - pooling of offers.

A single exchange has been supported by a few stakeholders, for the following reasons:

- Both the Victorian department and ABARES⁹¹⁸ supported the implementation of a centralised exchange for interzone or interstate trade. The Victorian department expressed a preference for an interstate exchange to be the ‘point of truth’ for the amount of water available for trade (note this does not extend to a single exchange for trade between different Victorian zones). ABARES considered a single exchange that received all the bids and offers would be required to support ABARES’ proposed ‘smart market’ for the interzone trade in the Basin⁹¹⁹, but that this exchange would not require real-time trading and would reduce demand for a ‘single market price’.
- H2OX consider that a single exchange can deliver the market depth needed. H2OX have been proponents of a single water exchange, but do not consider that simply centralising information is going to bring about the benefits needed.⁹²⁰
- SunRice Group and RGA reported over 50% of survey participants were in favour of a single exchange.⁹²¹
- Murray River Group of Councils propose a Trade Repository which ‘would receive, match and publish the details of every trade.’⁹²²

A single exchange has been opposed by stakeholders for the following reasons:

916 Victorian Farmers Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 14.

917 Central Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6.

918 ABARES, *Submission to Murray-Darling Basin water inquiry interim report*, 18 December 2020, p. 8.

919 ABARES, *Submission to Murray-Darling Basin water inquiry interim report*, 18 December 2020, p. 16.

920 H2OX, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, pp. 7–8, 9.

921 SunRice Group and the Ricegrowers’ Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 53.

922 Murray River Group of Councils, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4.

- Waterexchange consider placing one company in charge will not fix the issues identified in the ACCC's interim report.⁹²³
- Murray Irrigation Limited (MIL) stated that it did 'not agree with the concept of a single centralised transaction platform. An important component to competitive trade is customers and brokers leveraging some principles of market competition. Water could simply end up being the one price (either high or low) for a certain product type.'⁹²⁴
- The National Irrigators Council (NIC) stated it did not support a single exchange 'given it would lead to the creation of a monopoly, high transaction costs, remove flexibility for peer-to-peer trade, and have only one price for water in each market.'⁹²⁵

While there is some support for a single and central exchange from some stakeholders, on balance the ACCC is of the view that the additional benefits beyond those that could be achieved with the proposed recommendation package do not outweigh the additional costs. There is currently good competition between intermediaries to provide advisory and matching services.

A mandated single exchange also limits the ability for market participants to negotiate directly with each other, and makes it more difficult to engage in more complex or non-standard dealings (for example, bundled transactions of different water rights types, transactions for non-monetary consideration). It would also make it difficult for persons who wish to only engage in localised trading (for example, irrigators wanting to trade only within their irrigation district) to form these smaller markets. This limiting of avenues for trade which are currently available, and valued by stakeholders, could inadvertently *decrease* rather than *increase* market participation.

In the Southern Connected Basin, the ACCC estimates that – at most – currently only 25–30% (by number) or 10–17% (by volume) of water allocation trade annually occurs on-platform, meaning the trade is matched at arms-length on one or other of the currently-operating exchange platforms. A further 43–56% (by number) or 12–17% (by volume) of trades are matched off-platform but are still *lodged* via these platforms, meaning the trade is bilaterally negotiated but the platform is used as a convenient lodgement portal; the remainder is entirely off-platform, meaning applications are lodged with approval platforms via other, non-platform, avenues.⁹²⁶

There are examples of 'single markets' in other sectors – for example, the Australian Wool Exchange, Australian Stock Exchange, and various livestock exchanges. In practice, these are not actually complete monopoly central exchanges, as all allow for 'off-market' or 'off-platform' transactions. In these cases, data reporting protocols are in place for 'off-market' or 'off-platform' transactions although coverage and quality varies (for example, 'direct' or 'over-the-hooks' livestock sales⁹²⁷, private treaty wool sales⁹²⁸, or 'dark pools' in the ASX context⁹²⁹). In the ASX case, there is also a further regulatory mechanism whereby 'dark pool' transactions under a certain value threshold are required to form prices within a price band determined by 'on-market' transactions; this is a mechanism which is not currently

923 Waterexchange, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3.

924 Murray Irrigation Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

925 National Irrigators Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7.

926 ACCC analysis of NSW, Victorian and SA governments' responses to voluntary information requests and s. 95ZK notices. Note these shares are overestimates, because platform data acquired from exchanges *includes* internal irrigation right trades facilitated by platforms, whereas Basin State registry data does not include these trades.

927 For example, just over 30% of Australian lambs were sold via direct sales in 2014–15, and 30% of cattle in 2012–13; <http://sheepproducers.com.au/wp-content/uploads/2018/01/FINAL-Sheepmeat-market-structures-and-systems-investigation-report.pdf>, https://australianabattoirs.com/wp-content/uploads/2014/05/sub74_dept-agric.pdf, viewed 11 December 2020. The ACCC's Cattle and Beef market study identified significant shortcomings in data quality and coverage for direct sales and over-the-hooks marketing channels, but also deficiencies for saleyards, for cattle sales. See https://www.accc.gov.au/system/files/1128%20Beef%20and%20cattle%20report_D08.pdf, viewed 11 December 2020.

928 Private treaty wool sales comprise around 10–20% of total wool market sales, with the proportion varying significantly with market conditions. See <https://www.woolwise.com/wp-content/uploads/2017/07/WOOL-422-522-12-T-09.pdf>, viewed 11 December 2020.

929 'The value of activity on unlit or dark markets has been 'as high as about 40% but probably averages in the range of 25 to 30%. The ASX noted that this level is well below that in the United States, which can be above 50%. Recent ASIC reports indicate that around 10% of trade is public and private pools, with another 15% of 'oversize' blocks (i.e. trades that can occur out-of-market due to their special size. See https://www.apf.gov.au/Parliamentary_Business/Committees/Joint/Corporations_and_Financial_Services/Membership/asic/asic20131Feb/c02 ; <https://asic.gov.au/regulatory-resources/markets/market-structure/equity-market-data/2020/equity-market-data-for-quarter-ending-june-2020/>, viewed 5 November 2020.

considered as necessary in the water context, but which could be introduced into the proposed conduct regulation framework if warranted at a later date.

A single exchange for interzone allocation trade, could potentially form part of a long-term solution to the market architecture issues related to interzone trade and deliverability. For example, the 'smart market' solutions under consideration require a single 'smart market operator' to work effectively. Therefore, while not recommending that a single exchange is needed now, a transition toward a single exchange in the long-term may be needed to fully address these market architecture issues. Chapter 16 discusses these possibilities in more detail.

In summary, the ACCC considers that by setting the technology up to enable multiple players to connect more easily to the Backbone Platform, and through it to multiple other parties it will then be up to the market to figure out if more or fewer exchange service providers are required. By improving interoperability, the market will be encouraging competition in these services. Over time, a preferred exchange may naturally emerge via competition. The ACCC considers this is a preferable outcome to mandating a single created monopoly and ruling out competition by regulation.

12.8.3 An 'ASX-like approach' for water: multiple platforms for bids and single clearinghouse

The interim report also considered the option of an ASX-like approach, which would entail:

- maintaining and encouraging competition in exchange platforms for *matching* buy and sell offers
- restriction of access to the exchanges to registered users (such as brokers)
- a set of rules governing behaviour on the platforms and the behaviour of the exchange platform operators
- optionally, limiting off-platform trades, and/or prohibiting lodging of bids on multiple exchanges
- a single clearinghouse for *clearing* matched trades, which would entail existing trade approval authorities delegating their trade approval role (which is part of the clearing process) to the clearinghouse operator
- automation and integration between the exchange platforms, the clearinghouse, and respective underlying state registers and trading rules.

There was no support for the reallocation of IIOs' trade approval roles to state trade approval authorities. While there was support for further alignment of Basin State trade approval processes and a single portal or single form for lodgement of trade applications, there was little discussion and no strong support for reallocating Basin State trade approval roles to a single entity either.

On balance, that ACCC's view is that the additional benefits of reallocating trade approval roles to a single centralised entity that could be achieved with the proposed recommendation package are not likely to outweigh the significant costs. Moreover, the proposed approach for the Digital Messaging Protocol and the inclusion of a harmonised trading rules engine and a single trade application portal as functionalities of the Backbone Platform (which would then digitally transmit the applications through to the relevant approval authorities) would sufficiently mimic the outcomes that could be obtained from establishing a central clearinghouse.

12.8.4 Single common register

The interim report also considered the option of a single common register, as follows:

- ownership and trade for all water access rights in the Basin to be stored in a single common register
- all water account transactions (for example, announced allocation credits, usage debits, trade debits and credits) to be reported to this register at stipulated timeframes (such as on a monthly basis) – this would require reconciliation mechanisms between the central register and infrastructure operators' systems.

Feedback provided to the ACCC in consultation meetings and via submissions have indicated that a single register would not be a viable option for the following reasons:

- A single register has not been supported by Basin States and some stakeholders, primarily due to the costs associated with previous attempts at standardising registers under the Common Register Solution (CRS) or where registers support other operational needs (such as for IIOs). The CRS component of NWMS was abandoned in part because the very high costs of attempting to standardise registers. The project was far more complex than anticipated.
- CSIRO staff that worked on the Bureau of Meteorology's national water data collection program recalled the difficulty in reaching agreement across the states in relation to water information specified in Schedule 3 of the Water Regulations 2008. CSIRO staff noted that standardising terminology and presenting a national view can unintentionally encourage data users to just look at their local information instead: that is, because putting information into standardised, national terminology and reporting frameworks meant that it was difficult for individuals who are used to their local context to interpret nationally-standardised information.

The ACCC has found that the benefits of centralisation in terms of improving ease of interstate trade are not likely to be substantial enough to warrant the costs involved. Interstate trade made up just 7.7% of Southern Connected Basin allocation trades during 1 July 2017–30 November 2019 (excluding internal IIO temporary trades of irrigation rights).⁹³⁰

The ACCC agrees with the concerns raised by stakeholders, and considers that the additional benefits of a single common register, beyond the proposed recommendation package, are unlikely to outweigh the costs. The circumstances that ultimately caused the CRS to be abandoned have not been resolved and remain relevant. There is also little evidence to suggest that a single register will achieve the outcomes that market participants seek, and would significantly disrupt IIO operations if IIO registers were also incorporated. See also the discussion on the merits of harmonisation versus centralisation of trade services at section 12.7 above.

12.8.5 Full transparency: publishing identifying details of all market participants, including allocation account details

As explored at in chapter 11, some stakeholders have been calling for a national water register which publishes the names of water owners and water traders.

The interim report considered this option, but the ACCC's preliminary view was that publishing identifying details will not help solve market issues, for the following reasons:

- Publication of identity details in many, if not most, cases is insufficient to classify a person or entity into classes of interest to stakeholders. This may lead to unintentional or deliberate misuse of published information ('misinformation').
- Stakeholders may respond strategically to publication of entitlement details by taking action to 'mask' their identity (such as transferring entitlement holdings into the name of related parties with less identifiable names) – this outcome would work directly against the objective of improving transparency.
- Publication of identity details may have several drawbacks or unintended negative consequences.
- Publication may be inconsistent with personal privacy laws, particularly when relating to information on individuals.
- Publication may allow certain service providers avenues to inappropriately approach individuals to pressure them to engage in trade.
- Publication may allow inappropriate targeting of individuals or entities who are perceived to be engaging in inappropriate conduct, even where the conduct is lawful.⁹³¹

The ACCC retains this view. Having considered the information needs of market participants (outlined in chapter 11), the ACCC does not consider that publication of these details will provide the assistance that stakeholders need to make informed trading decisions, and other improvements to information should instead be prioritised. The ACCC also continues to consider that the publication of personal

930 ACCC analysis of NSW, Victorian and SA governments' responses to voluntary information requests.

931 ACCC, *Murray-Darling Basin Water Markets Inquiry: Interim Report*, 2020, p. 391.

details could lead to adverse outcomes, and further fuel concerns about misconduct of some traders as it may not always be possible to display 'the full picture'. The ACCC considers it more important that a regulator charged with monitoring and compliance have access to complete and identified trading data, which will provide market confidence in this way.

The ACCC considers that a better approach is to balance transparency and privacy concerns by improving the quality, timeliness and accessibility of *de-identified* trade data, and at the same time to address concerns about misconduct or scope to 'take advantage' more directly by the establishment of a whole-of-market regulator.

05

Market architecture

'Market architecture' refers to the framework of laws, rules, policies and arrangements that make markets for tradeable water rights work. Important elements of the Basin's market architecture include rules governing the trade of water between zones, and the sharing, storage and delivery of water. The following four chapters describe the ACCC's assessment and recommendations for market architecture.

Chapter 13 outlines the basis for the ACCC's high level conclusions about current trends impacting and being impacted by market architecture, and about how the Basin's market architecture is currently functioning.

Chapter 14 takes a detailed look at managing the impacts of interzone trade and delivery of traded water. It covers current rules and policies such as intervalley trade limits and other trade rules used to manage environmental impacts from trade, conveyance losses, delivery risk and managing environmental deliveries.

Chapter 15 looks at managing the interactions of trade with allocations, storage and use. It covers states' allocation policies and how they will deal with a changing climate, carryover policies and how efficiently they manage storages, the rise of carryover parking and its impacts, and the importance of modelling and accurate, timely measurement of water use.

Chapter 16 recommends priority actions governments can take to improve market effectiveness, through legal and policy reforms, and investments in improved information. It also proposes options to develop more efficient, integrated Basin market architecture.

13. Market architecture: understanding and managing the impacts of trade

Key Points

- 'Market architecture' refers to the framework(s) of laws, rules, policies and arrangements that make markets for tradeable water rights work. Important elements of the Basin's market architecture include rules governing the trade of water between zones, and the sharing, storage and delivery of water.
- Current market architecture and governance arrangements are largely state-based, complex, dispersed, lack transparency and are not well attuned to dealing with issues or effects that cross state borders.
- Market architecture rules should ensure that intervalley transfers occur within the bounds of ecological tolerances, and do not exacerbate deliverability issues. Rules for trade and delivery should manage water transfers with regard to all relevant users and operational considerations.
- Southern Basin market architecture design currently relies upon a range of simplifying assumptions, such as allocation trade generally occurs on a one-for-one basis and allocations can be delivered at any time of year. These assumptions are being challenged by changing water uses, trade patterns and water availability, and need to be reassessed as to whether they remain valid and how effectively they function to manage third party impacts.
- Not attributing the full costs of their decisions to traders creates a range of issues for other water users, but is currently most acute with regard to managing the interzone delivery of traded water and associated impacts.
- While arrangements for allocation trade have functioned reasonably well in the past, emerging pressures on the system, changing supply and demand factors and increasing trade mean key assumptions underpinning the market architecture need to be reassessed so that water markets remain robust and effective into the future.
- By developing tools that rely on market mechanisms to better signal the costs of decisions to trade, policy makers can design market architecture that will more efficiently facilitate trade and manage its impacts, offering benefits to market participants and to the wider community. For tools to be robust and to best mitigate third party impacts, they should align with the hydrological characteristics of the system
- Many issues such as delivery shortfall risk⁹³¹, environmental damage and conveyance losses, are more closely linked to the timing and location of water deliveries and use rather than the timing of trade. The market architecture currently manages these impacts largely through inexact and sometimes ineffective controls on trade, and mechanisms for capping extractions are not well established.
- Under current water register, metering and accounting systems, it is difficult to track traded water. This makes it difficult to identify the effects of trade in isolation from arrangements more generally, and to assess the magnitude of impacts or causal link between trade activity and the consequences that stakeholders attribute to trade.

931 Delivery shortfall occurs when available water cannot be delivered to users when they want it. This can occur even without trade, but trade that results in changes in the timing and/or location of water use may contribute to shortfall risk. This is considered further in section 14.2.2.

This report defines 'market architecture'⁹³² as the framework(s) of laws, rules, policies and arrangements that make markets for tradeable water rights work, including the storage and delivery of traded water. Key Basin market architecture elements include the:

- legal frameworks that create property rights⁹³³ (tradeable water rights include water access entitlements, water allocations, water delivery rights and irrigation rights) and provide for access to water resources
- intergovernmental agreements and Basin state and Commonwealth laws and policies that establish the arrangements for the sharing of water between the States, and among water users
- Basin State, Commonwealth and irrigation infrastructure operator (IIO) trading rules, that determine when and how trade can occur, in what water products, and if any special constraints or requirements apply to certain products or transactions
- a range of ancillary rules and arrangements that provide for the storage, delivery, measurement and use of, and accounting for, traded water and the operation of the river systems and their associated infrastructure.

The interim report drew on submissions from stakeholders and preliminary ACCC and other analysis to identify a range of concerns with the Basin's market architecture. This included concerns with carryover policies and the operation of rules to manage constraints on intervalley trade.⁹³⁴ For the final report, the ACCC has undertaken further analysis and drawn on others' research and analysis, to refine its views on the significant issues with, or arising from, the operation of the Basin's market architecture. To assist this work, we commissioned an independent consultancy to consider market architecture issues (see box 13.1).

932 The use of the term 'market architecture' is influenced by systems theory and takes its inspiration from similar terms used in other fields, such as information technology ("data architecture") and global trade and investment ('investment architecture', 'trade architecture'). See, for example: Ismail, F. 'The Changing Global Trade Architecture: Implications for Sub-Saharan Africa's Development', *Commonwealth Trade Hot Topics*, No. 131, 2016, <https://doi.org/10.14217/5jlv0qp7xsf0-en>, viewed 2 February 2021.

933 Note that the ACCC refers to property rights throughout this report with reference to their definition in economic theory, which is that a property right implies 'the powers to consume, obtain income from, and alienate ... assets'. Economic theory commonly notes characteristics of property rights as excludable, enforceable and transferrable and can include 'incomplete' property rights. Barzel Y, *Economic analysis of property rights* (2nd edition), Cambridge University Press, Cambridge, 1997, p. 64.

934 The inquiry terms of reference directed the ACCC to consider particular elements of Basin market architecture including the impact of carryover arrangements and the trade of water carried over; and arrangements for the management of storage and delivery constraints. See chapter 1.

Box 13.1: Independent analysis of the effects of market design on trade outcomes

To assist with its market architecture analysis, the ACCC engaged consultants Frontier Economics to assess whether the design of Southern Connected Basin water markets was constraining or distorting trade. This included asking Frontier to consider if a 'gap' existed between the trade and operational rules and the hydrological realities of the system and, if so, how closing such a gap could improve the operations, transparency, competitiveness or efficiency of Southern Connected Basin water markets.

Frontier worked with the ACCC, the MDBA and the southern Basin States, and drew on data and information collected and supplied by the ACCC for this analysis. Frontier prepared a report for the ACCC (the Frontier Economics Report) which outlined the issues it identified. These related primarily to interregional trade, delivery arrangements, carryover and individual storage arrangements, and governance. Consistent with the ACCC's interim report, Frontier also found the Southern Basin market architecture to be complex and fragmented, with overlapping governance arrangements which lacked consistency.⁹³⁵

Supplementing its own analysis and consultation, the ACCC has had regard to the Frontier Economics Report when considering market architecture and governance issues, and has drawn on Frontier's material in preparing this report. The ACCC has credited Frontier where appropriate and the Frontier Economics Report is published on the ACCC website along with this report.

For this final report, the ACCC has focused on identifying and analysing:

- evident, emerging or potential problems resulting from inadequately managed impacts of trade-related activity
- opportunities to better manage trade arrangements through changes to the rules regulating trade, with resulting improvements in market efficiency and outcomes.

Some of the analysis and commentary that follows is relevant to the whole Basin; however, this Part mainly focuses on concerns in the Southern Basin. Water markets in the Southern Basin are larger, more active and have more participants, and the issues are consequently more acute. This is true in particular for issues with deliverability risk and the management of intervalley trade.

The following three chapters describe the ACCC's assessment. This chapter, 13, outlines the basis for the ACCC's high level conclusions about how the Basin's market architecture is currently functioning. Chapter 14 takes a detailed look at the issues associated with managing the impacts of interzone trade and delivery of traded water. Chapter 15 looks at managing the interactions of trade with allocations, storage and use. Chapter 16 recommends actions governments can take as a matter of priority to improve market effectiveness through legal, regulatory and policy reforms, investment, improved information or other measures. It also proposes some options policy makers can explore to develop more efficient and integrated Basin market architecture in the years ahead.

13.1 Market architecture should be amended to accurately signal the costs of water usage and trading decisions

Market architecture defines property rights, determines how and where trade can occur, and manages the impacts of trade. The design of the Basin's market architecture determines whether its water markets are effective and how efficiently they operate.

⁹³⁵ Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 2020, p. 8, available at: <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/acc-commissioned-research>

The Basin's market architecture is created by a range of different Commonwealth, Basin State and irrigation infrastructure operator instruments. Chapter 2 of this report provides more detail on the specific laws, rules and policies that establish the key elements of these markets.

This part of the report considers how changing market activity and other conditions are altering how effectively the Basin market architecture is operating to facilitate trade and to manage the impacts of trade. Table 13.1 describes the key market architecture elements considered in the following chapters.

Table 13.1: Key market architecture elements discussed in this part

Market architecture elements	Role in market	Discussed in
Location-based trading rules (intervalley trade rules and Barmah Choke restriction)	Trade	Section 14.1
Water delivery and river operations	Delivery	Section 14.2
Entitlements and allocations policies	Supply	Section 15.1
Carryover rules and policies	Storage	Section 15.2
Metering, water accounting and modelling	Use/accounting/compliance	Section 15.3

13.1.1 Market architecture manages the impacts of trade and determines who can trade, and where

Water trading markets perform well when the costs of individuals' decisions on other parties (including the environment) are fully reflected in the prices and charges faced by that individual.⁹³⁶ Where prices correctly reflect the benefits, costs and risks of water use⁹³⁷, market participants are encouraged to make efficient usage, trading and investment decisions. If price signals are inaccurate, people may make choices which are not optimal for themselves or which may inadvertently cause negative impacts on the natural river system and on other water users (often referred to in economics as "third parties").

A key function of market architecture is to ensure that when individuals enter water markets, they are not able to undertake trades that would facilitate changes in water use and delivery that result in significant negative impacts on other parties.

Problems can arise where the market architecture does not adequately account for the impacts of trade and delivery (such as increased spill risk or environmental damage) or interactions between different policies or rules. Where this is the case, market participants may use water in ways that are privately beneficial to them, but 'socially' costly when the impacts on other water users or damage to the environment is taken into account.

For example, the existing market architecture does not allow trade of water allocations between locations that are not hydrologically connected, such as from the Goulburn Valley in Victoria to the NSW Border Rivers. The trading framework does not allow this because water capable of being delivered to users in the Goulburn Valley cannot be delivered to users in the Border Rivers region without negative impacts other users. Supplying the traded water allocation to the buyer's location would require water to be taken from the available supply in the Border Rivers, thereby reducing water available to other users in this region. In this example, the potential for negative impacts is obvious, and the case for the trade restriction is straightforward.

However, in many cases, making rules which appropriately protect third parties while still allowing for beneficial trade to occur is a difficult and complex exercise. One complicating factor is that impacts

⁹³⁶ This is recognised by the Basin water market and trade objectives and principles, set out in Schedule 3 of the *Water Act 2007* (Cth), which provide that the design of Basin water markets should (among other matters):

- facilitate the operation of efficient water markets and the opportunities for trading, within and between Basin States, where water resources are physically shared or hydrologic connections and water supply considerations will permit water trading
- enable the appropriate mix of water products to develop based on water access entitlements which can be traded either in whole or in part, and either temporarily or permanently, or through lease arrangements or other trading options that may evolve over time
- recognise and protect the needs of the environment
- provide appropriate protection of third-party interests.

⁹³⁷ In this case, water 'use' includes the trade or holding of water as an investment.

arising from trade are often only felt when the traded water is actually used, which may be a long time after the trade occurs. In order to reflect as accurately as possible the benefits, risks and costs of trading, the Basin's market architecture needs to consider the impacts of trade on water management and water delivery more generally.

To do this, market architecture should closely align with the hydrological realities of the Basin's rivers and storage systems. However these hydrological realities are complex and change over time. This complexity, along with the aim of ensuring markets accurately reflect all the relevant benefits, costs and risks sits in tension with providing users with simple, easy to use, low cost arrangements for trading.

An example of trading that is allowed by the existing market architecture is of water allocation from the Goulburn valley in Victoria to the South Australian Murray. In this case, since the two areas are hydrologically connected and the destination zone is downstream from the origin zone, it is possible to deliver traded water from the origin zone to the destination zone. Such a trade need not directly impact water rights held by third parties in either zone.

However, the trade creates the need to deliver water further down the river, and the buyer's use of the traded water may contribute to river channel congestion issues, conveyance losses or other issues such as increasing spill risks. For example, irrigators using water in a way that necessitates delivery of water from the Goulburn at times of heightened environmental sensitivity and when river flow is high might result in environmental damage which would not occur if delivery was required during a period of lower river flows. These indirect effects of trade may negatively impact others, and so need to be considered, but can be very difficult to assess. Assessing the effects of trade is further complicated by the timing of use of the traded water being individual's decision and not known in advance.

13.1.2 Southern Basin market architecture relies on simplifying assumptions

Designing and operating water markets is a fundamentally challenging exercise. Harvesting, storing and delivering a natural resource through a natural system has a number of implications for market design and operation, including:

- supply of the resource is limited and variable, being ultimately determined by the weather and government rules and decisions on allocating the resource rather than responding to traditional signals, such as high prices⁹³⁸
- delivery of water is limited by the capacity of man-made and natural infrastructure, including constraint points. Delivery also generally entails conveyance losses and it takes time for water to travel through the system
- storage is likewise subject to limited capacity (due to finite storage infrastructure) and losses
- protecting the environmental health of the natural river system and its associated ecosystems requires management strategies which may not align with the needs of other water users (such as irrigated agriculture).

To establish water markets that appropriately manage these characteristics but are simple enough to be relatively low cost and accessible for participants, policy makers adopted a number of simplifying assumptions when designing the Southern Basin's market architecture (see box 13.2).

⁹³⁸ Desalination plants may offer some very limited scope to contribute to water availability.

Box 13.2: Key simplifying assumptions made in the design of Southern Connected Basin market architecture

The key simplifying assumptions made in establishing water markets in the Southern Connected Basin, noted by Frontier Economics are:

- allocations can be delivered any time in the water year and are not tied to a particular season
- trade between trading zones does not result in additional conveyance losses and thus generally occurs on a one-for-one basis
- conveyance losses are socialised; that is, shared across all entitlement holders
- rainfall rejections⁹³⁹ are permitted
- shortfalls in delivery will be managed via rationing water extractions
- rights to storage and delivery can be combined in one instrument along with rights to inflows
- the period of water management is the water year, which runs from 1 July to 30 June.⁹⁴⁰

Information in chapter 3, in section 13.2 below and in the following chapters 14 and 15, shows systemic or behavioural changes are challenging the validity of some of these simplifying assumptions. These changes are affecting how river operators run the system, with consequential impacts on other users and the environment. In particular, the location of demand is increasing congestion in the system, carryover has changed the water year, and conveyance losses appear to be increasing.

- The assumption that water allocations can be delivered at any time contributes to the lack of signals water users face about the real costs and congestion associated with delivery, leading to increasing strain being placed on the Southern Basin's delivery infrastructure.
- The assumption that storage and delivery rights can remain bundled with rights to inflows has led to the rise of a 'proxy' market for storage capacity (in the form of carryover parking) and the absence of an effective mechanism for water users to manage their own delivery risks.
- While crop growth, weather and water availability and many elements of agricultural operations are not decided by the date, the construct of the water year (from 1 July to 30 June) was introduced to facilitate the development of administrative and accounting rules. Carryover has partly ameliorated the pressures created by this artificial construct, though it still requires a regime of account limits and accounting mechanisms to approximate finite storage capacity and address third party impacts.
- Conveyance losses from water delivery appear to be increasing for various reasons. While evidence on the magnitude is not strong, trade downstream may be contributing to increased conveyance losses, challenging the assumptions that all trade should occur on a one-for-one basis, and that conveyance losses should be socialised.
- It is assumed delivery shortfalls will be managed via non-priced based rationing of extractions but the mechanisms for doing so are not well established and a coordinated approach is yet to be agreed and communicated to water users. In the absence of efficient rationing mechanisms, consistently high flows during times of heightened environmental sensitivity have resulted in environmental damage.

Frontier Economics, in its analysis for the ACCC, concurred that 'some assumptions underpinning market trading architecture are being increasingly challenged. This in turn means that individual water trading decisions are having impacts on other water users, resulting in lost opportunities for more efficient use, increasing costs/losses of system operations, and/or adverse environmental impacts'.⁹⁴¹

939 Rainfall rejections occur when a water user places an order for water, but then no longer requires it because their water needs are subsequently met by rainfall, and so the water ordered stays in the river (possibly leading to increased flows and flooding downstream), and the user's account is not debited.

940 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 2020, p.19.

941 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 2020, p.7.

The concern is that if the market architecture does not accurately reflect the costs – increased deliverability risk, marginal conveyance loss impacts and environmental damage – water users will not face the full economic cost of their decisions, resulting in inefficient patterns of trade and investment. This points to the need to reconsider whether the assumptions underpinning current market design remain appropriate.

13.1.3 Market architecture creates a ‘disconnect’ between the timing of trade and the timing of water use and delivery

As explained in section 2.6 of this Report, water trading does not usually result in individualised delivery of water at the time of trade. When parties trade water, it is not physically moved between the parties or between storages. Rather, when trade occurs, it is the parties’ right to access water that changes rather than the physical movement of water.

Once traded water enters the buyer’s account, in regulated systems the buyer is generally free to use or trade it on at any time, including in future years (subject to relevant carryover rules), relying on river operators’ bulk deliveries of water to ensure water is available in the river system for use.⁹⁴² This creates a ‘disconnect’ between the timing of trade and the timing of water use and delivery.

A further ‘disconnect’ arises between retail water use and on-river bulk water movement because, as noted above, river operators do not generally release water to meet individual water orders. Rather, they estimate aggregate demand (based on historical usage data, prevailing weather conditions and other factors) and manage bulk releases to meet these forecast demands.

The ACCC’s assessment of the consequences of these disconnects for market operation is discussed below at section 13.3.2. It considers where current arrangements are generating, or increasing the magnitude of, impacts from water users’ delivery and use decisions, and focuses on identifying issues with the operation of the market, and the effectiveness of the market architecture, not the operational aspects of Basin water management.

13.1.4 Market architecture requires regular review and updating to reflect changing conditions

The influence of changing climatic, hydrological, market and other conditions means that the market architecture is unlikely to remain fit-for-purpose without regular review. This is particularly true in the context of climate change. A 2019 discussion paper by the MDBA identified that:

Climate change will have significant implications in the Basin, increasing pressure on the health of the Basin’s environment, its communities and its economy. It is also likely that the management, sharing and delivery of the basin water resources will become significantly more complex, and contested.⁹⁴³

These increasing pressures highlight the need to get the market architecture right, so that water users can make optimal decisions for themselves and their businesses, minimising negative impacts on other entitlements holders or the environment. The MDBA outlined the challenge of this task as follows:

Under declining water availability, the water market products offered by states need to remain fit-for-purpose. Inter-regional trade rules and limits need to be responsive to and sufficiently flexible to allow irrigators to trade water to mitigate risks associated with an increasingly warmer and drier climate. The reliability of water being able to be delivered to market users, particularly during an increasingly drier and low water availability future, needs to be well-understood. Research is needed into how production and financial risks of irrigators change and how irrigators may then respond to these changing risks (e.g. changing the extent, types and timing of crop plantings). Better understanding of these

942 Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 2020, p. 41.

943 Murray Darling Basin Authority, *Climate change and the Murray–Darling Basin Plan – MDBA Discussion Paper*, February 2019, <https://www.mdba.gov.au/sites/default/files/pubs/Climate-change-discussion-paper-Feb-19.pdf>, viewed 7 February 2021, p.10.

risks to irrigation will have implications for river operations with water management and planning decisions, and will reveal whether current water market rules are able to support irrigators mitigating and adapting to climate change risks.⁹⁴⁴

These design and information challenges point to the benefits of prioritising, and assigning clear responsibility for, the coordinated development of the Basin's market architecture. It is important not only to review the continuing fitness-for-purpose of the arrangements for trade but to anticipate emerging issues and address them early through market design.

Proactive action helps ensure that the negative outcomes associated with current arrangements do not continue to grow over time. Timely action will help ensure benefits from flawed arrangements are not taken as given, which can motivate resistance to change. The following section describes how changes are creating pressure for key elements of the market architecture.

13.2 Significant changes have occurred in the Basin since water markets were established

Water use and trade activity are dynamic, responding to changing climatic and market conditions. Since trade was introduced, water markets have continued to evolve, and trade growth has been enabled by incremental market architecture reform. Major reforms include the:

- gradual unbundling of water rights from land, to facilitate trade
- introduction of, and adjustments to, carryover policies
- evolution of rules restricting trade, with barriers progressively being removed and the Basin Plan water trading rules introducing a right to trade free of certain restrictions (among other matters)
- establishment of trading zones and the rules governing trade between zones
- introduction of environmental water held by governments, a category which now accounts for roughly 30% of water holdings in the Southern Connected Basin (see figure 3.29, and also section 4.2 for analysis of environmental water holdings).

These major policy changes enabled the growth of water markets and facilitated significant changes in water use and investment around the Basin, such as the increased plantings of horticultural crops in the lower Murray (see box 13.3).⁹⁴⁵ Removing trade restrictions has enabled market-based re-allocation of water, including from consumptive to environmental uses.⁹⁴⁶ The introduction of new forms of trade such as multi-year leases and forwards, together with reduced costs of allocation trade, have allowed irrigators to develop new water ownership and trading strategies; in particular, allowing them to carry on irrigation businesses without necessarily owning their own entitlements.⁹⁴⁷

At the same time, a range of non-market factors have affected water allocations, trade activity and system capacity. Long-term average temperature and inflow patterns have altered, with more frequent heatwaves and declining average inflows in the River Murray System. The Darling River has been in drought for much of the last 20 years⁹⁴⁸ and the MDBA has been unable to call water out from the

944 Murray Darling Basin Authority, *Climate change and the Murray-Darling Basin Plan – MDBA Discussion Paper*, 2019, p. 22

945 Aither, 2019, *Water Supply and Demand in the southern Murray-Darling Basin*, Victorian Water Register, https://waterregister.vic.gov.au/images/documents/Water-Supply-and-Demand-Report_Aither_FINAL.pdf, viewed 2 February 2021.

946 Productivity Commission, 2010, *Market Mechanisms for Recovering Water in the Murray-Darling Basin*, Productivity Commission, <https://www.pc.gov.au/inquiries/completed/murray-darling-water-recovery/report/water-recovery-report.pdf>, viewed 2 February 2021.

947 See table 4 in the report for the ACCC, which estimates around 3% of irrigators in the last 5 years “used no water from own entitlements (all water from purchases on temporary market and/or leased entitlements)”, J Schirmer & D Peel, 2020, *Understanding participation in water trading by irrigators in the Murray-Darling Basin* – report prepared for the ACCC, <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/accc-commissioned-research>, viewed 2 February 2021.

948 MDBA, 2020, *Managing Delivery Risks in the River Murray System*, Murray-Darling Basin Authority, <https://waterregister.vic.gov.au/images/documents/Managing-delivery-risks-in-the-River-Murray-system.pdf>, p. 16, viewed 2 February 2021.

Menindee Lakes to meet River Murray demand since 2017.⁹⁴⁹ Channel capacity through the Barmah Choke⁹⁵⁰ has also reduced from 11,500 ML per day in the 1980s to 9,200 ML per day in 2019, decreasing the volume of water that can be delivered from upstream storages in the River Murray without overbank flooding and increasing losses.

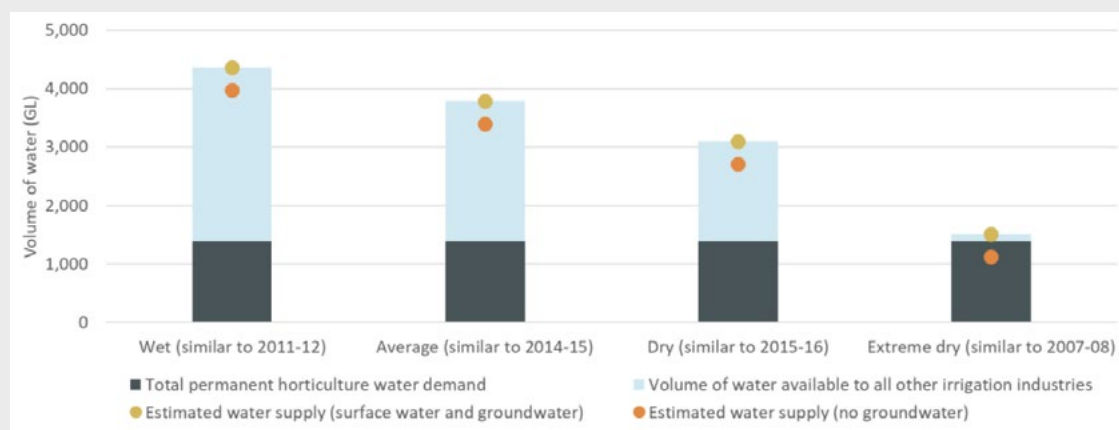
Box 13.3: Investment in permanent horticulture in the lower Murray region

In recent years, the lower Murray region has experienced significant growth in horticulture plantations, and in particular, almonds (see section 3.2.2). High almond prices have driven high gross unit returns for this crop, contributing to the increased planting area. Horticulture producers have relied on carryover and the increasing scale and sophistication of the market to facilitate access to water and to manage risks.

The scale of investment has increased the risk of delivery shortfall and supply shortages (where the volume of water available will be insufficient to meet the demands of permanent plantings in the system). In 2019, analysis for the Victorian Government by Aither forecast that, in similar drought conditions to the Millennium drought, current permanent horticultural plantation demand would require 125% of all of the surface water available in the connected Murray region (though groundwater and carryover may offer some relief, see figure 13.1). These forecasts are even direr once projections of predicted growth in plantings are applied, or the lower Murray is considered in isolation.⁹⁵¹ Under these scenarios, it can be assumed that the price of water would increase drastically (up to the price paid by the user with the highest willingness to pay, likely permanent horticulture), possibly well beyond what users in most agricultural sectors could afford to pay.

The ACCC considers this an example of a gap or flaw in the market architecture as current arrangements do not at present adequately signal risks and costs, likely contributing to inefficient patterns of investment in the agricultural sector, with ongoing impacts for water users and their communities.

Figure 13.1: Water availability scenarios and baseline permanent horticulture water demand (at full maturity), Southern Connected Basin (excluding Murrumbidgee)



Source: Aither⁹⁵²

949 Independent River Operations Review Group (IRORG), 2020, Review of performance against Objectives and Outcomes 2019-2020, <https://www.mdba.gov.au/sites/default/files/pubs/review-of-performance-against-objectives-and-outcome-2019-20.pdf>, viewed 2 February 2021, p.4.

950 The Barmah Choke is a naturally occurring narrow stretch of the River Murray that runs through the Barmah-Millewa Forests near Echuca, and is the lowest flow stretch of the River Murray.

951 Aither, *Water supply and demand in the southern Murray-Darling Basin*, p. 15-18.

952 Aither, *Water supply and demand in the southern Murray-Darling Basin*, prepared for the Victorian Department of Environment, Land, Water and Planning, p. 16.

13.2.1 Interzone trade has facilitated water use moving further down the Murray

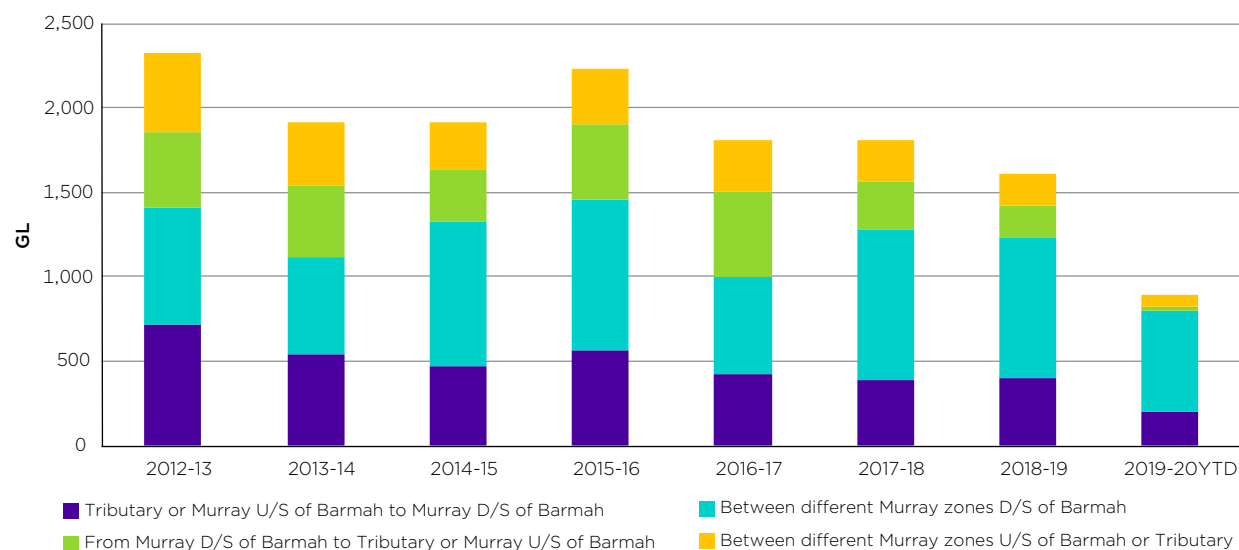
Trade, along with a range of other drivers such as climatic factors, is changing historical patterns of water use across the Basin. As noted in section 3.1.1, while the volume of water allocation trade in any given year strongly depends on total water availability, data indicates that volume traded relative to the total water allocated to entitlement holders is growing, and irrigators are increasingly participating in water markets.

Basin State trade data sheds some light on how trade is changing the location at which water may be taken in the Southern Connected Basin. The majority of individual allocation trades (measured by the number of transactions) occurs within a single zone⁹⁵³, and information on how the location of use varies within a zone is not available from this data. However, as some of these zones are quite large, these may not be appropriate to manage current river operation issues such as delivery shortfall risk or conveyance losses.

Note that interzone allocation trade is only one of several mechanisms to move water between zones. Additional mechanisms, such as legacy exchange rate trades, tagged usage, and transfers made under bulk arrangements are not included in the figures 13.2 and 13.3, and so they do not fully capture the volumes of water moving between these zones.

Figure 13.2 shows that the annual volume of interzone trade fluctuates across the Southern Connected Basin over time. However, the proportion of interzone trade which is from a tributary (for example, from the Murrumbidgee, Goulburn, or Lower Darling) or from upstream Murray zones to downstream of the Barmah Choke has remained relatively constant. This is despite significantly reduced water availability for the final three years, particularly in the Lower Darling and the Murrumbidgee.

Figure 13.2: Interzone trade flows in the Southern Connected Basin, 2012-13 to 2019-20 YTD



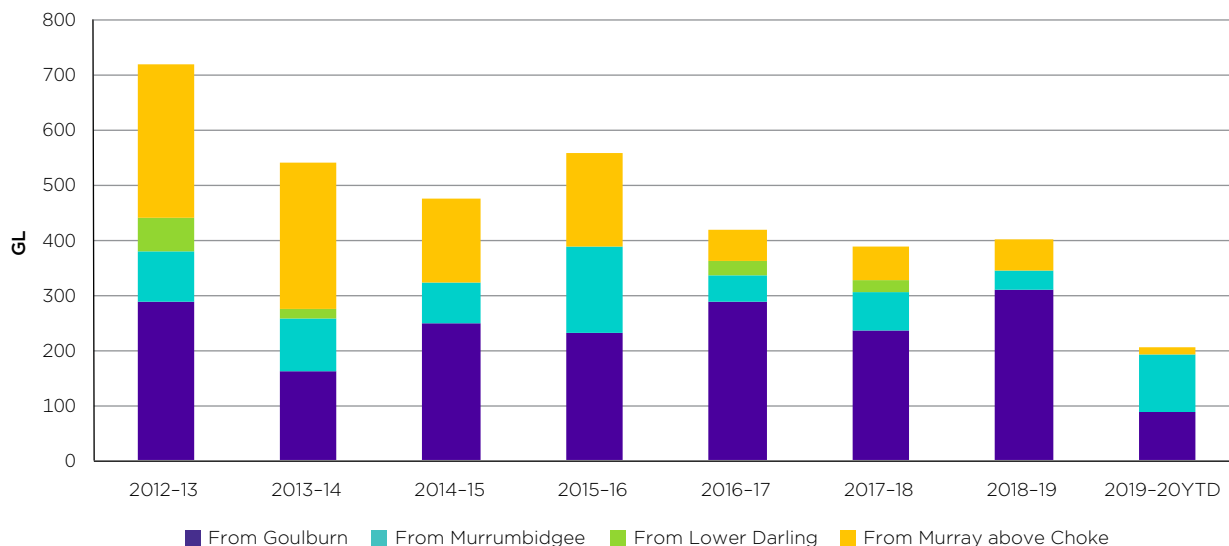
Source: ACCC analysis based on New South Wales, South Australian and Victorian Government responses to voluntary information requests.

Notes: Intrazone trades excluded, includes all interzone allocation trades in the Southern Connected Basin. U/S = upstream; D/S = downstream. Tributary zones comprise 13, 14, 1A, 1B, 2, 3, 4A, 4C, 5A, 6B. Upstream Murray zones comprise zones 10 and 6; Downstream Murray zones comprise zones 7, 11 and 12. Zero-price trades included. 2019-20YTD = 2019-20 year to 30 November 2020.

⁹⁵³ ACCC analysis based on New South Wales, South Australian and Victorian Government responses to voluntary information requests. Note that direct comparisons of the number or volume of intrazone trade versus interzone trade is complicated by the fact that an increasing proportion of interzone trade is facilitated via trade onto and off intermediaries' licences. This can occur in a variety of configurations, for example, a series of trades from (i) seller's account to intermediary origin zone account (intrazone trade), (ii) intermediary origin zone account to intermediary destination zone account (interzone trade) and (iii) intermediary destination zone account to buyer's account (intrazone trade). Where this occurs, by definition one or more intrazone trade happens for each interzone trade.

For interzone trades into the lower Murray, data reveals an increasing reliance on water allocations traded in from the Goulburn, exhibiting an upward trend since 2013-14 (see figure 13.3). This likely reflects the reintroduction of the Barmah Choke 'no-net trade' rule in October 2014⁹⁵⁴, low water availability in the Murrumbidgee, and the Lower Darling being unavailable for MDBA call-out or interzone trade since December 2017.

Figure 13.3: Interzone trade flows into the lower Murray by source zone, 2012-13 to 2019-20 YTD



Source: ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request

Note: Intrazone trades excluded, includes all interzone allocation trades in the Southern Connected Basin. 'Goulburn' includes 1A, 1B, 2, 3, 4A, 4C, 5A, 6B. Lower Murray zones include 7, 11 and 12, Murray above Choke includes zones 6 and 10. 2019-20 YTD = 2019-20 year to 30 November 2020.

For trades between the different lower Murray zones (that is, zones 7, 11 and 12), ACCC analysis shows that the overwhelming direction of trade is to move water allocation from Victorian Murray below Choke (zone 7) downstream to South Australian Murray (zone 12). Examination of the parties involved in these trades shows that, between 2012-13 and 30 November 2019, 94% of trades were undertaken by environmental water holders.⁹⁵⁵

Usage data also demonstrates changes in where water is being used, shifting use lower down the Murray

Analysis for the MDBA by consultants Hydrology and Risk Consulting (HARC) shows that, despite drought conditions in many recent years, the total volume of consumptive usage in the zones between the Barmah Choke and the South Australian border has remained relatively constant. However, a greater proportion of this use is being supplied by the 'call-out' of water from intervalley trade (IVT) accounts (a trend backed up by separate ACCC analysis).⁹⁵⁶ Reduced water availability due to environmental water buybacks and drought years has been offset by increased call out from IVT accounts, leading to consumptive use remaining relatively stable in downstream zones.⁹⁵⁷

Water use relative to available water determination volumes has increased significantly in the NSW Murray Below Choke zone, even exceeding 100% in 2018-19, due to the ability to access carryover and trade (see chapter 3, figure 3.33). Figure 13.4 below also represents this change, but examines aggregate changes in water use in zones below the Barmah Choke, and reflects the impact of the delivery of water from tributaries (IVT call-out), on these trends. In figure 13.4, solid lines represent

954 MDBA, *Barmah Choke trade balance and restriction*, n.d., <https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade/barmah-choke-trade-balance>, viewed 7 February 2021.

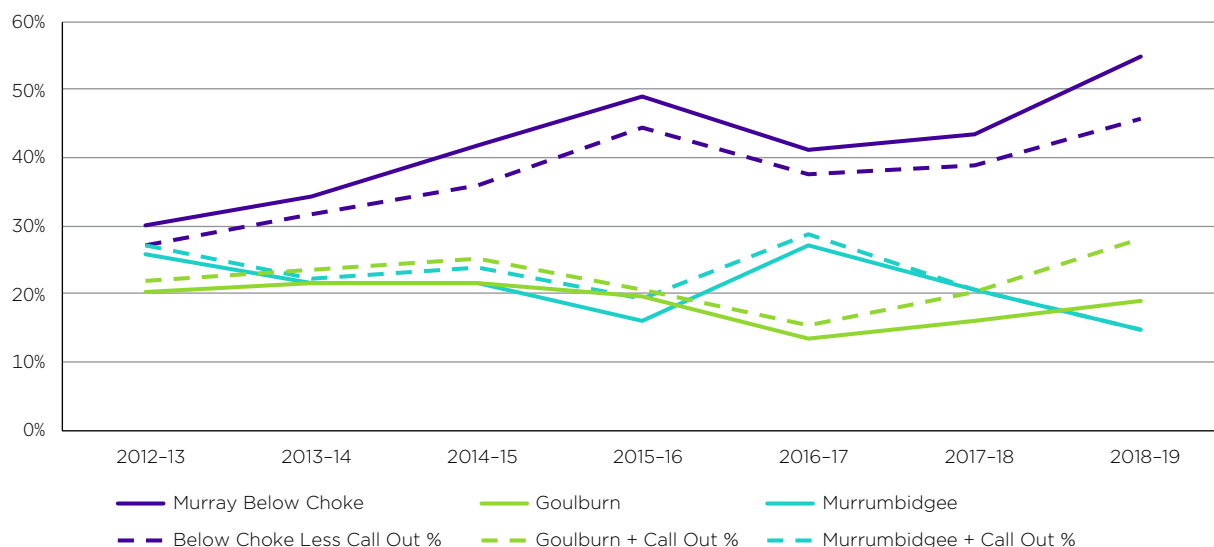
955 ACCC analysis based on New South Wales, South Australian and Victorian Government responses to voluntary information requests.

956 The MDBA has the ability to deliver or 'call-out' water from IVT accounts to meet water use demands in the Murray.

957 Hydrology and Risk Consulting (HARC), *Review of historical use of water: Barmah to the SA Border (HARC Report)*, prepared for the MDBA, 2020, <https://www.mdba.gov.au/sites/default/files/pubs/review%20of%20historical%20use%20of%20water%20barmah%20to%20south%20australia.pdf>, page viii, viewed 24 February 2021.

actual water use as a proportion of total Southern Connected Basin usage, while the dashed lines reflect the proportion of water used if all IVT water had been used in its origin valley. The gap between the coloured and solid lines of the same colour represents the volume of water called out from IVT accounts. The significant and growing gap between the solid and dashed purple lines indicates that IVT has been a significant driver of this increasing proportion of water use below the Choke, though it is likely that water availability has also played a role.

Figure 13.4: Proportion of total use (including environmental water) in the Southern Connected Basin in the Murrumbidgee, the Goulburn and Below Choke, with and without intervalley trade callout, 2012-13 to 2018-19



Source: ACCC analysis based on New South Wales, South Australian and Victorian Government responses to voluntary information requests.

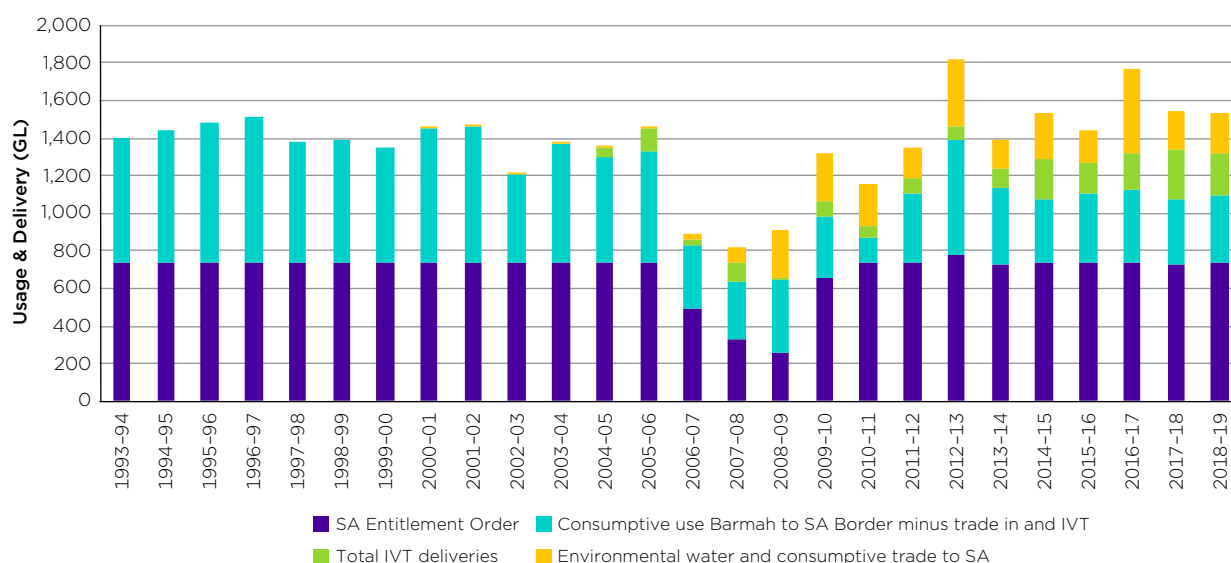
Notes: Assumes all IVT water is called out to zones below the Barmah Choke (Victorian Murray Barmah to SA, NSW Murray Below Choke or SA Murray). That is, it represents the volume of water use that changed valleys as a result of intervalley trade. This data is based on administrative records, which may contain errors or omissions.

13.2.2 Changes are making delivering water more challenging, increasing impacts on other water users and the environment

River operators are contending with changes to water use both in location, due to trade, and in purpose of application; that is, crop type. These changes are rendering historical assumptions about water demand patterns less useful. Figure 13.5 shows that although consumptive use (met from both regional resources and imports) between the Barmah Choke and the South Australian Border during the January to April period has remained relatively static, total usage and delivery through this reach has increased over the last seven years.⁹⁵⁸

958 Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 2020, available at: www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/accc-commissioned-research; Note, the January to April increase is of a lesser magnitude given that the pattern of environmental deliveries to South Australia tend to occur largely in winter-spring, and do not coincide with peak consumptive use. Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 2020, p. 58; HARC, *HARC Report*, 2020, pp. v-xi.

Figure 13.5: Annual flows into and through Barmah Choke to the South Australian border, January to April, 1993-94 to 2018-19



Source: Frontier Economics analysis of data used in the HARC report.⁹⁵⁹

Demand shifting to the lower Murray and increasing reliance by river operators on water from IVT accounts to meet that demand – together with other non-market factors – are increasing the operational challenges for water resource managers and river operators. These changes are contributing to a range of growing stakeholder concerns about the impacts of water trade and associated movement of water. During consultation, MDBA river operations staff indicated they are aware of the growth in trade since the Millennium drought and, in particular, the operational implications of water being traded between valleys. They acknowledged there may be a need for these patterns of water trade to be considered in the guidance framework used for guiding river operations decisions.⁹⁶⁰

River operators and water users increasingly face the risk that even though there may be enough water in the system, it may be unable to be delivered when and where it is needed. This is referred to as delivery shortfall, and this risk has been found to be increasing.⁹⁶¹ Delivery shortfalls and potential management options are discussed in section 14.2.

Understanding timing of use is an important component of assessing and managing delivery shortfall risk. There is limited consistent data available about actual time use of, and forecast demand for, water across the Basin. Shortfalls are likely to materialise in days and weeks rather than months, and in certain reaches of the river system rather than the whole river system. To effectively manage shortfall risk, river operators and water managers will need more granular data (see sections 15.3.1 and 16.2.3).

Decreasing Barmah Choke capacity and changes to Goulburn IVT and operational rules are also heightening the challenges for river operators in meeting downstream demand and managing shortfall risk.⁹⁶² Further, as environmental watering arrangements have developed, and the volume of environmental water has increased, the changes in delivery patterns resulting from environmental water deliveries has introduced additional complexity to managing river operations.

⁹⁵⁹ Frontier Economics *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 2020; Hydrology and Risk Consulting (HARC), *Review of historical use of water: Barmah to the SA Border (HARC Report)*, prepared for the MDBA, 2020, p. 59.

⁹⁶⁰ Trade Working Group discussion on Victorian Goulburn to Murray trade rule changes, 24 September 2020.

⁹⁶¹ J Doolan, D Davidson, D Harriss, T Hillman, P Simpson & G Turner, *Independent Panel for Capacity Project Review – Report to Murray-Darling Basin Ministerial Council*, 17 December 2019, MDBA, 2019, <https://www.mdba.gov.au/publications/mdba-reports/river-murray-water-delivery-shortfall-risks>, viewed 24 February 2021, p. 2.

⁹⁶² J Doolan, et. al, *Independent Panel for Capacity Project Review*, 2019, p. 13..

Environmental damage associated with interzone water delivery has been observed in the Goulburn, Murray, Edwards-Wakool systems and Murrumbidgee river systems.⁹⁶³ Movements of water including to facilitate trade also appear to be placing upward pressure on conveyance losses, which may be one of a number of factors impacting the reliability of allocations, particularly for lower reliability entitlement classes.

As noted in section 13.1.4, climate change is already having an impact on river operations, and is predicted to increase maximum temperatures and the number of hot days, decrease cool season rainfall, snowfall, soil moisture and run off, and increase the intensity of extreme rainfall, time in drought and frequency of severe drought.⁹⁶⁴ All these factors will contribute to future reduced water availability, increased operational losses and increased shortfall risk, exacerbating the challenges for river operators and water users.

13.3 Trade and market architecture design are contributing to growing problems

Despite challenges with obtaining robust data (see section 13.5 below), ACCC analysis has shown that under current market settings:

- carryover has the potential to result in third party impacts, though these are likely to not be of a significant magnitude
- proxy storage markets have emerged in the form of trade for carryover parking, reflecting that carryover is tied to entitlements rather than specified as a separate storage right. Due to low levels of trade, this is operating reasonably well. Higher levels of carryover parking may impact trade limits, and could increase the magnitude of any third party impacts not effectively addressed by existing policies.
- IVT limits do not adequately protect third parties from delivery related impacts resulting from trade. A limited number of market participants are also able to circumvent IVT limits using 'grandfathered tags'.⁹⁶⁵
- IVT limits are becoming more binding (or restricting trade) at the same time, and are expected to continue this trend. When IVT limits are binding, larger and better resourced participants such as agribusinesses and brokers dramatically increase their successful access to trade opportunities at the expense of irrigators.
- delivery related impacts are not well managed by market architecture, including:
 - changing patterns of water use are making the management of water deliveries more difficult and potentially contributing to increased conveyance losses
 - risks of delivery shortfalls are increasing, reflecting unpriced and bundled or uncapped rights to on-river delivery capacity
 - there is a need to better protect the environment, riparian landholders and other water users from the unintended impacts of delivering water throughout the system
- current metering data is not sufficiently timely nor spatially granular for a range of purposes, including for use in modelling and informing river operators' decisions.

As noted above in 13.1.3, the ACCC has found that the way the market architecture manages the hydrological characteristics of the storages and river systems produces a series of 'disconnects' between the time of trade and the actual movement of water, resulting in indirect, less efficient approaches to managing the impacts of trade. This can be seen in:

963 Delivery shortfalls occur when actual water usage is higher than it was forecast to be when water was released from the storages, weeks prior, to meet the forecast needs for irrigation and environmental water. MDBA, *Managing Delivery Risks in the River Murray System*, 2020, p.1; Victorian Department of Environment, Land, Water and Planning, *Changes to the Goulburn to Murray trade rule*, Consultation paper, 2020, https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/5915/8388/7812/Goulburn_to_Murray_trade_rule_review_consultation_paper.pdf, viewed 7 February 2020.

964 MDBA, *Climate change and the Murray-Darling Basin Plan*, MDBA Discussion Paper, pp. 9-10.

965 The term grandfathered tags refers to a small number of water access entitlements that are exempt from restrictions on the trade of water allocation within or between two regulated systems, because a 'tag' between the systems was established before 22 October 2010. Basin Plan Water Trading Rule 12.23(2) creates this exemption. See section 14.1.7.

- trade rules, such as intervalley trade limits, being used as an imperfect mechanisms for managing all of the impacts of intervalley water deliveries
- third party impacts of water trades that change the location or timing of use (such as environmental damage, delivery risks and conveyance losses) not being appropriately priced into water users' business decisions
- river operations being increasingly challenged by changing patterns of water use occurring in part as a result of trade (in conjunction with other non-market factors).

The ACCC concluded that the Southern Basin's market architecture may:

- not allocate available storage and delivery capacity efficiently. Market architecture does not always accurately reflect the hydrological realities of the system and does not effectively send price signals to users reflecting the limited storage and delivery capacity and the potential third party impacts of trade, storage and delivery decisions
- increase risks to other water users, river operators or the environment by failing to cost externalities into the market, such as the impact of individual decisions on conveyance losses, delivery congestion and environmental damage
- create distributional impacts, where some market participants are implicitly favoured at the expense of other water users. For example, when holders of grandfathered tags bypass intervalley trade limits; when well-resourced participants are able to monitor trade openings; in river operators' decisions to prioritise mitigating delivery risk at the risk of increasing conveyance losses; and in the combined effects of trade and declining inflows on allocations to low reliability entitlements
- not effectively distinguish between beneficial and undesirable trades and so may not efficiently allocate limited opportunities for intervalley trade to the highest value users. IVT limits have also prevented trades – when restrictions have been in effect because account limits have been exceeded – even though an individual trade might not actually increase spill risk, delivery risk or conveyance losses
- allow intervalley trade to occur beyond ecologically acceptable limits. For example, IVT limits have permitted trades that have contributed to water deliveries leading to environmental damage, as has been seen in the Goulburn in recent years
- add complexity and uncertainty to the roles and obligations of river operators by providing inadequate consideration of market impacts and guidance on trade-offs between different system operation requirements
- have an overall effect of reducing the net benefits of water trade.

The effective operation of the Basin's water markets is also significantly hindered by lack of transparent information on market architecture, adequate and reliable data, and coordinated and comprehensive modelling capabilities.

The ACCC considers that many of the market architecture problems identified arise from the simplifying assumptions made in the market design to enable the trade of water rights (see section 13.1.2) and from the characteristics of the underlying property rights. The balance of this chapter and the two chapters that follow set out and explain the basis for the ACCC's assessment.

13.3.1 The definition of water rights mean prices do not reflect the full costs of trading or using water

Water rights can be defined in many different ways. As outlined in chapter 2, the current approach to defining rights in most regulated systems in the Basin entails specification of a water access entitlement as a share of the relevant water resource, and issuing allocations against these entitlements throughout each water year.

One key feature of this approach is that the right to storage and ongoing right to inflows are combined or 'bundled' into water access entitlements, rather than being separately specified. Further, the right to have water delivered to an on-river extraction point has also effectively been bundled in with these rights in most states. In Victoria 'extraction shares' have been created though not capped.

On-river delivery infrastructure and storage infrastructure are scarce resources which offer significant value to their users. However, their scarcity is not explicitly signalled to users in current property rights or by market architecture. The lack of adequate price signals due to the lack of separate rights, leads to trades occurring that are not socially desirable. These are inefficient trades because the costs of externalities or third party impacts, such as reductions to the total available water resource, environmental damage or increased delivery risk, are not reflected in the prices of the traded rights to the individual.

Pricing scarce delivery capacity

Water markets in the Basin do not put a price on the scarce and dynamic on-river delivery capacity through which water can be delivered. The right to have water delivered to an on-river extraction point remains bundled with the right to access water, in the form of water entitlements, and is generally assumed there are no restrictions on the time of water delivery within a water year. When demand for delivery capacity (which derives from demand for water at specific locations) exceeds the amount of water that can be delivered, then a water delivery shortfall occurs. This results in broad restrictions on extractions, which act as a mechanism for rationing delivery capacity. In theory, limited delivery capacity could be rationed more efficiently using a market-based mechanism which determines a price for this limited resource.

In Victoria and New South Wales, water users pay charges for the delivery of water that include (or pass through) bulk water delivery charges imposed by the relevant bulk water suppliers (irrigation infrastructure operators also generally impose charges for delivery of water through their networks). However, water users are not required to pay a price for on-river delivery capacity which would vary according to its relative scarcity and increase during times of peak demand. This means there is no direct price signal to encourage water users to adjust their current or planned water use patterns away from times and locations where delivery capacity is scarce.

Many water users have assumed that delivery will continue to be the guaranteed and have made decisions based on this assumption. Note that this can be a rational response by individual growers to current market architecture settings. Providing a price based mechanism for allocation delivery capacity would allow for more efficient long term irrigation development downstream in the lower Murray, as market participants would be able to, and in some instances, be required, to pay to arrange their own delivery. Delivery shortfall risks are covered in section 14.2.2.

Socialising conveyance losses

Similarly, water users do not face the costs that their delivery decisions have on conveyance losses as conveyance losses are currently socialised across all entitlement holders (though impacts are being concentrated on holders of lower reliability entitlements). A decision by one water user to have water delivered in a manner that increases losses can result in a third party impact, in the form of reduced water availability for all water users.

The marginal impact of one individual water use or delivery decision is unlikely to have a significant impact on total conveyance losses in the River Murray System. However, the total aggregate volumes

of water lost to conveyance due to altered river management to support large volumes of additional downstream delivery may not be negligible under particular seasonal conditions.⁹⁶⁶

Under the current system for conveyance loss accounting, water users face no incentive to avoid seeking deliveries over longer distances or to seek delivery outside of peak periods. Peak periods usually have flow rates which are higher and weather conditions tend to be hotter and drier, usually increasing losses. The lack of price signals (or other mechanisms) reflecting the varied conveyance losses will likely lead to an increase in total losses and a reduction in total resource availability. This also constitutes a third party impact, the burden of which is most acutely felt by water users with less secure entitlement types. See section 14.2.3 for more detail.

Environmental impacts of delivery do not have a market cost

Water users also generally do not face the costs incurred as a result of environmental damage caused by their water delivery decisions. Water delivered to meet downstream demand can result in environmental damage, as seen with the environmental damage in the lower Goulburn from consistently high flows. However, once again, the costs of these impacts are not fed back to water users, meaning they are not incentivised to seek water deliveries in patterns which do not result in damage occurring.

Environmental damage that results from the use of natural river channels for delivery of water is an externality that is not accounted for within the market. Those who benefit from overuse of delivery resources – water users who are receiving water – are not facing the costs of their overuse. As part of the National Water Initiative in 2004, Basin States agreed to implement water pricing and institutional arrangements which give effect to the principle of user-pays in respect of water storage and delivery.⁹⁶⁷ These issues are explained in section 14.2.1.

Evaporative losses are largely socialised

The lack of evaporative loss factors attributed to individuals for allocation and some carryover policies also contributes to the imperfect price signals facing water users' use decisions. Similarly to conveyance losses, individual use and carryover decisions are unlikely to have significant impacts on evaporative losses. However at an aggregate level, decisions to carryover water or leave water in the dam for longer within the water year, will increase the overall level of losses and reduce the available water resources. Where carryover policies do not require water users' to incorporate the cost of these losses into their use decisions, these users will be incentivised to carryover more water than would be economically efficient, resulting in third party impacts. Ideally, evaporation losses would be applied at a more granular time period and for all water stored including allocated water, however this is not currently able to be done with current market architecture. See section 15.2.4 for more detail.

Market architecture flaws impact water markets and irrigation development

The outcomes of these flaws in the water market architecture depend in part on interactions with other factors outside of water markets. For example, expansion in irrigated agriculture in the lower Murray region is a factor of soil types, land values, agricultural zoning laws, relative costs of establishing greenfield irrigation sites versus adapting existing sites, and agricultural commodity prices coupled with an absence of incentives to take into account impacts of water trading and use decisions (see box 13.3).⁹⁶⁸

These changes in demand coupled with other shifts, and reductions in supply, are leading to an increase in these risks and third party costs. It is important to note that water trading itself does not create these

966 Frontier Economics *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 2020, pp. 48–49.

967 *Intergovernmental Agreement on a National Water Initiative 2004*, Between the Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/water/Intergovernmental-Agreement-on-a-national-water-initiative.pdf>, viewed 24 February 2021..

968 On 11 July 2019, the Victorian Water Minister announced that she would review all works licence applications in the lower Murray, including applications for new works licences and amendments to existing works licences. The conditions relating to extraction share will take into the consideration the cumulative impacts of growing extractions. The effect of this could be to restrict future growth in extraction share in this region: Victorian Minister for water, Minister announces review for works licence applications in lower Murray, media release, 11 July 2019, <https://waterregister.vic.gov.au/about/news/273-minister-announces-review-for-works-licence-applications-in-lower-murray-2>, viewed 7 February 2021.

issues, but is facilitating changes to water use patterns which appear to be contributing to increased risks and costs.

The above flaws in market architecture may result in distortions to market activity in addition to the direct impact of increased delivery risk, losses and environmental damage, such as:

- inefficient levels of development and use further downstream of constrained and environmentally sensitive reaches. This will likely lead to increasing conveyance losses, delivery risk and environmental impacts, compared with the case when development and use were to occur upstream of constrained reaches
- inefficient levels of investment in crops with use types with inflexible summer or peak demand profiles, compared to investment in crop types with more flexible or off-peak demand profiles
- a relative lack of investment in on-farm storages and other storage solutions, or other tools to manage the threat of a delivery shortfall faced by individual water users.

13.3.2 Trade rules struggle to manage impacts because of the ‘disconnects’ between time of trade, use and delivery

Rules governing trade between zones or valleys are generally specified with a view to ensuring the future obligations to supply water users at different locations do not change ‘too much’. This allows them to manage impacts from the ‘on-paper’ movement of water between accounts and between valleys, such as changes in the likelihood and burden of spills from storages.

However, the impacts on the river system generally result from the physical movement through, or extraction of water from, the river system, not the trade itself. Whether, and how substantially, impacts arise is influenced by the timing and flow patterns of water deliveries. This ‘disconnect’ means that existing trade rules have little influence on the timing of water use. As such, they are an ineffective mechanism for managing the physical impacts of water delivery and use (managing intervalley trade is discussed in section 14.1.)

The ACCC has found issues with how IVT limits are managing interzone trade, which are expected to worsen in the future. Specifically, IVT limits do not directly manage delivery related issues such as environmental degradation, delivery shortfall risk and conveyance losses from trade. These restrictions are ‘blunt’ mechanisms unable to distinguish socially beneficial trades from socially negative trades.

The lack of a separate right or mechanism to allocate delivery capacity has resulted in managing delivery constraints via trade restrictions. This is despite trade not having a direct relationship to when water is used and moved through the system, making trade restrictions an indirect control on delivery and conveyance loss issues, at best.⁹⁶⁹ This is discussed further in section 14.1.3.

These issues arise because of the ‘disconnect’ between the timing of trade and the timing of water use and delivery (see 13.1.3). These disconnects in the current architecture add to the complexity of designing rules and other mechanisms which effectively address the impacts of delivery.

13.3.3 Interzone trade rules can better address efficiency and equity considerations and operational outcomes

Access to IVT opportunity largely operates on a ‘first come, first served’ basis. Stakeholders have raised concerns that this may favour better-resourced market participants such as brokers, large agribusinesses and investors over smaller irrigators, as these market participants are able to invest more resources to capture this opportunity. These issues are examined further in section 14.1.6.

The effective management of IVT and delivery impacts related to this are also undermined by the presence of ‘grandfathered tagged entitlements’. The exemption awarded to these entitlements (under the Basin Plan water trading rules) allows a small number of water users to capture windfall gains by circumventing closed trade restrictions. Grandfathered tags are considered in detail in section 14.1.7.

⁹⁶⁹ Note that this disconnect does not exist for water traded and used by holders of tagged water access entitlements, as water ‘traded’ between these accounts remains in the source valley until the time use.

Taking all these issues together, the ACCC's view is that there is a need to rethink the current controls and model for interzone trade. Many issues such as delivery shortfall risk, environmental damage and conveyance losses, are more closely linked with timing of use rather than timing of trade. There is a need to reassess when and how water should be allowed to move between zones, and when and how it should be restricted.

13.3.4 Complex, inconsistent policies and requirements across Basin States create confusion

Overlaying a market on top of a natural system, with adequate rules to protect other water users and the environment, will almost inevitably result in complex rules. The state-based nature of a lot of governance arrangements for water and market architecture elements, have resulted in a complex web of policies. There are differences between states' policies in metering, entitlement, allocation, carryover policies, and IVT rules and other trade limits.

These differences feed stakeholder concerns that market architecture is overly complex and that water users in some Basin States face less stringent obligations than in others. Stakeholders are also concerned that in some states water users could be advantaged through access to arbitrage opportunities (that is, trading to take advantage of rule differences between zones). This occurs in the case of carryover parking trades which take advantage of more favourable carryover provisions in other zones.⁹⁷⁰ Carryover parking is considered in more detail throughout section 15.2.3.

Some policy differences are warranted by local conditions or features of state water management laws. However, Basin States should take the opportunity at the time of scheduled reviews (or sooner) to develop more harmonised policies, and simpler, clearer documents. Particularly in trade-connected valleys, this will help improve levels of understanding and confidence in market architecture.

Policies for metering and measurement of take are another example of policy inconsistencies of concern to stakeholders. Specific obligations vary between states, even with recent efforts under the Basin Compliance Compact to harmonise them. Inherent differences between the northern and southern Basin's hydrology and water markets can justify some ongoing differences in metering obligations. However, the similarities and interconnected nature of the Southern Basin mean long-term differences in metering and measurement-related obligations are difficult to justify.

Stakeholder confusion with market rules and policies can also be partially attributed to the currently dispersed nature of market information. Information can be found across numerous levels of government, government bodies and private information providers. Stakeholders need information about key rules and policies that is easy to access and understand. Basin States and the Australian Government are currently working together to create a centralised information portal to help water users easily find accurate and up-to-date information. This work, along with further analysis of market information is discussed in chapter 11.

The complexities of market architecture and related market elements favour individuals and businesses who are able to commit time to research and understand their intricacies. Brokers help users navigate these complexities, for a fee. Broker conduct is discussed further in chapter 8.

13.3.5 Governance arrangements and decision-making frameworks need to more effectively integrate water trade into water management regimes

Market architecture has evolved with changing trade needs and patterns, but change has not always been coordinated, consistent or timely across all Basin States. Market reforms at both national and state level have been ambitious and far-reaching. Over the last several decades, Basin States have formalised and expanded trade arrangements, introduced carryover policies and created statutory rights to water for the environment, among other measures.

⁹⁷⁰ Carryover parking refers to water that has been moved between accounts (either within or between trading zones). This can be between accounts owned by the same person (intraparty), or for carryover parking between accounts with different owners (interparty).

Despite the relevant intergovernmental agreements containing agreed objectives and principles to guide improvements, reforms to facilitate trade haven't always been implemented consistently across Basin States. Investment in metering technologies is a key example of where Basin States adopted different approaches to delivery agreed policy commitments.

Achieving a harmonised approach in practice is not easy. The system needs timely, informed, expert, coordinated and strategic policy making to design market architecture that can manage changing needs and conditions. Consistent oversight or input into market design and rule-making could promote increased harmonisation of trading rules over time. Governments should consider the benefits in having a market-focused expert institution that is able to analyse and consider market-wide as well as more localised impacts of any proposed rule change and provide advice into rule-making processes. This option is outlined further in chapter 17 in the discussion on establishing a Water Markets Agency.

13.4 Stakeholder concerns with Basin market architecture are growing

The existing market architecture has developed incrementally over a period of around 30 years. Key elements of the existing architecture have been designed with the input and support of stakeholders. For example, the simplifying assumption that trade within zones should be wholly free of restrictions has been long-supported by stakeholders, as has the view that exchange rates should not be applied to interzone trade.⁹⁷¹

However, as the shortcomings of the current market architecture become more apparent, stakeholder concerns about market architecture are growing, and many stakeholders are showing increased willingness to re-examine at least some of the simplifying assumptions, and to re-consider whether existing arrangements are likely to remain fit-for-purpose in the future.

In consultation, the ACCC heard a wide range of views on how the Basin's market architecture managed the impacts of trade and influenced the opportunity to trade. Stakeholder perspectives on, and concerns with, market architecture differed across the Basin, including between the Southern and Northern Basin, and as concerned different rules, policies and arrangements. The ACCC heard opinions like those of one water user who said:

The biggest problem is market architecture. [...] The whole way water is set up, tangled up in rules and regulations, it just goes on for ever. And tickets are getting clipped all over the place...How can all these other markets work? Water is a shocker.⁹⁷²

The diversity of views from stakeholders reflects, among other factors, stakeholders' differing experiences with the largely state-based legal and policy frameworks governing water management, and the wide range of highly technical matters encompassed by market architecture. The following sections outline common themes identified across market architecture concerns, with more detailed coverage of views relating to particular issues set out in the following chapters.

13.4.1 Stakeholders were concerned about the complexity of market architecture

A number of submissions commented on the complexity of the Basin's market architecture. This can make it difficult for individual stakeholders to find relevant information, understand key rules and policies, and establish the materiality and main drivers of perceived issues. The complexity also decreases trust placed in institutions and stakeholder confidence that issues are being well-managed.⁹⁷³ Australian Dairy Industry Council's submission to the ACCC's interim inquiry report stated:

971 For example, in developing its advice on the Basin Plan Water Trading Rules in 2010, the ACCC engaged with a wide range of stakeholders and stakeholder views on market architecture arrangements at that time are documented in the ACCC, *Basin Plan Water Trading Rules Draft Advice and Final Advice*, 2010. See <https://www.accc.gov.au/regulated-infrastructure/water/water-trading-rules-advice-development>, viewed 13 January 2021.

972 ACCC post-Interim report consultation with stakeholders, 14 October 2020.

973 National Farmers Federation, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020; Robert Campbell, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020.

The ability to manage a complex water portfolio is increasingly a key skill requirement in dairy farm businesses operating in the Basin. It is in this context that the water market must better assist in making dairy farming more efficient, productive and sustainable.⁹⁷⁴

Chapter 12, discusses the need to improve the transparency, availability and understanding of water market information. Part III of this report covers oversight of the conduct and regulation of market participants, and matters relating to integrity and confidence in the market.

13.4.2 Stakeholders raised concerns with the current operation of elements of market architecture

Stakeholders expressed concerns with how particular elements of the market architecture were operating. This included managing the impacts of trade, allocation policies, metering, carryover, deliverability and conveyance losses, intervalley trade restrictions, and tagged trades⁹⁷⁵, among other issues.

Stakeholders were concerned that trade increased the risk of delivery shortfall and conveyance losses, impacting lower priority entitlement users.⁹⁷⁶ Some identified that these problems arose because interzone trade rules did not adequately manage the impacts of trade and caused environmental damage.⁹⁷⁷ There were also concerns about the rules managing trade opportunities, such as the intervalley trade limits, the equity of access of participants,⁹⁷⁸ and support for removal of 'grandfathered tags'.⁹⁷⁹

In New South Wales particularly, stakeholders had concerns regarding allocation policies. Many expressed distrust in the allocations process and alleged that New South Wales had changed its policies at the expense of general security entitlement holders.⁹⁸⁰ Some submitters held the view that allocations were being received later than in previous years.⁹⁸¹

Stakeholders held contested views on carryover, with some wanting it abolished⁹⁸² or restricted to productive users only⁹⁸³, whereas others saw it as a valuable risk management tool.⁹⁸⁴ Some expressed

974 Australian Dairy Industry Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020.

975 'Tagged entitlement trading' is an arrangement to trade water between water sources or trading zones where the water access entitlement continues to be held in the source zone but is 'tagged' for extraction in a different source or destination zone. When an allocation announcement is made in the source zone, the purchaser is credited with the volume allocated and can order water for delivery in the destination zone.

976 Sunrice Group and Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020; Goulburn Valley Environmental Group Inc, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020; Bega Cheese, *Submission to the Murray-Darling Basin water inquiry issues paper*, February 2020, p. 4; Environmental Farmers' Network, *Submission to the Murray-Darling Basin water inquiry issues paper*, January 2020, p. 1.

977 Goulburn Valley Environment Group Inc., *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 2; NSW Farmers' Association, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 6; SunRice, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 6.

978 Central Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

979 Robert Campbell, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Southern Cross Farms, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; NSW Irrigators' Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Coleambally Irrigation Cooperative Ltd, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Victorian Farmers' Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

980 Coleambally Irrigation Co-operative Ltd, *Submission to the Murray-Darling Basin water inquiry issues paper*, February 2020; Murrumbidgee Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry issues paper*, January 2020, p. 2.

981 Rob McGavin, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

982 Gavin Dehne, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

983 Jodie Hay, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Gavin Dehne, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

984 Renmark Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Lislea Lodge Pty Ltd, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

concerns about carryover's impact on other users, particularly low security entitlement holders, through third party impacts.⁹⁸⁵

Stakeholders expressed support for improved metering and more telemetry⁹⁸⁶ and concerns about floodplain harvesting and overland flows in the Northern Basin not being metered.⁹⁸⁷

13.4.3 Feedback on interim report options acknowledged some problems but showed preferences for incremental reforms

The ACCC's interim report outlined a range of options for market architecture reform.⁹⁸⁸ Submissions in response to the interim report largely expressed preferences for making incremental changes to improve operation of existing market architecture over pursuing more significant reforms. One intermediary, Waterexchange, stated that irrigators are weary of water reform and investment decisions have been based on the existing market framework.^{989a} In contrast, investor Argyle Capital Partners supported progressive changes to market architecture, provided they accord with the National Water Initiative Principles and the Basin Plan.^{989b}

Others, like the Murrumbidgee Valley Food and Fibre Association, submitted that the ACCC's interim report highlighted the poor design of the 'market architecture', which was not fit for purpose and open to manipulation.⁹⁹⁰ Chris Guest submitted that the water market had perhaps had far less reform attention than any other aspect of Basin management:

Reform is well overdue...the Interim Report presents the information and analytical base from which a reform program can be constructed.⁹⁹¹

In contrast, Aware Water, an investor, said that at this time, it did not support changes to water market architecture. Aware Water stated that water entitlements were an important asset and it was important to maintain certainty in relation to the features and values of those entitlements, to attract investment into Australian agriculture.⁹⁹²

One representative body, the New South Wales Irrigators Council (NSWIC), submitted that many market architecture problems were likely best addressed through state planning frameworks. They outlined that further investigations and stakeholder consultation would be required on specific reform areas and options. In their view, a staged pathway should be developed; any more-significant proposals should be based on principles of best-practice regulation and include cost-benefit analysis. NSWIC also noted there were differences between the southern, central and northern systems, which must be taken into account in determining the scope of reform options.⁹⁹³

985 Robert Campbell, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2; Sandra Williams, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 4; David Morrison, *Submission to the Murray-Darling Basin inquiry issues paper*, 30 January 2020, pp. 2-3; ACCC, Murray-Darling Basin water markets inquiry public forum – Kerang, published 12 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20Kerang%20public%20forum.pdf>, viewed 7 February 2021; ACCC, Murray-Darling Basin water markets inquiry public forum – Shepparton, published 13 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20the%20Shepparton%20public%20forum.pdf>, viewed 7 February 2021.

986 Select Harvests, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7.

987 Murray Darling Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Jim Pratley, *Submission to the Murray-Darling Basin inquiry issue paper*, January 2020, p. 1; Citrus Australia, *Submission to the Murray-Darling Basin inquiry issue paper*, January 2020, p. 12; Green Dymension, *Submission to the Murray-Darling Basin inquiry issue paper*, January 2020, p. 4.

988 ACCC, *Murray-Darling Basin water markets inquiry Interim report*, 2020, <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/interim-report>, chapters 12-15.

989 a. Waterexchange, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p.4.

b. Argyle Capital Partners, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 7.

990 Murrumbidgee Valley Food and Fibre, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

991 Chris Guest, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

992 Aware Water Group, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

993 NSW Irrigators' Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

Overall and at a high level, the views expressed by governments and water users can largely be summarised as:

- Many water users advocated fixing current problems through incremental solutions; being wary of major changes and the cost they might entail.⁹⁹⁴
- Basin State governments indicated some willingness to fix what might be seen as already-acknowledged issues, such as concerns with 'grandfathered tags' and access to IVT opportunities. Some expressed cautious interest in some more significant reform ideas, such as revised mechanisms for handling and processing IVT applications. There was some wariness of major changes, because of what these might cost to implement and maintain, because they question the need for them, because they consider there are gaps in the information available on the issue to determine their merits, or because of concerns about reform fatigue.
- The Victorian Department of Environment, Land, Water and Planning indicated, in particular, that in recognition of the cost to implement and maintain any further significant reforms, Victoria expected clearly demonstrated benefits to justify the costs of reform. With regard to processing and managing trade opportunities, the Department considered that it was important to look at options to keep up with technological advances in market operations and harness the benefits of modern technology.
- Basin State governments were generally of the view that storage management arrangements, including carryover arrangements, do not need major reform.⁹⁹⁵ While many stakeholders value carryover as a risk management tool,⁹⁹⁶ a limited number of other stakeholders expressed concern about the potential for third party impacts to arise from specific carryover settings, with some advocating the removal of carryover altogether, or limiting access to carryover to certain users only.⁹⁹⁷ On the whole, concern about storage and carryover arrangements was less than concerns about other elements of market architecture.
- There was mixed and cautious interest in considering whether there should be new mechanisms to price and distribute on-river water delivery capacity.⁹⁹⁸ However stakeholders are concerned about the costs of further reforms and are unconvinced that significant reforms would be justified.⁹⁹⁹
- Many stakeholders continued to express concerns about the impact of conveyance losses, and commonly supported the introduction of conveyance loss factors on trade to account for these, while others supported alternative measures (such as preventing over bank flows).¹⁰⁰⁰ Other stakeholders raised questions over the practicality of and justification for loss factors.¹⁰⁰¹
- Many water users and Basin State governments were concerned about how potential changes to market architecture could affect the current definition of property rights for water, and the potential additional complexity significant reforms could introduce to the market.¹⁰⁰²

994 Central Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 3; National Farmers Federation *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

995 Victorian Government, *Submission to the Interim Report*, 13 November 2020, p.1.

996 Lislea Lodge, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

997 Gavin Dehne, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Marieann Westerhoff, *Submission to the Murray-Darling Basin water inquiry interim report*, 4 December 2020.

998 Southern Cross Farms *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

999 Central Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; NSW Irrigators' Council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

1000 Murrumbidgee Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; New South Wales Irrigators' Council *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Coleambally Irrigation Cooperative Limited, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

1001 Kilter Rural *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Central Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

1002 Victorian Government *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; NSW irrigators' council, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; National Farmers' Federation *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

- How the Basin States and the MDBA manage trade and delivery of water through constrained points like the Barmah Choke and between the Goulburn and Murray Rivers remains of concern.¹⁰⁰³ This included support for removing the exemption for grandfathered tagged entitlements.¹⁰⁰⁴
- The Australian and Basin State governments generally recognised the need for better guidance and resourcing for considering trade and the market's impacts within water management and river operations decisions, and improvements to the consultation and decision-making processes, when making changes to trade rules.

13.5 Trade is one factor driving changes in the Basin, but assessing the magnitude of trade's role in changes can be challenging

The current market architecture is operating increasingly inefficiently, with some elements undermining the achievement of the Basin water market and trade objectives and principles.¹⁰⁰⁵ In reaching this conclusion, the ACCC has integrated a wide range of data sources and information to inform its assessment. However, existing water data was not always fit-for-purpose for analysing water market impacts.

Due to a lack of reliable data, the ACCC was unable to identify the precise contribution trade made to aggravating third party impacts such as increasing conveyance losses, environmental damage to river banks, and growing delivery shortfall risk. This lack of data included the absence of comprehensive, real-time water use and location data, and of comprehensive trade opportunities data sets from certain sources: these and other data gaps have contributed to the difficulty of robustly analysing the contribution of traded water to growth in these impacts.

Current water trade arrangements and accounting systems also do not allow water to be 'tracked' as it moves through the system (see section 11.5.3). This means that once water has left a zone, it can be effectively 'mixed' with other allocated water on a person's account to be on traded, used or carried over. The ACCC cannot trace when and where traded water is being moved and used, making assigning trade's role in wider changes in the system difficult. Measures to improve the ability to track water are discussed in section 12.4.4.

The difficulty in identifying and allocating trade's impact is compounded by the large changes occurring in the river system. The dynamic interactions between, and large changes in, hydrology and climatic conditions, river operation decisions and other environmental factors contribute to the difficulties to assess whether trade has exacerbated these externalities.

1003 Greater Shepparton City Council *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Australian Water Brokers Association *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Select Harvests, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

1004 Robert Campbell, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Sunrice and Ricegrowers Association *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020; Victorian Farmers' Federation, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020.

1005 See the Basin Plan water market and trading objectives and principles in Schedule 3 of the *Water Act 2007* (Cth), and Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 2020.

14. Managing the impacts of trade and delivery

Key Points

- Intervalley trade (IVT) limits aim to manage the third-party impacts of trade between valleys and are key regulators of allocation trade in the southern Basin. However they are not managing these impacts effectively.
- IVT limits have become increasingly binding in recent years, a trend which is anticipated to continue. This is contributing to price differences between valleys, and reflects that there may be more demand for intervalley trade than can be met under current arrangements. This raises the question of whether current settings are optimised to maximise the value of intervalley trades by allowing efficient, and restricting inefficient, trades.
- Trade rules could better align with changing system conditions, be more equitable and better able to maximise trade within physical constraints and environmental tolerances.
- Environmental damage is occurring, particularly in the Lower Goulburn, as large volumes of water from IVT accounts have been delivered at consistently high flow rates – a cost not borne by the beneficiaries of these water movements.
- ‘First-in, first-served’ queueing systems for administering access to intervalley trade opportunities are likely not the most efficient mechanisms and have resulted in large market participants investing in information technology systems for lodging quick trade applications in order to get to the front of the queue.
- ‘Grandfathered’ tagged water access entitlements are exempt from allocation trade restrictions. This provides a small number of market participants an inefficient and inequitable ‘loophole’ to circumvent trade limits.
- Delivery infrastructure is becoming increasingly congested and the risks of shortfalls are increasing as demand patterns and system operations change. Meanwhile, strategies for managing an actual shortfall are not well established or communicated.
- The guidance to river operators provides little direction over how river operators should manage conflicting objectives, such as delivery risks, conveyance losses and environmental damage, while also not effectively integrating water markets and water management.
- Interzone trade rules and the operational arrangements for managing water delivery arrangements are failing to adequately accommodate users’ different delivery needs, pointing to the need for better integration of trade and delivery arrangements for environmental water, and water markets.

This chapter examines issues associated with managing the impacts of interzone and intervalley trade (IVT) and delivery of traded water.

14.1 Understanding the issues with interzone and intervalley trade

Water markets aim to move water to its highest valued use. To achieve this, trading rules allow the location of water use to change, including through trade between zones, valleys and even rivers, where hydrological and water supply considerations permit, it and the impacts on other water users and the environment can be managed.

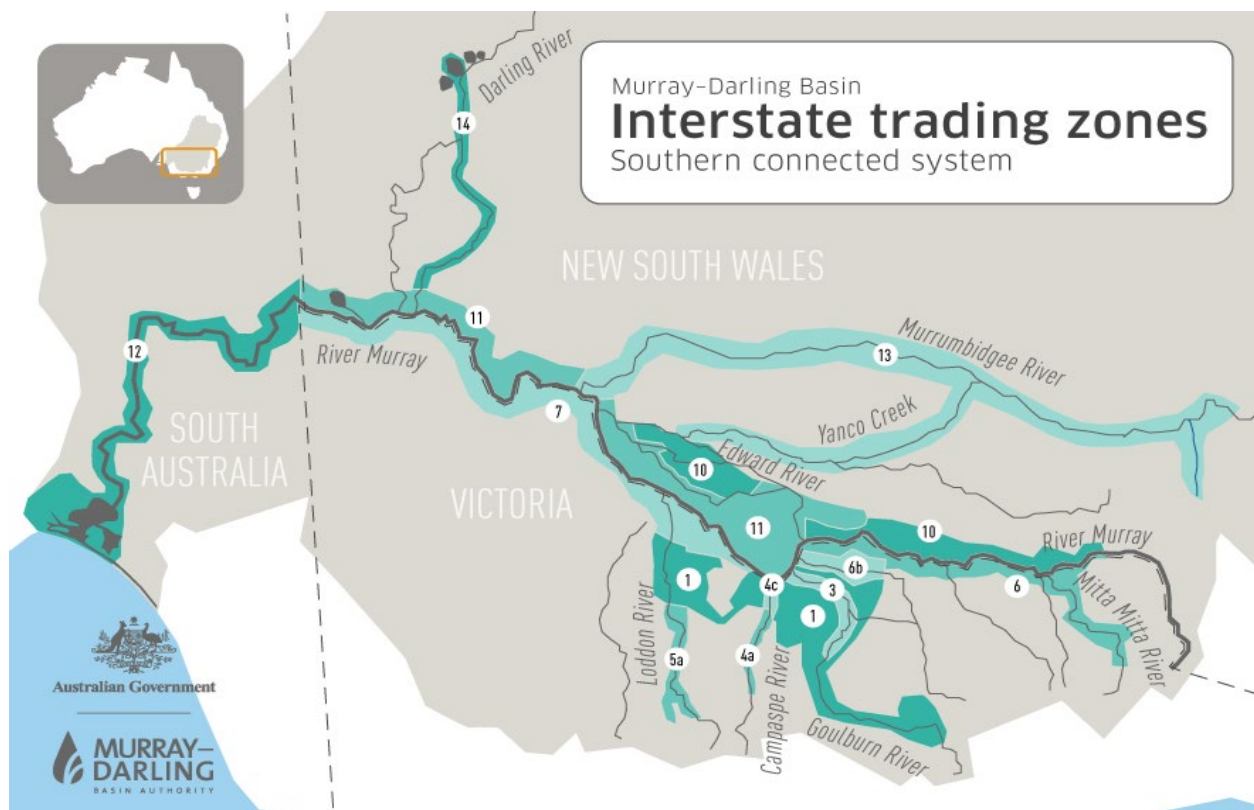
There are some concerns with how the market architecture currently manages trades between valleys and their potential impacts. These relate to how efficiently and effectively the intervalley trade rules manage the movement of traded water and associated impacts and trade opportunities.

14.1.1 Interzone and intervalley trade limits are key regulators of allocation trade

Interzone and IVT rules are a major factor in determining where and when trade can occur at a given time and in influencing arbitrage opportunities. These trade rules limit the volume of water than can be owed to the destination valley, to manage third party impacts (discussed in subsection 14.1.2). They are therefore significant influences on trade and price differentials in the Southern Connected Basin.

Allocation trade between valleys works by moving water from the source valley to the destination valley through a series of water accounting adjustments at the individual account and bulk level (figure 14.1 shows a map of trading zones in the Southern Connected Basin). River operators and trade approval authorities use IVT accounts to track the water owed, and delivered, between valleys to seek to 'ensure there is sufficient supply as a result of a sale to meet the purchaser's demand'.¹⁰⁰⁶ Water in IVT accounts is available for delivery or 'call-out' by the MDBA, to be used to meet water demands in the Murray.

Figure 14.1: Interstate trading zones, Southern Connected Basin



Source: MDBA¹⁰⁰⁷

In the Southern Connected Basin, IVT and interstate trades are the subject of joint management and oversight through arrangements set out in Schedule D of the Murray–Darling Basin Agreement (and supported by various protocols).

As the river operator in the Murray, the MDBA maintains the IVT accounts, administers the Barmah Choke trade balance, and directs the call out (or ordering) of water. Basin States and intergovernmental protocols set limits on maximum (and minimum) IVT account balances (see table 14.1). As restrictions on trade, these rules must comply with the Basin Plan water trading rules. When the limit is reached,

¹⁰⁰⁶ Victorian Department of Environment, Land, Water and Planning (DELWP), *Changes to the Goulburn to Murray trade rule*, 2020, https://engage.vic.gov.au/download_file/26084/3373, viewed 3 February 2021.

¹⁰⁰⁷ MDBA, *Interstate Water Trade*, 2017. <https://www.mdba.gov.au/managing-water/water-markets-trade/interstate-water-trade>, viewed 5 February 2021.

trade halts until the balance owed reduces to a specified level. Basin state trade approval authorities manage the processing of allocation trades between states and valleys.¹⁰⁰⁸

IVT account balances:

- increase when water is sold from the upstream valley to the downstream valley, representing a net future obligation on the valley. This occurs whether or not the water has physically left the dam or water source for use by the individual
- increase due to legacy entitlement trades. Legacy entitlement trades were abolished in 2007, but involved 'converting' a traded entitlement by cancelling it in the source valley and reissuing it in the destination valley with an exchange rate applied¹⁰⁰⁹
- reduce when the net amount of water owed is reduced, such as when the operator of the Murray River, the MDBA, 'calls out' or orders water to meet downstream demand; or water is 'back traded' upstream into the IVT account valley.

Table 14.1: Allocation trade limits within the Southern Connected Basin

Limit name	Rationale	Trade limit
Barmah Choke	The Barmah Choke is a narrow stretch of the Murray, which has a limit 'to protect water delivery to existing entitlement holders and for environmental reasons'. ¹⁰¹⁰	No net trade allowed downstream
Murrumbidgee IVT limit	<p>The 0 GL limit is so that the Murray cannot owe water to the Murrumbidgee, as a negative balance would require water to be delivered upstream into the tributary to clear the valley account.</p> <p>The 100 GL limit represents approximately 5% of general security allocations in the Murrumbidgee system and is viewed as an acceptable level of risk to third parties, particularly conveyance losses.¹⁰¹¹</p>	0–100 GL (following closures, trade opens at 15 GL and 85 GL)

¹⁰⁰⁸ *Murray–Darling Basin Agreement (Schedule D – Permissible Transfers between Trading Zones) Protocol 2010* (Cth) s. 6(6), Schedule to the Murray–Darling Basin Agreement, *Water Act 2007* (Cth).

¹⁰⁰⁹ Approximately 100 GL of water shares were cancelled in the Goulburn and re-issued in the Murray, including some traded to South Australia. There is also 40 GL of water in the Goulburn for environmental flows in the Snowy and Murray rivers. Up to 140 GL of water entitlement in the Goulburn system is owed to the Murray system. This water needs to be delivered to the Murray every year. This is discussed in more detail here: Victorian DELWP, Changes to the Goulburn to Murray trade rule, 2020, available at https://engage.vic.gov.au/download_file/26084/3373.

¹⁰¹⁰ MDBA, *Barmah Choke fact sheet*, 2020, <https://www.mdba.gov.au/sites/default/files/pubs/The%20Barmah%20Choke%20fact%20sheet.pdf>, viewed 5 February 2021. See also <https://www.mdba.gov.au/managing-water/water-markets-trade/barmah-choke>, viewed 16 November 2020

¹⁰¹¹ NSW Government, *Murrumbidgee IVT Limit – Fact Sheet*, n.d., p.2, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0018/209412/murrumbidgee-ivt-fact-sheet.pdf, viewed 5 February 2021.

Limit name	Rationale	Trade limit
Goulburn IVT limit	The limit is needed to protect Victorian Murray water entitlements stored in dams and prevent the volume of trade adversely affecting storage levels (spill risk). ¹⁰¹²	200 GL Trade from the Murray and other main tributaries are limited to back trade only, ¹⁰¹³ effectively limiting trade from downstream to prevent water being owed from the Murray to the Goulburn. ¹⁰¹⁴
Lower Darling	Trade is only allowed when the lower Darling is connected to the Southern Connected Basin, and under MDBA control to ensure traded water can be delivered from the Lower Darling. ¹⁰¹⁵	MDBA gives control of Menindee Lakes to New South Wales when the total storage volume falls below 480 GL. Control reverts back to the MDBA once storage levels rise above 640 GL.
Interstate trade limit	Victoria has imposed a general limit on trades from New South Wales into Victoria to prevent spills. Victoria considers these rules provide a safety net to 'avoid the need for future sudden trade suspensions that affect how people can manage their water'. ¹⁰¹⁶ This is to help manage dam capacity constraints.	This limit operates in two parts: <ul style="list-style-type: none">First, trade into Victoria is not permitted if Victoria's share of Hume and Dartmouth Dams has a risk of spill of 50% or more.Second, total trade from New South Wales into Victoria is limited to 200 GL per year.¹⁰¹⁷

14.1.2 Limits on interstate and intervalley trade aim to manage third party impacts of trade

Rules limiting trade interstate, intervalley and through the Barmah Choke are designed to manage the operational issues associated with moving water between valleys and the potential impacts of these transfers on other water users. Some potential impacts which are supposed to be managed by rules on interzone trade can include:

- spill risk – the limit reflects that water traded out 'on paper' still physically sits in the origin valley and takes up airspace in the storage. In a wet year, this water can potentially displace (that is, prevent the storage of) inflows that would otherwise be allocated to origin valley (or, in the case of the interstate trade limit, Victorian) entitlement holders in the following year
- delivery risk – the physical capacity of the river channel constrains how much water can be delivered within a period of time. If too much water has been pledged to other regions via trade, river operators may not be able to supply adequate water at the time and place it is needed (discussed in subsection 14.2.2)
- conveyance losses – depending on prevailing conditions, when water is traded downstream to a zone beyond the water source, such as beyond the long reach of the Murrumbidgee River, more water may be lost to evaporation or seepage as the traded water is called out to meet demand and flows through the river system. Losses can impact the pool of consumptive water available for allocation (discussed in subsection 14.2.3).

¹⁰¹² Victorian Water Register, *Understanding the Goulburn to Murray trade limit*, 2019, <https://waterregister.vic.gov.au/about/news/218-understanding-goulburn-to-murray-trade-limit>, viewed 5 February 2021.

¹⁰¹³ 'Back trade' means a transfer from one trading zone to another trading zone, being a transfer that is no greater in volume than the net volume of preceding transfers between the same trading zones in the opposite direction and the volume available in the relevant valley account, as defined in Schedule D – Permissible Transfers protocol.

¹⁰¹⁴ Schedule D – Permissible Transfers protocol.

¹⁰¹⁵ Schedule D – Permissible Transfers protocol.

¹⁰¹⁶ Schedule D – Permissible Transfers protocol.

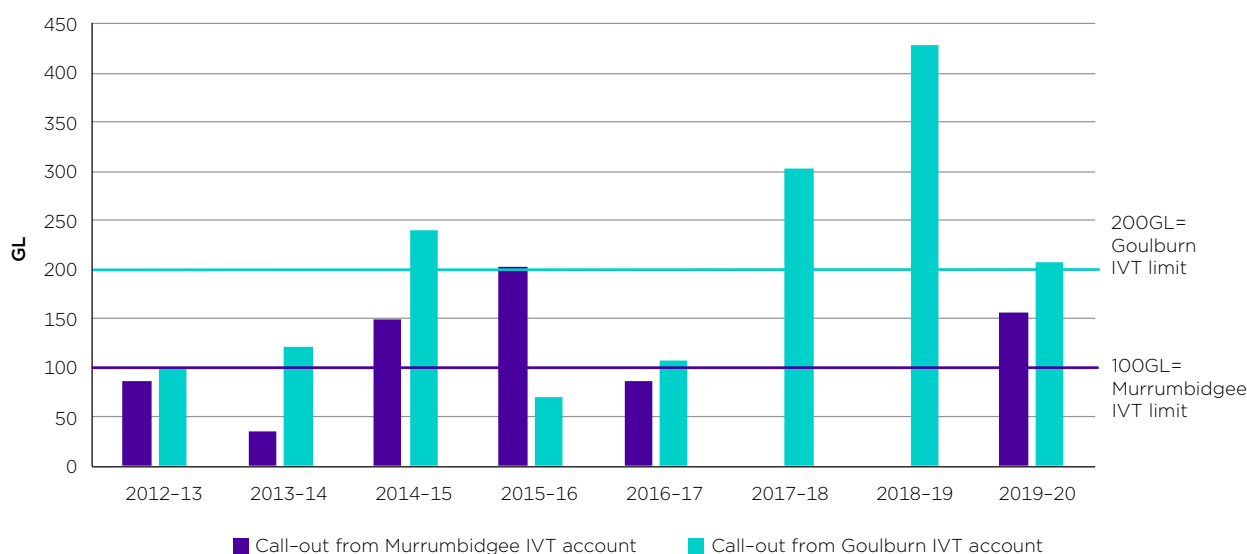
¹⁰¹⁷ Victorian Water Register, 2012, *Victoria refines controls on water allocation trade between valleys*, https://waterregister.vic.gov.au/images/documents/Victoria%20refines%20controls%20on%20allocation%20trade%20between%20valleys_November2012.pdf, viewed 30 June 2020.

- environmental damage – large amounts of water moving through river systems over long periods of time, particularly out of line with seasonal patterns, can cause bank slumping, erosion, loss of vegetation and negative impacts on the river environment (discussed in subsection 14.2.1)

14.1.3 Intervalley trade limits do not cap how much water can be traded and do not adequately manage issues related to timing of use

IVT limits do not cap the amount of water that can be traded or delivered from one valley to another, nor control or track time of use. In some years the large volumes delivered between valleys far exceed the volume of the IVT account balance limit. Figure 14.2 demonstrates the substantial volumes of call-out from, in particular, the Goulburn IVT account in recent years, and reveals that call-out volumes can far exceed the volume of trade limits. Concern over the environmental damage associated with the high volume and the pattern of this call-out is discussed in subsection 14.2.1.

Figure 14.2: Volumes of call-out from intervalley trade accounts, 2012-13 to 2019-20



Source: ACCC analysis based on MDBA response to voluntary information request.

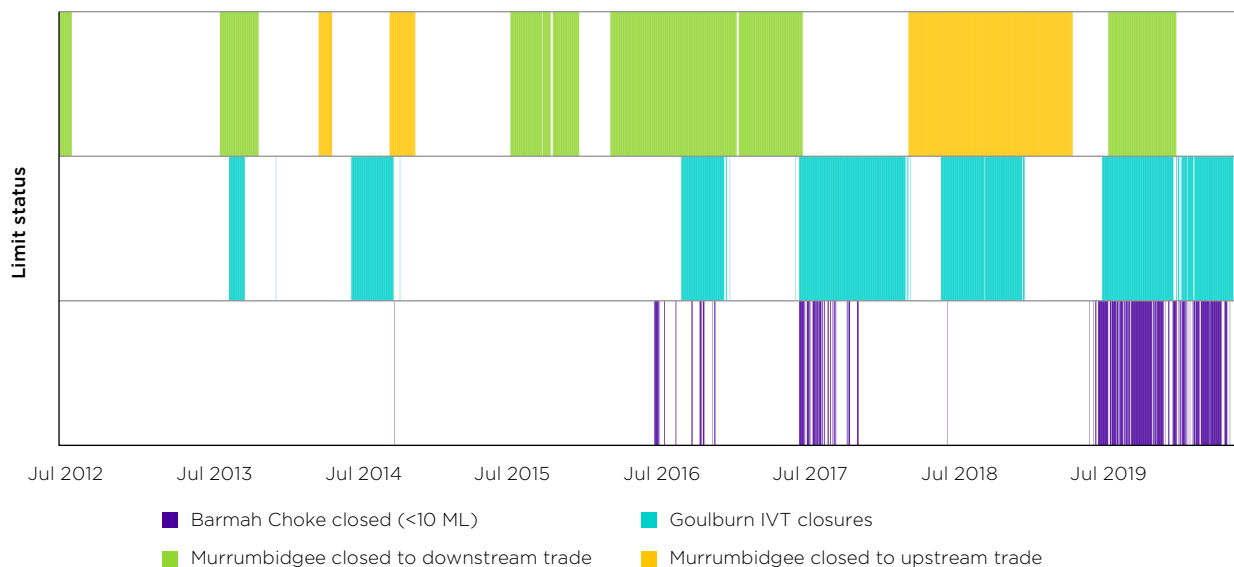
The inability of the current regime of IVT restrictions to cap the total volume of water delivered from an IVT account also means that they are an ineffective mechanism for managing conveyance losses associated with delivering this water through the source valley. Conveyance losses are discussed in more detail in subsection 14.2.3.

The way market architecture manages the hydrological characteristics of the system produces a series of ‘disconnects’ between the time of trade and the physical movement of water. This is why trade rules, such as intervalley trade limits, are an indirect, less efficient approach to managing the impacts associated with the delivery and use of water. While conveyance losses and environmental damage are linked to the timing and patterns of physical water delivery (rather than the time of trade), IVT limits operate by restricting trade itself, while delivery patterns are determined by river operations decisions regarding call-out of water from IVT accounts.

14.1.4 Intervalley trade restrictions have been limiting trade at the same time more frequently

IVT limits for trade into the Murray below Choke are increasingly ‘binding’ at the same time. An IVT limit is binding when trade is closed due to the limits being reached; meaning that market participants cannot trade between valleys for increasingly extended periods. In 2019–20, trade into the Murray from the Goulburn and Murrumbidgee, as well as from upstream to downstream of the Barmah Choke were all binding simultaneously for an extended period for the first time. This is shown in figure 14.3.

Figure 14.3: Occurrences of binding trade limits, Southern Connected Basin, 31 July 2012 to 30 June 2020



Source: ACCC analysis based on MDBA and NSW, Victorian and SA governments’ responses to voluntary information requests.

Note: First Goulburn trade restriction data point is 20 November 2012, and for Barmah Choke it is 31 October 2014. Barmah Choke ‘closure’ is defined as account balance is less than 10 ML.

Murrumbidgee closures from 31 July 2012 are calculated from intervalley trade account balance data. For 2019–20 water year, daily data for this account did not accurately capture IVT closures, so these were manually corrected. It is possible other such discrepancies exist for previous water years.

Chart incorporates changes to Murrumbidgee IVT limit operation over time.

Frontier contends that limits can be expected to be reached earlier each year (assuming underlying conditions remain the same), as irrigators will be incentivised to trade earlier in the season, if limits are consistently reached.¹⁰¹⁸ Research by the Australian Bureau of Agricultural and Resource Economics (ABARES) has also concluded trade restrictions are likely to be more binding in future.¹⁰¹⁹ Compared with total Basin water volumes, the amount of water moved between valleys in this manner remains small.

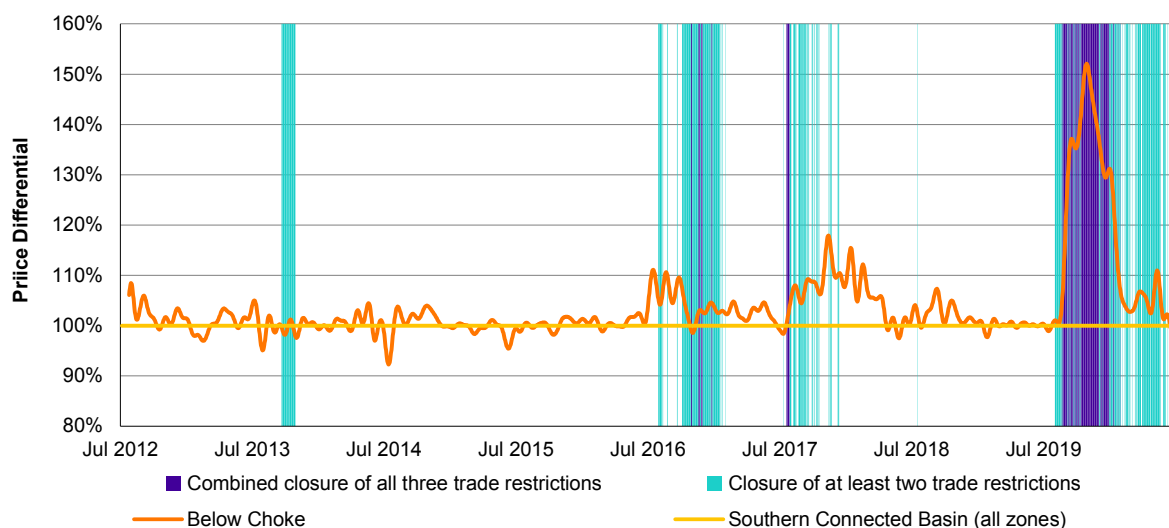
Greater Goulburn (zone 1a) and Murrumbidgee (zone 13) have experienced prolonged periods of significant divergences from Southern Connected Basin average prices in recent years. Figure 14.4, below, further demonstrates that trade restrictions binding concurrently is a relatively recent phenomenon in the Southern Connected Basin, while also revealing the impact of this on allocation trade prices. Where the price series is above 100%, this means that the average price of allocations traded in the below Barmah Choke zones is above the Southern Connected Basin as a whole, and vice versa. Prices below the Choke are more likely to be above the average Southern Connected Basin prices, and rise when all three restrictions are binding, a trend particularly evident in the second half of 2019. This is due to higher demand in Below Choke regions.

¹⁰¹⁸ Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 2020, p. 44, available at: <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/accc-commissioned-research>.

¹⁰¹⁹ ABARES, *Future scenarios for the southern Murray-Darling Basin water market*, 2018, available at: <https://www.agriculture.gov.au/abares/research-topics/water/future-scenarios-smdb>.

At a time of scarce supply and strong demand in late 2019, average water-allocation prices across the New South Wales, South Australian and Victorian trading zones below the Barmah Choke were up to \$330 per ML higher than Goulburn-zone prices and \$210 higher than Murrumbidgee prices. This compares with an estimation by market intermediary H2OX that the volume-weighted average price of water allocations in the Southern Basin since mid-2007 has been about \$180 per ML.

Figure 14.4: Timing of combined intervalley trade restrictions compared to average trade price for water allocations below the Barmah Choke, 1 July 2012 to 29 November 2019



Source: ACCC analysis of Basin State information request responses.

Note: Trade restrictions include Goulburn and Murrumbidgee intervalley trade limits and the Barmah Choke trade restriction.

First Goulburn trade restriction data point is 20 November 2012, and for Barmah Choke it is 31 October 2014.

Barmah Choke 'closure' is defined as account balance is less than 10 ML.

Murrumbidgee closures from 31 July 2012 are calculated from intervalley trade account balance data. For 2019-20 water year, daily data for this account did not accurately capture IVT closures, so these were manually corrected. It's possible other such discrepancies exist for previous water years.

Chart incorporates changes to Murrumbidgee IVT limit operation over time.

Daily average price for 'Below Choke' zones (zones 7, 11 and 12) and Southern Connected Basin (all zones) price series derived using ABARES GAM methodology.^{[1]¹⁰²⁰}

Excludes zero dollar trades. Price differentials of <0.2 and >1.8 are excluded. This figure shows price differentials for the Below Choke zones as a percentage of the Southern Connected Basin (all zones) average price. For example, on 16 November 2019, average prices in Below Choke zones were 143% of the Southern Connected Basin (all zone average price).

As noted in subsection 3.3.2, the ACCC considers that, while the overall objective of water markets is not to achieve a single price across the whole Southern Connected Basin, sustained pricing differentials between zones, combined with data on the volume of interzone trades that are refused, indicate that there is more demand for intervalley trade than is able to be met under current intervalley trade arrangements. This gives rise to the question of whether current settings governing intervalley trade are optimised to maximise the value of intervalley trades by allowing efficient and restricting inefficient trade, within system constraints.

¹⁰²⁰ ABARES, *Measuring water market prices: statistical methods for interpreting water trade data*, 2019, <https://www.agriculture.gov.au/sites/default/files/abares/documents/research-topics/water/measuring-water-market-prices.pdf>, viewed 10 March 2020.

14.1.5 Dynamic intervalley trade limits may better reflect river system constraints

Given the potential impacts on the price of water due to IVT closures, IVT limits should only be binding when necessary. Dynamic limits that change with changing system conditions would be better at restricting potentially harmful trades while allowing beneficial trades.

These dynamic limits may help incentivise trade to occur at times when there are fewer impacts on the river system, and reduce trade when there are negative impacts on the river system. For example, lowering the IVT limit during summer, when high unseasonal flows create more damage in the river system, may help reduce the amount of water owed and required to be delivered.

IVT limits could be improved by better aligning the rules with the risks that they are meant to manage. While changes to directly address issues of environmental damage and conveyance losses are complex, incremental changes to the current accounting and water trading system may help to lessen the impact of some of these issues. Options for what this could involve are explained in subsection 16.2.5.

The Victorian Government is currently considering alternatives the current IVT limit mechanism through the Goulburn to Murray trade rule review, discussed in in box 14.1.

Box 14.1: The Goulburn to Murray trade rule review¹⁰²¹

The Goulburn suffered environmental damage in 2018 and 2019 due to high volumes of water traded and called out. This prompted the Victorian Government to investigate whether changes were needed to intervalley trade limits to better protect the river and better reflect the natural constraints of the system.

The options the Victorian department are considering include:

- an annual, capped limit
- a dynamic rule. This operates as a two part rule:
 - the first part early in the season works similarly to the current IVT limit which can be drawn down as water is delivered
 - the second part would work similar to an annual limit which caps tradeable volumes for the rest of the year based on what can be delivered
- seasonally-based rule. This operates as a two part rule:
 - the first part allows the use of water from a tagged account from the Goulburn to Murray during spring, late autumn and winter
 - the second part works similarly to an annual limit, capping tradeable volumes for the rest of the year to what can be delivered.

The Victorian Government also introduced interim measures, including a cap of 40 GL per month on call-out of water intervalley accounts during summer. Both these interim measures and the introduction of the longer term alternative options, which are currently proposed to commence in July 2021, have the potential to significantly influence trade opportunities and access to water in the Southern Connected Basin (see subsection 14.2.2).

1021 Victorian DELWP, *Changes to the Goulburn to Murray trade rule consultation paper*, https://waterregister.vic.gov.au/images/documents/Goulburn-to-Murray-trade-rule-review_consultation-paper.pdf.

14.1.6 Current ‘first-in, first-served’ trade processing is inefficient and is creating an ‘arms race’ for submitting applications faster

Services for processing intervalley trade applications operate on a ‘first come, first served’ queuing system. This has prompted a technological ‘arms race’ between a limited number of market participants who have the expertise and resources to use digital technologies to help ensure they are at the ‘head of the queue’ and able to capture the majority of benefits from intervalley trading opportunities. This issue has gained the nickname of the ‘fastest-finger’ problem. The systems and registry related aspects are further discussed in subsection 10.2.4.

For example, recent MDBA analysis found that, for trading across the Barmah Choke:

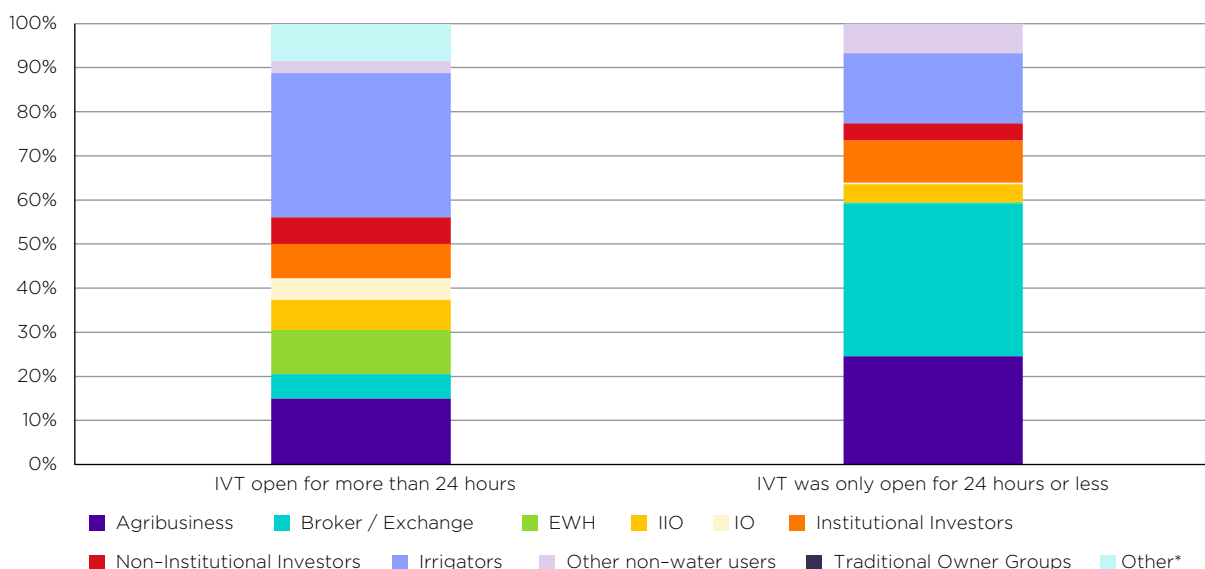
Since early September, most trades from Up to Down [above to below the Choke] occurred within 2 minutes of trade opportunity becoming available.

In one instance, the entire 14.5 ML of trade opportunity was taken up by one trade two minutes after opening.

The ACCC has examined data on who is gaining access to intervalley trade opportunities during those constrained periods, to investigate concerns that there are just a few market participants who are gaining the bulk of these opportunities. This is not illegal behaviour, although the ACCC has concerns about equity of access to IVT opportunities.

Analysis of Goulburn IVT trading data, included in figure 14.5, shows who gets access to trading opportunities when the IVT opportunity is open for less than 24 hours, compared to periods where it is open for longer. This analysis indicates that the share of the IVT capacity that irrigators won was reduced by half when the IVT opportunity was limited (33% to 16%), with agribusiness’ and brokers’ shares significantly increasing (15% to 25% and 5% to 29%, respectively). This suggests that the ‘first in, first served’ approach does favour better resourced market participants, when IVT capacity is constrained. The ACCC was unable to conduct a similar analysis for Murrumbidgee IVT opportunities due to the lack of granular data on the timing of opening and closing of the IVT.

Figure 14.5: Proportion of Goulburn intervalley trade opportunity captured by different types of water users when restrictions are open for more than and less than 24 hours (November 2012 to September 2019)



Source: ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests.

Note: Excludes a small number of transactions where the buyer and seller are unknown. EWB refers to Environmental Water Holders, IIO refers to Irrigation Infrastructure Operators, IO refers to Infrastructure Operator.

Current IVT accounts and restrictions use a queueing system to allocate out capacity for trade. Allocating out capacity using a queueing system is inefficient as:

- it does not facilitate the scarce intervalley trade opportunity being allocated to those who value it most; but rather to whoever has the ‘fastest finger’
- it results in incentives for socially wasteful expenditure to capture the trade opportunity, such as investments in technology for monitoring trade opportunities or lodging quick trade applications.

There was widespread concern in written submissions in response to the Inquiry Interim Report that IVT operation is not transparent and may be unfair or inequitable. For example, Lislea Lodge expressed concerns about ‘unfairness or uneven transparency’ in the current IVT arrangements.¹⁰²² South Australian Irrigation Infrastructure Operator Central Irrigation Trust wrote ‘the IVT transfer process needs to be more equitable to all market participants through mechanisms such as a ballot’.¹⁰²³

For the reasons described above, the ACCC recommends that New South Wales and Victoria implement a new way of allocating out the available trade capacity. The ACCC recommends the use of market-based mechanisms for allocating the capacity for trade through IVT restrictions and the Barmah Choke. This is likely to be more efficient, as well-functioning market-based mechanisms will allocate the capacity to those who value it most. Gaining access to these opportunities allows parties to purchase water in one zone and sell it in another. It can be expected that market forces would value this right at the price difference between the source and destination trading zones. Doing so would also eliminate the fastest finger problem by allocating IVT opportunity to those who are willing to pay for it, rather than those who are fastest at submitting applications.

Further detail on this proposal, and discussion of alternatives such as a ballot, appear in the subsequent chapter of this report, in subsection 16.2.5.

14.1.7 ‘Grandfathered tags’ undermine the effectiveness of intervalley trade limits

‘Tagged entitlement trading’ is an arrangement for trading water between water sources or trading zones where the water access entitlement continues to be held in the source zone but is ‘tagged’ for extraction in a different source or destination zone. When an allocation announcement is made in the source zone, the purchaser is credited with the volume allocated and can order water for delivery in the destination zone.

The term ‘grandfathered tags’ refers to a small number of water access entitlements that are exempt from restrictions on the trade of water allocations within or between two regulated systems, because a ‘tag’ between the systems was established before 22 October 2010. Basin Plan Water Trading Rule 12.23(2) creates this exemption.¹⁰²⁴

The currently available data on grandfathered tags is complex and contradictory. Different data sources show different numbers of grandfathered tagged entitlements. It appears that, as at December 2020, there were: five remaining interstate grandfathered tags – all New South Wales to Victoria or South Australia; none from Victoria to New South Wales or South Australia; and 16 intrastate tags in Victoria. Note the Victorian tags are tagged accounts rather than water access entitlements, so these may have multiple water access entitlements attached to the account. New South Wales did not provide data to the ACCC on intrastate grandfathered tags, and these tags are not included on the New South Wales public water register.¹⁰²⁵

1022 Lislea Lodge, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 1.

1023 Central Irrigation Trust, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020, p. 8.

1024 Rule 12.23(1) of the Basin Plan Water Trading Rules, contained in the *Basin Plan 2012* (Cth), provides, in simple terms, that delivery of water under tagged water access entitlements is subject to the same restrictions as trades of water allocations between the two locations relevant to the tag. The purpose of this rule is to ensure that water made available through a tagged water access entitlement is not treated differently to water made available through the trade of water allocation. However, rule 12.23(2) states that rule 12.23(1) does not apply to tagged entitlements established before 22 October 2010. The 22 October 2010 date relates to when the MDBA indicated its intention to propose a rule of this kind, in Volume II of the Guide to the Basin Plan.

1025 *WaterNSW, NSW Water Register*, n.d., <https://waterregister.waternsw.com.au/water-register-frame>, viewed 5 February 2021.

New South Wales reported a number of tags established between Queensland and New South Wales; (however, Queensland does not record these arrangements as tagged trades). The effect of Basin Plan water trading rule 12.23 is immaterial to interstate trade arrangements between Queensland and New South Wales as there are no restrictions exist on allocation trade between New South Wales and Queensland in the Border Rivers water source, which is the only Northern Basin water source in which tagging currently exists.”¹⁰²⁶

The ACCC has identified that the owners of the handful of grandfathered tags established for interstate trade in the Southern Connected Basin include an irrigation infrastructure operator and substantial locally and internationally owned agribusinesses.

Table 14.2 below features data on the use, by volume, of grandfathered tag Water Access Entitlements, excluding tags in the Northern Basin, in GL. Note that as the ACCC has been unable to analyse usage occurring under intrastate grandfathered tags in New South Wales, figures representing the magnitude of usage are likely to be at the low end of the scale.

Table 14.2: Usage of water allocation available under grandfathered tags (GL)

Years	Victoria	South Australia
2008-09	0.26	0.00
2009-10	7.16	0.25
2010-11	14.35	0.00
2011-12	6.06	0.00
2012-13	19.23	0.00
2013-14	25.39	0.00
2014-15	31.86	0.00
2015-16	25.10	0.69
2016-17	32.22	1.07
2017-18	33.27	0.00
2018-19	0.28	0.00
2019-20 YTD	27.73	0.00

Source: ACCC analysis based on Victorian and SA governments' responses to voluntary information requests.

Note: YTD = 2019-20 year to 30 November 2019. This data covers the five interstate grandfathered tags (originating in NSW, used in Victoria or SA), plus the grandfathered intrastate tags in Victoria. No data is shown for NSW because the ACCC is not aware of any grandfathered interstate tags established for use in NSW, and NSW did not provide data on intrastate tags.

The exemption means holders of a grandfathered tag can order water for delivery even when a restriction, such as the Barmah Choke restriction or the Murrumbidgee intervalley trade limit, restricts allocation trade from the source to the destination valley. The implications of this are:

- grandfathered tag holders may be able to move water¹⁰²⁷ between valleys when such opportunities are not available to other users (see figure 14.6 below)
- use of water under grandfathered tags can cause IVT account balance limits to be exceeded in real terms, as the exempted delivery is not counted for the purposes of trade limits. This can undermine the limits effectiveness and market confidence in them.

IVT account balances are credited or debited (depending on the direction of the tag) at the time water available under the tag is ordered for usage. Given that this timing is known to the person making the order, this creates the opportunity for that person to strategically time their tagged usage to create, or close, trade opportunities, and to capture the benefits of trade openings. Since trade applications are currently assessed on a 'first come, first served' basis, a person with knowledge of the timing and size of a trade opportunity (which they themselves created by their tagged usage) is best-placed to submit a trade application for the right volume, and at the right time, to successfully capture that opportunity.

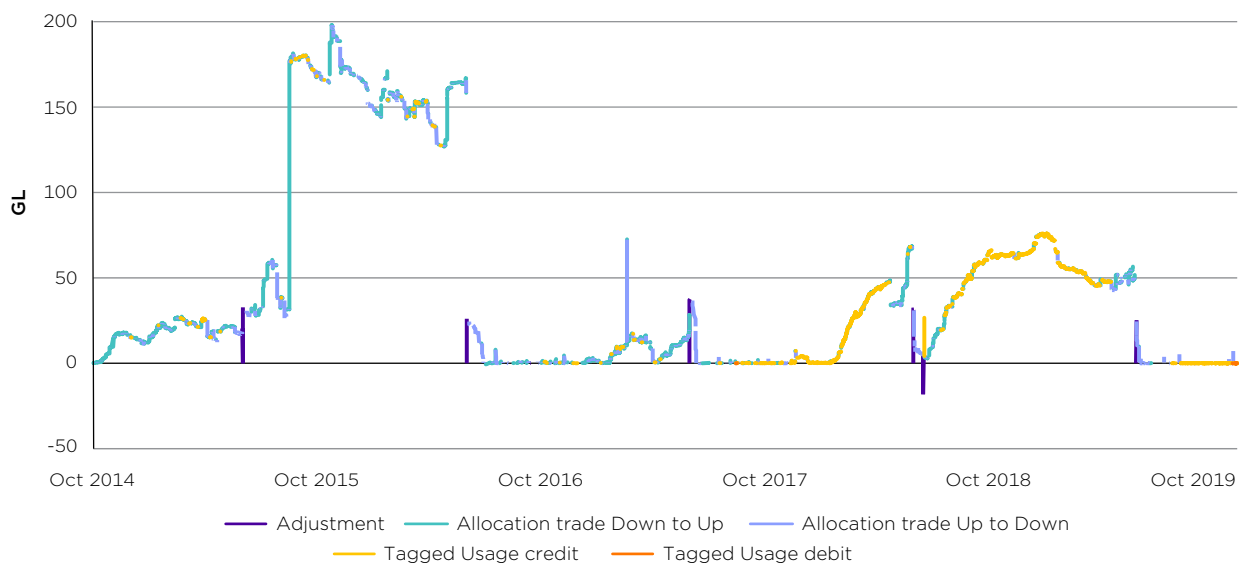
¹⁰²⁶ ACCC analysis based on New South Wales and Queensland governments' responses to voluntary information requests.

¹⁰²⁷ Water movement is for usage, not for further trade or carryover.

The ACCC's analysis of trade and usage data for the period October 2014 to October 2019 indicates that this is indeed occurring in practice. Although this conduct may not breach any current laws, concerns include that any party undertaking such activity has an advantage over other market participants in knowing when it would trigger the 'opening' for potentially lucrative arbitrage opportunities.

Figure 14.6 shows this phenomenon occurring. In recent years, the transactions that are increasing the Barmah Choke trade account balance are increasingly tagged upstream usage (shown in yellow), rather than upstream trades (shown in teal). In particular, increases (credits) driven by tagged use were very significant in early 2018 and again in late 2018. These usage credits were then generally followed by decreases (debits) due to downstream trade (shown in purple).

Figure 14.6: Influence of different transaction types on the Barmah Choke trade account balance, 30 October 2014 to 12 December 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests
 Note: Gaps in data series occur at 1 July each year when the Barmah Choke trade account balance is reset to zero.

ACCC analysis of the use of grandfathered tags in Victorian zones found that tagged usage was more likely to occur during periods when the Goulburn IVT limit was binding. The ACCC has not compiled comparable figures for the Murrumbidgee because of the lack of sub-daily time series data on Murrumbidgee IVT closures.

However, publicly available information supported by ACCC consultation indicates New South Wales intrastate tags do affect IVT account balances in this state.¹⁰²⁸ The Murrumbidgee IVT account balance has been observed to go into the negative as a consequence of use of water under a grandfathered tag from the Murray to the Murrumbidgee.¹⁰²⁹ This creates third party impacts, such as increased delivery risks for water users in the Murrumbidgee as water cannot be delivered upstream from the Murray into the Murrumbidgee.

The ACCC recommends that the Australian Government remove the exemption that so-called 'grandfathered tags' enjoy from restrictions on delivery of water when allocation trades between 2 regulated systems are restricted. This is because it enables a limited number of licence holders to circumvent the operation of intervalley trade limits, undermining confidence in the limits and their effectiveness. In this way, the exemption can impose detriment on other entitlement holders and the environment, with holders of these entitlements awarded a windfall gain not available to others in the

¹⁰²⁸ WaterNSW, *Murrumbidgee River Operations Plan*, n.d., <http://docplayer.net/155881373-Murrumbidgee-river-operations-plan.html>, viewed 5 February 2021.

¹⁰²⁹ Negative balances in the Murrumbidgee IVT account balance were observed twice in 2014, and then from April to November 2018 (reaching a balance of -17.6 GL) and again in early 2019. ACCC analysis based on NSW Government's response to voluntary information request.

market. While the current arrangements for managing intervalley trade remain in place, all market participants should face the same rules for moving water between valleys.

Further detail on potential pathways for enacting this proposal appear in subsection 16.2.7. This includes noting the most direct avenue to effect this recommendation, by amending Basin Plan Water Trading Rule 12.23, as well as recommending that Basin States consider whether all water entitlements for which grandfathered tagging has been claimed are, in fact, entitled to the benefit of Rule 12.23(2). Separately, 16.2.7 also includes discussion and recommendations relating to alternative mechanisms Basin States should consider for allocating the capacity for interzone and intervalley trade.

14.2 Understanding the delivery-related impacts of traded water

The ACCC's focus in this section is on the impacts of trade on water deliveries managed 'on-river' by river operators, rather than deliveries to 'off-river' users (located within an irrigation network). Off-river delivery is managed by the relevant irrigation infrastructure operator (IIO), largely relying on 'water delivery rights' (known as delivery shares in Victoria or as delivery entitlements within some IIOs) to allocate the available delivery capacity. The ACCC discusses the feasibility of developing a similar regime of on-river delivery rights in 16.2.3.

The ACCC is aware of stakeholder concerns about water delivery rights within IIOs, including concerns relating to continued expansion and issuing of additional delivery rights by IIOs and transparency of policies, rule changes and trade information regarding water delivery rights.¹⁰³⁰ The ACCC has not been able to consider in detail the market architecture issues relating to delivery rights within IIOs networks, though has been aware of the apparent issues in these schemes in considering the feasibility of developing a similar regime of on-river delivery rights (see in 16.3.2). Chapter 9 considers regulation of conduct by parties including IIOs.

As with other chapters in Part 5, this section is largely focused on the Southern Connected Basin, as it is here that the challenges of managing the delivery of intervalley trade involving tributaries arises almost exclusively.

As outlined in chapter 13, the ACCC has concerns that the full costs of the delivery of water within the Southern Basin, including environmental damage, conveyance losses and the risk of delivery shortfalls, are not effectively reflected back to water users, and so are not being properly priced or incorporated into their water use decisions. As a result, water users are not incentivised to make optimal decisions about water use, storage or trade, and trades are occurring which generate private benefits for the individuals making them but which are not 'socially beneficial' because of the externalities being borne by other water users and the environment.

Quantifying the contribution trade makes to increasing delivery risk, conveyance losses and environmental damage is complex as such impacts are dynamic, being heavily tied to broader operational decisions, timing of use and dependent on the prevailing river conditions. However, it is clear that trade has enabled changes in demand for water that are exacerbating the impacts of moving water through limited channel capacity points. As noted in subsection 3.3.1, the ACCC has found that carryover and trade are interacting to allow concentration of water use in particular places, at particular times, for particular uses.

ACCC analysis found conflicting evidence on whether water trade and observed changes in irrigation patterns are driving 'peakier demand' (that is, concentrating water use in smaller time periods).¹⁰³¹

1030 Horne Legal, *Submission to Murray-Darling Basin water inquiry interim report*, 25 January 2021; Joy Boucher, Narelle Pratt, Jamie Park, *Submission to Murray-Darling Basin water inquiry interim report*, 18 December 2020.

1031 The Hydrology and Risk Consultancy (HARC) *Review of historical use of water: Barmah to the SA Border report*, <https://www.mdba.gov.au/sites/default/files/pubs/review%20of%20historical%20use%20of%20water%20barmah%20to%20south%20australia.pdf>) and usage data collected from NSW, Victorian and SA and analysed by the ACCC revealed no major changes to peak usage. The ACCC has concerns about the accuracy of time of use data it has collected from Basin States. Conversely, other statements by the MDBA (<https://www.mdba.gov.au/sites/default/files/pubs/Water-delivery-shortfall-assessment-2018-19.pdf>) and Independent Review of River Operations Review Group's *Review of Performance Against Objectives and Outcomes – 2019/20* (available here: <https://www.mdba.gov.au/sites/default/files/pubs/review-of-performance-against-objectives-and-outcome-2019-20.pdf>) seem to conclude peak demands are increasing.

Regardless, the significant additional horticultural plantings (particularly almonds) observed in the Lower Murray in recent years will continue to mature, increasing their water demands during peak irrigation periods which will likely continue to drive increased peak demand.¹⁰³² Aither has stated that the 'flexibility' of water demand will decrease, meaning there will be less ability to reduce demand at times of high delivery risk:

As growth in permanent horticulture increases, a greater proportion of irrigated agricultural water demand in the connected Murray will come from industries with fixed rather than flexible water demands as well as industries with a higher willingness to pay for water.¹⁰³³

Despite some information gaps, it is generally accepted that delivery risk appears to be increasing with trade and that river operators' decisions to avoid delivery shortfalls can increase conveyance losses, though the impact of trade on losses is still unclear.¹⁰³⁴

The ACCC considers that there is a range of short term measures Basin states can take to address the most immediate concerns relating to the delivery of water, such as finalising shortfall management plans, improving information on risks to users, reviewing river operations guidance materials to be more holistic and to better incorporate trade, and strengthening measurement and modelling capability to better understand issues.

To properly address the underlying flaws in market architecture relating to delivery, long term investigation of significant reforms should also be pursued. There are limited opportunities for smaller step changes to address these underlying flaws, but the ACCC has not been able to conclusively determine whether the substantial, disruptive and costly reforms to the market architecture would be justified, or proportionate to the magnitude of the problem driven by trade.

14.2.1 Detrimental environmental impacts of water deliveries are not being adequately managed

As stated above, the delivery of water in the Basin can cause environmental damage. This is most likely to occur when large volumes of water are transferred at high and consistent flow rates for extended periods of time, during periods of increased environmental sensitivity. The impact of this can include erosion and bank instability. In recent years, this kind of environmental damage has occurred in a number of reaches throughout the Southern Basin.

Not all these impacts result from trade, though trade can facilitate changes to water use and delivery away from historical patterns. In this way, trade can contribute to externalities, such as the damage to the environment that can arise from water volumes delivered downstream of constraints or in excess of seasonally appropriate volumes and flow rates, or through poorly timed or unauthorised flooding of private farmland. Trends in volumes of trade between valleys and changing patterns of water use are discussed in subsections 3.3.1 and 13.3.4.

Goulburn River system

As discussed in box 14.1, environmental damage has occurred as a result of intervalley trade delivery through the Lower Goulburn. The Goulburn to Murray trade rule review acknowledged recent demands on the Lower Goulburn had been too great, and the record volumes of IVT delivery had put the Lower Goulburn under stress and caused environmental damage.¹⁰³⁵ Large volumes of IVT call-out in recent years are demonstrated figure 14.2.

1032 Aither, *Water Supply and Demand in the southern Murray-Darling Basin*, 2019, p. 11, available here: https://waterregister.vic.gov.au/images/documents/Water-Supply-and-Demand-Report_Aither_FINAL.pdf (Aither Supply and Demand report).

1033 Aither Supply and Demand report, p. 9.

1034 MDBA, *Managing Delivery Risks in the River Murray System*, 2020, p. 6, available at <https://waterregister.vic.gov.au/images/documents/Managing-delivery-risks-in-the-River-Murray-system.pdf>.

1035 Victorian DELWP, *Changes to the Goulburn to Murray trade rule consultation paper*.

Stakeholders have also identified concerns with the environmental impact in the Goulburn, such as the Goulburn Valley Environmental Group, who commented that:

Substantial environmental damage is being experienced by rivers due to high summer flows (IVT's) needed to deliver increased traded allocations to downstream developments. High flows and sandbar inundation have social impact on campers, fishing and local communities.¹⁰³⁶

The ACCC's analysis of river gauge data revealed an increasing proportion of summer and early-autumn days¹⁰³⁷ on which discharge rates through the Lower Goulburn (as measured at McCoy's Bridge) exceeded 940 ML/day in recent years. During these months, the environment is detrimentally affected when flows are consistently above 940 ML/day.¹⁰³⁸ Further, periods of five consecutive days above this discharge rate were also more common from the 2017-18 water year onwards.¹⁰³⁹

Murray and Edward Wakool River systems

Many stakeholders have been vocal with concerns about environmental damage in and around the Barmah Choke on the River Murray and Edward Wakool River systems.¹⁰⁴⁰ The *Managing Delivery Risks in the River Murray System issues paper* has noted that 'the banks of the Barmah Choke are eroding, [in part due] to the river being run at consistently high flows'.¹⁰⁴¹

Further, the capacity of the Barmah Choke is decreasing, having fallen from 11,500 ML/day in the 1980s to 9,200 ML/day in 2019.¹⁰⁴² Recent MDBA research concluded a 'massive slug of sand' caused by early gold mining is slowly moving downstream and accumulating in the Barmah Choke, causing the reduction in capacity. This declining capacity in the Barmah Choke is one of the key drivers of shortfall risks in the Southern Connected Basin.¹⁰⁴³

The Barmah Choke trade restriction prevents net trade of water from above the Choke to below, meaning that water trading from upstream to downstream of this constraint cannot contribute to increased deliveries through this constraint. One of the main drivers of high flows through the Barmah Choke in recent years has been the lack of inflows from the Darling River. The MDBA has been unable to call on water resources in the Menindee Lakes system since December 2017, resulting in a heavy reliance on releases from upstream Murray storages and intervalley transfers to meet downstream demand.

Increasing congestion through the Barmah Choke is leading to river operators exploring alternative pathways for delivering water from upstream storages in the Murray. Alternatives include the Edward Wakool system, through infrastructure operated by Murray Irrigation Limited, and through Goulburn-Murray Water infrastructure. The ACCC understands the Edward Wakool system is already subject to heavy use and further increasing use to alleviate delivery pressures on the Barmah Choke will expand environmental pressures across all systems.

Murrumbidgee River system

The ACCC has heard concerns about environmental damage in the Murrumbidgee as a result of delivering irrigation water.¹⁰⁴⁴ It is alleged that unseasonal high and steady summer flows in the Murrumbidgee are resulting in erosion and bank instability like that in the Barmah Choke.¹⁰⁴⁵

1036 Goulburn Valley Environment Group Inc., *Submission to the Murray-Darling Basin inquiry issues paper*, 13 February 2020, p. 2.

1037 Summer and early-autumn includes the months of December, January, February and March.

1038 Victorian DELWP, *Changes to the Goulburn to Murray trade rule consultation paper*.

1039 ACCC analysis based on MDBA river operations data, available at <https://riverdata.mdba.gov.au/mccoy-bridge>.

1040 Ray Anker, *Submission to the Murray-Darling Basin inquiry interim report*, 13 November 2020.

1041 MDBA, *Managing Delivery Risks in the River Murray System*, p. 8.

1042 MDBA, *Managing Delivery Risks in the River Murray System*, pp 8-9.

1043 MDBA, *MDBA research finds centuries-old sand 'slug' in Barmah Choke*, media release, <https://www.mdba.gov.au/media/mr/mdba-research-finds-centuries-old-sand-slug-barmah-choke>, viewed 10 February 2021.

1044 ABC News, 'Murrumbidgee River kayaker calls for more investigation into bank degradation', *ABC News*, 25 September 2015, <https://www.abc.net.au/news/2015-09-25/bidgee-kayaker/6803690>, viewed 5 February 2021.

1045 MDBA, *Managing Delivery Risks in the River Murray System*, p.9.

In correspondence with the ACCC, the New South Wales Department noted the potential for large or frequent water deliveries to create environmental impact, as has been seen in the Lower Goulburn. However, it noted that deliveries of IVT water are less likely to cause impacts to the Murrumbidgee environment than has been seen in the Goulburn. This is because the Murrumbidgee is a heavily regulated system and total annual IVT volumes have not been as consistently large and there is not a consistent trend of trade out of the valley. As a result, the New South Wales Department indicated it has not considered it necessary to undertake a formal assessment of environmental pressures, but that if one were to occur, it should be a joint initiative between the MDBA (as the IVT operator) and the southern Basin States. It also noted IVT volumes can have environmental benefits.

Based on New South Wales's response, while it appears environmental damage in the Murrumbidgee is less of a concern than in other reaches, the potential for damage to occur still needs to be factored in market design. Governments should stay vigilant in monitoring environmental health in this river system.

Environmental impacts are likely being exacerbated by market activity

The value of environmental health (or, conversely, the cost of environmental damage) is not reflected back to water users when making their use and delivery decisions. This is because rights for delivery remain largely bundled with water access entitlements and there is no separate, effectively capped property right for the on-river delivery of water through the system. Therefore there is no effective cap on delivery volumes at any given point in time. This results in some water trades generating third party impacts, in the form of environmental damage. Because delivery is generally guaranteed and there is no additional cost associated with use and delivery decisions that generate environmental damage, there is no incentive for users to avoid taking delivery around these times.

Complicating matters further, there is no direct link between the time of trade and time of delivery – that is, there is a disconnect between retail usage and bulk river operations (as explained in subsection 13.1.3). Because the impacts of delivery are significantly influenced by the time delivery occurs, this means there are no effective mechanisms to distinguish between, and restrict trades that are socially inefficient (as a result of their environmental impacts), and allow trades that are socially beneficial.

As noted in subsection 14.1.4, IVT limits do not put a hard cap on the volume of water that can be delivered between valleys. Existing trade restrictions, which are sometimes considered to act as proxy environmental limits, in reality do not provide effective protection of the environment from the impacts of delivery. As noted in subsection 13.2.1, water trade is facilitating an increasing proportion of water use to occur in the lower Murray.

Instead of a cap on delivery volumes (or even hard flow limits), environmental priorities and impacts are managed by river operators who are guided by environmental objectives in the Objectives and outcomes for river operations in the River Murray System (OnO document).¹⁰⁴⁶ The document specifies minimum and maximum flow limits for reaches of the river system. Water Liaison Working Group can provide approval for river operators to deliver water at flow rates aimed at inundating the Barmah Millewa Forests, when desirable. In recent years, river operators have had to 'run the system harder and use [system] buffering capacity more frequently and for longer periods'.¹⁰⁴⁷ Joint Basin State governments note that to avoid delivery shortfalls, large volumes of water have been delivered as unseasonal flows through various tributaries, an approach which is increasingly causing significant environmental damage and high conveyance losses.¹⁰⁴⁸

The ACCC is concerned that the framework guiding river operations decisions may be favouring prioritisation of mitigating delivery risk at the expense of environmental health and conveyance losses. An example of this can be seen in the 2018–19 water year (see box 14.2) and the issue is discussed further in subsection 14.2.4.

¹⁰⁴⁶ Basin Officials Committee (BOC), *Objectives and outcomes for river operations in the River Murray System*, 2020, available at <https://www.mdba.gov.au/sites/default/files/pubs/Objectives-and-outcomes-for-river-operations-in-the-River-Murray-Systems-2020-2021.pdf>.

¹⁰⁴⁷ MDBA, *Managing Delivery Risks in the River Murray System*, p. 8.

¹⁰⁴⁸ MDBA, *Managing Delivery Risks in the River Murray System*, p. 9.

14.2.2 Trade and flaws in the market architecture are contributing to increased delivery risk

Where a water delivery shortfall occurs, the river operator is unable to supply enough water to meet the demands of water users in a region or regions. This occurs because the river operator (the MDBA in the River Murray system) cannot provide the water necessary to the state resource managers. Resource managers are then forced to introduce temporary restrictions or embargos on water extractions to reduce extractions to the volume of water available for consumptive use.

As shortfalls are most likely to occur during times of peak demand, the greatest threat for shortfalls is during peak irrigation season and during periods of extreme heat. This is most likely in January when evapotranspiration and hence demand from horticultural crops peak, though many other factors can play a role.

There are two main types of shortfalls:

- 'System shortfalls' can arise when water is available in the storages but is not able to be delivered though the system in line with demands due to physical or environmental constraints within the tributaries. This could occur because of a long period of unexpected dry weather combining with physical and operational system constraints. It could also occur because of inaccurate demand forecasting or difficulty in managing shifts in demand patterns from the shoulder to peak period which results in water being in the wrong place at the wrong time.
- 'Short-term shortfalls', also known as 'delivery shortfalls', arise when demand for water unexpectedly spikes in the short term because of a period of hot weather and these demands are unable to be fully met requiring short-term (temporary) restrictions to deliveries. These generally occur upstream of the South Australian border.¹⁰⁴⁹

There always have been, and likely always will be an inherent risk of shortfall in the River Murray system. As noted in subsection 13.1.1, river operators do not generally release water to meet individual water orders but rather manage bulk releases of water according to forecast aggregate water demands. The presence of capacity constraints, and the long travel times for water to be delivered downstream (three weeks delivery time for water from Hume to Sunraysia compared to weather forecasts which are only accurate a week out), mean river operators will always face uncertainty and challenges in delivering water.

Non-market factors have also contributed to increased delivery risks (see further down this section). To date, shortfall risks have been well managed by river operators, with only one delivery shortfall event occurring for consumptive users in 2002, though environmental water holders experienced a shortfall in 2018.¹⁰⁵⁰

Delivery risks are not reflected back to water users

The right to have water delivered to an on-river extraction point largely remains bundled with the right to access water and water markets in the Basin do not put a price on the scarce on-river delivery capacity. As such, the limited delivery capacity is not being rationed as efficiently as would be the case if prices were used to allocate this limited resource, leading to the generation of externalities in the form of increasing shortfall risk.

The ACCC is concerned because delivery risks have not been reflected back to users and incorporated into business decisions, water users may have made decisions to invest (such as in new irrigation developments in the lower Murray) on the false premise of continued delivery reliability (see box 13.2). However, the threat of a shortfall is real and increasing due to a number of factors. Continued unmitigated development based on the assumption that water will always be available when it is needed in constrained reaches of the river system will only increase the threat of shortfalls for all users and not just new entrants to a region (hence creating an externality).

1049 Frontier Economics, *Market architecture assessment*, p. 62.

1050 MDBA, *Managing Delivery Risks in the River Murray System*, p. 6.

As development becomes more entrenched, addressing issues will become more challenging as reforms would affect more stakeholders. The sooner governments can improve information for market participants, better prepare for actual events and implement more effective architecture to ration delivery capacity and send appropriate price signals to users, the more likely they are to implement successful reforms.

The risks of a shortfall are increasing as demand patterns and system operations change

As noted in section 13.2, trade is facilitating significant changes in patterns of water use in the Southern Connected Basin. These patterns are posing increasing challenges to river operators, who are also faced with changing system conditions on a number of fronts.

Frontier Economics drew out this point stating ‘the MDBA’s river operations team has indicated during consultation for this report that it is increasingly challenged to deliver large and growing volumes downstream. This is not necessarily due to increased downstream consumption’ but due to a combination of factors in the Victorian and NSW Murray Below Choke zones that are contributing to challenging delivery conditions for river operators, including:

- significant increase in volumes traded into zones 7 and 11
- river system constraints, including the declining capacity of the Barmah Choke
- water recovered for the environment, and increased flows to South Australia due to trade and environmental flows.¹⁰⁵¹

The MDBA and Basin States have dedicated increasing resources over the last couple of years to investigating delivery risks, their drivers and potential solutions. The intergovernmental Capacity Policy Working Group, informed by the Independent Panel for Capacity Projects Review, is dedicated to assessing delivery risks and issues posed by capacity constraints in the system. The results of the work of these bodies have been much more concrete statements about the fact that delivery risk is increasing in the River Murray System, and that this threat is likely to continue to increase:

It is clear that shortfall risks in the lower Murray are increasing, and the River Murray system and its tributaries, the Barmah Choke and its forests are being operated at flows in excess of tolerable seasonal rates. Things are likely to get worse in the future if the capacity of the Barmah Choke further declines, if the ecological tolerances are factored into river operations to mitigate and avoid ongoing damage to tributaries and as climate change results in more severe heatwaves.¹⁰⁵²

Goulburn to Murray trade rule review

As discussed in box 14.1, Victoria has been undertaking a review into the Goulburn IVT limit and a number of interim arrangements, the results of which may have impacts on market functioning and delivery risk. New rules will come into effect in July 2021. The new monthly limit on call out over the summer months forms a hard cap on volume of water that can be delivered out of the Goulburn which will limit trade. The Victorian Department of Environment, Land, Water and Planning has advised that with a 40 GL/month interim limit over summer, it is assuming that this will limit the volume of IVT call out to a maximum of 220 GL annually. When considered against the 304 GL called out in 2017-18 and the 428 GL called out in 2018-19¹⁰⁵³, this could mean a significant reduction in water availability in the River Murray.

Water users who have invested in irrigation developments in the lower Murray assuming ongoing delivery demands will be met by water out of the Goulburn may soon find that water is harder to get out of the Goulburn. Even if changes to the Goulburn to Murray trade rule do not increase delivery risk

1051 Frontier Economics, *Market architecture assessment*, p. 43.

1052 MDBA, *Managing Delivery Risks in the River Murray System*, p. 1.

1053 ACCC analysis based on MDBA response to voluntary information requests.

in the immediate term (as stated by the MDBA)¹⁰⁵⁴, they will impact water availability and likely drive up price differentials between the valleys (which already reached \$342/ML in November 2019).¹⁰⁵⁵

Information gaps in assessing and planning for shortfalls remain

The ACCC considers that the movements of water use facilitated by trade are a contributing factor to increasing delivery risk. However, while it is increasingly accepted and publicised that delivery risks are increasing, separating out how much of this is caused by water movements facilitated by interzone trade remains difficult, and so complicates the devising of solutions to address increasing risks.

As challenges evolve and expectations on modelling continue to grow, continually improving modelling will provide the best foundation for understanding and addressing issues for the benefit of both governments and water users. An improved ability to model water market participant behaviour in response to policy changes, and carryover and trade behaviour will assist river operations decision-making and support the assessment of shorter and longer term solutions to delivery issues. Further, a significant information gap is the lack of timely and fit-for-purpose time of use information, stemming from the limited roll out of telemetry, poor interoperability between systems and inconsistencies in metering between states. These issues are discussed further in section 15.3.

While uncertainty around the effects of climate change is likely to be somewhat unavoidable, this is another area where continual improvement of modelling and forecasting should be targeted, as highlighted by the Independent River Operations Review Group (IRORG):

The effects of climate change are starting to be seen in a range of areas. It is becoming increasingly clear that history is no longer a guide to the future regarding water resources availability and temporal variability. IRORG is of the view that the MDBA needs to challenge its existing assumptions and operational norms ... [and improve management of] the system in response to a changing climate.

Another significant shortcoming in the information available on shortfall risk is how individual water users can best prepare their business operations to manage an actual shortfall event. The ACCC considers that publicly available information how shortfalls would actually affect individual water users, and how they should manage these events is lacking. The MDBA and Basin States have recently improved the public information about delivery risks, with a dedicated webpage now on the MDBA website and the publication of the Managing Delivery Risks in the River Murray System issues paper.¹⁰⁵⁶ In January 2021, Victoria published a new fact sheet, designed to help water users to understand the latest information about delivery risks in the River Murray System. It describes how delivery risks in the River Murray downstream of Barmah are changing and the actions that the Victorian and other River Murray governments are taking to address these risks. Work on defining ecological tolerances and planning how shortfalls will be managed is ongoing.¹⁰⁵⁷

1054 Premier of Victoria, *Delivery for Basin Water Users*, media release, 13 August 2020, <https://www.premier.vic.gov.au/delivering-basin-water-users>, viewed 5 February 2021.

1055 ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

1056 MDBA, *Managing Delivery Risks in the River Murray System*.

1057 DELWP, *Managing Delivery Shortfalls in the River Murray*, January 2021, Victorian Water Register, <https://waterregister.vic.gov.au/about/news>, viewed 19 February 2021.

It is unclear how an actual shortfall event would be managed

As noted previously, water sharing in the River Murray System follows a tiered approach, with the MDBA allocating water to the southern Basin States and delivering water to meet these states' entitlement demands. Basin States are then responsible for allocating water to their own entitlement holders based on agreed allocation priorities. The implication of this for delivery shortfall management is that it is the responsibility of each state to manage diversions in its jurisdiction.¹⁰⁵⁸

Frontier Economics found that 'under current arrangements the reliability with which water can be delivered throughout the [Southern Connected Basin] is incompletely defined'.¹⁰⁵⁹ Property rights for on-river water delivery have not been clearly defined or fully unbundled in all Basin States. 'Extraction components' or 'extraction shares' are used to specify the water source from which water can be taken and some constraints on the times, rates and circumstances when water can be taken. However, the role of these in managing access to flows during a shortfall event is not specified and they are not capped in some stretches of river, where physical capability to deliver water volumes in accordance with these shares is limited. Further, Frontier argued that the conditions on, and rights contained in, works licences are not defined in a way that would enable them to be readily used for rationing or sharing if a shortfall occurred.¹⁰⁶⁰

Frontier concluded 'there are limited mechanisms for river operators or environmental water managers to quickly and easily reduce or ration extractions in segments of the system to protect the environment or third parties [in the Southern Connected Basin]'.¹⁰⁶¹ River operators actively manage rivers to minimise the need to ration water and to protect the environment, and state-based legal mechanisms exist for rationing individuals' extractions (including for environmental water holders and private users). However, these rationing mechanisms have rarely been used to manage short-term shortfalls. The ACCC considers rationing mechanisms could be strengthened and the specifics of how they would be utilised in the event of a shortfall should be more clearly communicated to the market.

All water access licences issued in New South Wales include an 'extraction component'¹⁰⁶² which defines times, rates and circumstances of access, the type of water supply that can be accessed, and, if applicable, the extraction zone in which water can be accessed. Extraction components for Murray and Murrumbidgee regulated licences do not currently impose restrictions with regard to the time, rate and circumstance of accessing water.¹⁰⁶³ The NSW Government can use section 324 of the *Water Management Act 2000* (NSW) to impose restrictions on extractions in segments of the system to protect the environment or third parties.¹⁰⁶⁴

Likewise, although the legislation provides for it, South Australia has indicated that it does not currently issue delivery capacity entitlements.¹⁰⁶⁵ There is provision under section 109 of the *Landscape SA Act 2019* for temporary restrictions on extractions from the River Murray Prescribed Watercourse.¹⁰⁶⁶

1058 MDBA, *Managing Delivery Risks in the River Murray System*, p. 22.

1059 Frontier Economics, *Market architecture assessment*, p. 64.

1060 Frontier Economics, *Market architecture assessment*, p. 65.

1061 Frontier Economics, *Market architecture assessment*, p. 9.

1062 The extraction component is also subject to licence conditions set by DPIE, issued to holders and listed on the public register. See Part 2 Division 1 of the *Water Management Act 2000* (NSW).

1063 New South Wales is able to amend the extraction component conditions, as has recently been implemented in the Barwon Darling with the administering of individual daily extraction components (IDECs), though this has not been done in the NSW Murray or Murrumbidgee.

1064 S. 324, *Water Management Act 2000* (NSW), <https://www.legislation.nsw.gov.au/view/html/inforce/current/act-2000-092>.

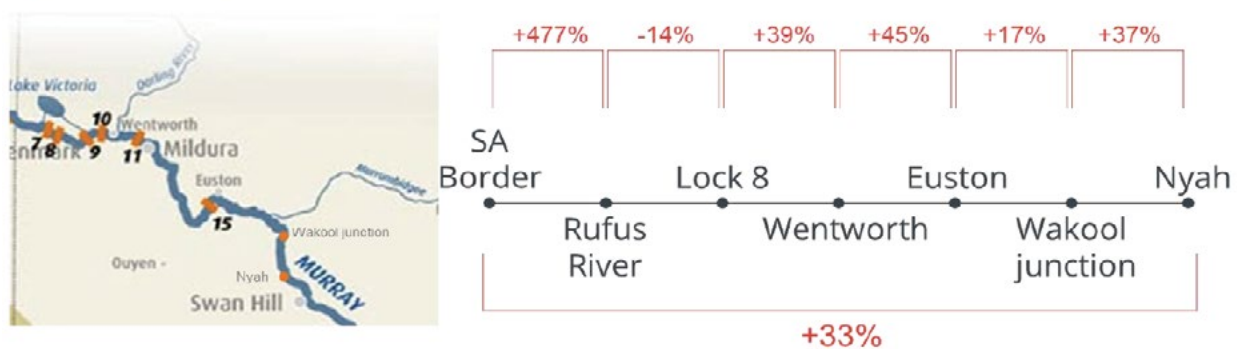
1065 *Landscape South Australia Act 2019*. This Act repealed the *Natural Resources Management Act 2004* (SA) and made provision for the protection of the State's natural resources, including for the licensing of water and associated entitlements. Division 3, subdivision 5, provides that the Minister can issue delivery capacity entitlements.

1066 S. 109, *Landscape SA Act 2019*, <https://www.legislation.sa.gov.au/LZ/C/A/LANDSCAPE%20SOUTH%20AUSTRALIA%20ACT%202019.aspx>.

Victoria's regime of extraction shares appear to be the most established, though these too have gaps.¹⁰⁶⁷ Extractions shares, which are a condition on a works licence, issued with respect to a particular location, determine the rights of the licence holder to take a share of the water that can be delivered during a shortfall. In the event of a shortfall, diverters will be restricted proportionally, based on their extraction share. However, how any rationing that would be determined and applied to extraction shares to manage access to flows during a shortfall event has not been specified. Extraction shares are also not capped in some stretches of river, where physical capability to deliver water in accordance with these shares is limited. This means water users would receive a smaller water share of the water that can be extracted during a rationing event.

Figure 14.7 below reveals the significant increase in extraction shares in the Victorian Murray between the Barmah Choke and the South Australian border since 2010-11, which is notable particularly in the context of significant environmental buybacks over this time period and reflects the lack of a cap on these extraction shares.

Figure 14.7: Change in Victorian extraction share from 2010-11 to 2020-21



Source: Frontier Economics, based on information provided to ACCC by the Victorian Department of Environment, Land, Water and Planning.¹⁰⁶⁸

The specifics of how these restrictions would be imposed, such as details relating to the timing and duration of restrictions, the volumetric basis upon which they would be applied in New South Wales and South Australia (Victoria would use extraction shares), and how restrictions would vary by location, are not well specified or communicated to the market. Lack of information and certainty regarding how shortfalls will be managed will reduce water users' ability to make informed business decisions. Further, as short-term shortfall events tend to materialise over a period of days or weeks, it is crucially important that to mitigate the worst impacts of a shortfall event that Basin States and the MDBA have a pre-planned and coordinated mitigation strategy.¹⁰⁶⁹

The ACCC also understands that some operational measures, such as modifying weir pool levels and utilising alternative delivery pathways might offer some potential for mitigating the impact of a shortfall; though once again it is not entirely clear how these measures could be used to complement state actions. How operational measures can be used should also be incorporated into shortfall management plans.

The Independent Panel for Capacity Projects Review also highlighted this gap in arrangements to respond to an actual shortfall event:

¹⁰⁶⁷ Victoria issues works licences and water use licences under the Water Act 1989 (VIC) and the associated Policies for Managing Works Licences (see, in particular, clause 14 of the policy): https://waterregister.vic.gov.au/images/documents/Policies%20for%20Managing%20Works%20Licences_SIGNED_20160902.pdf, viewed 4 February 2021. On 11 July 2019, the Victorian Water Minister announced that she would review all works licence applications in the lower Murray, including applications for new works licences and amendments to existing works licences. The conditions relating to extraction share will take into the consideration the cumulative impacts of growing extractions. The effect of this could be to restrict future growth in extraction share in this region. Victorian Water Register, Minister announces review for works licence applications in lower Murray, media release, 11 July 2019, <https://waterregister.vic.gov.au/about/news/273-minister-announces-review-for-works-licence-applications-in-lower-murray-2>, viewed 5 February 2021. On 20 August 2020, the Minister announced she was extending referral of assessments for a further 12 months: see <https://waterregister.vic.gov.au/about/news/326-goulburn-to-murray-trade-arrangements-for-2020-21>, viewed 23 February 2021.

¹⁰⁶⁸ Frontier Economics, *Market architecture assessment*, p. 63.

¹⁰⁶⁹ MDBA, *Managing Delivery Risks in the River Murray System*.

Currently, jurisdictions do not have contingency arrangements in place to manage [a delivery shortfall]. Whilst it may not be possible to agree on exact sharing arrangements, given that the impacts of every shortfall will be different depending on timing and duration, it should be possible to develop a framework for making these decisions when they occur and agreeing on key steps, roles and responsibilities in implementing and communicating them..The Panel consider this to be an urgent priority.¹⁰⁷⁰

The ACCC recommends that Basin States and the MDBA move promptly to formalise their arrangements for managing shortfall events, including how they will enforce those arrangements. This is discussed further in subsection 16.2.5.

Impact of a shortfall event

The impact of a delivery shortfall on the operations of water users will vary significantly based on what they are producing, where they are located, when in their annual water schedule the shortfalls occurs and the specific rules of any restriction implemented. Overall impacts on the market and the environment will also vary based on the level of compliance with the rationing rules.

For example, table grapes are particularly susceptible to water stress, with varying impacts based on timing. Specifically, a lack of water prior to flowering and fruit setting will reduce yields in the current and following year, while water shortages after fruiting could result in a crop that is not fit for market.¹⁰⁷¹ Meanwhile, water shortages for almonds or dairy pastures may result in reduced yields in either the current or the following year. Sufficient water shortage can also result in permanent crops dying off. Accordingly, while contingent on a number of factors, the production losses as a result of a delivery shortfall have the potential to be significant.

The Capacity Panel warned that the economic consequences of a shortfall is likely to be much higher than in the past 'because of the level of investment in Sunraysia and the Riverland'. The Panel also noted the impact would depend on the timing and duration of the event, while the impact of a shortfall on the environment had not yet been assessed.¹⁰⁷²

14.2.3 Trade may be putting upward pressure on conveyance losses but the magnitude is extremely hard to quantify

Conveyance or transmission losses are the water that is lost while flowing through the river system (or irrigation channels), generally as a result of seepage, evaporation and transpiration. Conveyance losses are calculated as the difference between the volume of water that flows past an upstream gauge and a downstream gauge once extractions have been accounted for. Given as a net figure, losses can be reduced (sometimes to below zero) as a result of rainfall directly over the river, return flows and inflows from un-gauged systems. Generally, conveyance losses are higher during sustained periods of hot, dry and windy conditions (and dry antecedent conditions¹⁰⁷³), and when river flows are higher.¹⁰⁷⁴

Losses are an inevitable part of river management, and are heavily influenced by a range of factors, many of which are outside the control of the system operators.¹⁰⁷⁵ Deliveries of traded water are only one relatively small component of the overall amount of water flowing through the river system. Sufficient volumes of conveyance water are required to ensure water can be delivered for environmental purposes, critical human water needs, regular entitlement flows, and other reasons. As such,

1070 Independent Panel for Capacity Project Review, *Report to Murray Darling Basin Ministerial Council*, 2019, p. 16, available at <https://www.mdba.gov.au/sites/default/files/pubs/ipcpr-minco-final-report-2019.pdf>.

1071 Frontier Economics, *Market architecture assessment*.

1072 Independent Panel for Capacity Project Review, *Report to Murray Darling Basin Ministerial Council*, 2019, p. 12.

1073 Antecedent conditions refers to the relative wetness or dryness of catchments and the floodplain environment bordering the river channel; this can impact losses, particular when overbank flows occur. MDBA, *Conveyance Losses in the River Murray System 2018-19*, 2019, p. 2 available at www.mdba.gov.au/sites/default/files/pubs/River-murray-system-losses-report.pdf.

1074 MDBA, *Conveyance Losses in the River Murray System 2018-19*, p. 2.

1075 Independent River Operations Review Group, *Review of Performance Against Objectives and Outcomes – 2019-20*, 2020, p. 24, available at <https://www.mdba.gov.au/sites/default/files/pubs/review-of-performance-against-objectives-and-outcome-2019-20.pdf>.

conveyance water is the highest priority of water allocated at the bulk level in the River Murray System by the MDBA.¹⁰⁷⁶

In the River Murray System, conveyance losses between Hume Reservoir and the South Australian border are calculated and accounted for at the bulk level by the MDBA before state shares are calculated. Water is then allocated out by states to rights holders based on relevant state allocation policies. The bulk level calculation means that losses are socialised across all water rights holders. Losses downstream of the South Australian border are covered by South Australia's entitlement, which includes 696 GL annually for dilution and loss. Section 15.1 details allocation policies in more detail.

In river systems which sit entirely within one state's jurisdiction, including tributaries of the River Murray like the Murrumbidgee and the Goulburn, calculating and accounting for losses is the responsibility of the relevant state. Losses in those systems are also 'socialised' among rights holders in those systems. This means that increased losses from intrazone trade are shared among water users in that zone. Additionally, rights holders in the source zone will bear the burden of increased conveyance losses as a result of net intervalley trade delivered to the point of confluence with the Murray, such as from the Murrumbidgee or Goulburn. The Victorian Department of Environment, Land, Water and Planning explained:

[W]hen Goulburn IVT is delivered to Murray, losses in Goulburn River upstream of McCoys are attributed to the Goulburn (these may be more or less than the losses previously incurred in delivering water to the seller), but any losses downstream of McCoys and location of use are attributed to the Murray.

Many stakeholders raised concerns about increasing conveyance losses, particularly as a result of water trade facilitating the movement of water use further downstream.¹⁰⁷⁷ Sunrice and Ricegrowers' Association of Australia's submission to the ACCC Interim Report articulated these concerns, with regard to their impact on the reliability of general security entitlements:

The failure to account for conveyance losses in the price of water trades is the most pertinent example of how the market architecture for trading in the Basin is misaligned with the physical characteristics of the Basin. As noted in our submissions to the Issues Paper, transmission losses created by downstream trade in the Basin continue to have a material and detrimental impact on the yield of General Security water entitlements.¹⁰⁷⁸

Several stakeholders argued that, because water lost to conveyance in operating the river system can generate environmental benefits, these losses should be debited against the accounts of environmental water holders, rather than socialised and shared equally among all entitlement holders.

However, the environmental benefits of conveyance water were considered and taken into account during the development of the Basin Plan. Attributing conveyance losses to the environment would require a greater volume of water to be recovered from water users to achieve the same level of environmental outcomes and the Environmentally Sustainable Level of Take required under the Basin Plan. Where an environmental water holder's water orders incur increased losses, this additional loss is debited against its account.¹⁰⁷⁹

1076 MDBA, *Water critical for human needs*, 2020, <https://www.mdba.gov.au/water-management/allocations-states-mdba/water-critical-human-needs>, viewed 5 February 2021.

1077 Sunrice Group and Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020; Goulburn Valley Environmental Group Inc, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020; Bega Cheese, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 4; Environmental Farmers' Network, *Submission to Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 1.

1078 Sunrice Group and Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020.

1079 MDBA, *Conveyance Losses in the River Murray System 2018-19*, p. 13.

Conveyance losses vary widely due to a number of factors

The shift of water traded downstream for extraction does not always correlate to the distance travelled by the water. The MDBA has significant flexibility in operating the River Murray system and the ability to meet downstream demands through deliveries from tributaries (such as the Goulburn, Murrumbidgee and, when connected, the Darling) and from other storages. This means that a trade from an upstream user to a user a certain distance downstream will not necessarily result in the corresponding water delivery travelling that same additional distance through the river.

However, the relative location of water's release and demand points (that is, the distance water travels) can impact conveyance losses.¹⁰⁸⁰ Assuming inflow volumes and locations remain constant, it is reasonable to assume that a large enough shift in the location of water extraction further downstream (and away from the various water origin points) would put upward pressure on conveyance losses. Frontier Economics notes that:

Given [the issues around accurately measuring the incremental change in losses from individual trades], it is reasonable for water to be traded between regions without the need to adjust volumes due to changes in conveyance losses. However, at an aggregate level, increased water demand downstream requires increasingly large volumes of water to be delivered. The incremental losses associated with altered river management to support additional downstream delivery when required may not be negligible under all seasonal conditions.¹⁰⁸¹

These trends were identified as far back as 2012 by the National Water Commission, which stated water trade was moving water further away from the source, increasing travel distance and increasing flow rates in some reaches which would be expected to increase transmission losses and affect the general resource pool and hence environmental outcomes.¹⁰⁸² However, the National Water Commission went on to note that the magnitude of the probable increase in conveyance losses due to trade is highly uncertain and that insufficient information is available to quantify this impact.¹⁰⁸³

Current market architecture assumes no additional water is lost due to trade

As noted in subsection 13.1.2, one of the simplifying assumptions of Basin water market architecture is that water trade occurs on a 1:1 basis. This assumes that marginal losses as a result of water trade and from the delivery of individual water parcels are zero.

Actual marginal losses depend on when the traded water is used and on the aggregate volumes being delivered at that time (subsection 13.1.3 discusses the disconnect between time of trade, delivery and use).¹⁰⁸⁴ Water trades that result in bulk deliveries increasingly occurring during hotter, drier periods (such as through the summer peak) and at high flow rates could be driving increased losses.

The marginal impact on losses of an additional ML of water being delivered downstream is likely small, as the incremental increase in flow rates would be minimal. However, where aggregate changes in delivery patterns shift more significantly, the additional distance travelled and change in flow rates could result in a material impact on total conveyance losses and available water resources.

Frontier Economics sums this up succinctly in saying:

Downstream users currently do not face efficient price signals relating to the external socialised costs and risks arising from increasing downstream delivery – as experienced in 2018–19. Current trading arrangements do not address this as they assume the marginal losses from delivery are zero.¹⁰⁸⁵

¹⁰⁸⁰ MDBA, *Conveyance Losses in the River Murray System 2018–19*, p. 38.

¹⁰⁸¹ Frontier Economics, *Market architecture assessment*, p. 48–49.

¹⁰⁸² National Water Commission, *Impacts of water trading in the southern Murray–Darling Basin between 2006–07 and 2010–11*, NWC, 2012, pp. 116–117.

¹⁰⁸³ National Water Commission, *Impacts of water trading in the southern Murray–Darling Basin between 2006–07 and 2010–11*, NWC, 2012, pp. 116–117.

¹⁰⁸⁴ Frontier Economics, *Market architecture assessment*, p. 48.

¹⁰⁸⁵ Frontier Economics, *Market architecture assessment*, p. 52.

Similarly to the absence of price signals for delivery risk, the lack of a price signal for conveyance losses for downstream trade would in theory have a distortionary impact on the market. This is explained in subsection 13.3.1.

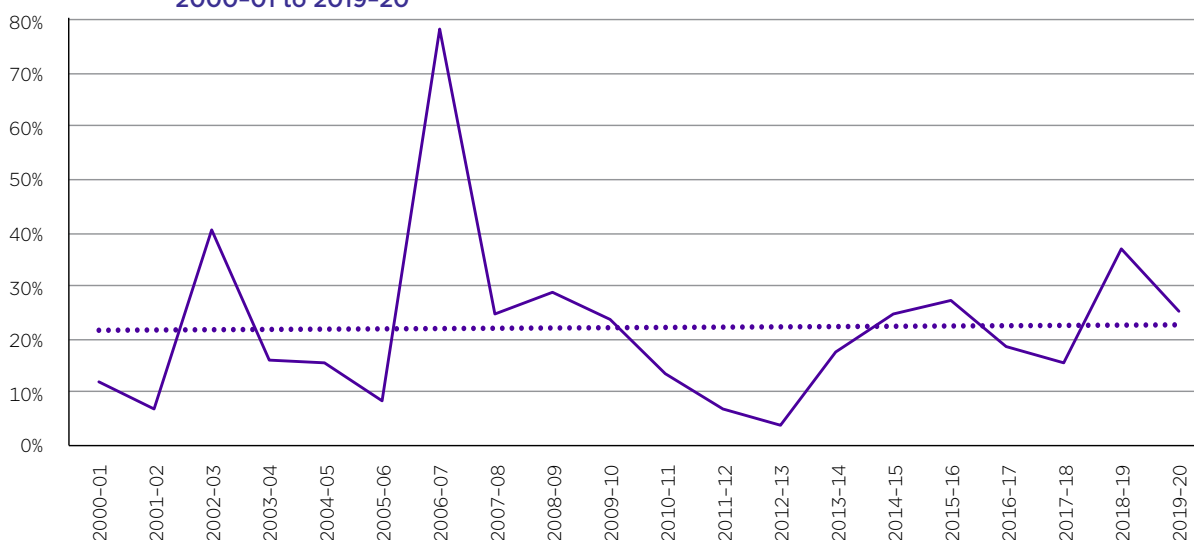
Overall trends in conveyance losses are difficult to discern, and the proportional impact of trade is even harder to separate. The ACCC's analysis of conveyance losses and their impacts has focussed on the Murray and the Murrumbidgee as this has been where stakeholder concerns have been concentrated. The ACCC also undertook some high-level analysis of the Goulburn system, and generally considers the conceptual problems identified in other systems also apply there.

Losses in the River Murray System

Figure 13.14 in the ACCC's Interim Inquiry Report revealed a significant increase in the proportion of total River Murray system inflows that was being lost to conveyance losses each year since 2012-13. Since then, the ACCC has collected additional data to examine this trend over a longer time period in order to try and better understand trends in conveyance losses without undue influence of climate variability. Figure 14.8, below, is based on the same data but on a longer time scale. Previous analysis by the ACCC was distorted by the uncommonly low results in 2012-13, giving the impression of a strong upward trend over time. However, over the full 20 year timescale, figure 14.8 only reveals a gentle upward trend in losses as a proportion of inflows, despite an upward trend in losses overall over this time period.

Figure 14.8 shows the significant impact of climatic variability on losses, given the peaks and troughs line up with years of notable rainfall. The significant spike in 2006-07 was driven largely by a substantial drop in inflows during the height of the Millennium Drought. Meanwhile, low figures occur from 2010-11 to 2012-13 in and immediately following flood years; losses in 2010-11 were actually far higher than any other year but were dwarfed by massive inflows. Likewise, in the 2016-17 high losses occurred as a result of flooding, which suppressed losses as a proportion on inflows that year and the following year. The MDBA notes that losses are low in 'transitional years' following flood years due to the wet antecedent conditions. While small spikes in loss relative to inflows did occur in 2018-19 and 2019-20, this was driven by both above average losses as well as below average inflows.

Figure 14.8: Annual conveyance losses in the River Murray system as a proportion of total system inflows, 2000-01 to 2019-20



Source: ACCC analysis based on MDBA's response to voluntary information requests.

Note: Dotted line represents linear trend (least squares).

The Interim Inspector Generals Report plotted conveyance losses against delivery volumes with similar findings. Importantly, the Interim Inspector General's report found that in 2018-19 (a dry year) losses accounted for 25% of water delivered, which was equal to the period from 2006-07 to 2009-10

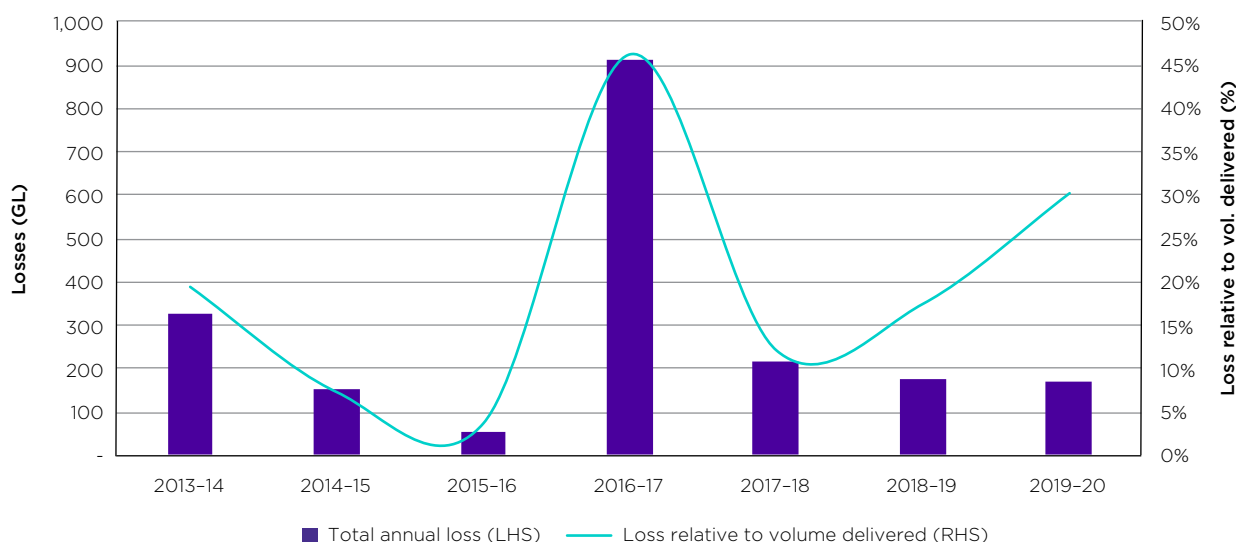
(a similarly dry period).¹⁰⁸⁶ The implication of this is that while conveyance losses may appear to be becoming a more significant influence on water availability, this trend may be less significant once climatic factors are accounted for. Subsection 15.1.3 notes that forecast impacts of climate change are likely to put upward pressure on conveyance losses in the future.

Losses in the Murrumbidgee River system

The New South Wales Department has noted, ‘the Murrumbidgee is a long river and releasing water from headwater storages for delivery to the Murray can be ‘expensive’ in transmission losses’ and that these losses are socialised. It further explained that, ‘historically, with small volumes of trade in both directions, this cost was accepted as necessary and offset by the benefits of the trade opportunity. However, as markets are pulling more water physically out of the valley Murrumbidgee water users are paying the increased operational costs.’ The intergovernmental group (featuring the MDBA and Basin State governments) responsible for the trade adjustments project noted the potential for negative third party impacts (including conveyance losses) if a significant volume of water is owed from a tributary.

ACCC analysis provides some circumstantial evidence the losses in the Murrumbidgee have increased relative the volume of water delivered in the system in recent years (see figure 14.9). However, as for the Murray, it is very difficult to separate this trend from the impacts of climate variability, noting the large spike in the flood year of 2016–17 and the extreme dry conditions experienced from mid-2017–18 to 2019–20. Figure 14.9 reveals that the spike in losses relative to delivery volumes in 2019–20 was driven by reduced water delivery, rather than increased total losses.

Figure 14.9: Total annual conveyance losses, and conveyance losses relative to the volume of water delivered in the Murrumbidgee, 2013–14 to 2019–20



Source: Conveyance loss data from NSW Water Insights Portal. Delivery volumes data from WaterNSW response to ACCC water monitoring report requests for information, 2013–14 to 2019–20.

These statements contrasts with the position of the MDBA with respect to losses in the River Murray system, in which the MDBA has indicated the resolution of loss data does not allow them to estimate the proportionate impact of drivers such as traded water delivery. If New South Wales is able to robustly determine that the magnitude of traded water’s impact on conveyance losses is significant, it should prioritise implementation of mechanisms to account for this. Further, Frontier Economics argued that as the Murrumbidgee IVT limit is partially motivated by conveyance loss concerns, the Murrumbidgee River may be a suitable valley to consider for the earliest implementation of conveyance loss factors to better attribute these losses to those incurring them.¹⁰⁸⁷

¹⁰⁸⁶ Interim Inspector General of Murray–Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray–Darling Basin Agreement*, 2020, p. 27, available at https://www.igwc.gov.au/sites/default/files/2020-09/iig_final_report.pdf.

¹⁰⁸⁷ Frontier Economics, *Market architecture assessment*, p. 57.

Losses in the Greater Goulburn River system

The ACCC undertook some analysis of losses set aside from seasonal determination water balances at the start of the season against the volume of on-river water delivery in the Greater Goulburn system. This analysis revealed a slight upward trend from 2012–13 to 2018–19. Estimated losses ‘set aside’ data was analysed, as Victoria’s Department of Environment, Land, Water and the Environment stated that ‘used loss for river losses is not calculated. Unknowns in the water balance, such as monthly river diverter use (some diverter meters may be only read once or twice a season depending on location) and ungauged system inflows, make this difficult to calculate’.

Despite not focussing on losses in the Greater Goulburn system and generally fewer stakeholder concerns, the ACCC considers the issues identified in other systems are still relevant for the Goulburn. It is likely that concerns about conveyance losses are less acute in Victoria as a result of its entitlement framework (outlined in subsection 15.1.2) which, in the absence of allocations to low reliability entitlements, means that the impact of increases is generally felt by one entitlement class (high reliability water shares), rather than being concentrated upon holders of one lower reliability entitlements.

Increased conveyance losses will undermine entitlement reliability, with disproportionate impact on low reliability water users

Conveyance losses are socialised in the systems mentioned above, and in most systems throughout the Basin. This means that water users are not required to directly pay the cost of their water use decisions, in the form of conveyance losses, and the impact of any increase in losses is shared among water users. Where two parties engage in a trade that changes the location or timing of water use in a way that increases conveyance losses, this generates an externality (or third party impact) by reducing the overall pool of water resources available for consumptive use. Section 15.1 outlines why the impact of this reduction of the consumptive pool most directly manifests in reduced entitlement reliability, particularly for low reliability entitlement holders.

The ACCC does not have the information available to effectively assess the magnitude of the potential impact of trade on conveyance losses, and the corresponding impact on entitlement reliability. However, table 14.3 provides some insight into the relative relationship between losses and allocations in the Murray, under the circumstances and assumptions outlined below. It reveals that for each additional one per cent increase in losses in the River Murray System, general security entitlement holders will experienced a reduced allocation of 0.15% to 0.18%. Meanwhile in Victoria, the same increase in losses will reduce current year HRWS allocations by roughly 0.32% to 0.16% (in the latter case, the impact of the increased losses will be spread across the current year, and the next).

Table 14.3: Approximate impact on current year NSW Murray general security and Victorian Murray high reliability allocations of a one per cent increase in River Murray System conveyance losses

NSW Murray GS entitlement holdings	Impact on state's available resource	Impact on GS allocation (0 to 60%)	Impact on GS allocation (60 to 100%)
1674 GL	- 4.1 GL	- 0.18%	- 0.15%
VIC Murray HRWS holding	Impact on state's available resource	Impact on HRWS allocation (0 to 30%)	Impact on HRWS allocation (30 to 100%)
1282 GL	- 4.1 GL	- 0.32%	- 0.16%

Source: ACCC analysis based on BOM entitlements on issue data, conveyance losses data provided by MDBA in response to ACCC information request

Note: HRWS = high reliability water share, GS = general security.

Does not reflect an in-season reduction in available resource, but rather a scenario in which available resource accrues slightly less than the default scenario. Assumes annual losses of 823 GL in the River Murray System (based on median losses from 2000–01 to 2019–20). Assumes additional volume of losses from a one per cent increase is shared equally between NSW and Victoria, and as such that South Australia's full 1850 GL entitlement has already been accounted for. Assumes all additional available water resource is allocated to entitlement holders.

In the NSW Murray, table 14.3 applies assumptions based on the water sharing plan that when allocations are at a point where high reliability entitlements (such as high security, local water utilities, stock and domestic, etc.) have received a full allocation (of 97% for high security entitlements), then conveyance entitlements are eligible for an allocation of 50% of entitlement. Then, for each additional 1% of allocation to general security entitlements, conveyance entitlement holders are allocated an additional 0.3883% of entitlement. When general security entitlements reach beyond an allocation of 60%, for each additional 1% of allocation to general security entitlements, an additional 0.6675% of allocation is provided to conveyance entitlements.^{1088 1089}

In Victoria, table 14.3 assumes that once current year high reliability allocations reach 30 per cent, half of any additional available resource would be allocated to the following year's high reliability allocations.

From this, the ACCC concludes that while variation in conveyance losses can affect water allocations, the likely magnitude of trade's influence on these losses is likely to be somewhat lower than many stakeholders are assuming. The ACCC urges improved modelling and assessment capability to better understand the proportionate impact of drivers of conveyance losses, but on current evidence does not consider the scale of the problem to be sufficiently large to justify urgent, major reform to change accounting of conveyance losses (such as through trade loss factors, see subsection 16.3.2).

Information gaps remain to assess the magnitude of trade's impact

The ability of the ACCC, and various other agencies, to effectively assess the scale of the problems relating to conveyance losses is curtailed by significant information gaps relating to how trade and losses interact. There are significant inherent difficulties involved in developing accurate assessments of the incremental losses associated with the delivery of individual parcels of water. Lifetime tracking and tracing of water may help one side of the information problem (discussed in 11.5.3).

Frontier Economics outlines further information gaps, including that:

Actual marginal losses depend on when the traded water is used and on the aggregate volumes being delivered at that time, making it inherently difficult to accurately estimate the change in conveyance losses incurred as a result of individual water delivery decisions. Imposing conveyance loss factors, where one megalitre of water sold from an upstream water user would be converted to less than one megalitre received by the downstream purchaser, for allocation trade in the Southern Connected Basin would be extremely challenging to implement in practice.¹⁰⁹⁰

The MDBA has indicated that the resolution of system losses data does not allow for an accurate measurement of the proportionate impact of additional drivers such as traded water delivery against other drivers such as climate on total conveyance losses.

¹⁰⁸⁸ *Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources 2016* (NSW); ACCC consultation with NSW Department of Planning, Industry and Environment, 15 February 2021.

¹⁰⁸⁹ Conveyance entitlements are a category of access licence originally issued to Irrigation Infrastructure Operators to facilitate delivery of water through their channel systems. Note that water use against these licences is considered consumptive use. New South Wales Government, NSW Murray and Lower Darling Water Allocation Update, 2019, at https://www.industry.nsw.gov.au/_data/assets/pdf_file/0006/270771/WAS-murray-190815.pdf, viewed 25 June 2020.

¹⁰⁹⁰ Frontier Economics, *Market architecture assessment*, p. 48.

Another gap in addressing accounting for conveyance losses is the lack of a direct link between the time of use and trade. The actual marginal loss rate depends on when water is used and the aggregate volumes being delivered at that time. Within current water market architecture no mechanism is widely used to effectively track the time of use of a parcel of traded water, which would allow the application of conveyance loss factors that more accurately reflect the differences in loss rates over time. These issues are covered in more detail in section 16.3.

Work to close these information gaps and improve river operations guidance will lay the foundation for long term solutions to conveyance loss accounting.

14.2.4 Guidance for river operators needs to be improved

The current river operations guidance framework for the Southern Basin does not adequately describe how what are often conflicting objectives should be balanced and how trade-offs should be made. This requires the MDBA to balance competing risks and make decisions based on collaboration and professional judgments. The ACCC notes that annual Independent River Operations Review Group (IRORG) reports have consistently found that the MDBA's river operations have met their specified objectives.¹⁰⁹¹

The Objectives and Outcomes for River Operations (Objectives and Outcomes) document set by the Basin Officials Committee is the primary document guiding river operations in the River Murray. It sets a number of general objectives such as, relating to 'water storage and delivery and accounting':

To operate the River Murray System efficiently and effectively in order to deliver State water entitlements [and]

To maximise the water available to the Southern Basin States, after providing for operating commitments in the River Murray System.¹⁰⁹²

And relating to the 'environment':

To contribute to the protection and, where possible, restoration of priority environmental assets and ecosystem functions within the River Murray System.¹⁰⁹³

River operators' decisions may have distributional consequences, for example by prioritising delivery objectives over managing losses, thereby meeting the needs of some water users while incurring losses that impact other users. The interaction between maximising delivery reliability and environmental health (as well as conveyance losses) is expanded upon in the recent Managing Shortfall Risks in the River Murray System issues paper:

Avoiding shortfalls in recent years has not been without cost. At times, large volumes of water have been delivered as unseasonal flows through various tributaries to avoid a shortfall, and, increasingly this approach is causing significant environmental damage and higher conveyance losses.¹⁰⁹⁴

1091 For example, Independent River Operations Review Group, *Review of Performance Against Objectives and Outcomes - 2019-20*, 2020, p. 24.

1092 These objectives are then supplemented by outcomes under the general objectives to be achieved by river operations as well as specific objectives and outcomes. These outcomes include the minimisation of losses and the delivery of authorised water orders to southern Basin States unless prevented by physical constraints; BOC, Objectives and outcomes for river operations in the River Murray System, p. 10.

1093 BOC, Objectives and outcomes for river operations in the River Murray System, p. 11.

1094 MDBA, *Managing Delivery Risks in the River Murray System*, p. 6.

Frontier Economics identified the impacts of this in balancing delivery reliability and conveyance losses. It stated 'the immediate benefits of meeting demand downstream are realised by the users downstream, but [doing so] increases the risk of losses which are socialised across all entitlement holders.'¹⁰⁹⁵

A specific example of this trade-off is outlined below in box 14.2, which provides a case study of river operators' decision-making during the 2018–19 water year.

Box 14.2: River operations and increased conveyance losses in 2018–19

Stakeholders expressed particular concern around the overbank transfers through the Barmah–Millewa forests during 2018–19, and the resulting high conveyance losses and environmental damage.

In 2018–19, dry climate conditions led to low inflows to Lake Victoria, meaning that the MDBA was required to manage the risk of water delivery shortfalls downstream of Lake Victoria through overbank transfers from Hume Dam. Higher than normal conveyance losses occurred from these overbank transfers as a result of the dry antecedent conditions in the Barmah–Millewa forests. These transfers were undertaken in spring to avoid making deliveries through the heat of summer when conveyance losses would have been higher. This decision increased the risk of spills from Lake Victoria (if late spring rains had led to significant inflows).¹⁰⁹⁶

MDBA river operations staff consulted with Basin State governments on the trade-off between increased conveyance losses and elevated risk of storage spills or water delivery shortfalls. The ACCC understands that Basin State governments indicated a willingness to incur additional conveyance losses when faced with the threat of water delivery shortfalls and potentially having to restrict extractions. This is ultimately what the MDBA decided to do, and reveals that while the decision on timing of releases was a primarily technical concern, the decision-making process on how to address it was essentially a political one. This reflects that the MDBA's river operating functions are not bound by strict rules but guided by objectives, principles, collaboration and professional judgement.

Conveyance losses in 2018–19 (of 1039 GL) were both higher than average, and higher than years with similar operational strategies.¹⁰⁹⁷ The MDBA described the impact of these overbank transfers as 'in the order of tens of GL' compared to 'a few thousand' GL of inflows.¹⁰⁹⁸ It is important to note, that a substantial volume of conveyance water is required to operate the River Murray system regardless of trading activity, with incremental loss because of net trade downstream likely to make up a very small proportion of total losses.

Ultimately, despite stakeholder concerns, climatic factors were the primary driver of high conveyance losses in 2018–19. While overbank flows were incurred intentionally by the MDBA, incurring the associated conveyance losses was considered a necessary operational decision to avoid the perceived greater impact of a water delivery shortfall. The IROrg 2018–19 report concluded the MDBA effectively managed losses in this year in line with agreed outcomes, though the ACCC considers there is a need to revise operational guidance (subsection 16.2.6).

Some stakeholders indicated a belief that increased conveyance losses due to overbank transfers in 2018–19 were the result of environmental watering activities, and should have been debited from environmental water holders' accounts. Others alleged this event directly led to a 400 GL impact on conveyance losses.¹⁰⁹⁹ These misconceptions reveal the potential for improved market confidence through better communication and information availability regarding river operations decision-making. IROrg noted there was a lot of misleading information about operational losses and environmental water transfers in this year.

¹⁰⁹⁵ Frontier Economics, *Market architecture assessment*, p. 8.

¹⁰⁹⁶ MDBA, *Conveyance Losses in the River Murray System 2018–19*, <https://www.mdba.gov.au/sites/default/files/pubs/River-murray-system-losses-report.pdf>, viewed 26 June 2020.

¹⁰⁹⁷ ACCC analysis based on MDBA response to voluntary information request.

¹⁰⁹⁸ ACCC discussions with MDBA, 6 February 2020.

¹⁰⁹⁹ Fruit Growers Victoria Ltd, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 4.

The ACCC understands that:

The MDBA has signalled water managers and river operators will in future consider whether significant losses can be justified to avoid restricted delivery to avoid the associated on-farm economic costs. It stated that a shortfall may be justified in the case of over-development as a potential natural correction to irrigation demand, rather than imposing costs (e.g. overbank transfers) on all entitlement holders to meet the demands of a select few'.¹¹⁰⁰

This exemplifies the lack of information about delivery risks that is being fed back to water users, and is partly a function of the fact that delivery risks are managed at a bulk level, not by individual water users.

Multiple factors influence river operation decisions, such as the timing and location of demand, antecedent conditions, short and long-term weather forecasts and channel capacity of multiple delivery pathways. These factors vary significantly and cannot always accurately be predicted. The significant inherent uncertainty facing river operators means it is likely not feasible or desirable to impose rigid, inflexible rules dictating exactly how decisions should be made. There is a trade-off between providing certainty as to how decisions will be made under particular conditions so as to assist market participants' decision making, and retaining a level of flexibility so that river operators can effectively react to unusual, unanticipated or evolving circumstances.

The MDBA strives to balance the trade-off between certainty and flexibility by communicating anticipated river operations decisions. This is done at the start of each year through the Annual Operating Outlook (which updated in October)¹¹⁰¹ and throughout the year via weekly river operations reports.¹¹⁰² These communications, coupled with the (now publicly released) summary and review of the previous year's river operations,¹¹⁰³ are generally informative about river operations decisions relevant to market operations. Additional benefit would come from more directly considering and highlighting the decisions that are likely to influence markets, through their effect on prices and trade opportunities.

Water markets and water management lack integration

The ACCC has also found there is a lack of guidance around how volumes of traded water should be managed. Frontier found that in order to minimise third party impacts, IVT volumes should be delivered in a pattern that reflects use of the water traded out of the valley, but this water has in reality been called out in a pattern that matches peak demands in summer.¹¹⁰⁴ MDBA and some Basin State officials have acknowledged these gaps in river operations governance frameworks and the need to balance trade and ecological tolerances, and have noted there is potential value in incorporating the protocols under Schedule D of the Murray–Darling Basin Agreement into the Objectives and Outcomes document.

The large volumes of IVT call out in recent years (see figure 14.2) and the subsequent environmental impacts, combined with the lack of environmental objectives on tributaries in the Objectives and Outcomes, are driving the need to incorporate traded volumes into guidance documentation.¹¹⁰⁵ River operations guidance should be reviewed and amended to give it a greater breadth and incorporate consideration of traded volumes of water, and how these should be handled by river operators. Learnings from the Goulburn to Murray trade rule review as well as the work of IRORG will be important in this endeavour.

¹¹⁰⁰ Frontier Economics, *Market architecture assessment*, p. 52.

¹¹⁰¹ MDBA, *River Murray System Annual Operating Outlooks*, 2021, <https://www.mdba.gov.au/publications/mdba-reports/river-murray-system-annual-operating-plan>, viewed 5 February 2021.

¹¹⁰² MDBA, *Weekly Reports*, n.d., <https://www.mdba.gov.au/water-management/regular-reports-murray-data-storages/weekly-reports>, viewed 5 February 2021.

¹¹⁰³ MDBA, *River Murray System annual summaries and reviews of river operations*, 2020, <https://www.mdba.gov.au/publications/independent-reports/river-murray-system-annual-summaries-reviews-river-operations>, viewed 5 February 2021.

¹¹⁰⁴ Frontier Economics, *Market architecture assessment*, p. 42.

¹¹⁰⁵ BOC, *Objectives and outcomes for river operations in the River Murray System*; Frontier Economics, *Market architecture assessment*.

Ecological tolerances should be investigated and established

As noted in subsection 14.2.2, environmental damage has been occurring through the southern Basin as a result of the movements of water driven by water market. While the Objectives and Outcomes Document does include minimum and maximum flow rates in the River Murray system, river operations processes and guidance frameworks appear not to have been successful in fully protecting the environmental health of river systems. Australian and Basin State governments have acknowledged ‘they need to continue to understand the ecological tolerances of our rivers and factor this into system operations to mitigate and avoid ongoing damage.’¹¹⁰⁶

It is possible that establishing and adhering to stricter flow limits will increase delivery risks. However, investigation and improved understanding of the ecological tolerances, including how ecosystems will respond to various operational decisions, will help river operators understand and manage trade-offs effectively.

As outlined in subsection 16.2.5, the ACCC recommends that the MDBA and Basin states, through Basin Officials Committee, refine river operations guidance to more effectively and more transparently balance trade-offs.

14.2.5 Trade and delivery arrangements need to better manage all users’ needs, including for environmental water

The combined effect of current interzone trade rules and the operational arrangements for managing water deliveries is that these arrangements are failing to adequately accommodate users’ different delivery needs. This is seen particularly with respect to environmental water, with deliveries occasionally not able to be satisfied because of operational decisions to prioritise consumptive users’ needs.¹¹⁰⁷ The ACCC considers that the Australian and Basin State governments, the MDBA and Environmental Water Holders (EWH) should work together to update river operations guidance and consider how trade arrangements are used by EWH, to improve arrangements for managing environmental water deliveries.

The use of trade mechanisms and other arrangements by EWHs to deliver water, is generally not well understood by water users. This contributes to perceptions that EWHs receive special treatment and that environmental watering is negatively affecting other water users, such as through increased conveyance losses or receiving priority delivery.¹¹⁰⁸

A fundamental policy commitment in the acquisition of environmental water under the Basin Plan was that entitlements held by the Commonwealth Environmental Water Holder (CEWH) would retain the same characteristics as when they were held by consumptive users. This means that CEWH’s environmental entitlements are subject to the same allocation and carryover policies, and the same trading rules and delivery rules, as consumptive entitlements (of the same class).¹¹⁰⁹ In addition to entitlements held by CEWH, the Victorian Environmental Water Holder (VEWH) also holds a significant volume of ‘bulk entitlement’.¹¹¹⁰

¹¹⁰⁶ MDBA, *Managing Delivery Risks in the River Murray System*, p. 22.

¹¹⁰⁷ *ibid.*

¹¹⁰⁸ This was illustrated by concerns expressed in the ACCC’s public forums. For example, at the Deniliquin forum, the ACCC heard stakeholders were unclear on issues such as what the specific aim of environmental water was and the distinction between environmental water and operational water. Stakeholders also raised a perception of two sets of rules for the Commonwealth Environmental Water Holder and other bodies and concerns that general security entitlement owners have had their rights eroded unfairly due to the Commonwealth Environmental Water Holder’s decisions. Forum summary available here: <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20Deniliquin%20public%20forum.pdf>.

¹¹⁰⁹ Commonwealth Environmental Water Holder, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, pp. 1-7.

¹¹¹⁰ ACCC analysis based on Victorian Government response to voluntary information request. VEWH’s bulk entitlements are most similar to entitlements held by Victorian IIOs, such as Goulburn-Murray Water and Lower Murray Water. Bulk entitlements characteristics do differ somewhat to retail-level entitlements such as water shares; for example, VEWH bulk entitlements include provisions for re-crediting and reuse.

As environmental watering practices have evolved, EWHs have identified different delivery needs to those of extractive water users.¹¹¹¹ In particular, they require some unique delivery services, reflecting that environmental water stays in (or returns to) the river instead of being extracted.¹¹¹²

Trade data reveals the CEWH often trades allocations made to its entitlement to the VEWH, which the ACCC understands is for delivery because Victorian bulk entitlements (including VEWH's) have some different characteristics to standard retail entitlements. This trade is conducted under the standard allocation trade framework, and no exemptions or preferential treatment occurs relative to trade by consumptive users.¹¹¹³

EWHs also make use of delivery arrangements and accounting mechanisms under 'pre-requisite policy measures' under the Basin Plan. One example is the 'Bulk Entitlement Delivery' mechanism used in New South Wales (see box 14.3). These arrangements allow for delivery of environmental water to be managed as part of bulk operations in the southern Basin. The Basin Plan requires that there be no "detrimental impacts on reliability of supply of water to the holders of water access rights that are not offset or negated" in the implementation of Prerequisite Policy Measures (PPMs).¹¹¹⁴

1111 Commonwealth Environmental Water Holder, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 1. For information about CEWH's access to and use of carryover, see: <https://www.environment.gov.au/water/cewo/about/carryover>.

1112 For example, EWHs need to ensure releases of held environmental water are protected in transit (that is, cannot be extracted by other water users). Also, EWHs may wish to use a particular volume of released environmental water to water multiple sites – this requires 'return flow' accounting mechanisms to ensure water used at those different sites is accounted for so that only unused volumes are re-credited for further use downstream. CEWO, Response to questions submitted by Aither on behalf of the Interim Inspector-General of MDB Resources, 2020, p.11, available at <https://www.environment.gov.au/system/files/pages/dca287c3-73bd-4ec1-a3b1-c29dd5cf95f9/files/response-questions-submitted-aither-iig.pdf>.

1113 Commonwealth Environmental Water Holder, *Submission to the House of Representatives Inquiry into the management and use of Commonwealth Environmental Water*, 2018, p. 5, available at <https://www.environment.gov.au/system/files/pages/dca287c3-73bd-4ec1-a3b1-c29dd5cf95f9/files/cewh-submission-inquiry-mgt-and-use-cew.pdf>.

1114 Basin Plan (2012) (Cth), Section 7.15 (1) (d).

Box 14.3: Bulk Entitlement Delivery mechanisms in New South Wales

In New South Wales, the department uses Bulk Entitlement Delivery processes to deliver Held Environmental Water. This allows allocation of this water against a NSW Murray above Barmah Choke water access entitlement to be delivered (across trading zones) to any environmental asset in New South Wales or South Australia that is along the River Murray, including below the Barmah Choke. This involves providing a written direction to the MDBA, as the river operator, for the release of a specified volume of Held Environmental Water allocation from the Hume Dam. Orders of Held Environmental Water using the Bulk Entitlement Delivery mechanisms are subject to any relevant river constraints that could prevent the delivery of that water.

The New South Wales government does not regard the delivery or transfer of Held Environmental Water return flows or the delivery or transfer of Held Environmental Water using Bulk Entitlement Delivery mechanisms to be a trade for purposes of New South Wales state water management law even if the process results in change in the location at which water associated with the water access entitlement can be taken. This means that the delivery of Held Environmental Water return flows and Held Environmental Water that is delivered using the Bulk Entitlement Delivery mechanisms are not subject to New South Wales's water trading rules, including intervalley trades. However, the ACCC understands that, if, for example, the CEWH wanted to deliver Held Environmental Water, and Bulk Entitlement Delivery mechanisms were used to deliver that Held Environmental Water:

- from Hume Dam to a location below the Barmah Choke when the Choke was at or near capacity (for example, in peak irrigation season), the MDBA, the CEWH and the NSW Department, DPIE, would work collaboratively to determine the best way (including timing) for the Held Environmental Water to be delivered without causing third party impacts.
- from the Murrumbidgee into the Murray, WaterNSW, the NSW Department and the CEWH would work collaboratively to determine the best way (including timing) for the Held Environmental Water to be delivered without causing third party impacts.

Source: ACCC (2020) Advice on the operation of 12.02(2) to (4) of the Basin Plan water trading rules.¹¹¹⁵

In 2020, the ACCC provided advice to MDBA on the operation of section 12.02 of the Basin Plan, which provides an exemption from certain Basin Plan water trading rules for trades of environmental water (when the relevant tests for the exemption are met). In that review, the ACCC identified that there is a lack of clarity about whether some of the new arrangements being developed for delivery of held environmental water should, or should not, be considered a trade of environmental water. Delivery of held environmental water under these arrangements does not use conventional allocation trade mechanisms. While EWHs are subject to the same rules as all other users when trading allocations, allocation trade is not the only kind of trade mechanism or delivery arrangement available to EWH.

The ACCC's 12.02 advice identified that there is a need to clarify the status of mechanisms available to EWH going forward.¹¹¹⁶ Consistent with this, EWHs have themselves identified the need for the continued evolution of the operating rules that manage deliveries and enable water use to ensure arrangements can meet the needs of all water users.

River operators and EWH have also encountered issues with delivering environmental watering due to the prioritisation of consumptive water deliveries over environmental water. For example, the CEWH stated that orders to deliver proposed environmental watering were unable to be fully met in 2018–19 because operational transfers were diverted along the way or contributed to Lake Victoria filling. The ACCC is concerned that environmental water may not be treated equally to consumptive water, despite commitments that this should be the case.

1115 ACCC, *Advice on the operation of 12.02(2) to (4) of the Basin Plan water trading rules*, 2020, available at <https://www.accc.gov.au/system/files/ACCC%20advice%20to%20MDBA%20re%2012.02%20BPWTR%20-%20final%20version%20-%203%20September%202020.pdf>.

1116 ACCC, *Advice on the operation of 12.02(2) to (4) of the Basin Plan water trading rules*, 2020, available at <https://www.accc.gov.au/system/files/ACCC%20advice%20to%20MDBA%20re%2012.02%20BPWTR%20-%20final%20version%20-%203%20September%202020.pdf>.

However, in discussing these examples with the relevant parties, the ACCC also understands that environmental users may have a different flexibility in terms of the timing of deliveries, compared to consumptive users.¹¹¹⁷ For example, whereas an irrigator may only have flexibility within a period of several days as to when they need to take water (due to crop water needs), environmental water holders may be able to shift environmental watering activities over multiple days, or even weeks, and still achieve similar environmental outcomes. This raises the possibility that EWHs may be able to work with river operators and consumptive users to find ‘win-win’ situations in which timing of environmental water deliveries can be flexibly adapted to ensure both consumptive and environmental needs are met, and to help alleviate system congestion in peak consumptive use periods.

Overall, the ACCC’s view is that there needs to be better integration between delivery arrangements for environmental water, and the trading framework. In particular, it appears that delivery of environmental water through constraints or between valleys and zones may in some cases be an alternative to using trading mechanisms, while in other cases allocation trade may be used to effect this movement, or a combination of the two.¹¹¹⁸

The ACCC considers that it is essential that all mechanisms which facilitate movement of water between locations (whether intra- or intervalley) need to be considered together. Further, the ACCC considers that, while new arrangements may be first trialled in the context of environmental delivery, in principle, they should be made available to all uses, regardless of purpose of use.¹¹¹⁹

1117 The CEWH’s ‘good neighbour’ policy states that it includes the principle of flexibility, described as: “At times of critical environmental need, the Commonwealth may assert its rights to access its share of channel capacity. However, in the event of channel capacity becoming limited, we can be flexible about how and when environmental water is ordered so as to minimise any potential impact on others.” CEWO, Approach to managing Commonwealth environmental water, <https://www.environment.gov.au/water/cewo/about/planning>, viewed 4 February 2021.

1118 ACCC, Water trading rules: advice to the Murray Darling Basin Authority about section 12.02, September 2020, <https://www.accc.gov.au/regulated-infrastructure/water/water-projects/water-trading-rules-advice-to-the-murray-darling-basin-authority-about-section-1202/accc-advice>, viewed 4 February 2021.

1119 This is not to say that some conditions on access to different mechanisms may not be necessary. For example, a size threshold may need to be applied, as certain mechanisms may not be feasible with respect to a small parcel of water.

15. Managing the interactions of trade with allocations, carryover and use

Key Points

- State entitlement frameworks concentrate the impacts of reduced inflows from climate change and other factors, on low-reliability entitlement types. Reliability may be influenced to a lesser degree by conveyance losses and the impacts of carryover policies but the evidence for this is not strong.
- The specifics of allocation policies are not always well understood by water users and can lack transparency, particularly in New South Wales. Governments are not transparent about the discretion given to water managers, and how extreme events (such as severe dry periods) will be managed. This contributes to uncertainty and is diminishing market confidence.
- Water users value carryover, to help manage their supply risks. While some stakeholders have called for Basin States to abolish or further restrict access to carryover, the ACCC does not support these calls.
- Individual parties should bear the risks and costs of carryover – particularly losses while in storage – rather than ‘socialising’ these across other rights holders. Carryover rules do this reasonably well, but there is room for improvement through better attributing evaporation losses in New South Wales and South Australia.
- Differences in carryover policies between States and water sources are the result of differences in the relationship between the volume of entitlements on issue and the volume of storages in a valley, and state accounting frameworks. For this reason, harmonising carryover policies cannot simply be achieved by aligning carryover limits without increasing the risk of third party impacts.
- The total volumes of current carryover parking appears manageable. Once trade to pursue carryover parking starts to affect trade limits such as IVT limits, authorities will need to consider more fundamental reforms around access to storage.
- Long term, reforms to implement continuous accounting or capacity sharing which harmonise access to storage policies, may offer the best practice system for managing storage capacity.
- With increasing water trade, Basin modelling should be continually improved to better incorporate water markets and user behaviours in to river operations decisions. Improved resourcing for modelling and ‘real-time’ usage data will help improve the management of delivery arrangements and system risks.
- Telemetry will be a key way to improve the operation of the systems, market confidence, tracking of trade and its effects, and the handling of extreme events such as rationing water.
- Market confidence should be improved by ensuring that water users cannot run ‘negative balances’ without consequences, and continue to take compliance and enforcement action on use or ‘take’ and metering matters.
- The flaws in mature water markets and emerging impacts provide lessons which should be applied as early as possible to the development of other markets which are less mature, such as groundwater and unregulated water sources.

This chapter examines issues with the policies that deal with monitoring and measuring water use (metering, accounting and modelling), water market activity, water supply and allocation policies, and storage and carryover policies.

15.1 Understanding how water markets can influence water supply, allocations, available water determinations

Supply of water and demand for water determine what the price of water will be, and therefore have an integral role and impact on the market. The main driver of supply in Basin water markets is inflows, which are primarily a function of rainfall. However, the exact volume of water that is supplied to the market is determined by the entitlement frameworks and allocation policies implemented by Basin States governments.

The ACCC is aware of significant distrust of Basin State governments', and particularly New South Wales', approach to allocating water to entitlement holders. The ACCC has found that while a significant amount of information is released by Basin States, the actual operational procedures and calculations performed by the states to determine allocation levels for each entitlement class are opaque. This, coupled with reduced allocations in recent years, has resulted in water users' perceiving that governments have changed their approach to become increasingly conservative, and to hold more water in reserve for critical human water needs and conveyance losses in future years.

ACCC analysis, which has focused on New South Wales due to the strength of concerns in that state, has failed to find definitive evidence that states' allocation policies have changed. However the ACCC has identified a need for improved transparency around decision making and the inputs and calculations involved in these. Misconceptions and misunderstandings about allocation policies are inhibiting market confidence and contributing to distrust of water management agencies more generally.

Additionally, the ACCC examined whether trade impacts and the current design of water market architecture have led to reduced entitlement reliability. The ACCC has found that while there are likely some elements of market architecture that have the potential to reduce the reliability of low security entitlements, these impacts are extremely hard to quantify, and are likely less significant than the impacts of changing inflow patterns.

15.1.1 Water supply in the Basin is a function of weather, but ultimately determined by state entitlement frameworks and allocation policies

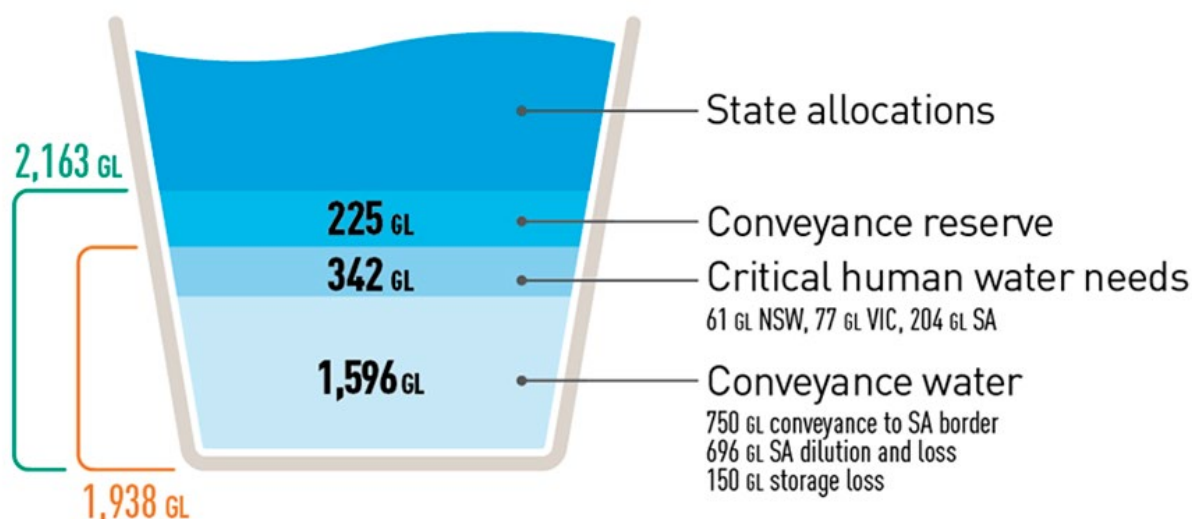
As noted in subsection 2.3.2, MDBA undertakes the bulk water resource assessment for the River Murray System – a tiered process that sets volumes aside for conveyance, critical human water needs and the conveyance reserve¹¹²⁰ – before allocating a proportion of the shared water resource to the states (see figure 15.1).¹¹²¹ This includes determining how much of its 1,850 GL total entitlement South Australia receives (including 696 GL for dilution and losses) for distribution to its different commitments.¹¹²²

1120 Conveyance represents the water that is lost while flowing through the river system during the current year. The conveyance reserve allows for delivery of the next year's critical human water needs.

1121 Murray–Darling Basin Authority, *Water critical for human needs*, 16 June 2020, www.mdba.gov.au/river-information/water-sharing/critical-human-water-needs, viewed 18 January 2021.

1122 South Australian Department for Environment and Water, *How water is allocated*, n.d., www.environment.sa.gov.au/topics/river-murray/about-river-murray/water-allocations-and-announcements/how-water-is-allocated, viewed 18 January 2021.

Figure 15.1: Bulk water sharing tiers in the Murray-Darling Basin



Source: Murray-Darling Basin Authority.¹¹²³

Following the bulk assessment, Basin State water resource managers in New South Wales and Victoria determine the share of the available water in each water source to be allocated to their entitlement holders, also known as the consumptive pool. This is done according to state water management law, including water sharing plans and entitlement and allocation frameworks. The decision about how much water to allocate out generally involves examining volumes of reserved state water held in relevant storages, inflow forecasts and other considerations at the beginning and throughout each year.¹¹²⁴ These decisions are generally communicated through regular (often fortnightly) allocation announcements (known as water allocation statements in New South Wales and South Australia, and seasonal determinations in Victoria) on relevant state government websites.

15.1.2 Allocations have been influenced by states' historical issuing of entitlements and the different risk demand profile of each state

When examining allocation policies, it is important to take into consideration the differences between states' entitlement frameworks and histories. Many of the issues raised by stakeholders about differences in allocations between states along the River Murray, are partly due to different decisions about how states decided to issue volumetric entitlements.

Water licences were given out largely on demand until widespread environmental problems from the over-extraction of water became clear.¹¹²⁵ During this time, water licences were linked to the land, were area based (not volumetric)¹¹²⁶ and had previously not been traded apart from a few instances during severe droughts.

Different states have different mixes of entitlement reliabilities, impacting allocation policies

Differences in state entitlement frameworks and allocation policies influence the supply of water to the market. New South Wales continued to issue new licences until 1981 and issued a larger number of water entitlements, with the majority being general security entitlements. The larger volume of lower

¹¹²³ Murray-Darling Basin Authority, 2018 www.mdba.gov.au/river-information/water-sharing/critical-human-water-needs, viewed 28 March 2020.

¹¹²⁴ The priority order of water allocations in New South Wales is enshrined in Water Sharing Plans, legislative instruments made under the *Water Management Act 2000* (NSW), and updated every 10 years.

¹¹²⁵ National Water Commission, *Water markets in Australia – a short history*, 2011, Canberra, p. 36.

¹¹²⁶ As impacts of over allocation began to emerge, governments began replacing area based licenses with volumetric limited licenses and also stopped issuing licenses. National Water Commission, *Water markets in Australia a short history*, 2011, p. 37.

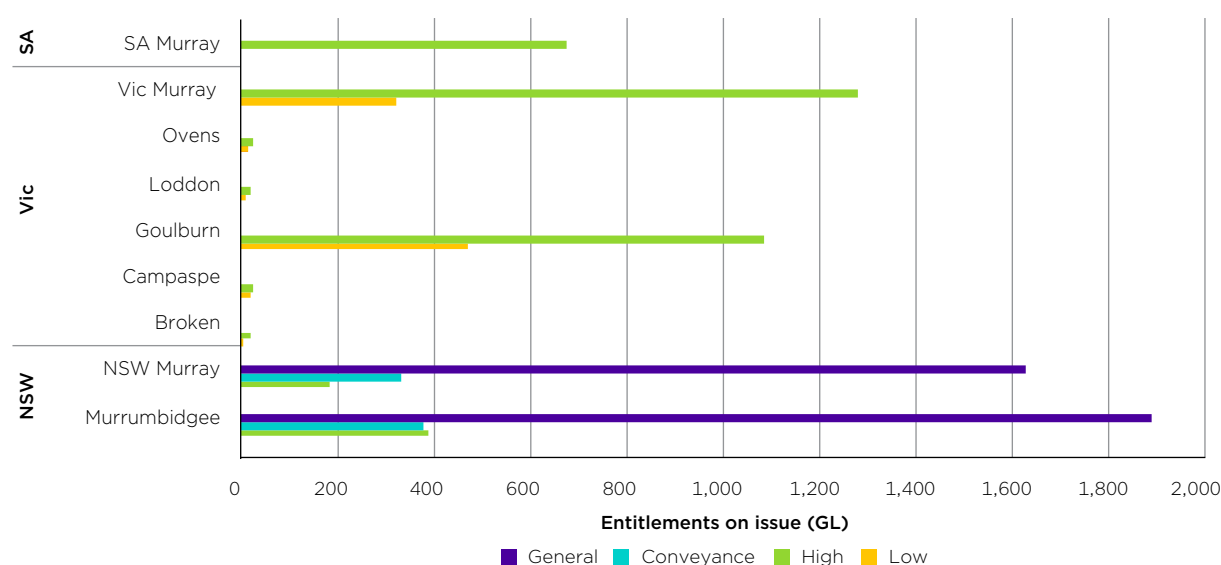
reliability entitlements aligned with irrigator preferences and the prevalence of annual cropping (such as rice and cotton) and climatic conditions at the time.

In contrast, the Victorian Government stopped issuing new licences in the 1960s and limited the volume of entitlements on issue which was partly driven by the objective of maintaining reliability of water for permanent plantings.¹¹²⁷ The choice to reserve water for future years and make it more reliable was made before carryover, meaning that all water was lost and socialised back into the consumptive pool at the end of the year. The introduction of carryover allowed water users to manage their own water availability risks to an extent, and may have reduced the importance of governments maintaining volumes of water in reserves for future years' allocations.

Moving to a harmonised entitlement and allocation regime would involve changing underlying property rights and would not result in equal allocations in different valleys, due to differing inflows.

The *nominal* volume of entitlements (that is, the total volume on issue, as opposed to the long term average annual yield) for each state can be seen in figure 15.2.

Figure 15.2: Nominal volume of water access entitlements on issue in the Southern Connected Basin, by water system and reliability, 2018-19



Sources: ACCC analysis based on New South Wales, South Australian and Victorian Government response to voluntary information request.

Notes: Includes the following: for South Australia River Murray: Class 3, 3b, 4, 7, 8, 9 entitlements; for Victorian regulated water sources: High and Low reliability water shares; for NSW Murray and Murrumbidgee: High Security, General Security and Conveyance water access licences. NSW Murray = NSW Murray Regulated River Water Source; Murrumbidgee = Murrumbidgee Regulated River Water Source.

Some states follow more 'conservative' allocation policies than others

The choice of how much water to reserve for future use against how much water to allocate out is a risk-based decision, based on inflow predictions. Over the last 20 years, New South Wales has allocated a greater proportion of available water resources to entitlement holders.¹¹²⁸ This more fully assigns the risk of variability to water users and gives them greater flexibility to choose whether to increase production in the immediate term, or store water for future years (via carryover, for general security entitlement holders). Victoria and South Australia have more conservative allocation policies, ensuring that the water supply is more stable. This involves greater volumes available for allocation in drier years

1127 Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray-Darling Basin Agreement*, 2020, https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf, p. 21.

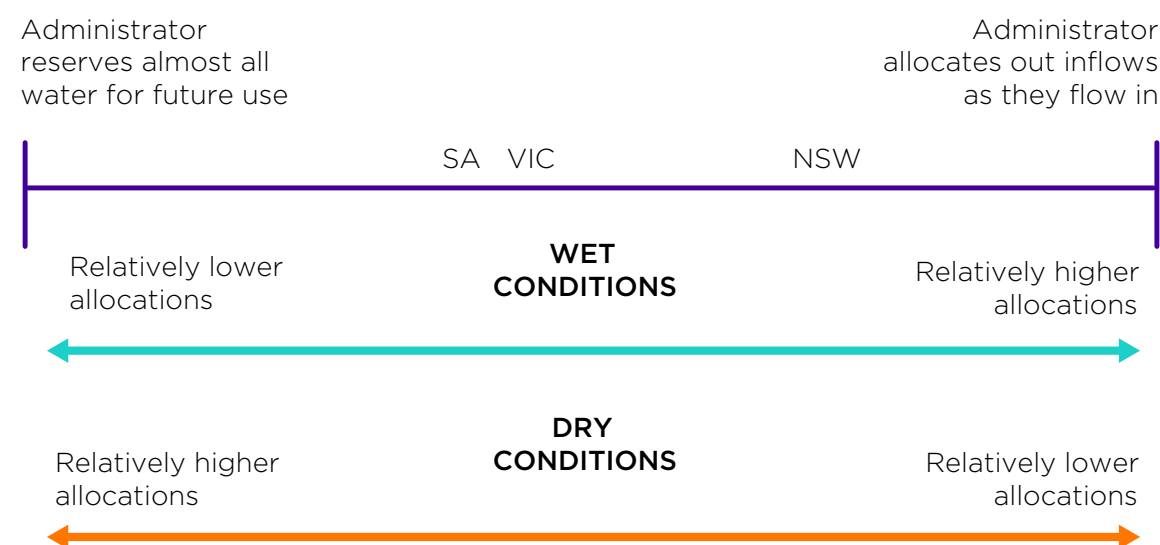
1128 Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray-Darling Basin Agreement*, 2020, at https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf, viewed 25 June 2020.

but less allocated out in wet years, possibly assisting in some planning decisions, and the ability to access finance based on anticipated allocations.¹¹²⁹

Figure 15.3 shows the trade-off between the two different allocation policy approaches. This can be thought of as a sliding scale where at one end almost all water is reserved for future years with the administrator seeking to smooth allocation volumes over time using storage. At the other end, the administrator does not seek to smooth allocation volumes and allocates out the water as it flows in.

From a market perspective, it is likely to be more efficient to allocate out all water as it flows in (similar to capacity sharing), and allow water users to make their own decisions as to storage, carry-over and use, rather than have this decision being made by an administrator. However, it's important to note that not all water use in the Basin is for irrigation. For example, maintaining some water in storages buffers the risk that critical human water needs will not be met during extreme droughts.

Figure 15.3: Allocation policies of states



Source: ACCC.

Note: This diagram is only illustrative and is not based on actual data.

15.1.3 Entitlement reliability is declining and reduced inflows are likely the primary factor

Entitlement reliability refers to the average allocation that can be expected to accrue to a particular entitlement where climatic influences are held constant. Figure 3.12 in chapter 3 includes the end of year announced allocations for selected water systems in the southern Basin from 2010–11 to 2018–19.

The ACCC's Interim Inquiry report found that many water users, particularly general security entitlement holders in New South Wales, expressed concern about reduced entitlement reliability.¹¹³⁰ Many stakeholders linked this to changes to government policies and approaches (discussed in subsection 15.1.5), increased conveyance losses due to trade and the impacts of carryover.¹¹³¹ The potential impact of conveyance losses and carryover are discussed in subsections 14.2.3 and 15.2.4, respectively.

The Interim Inspector General (IIG) found that the most significant driver of reduced allocations for Southern Basin entitlement holders has been reduced inflows. This is particularly acute in New South

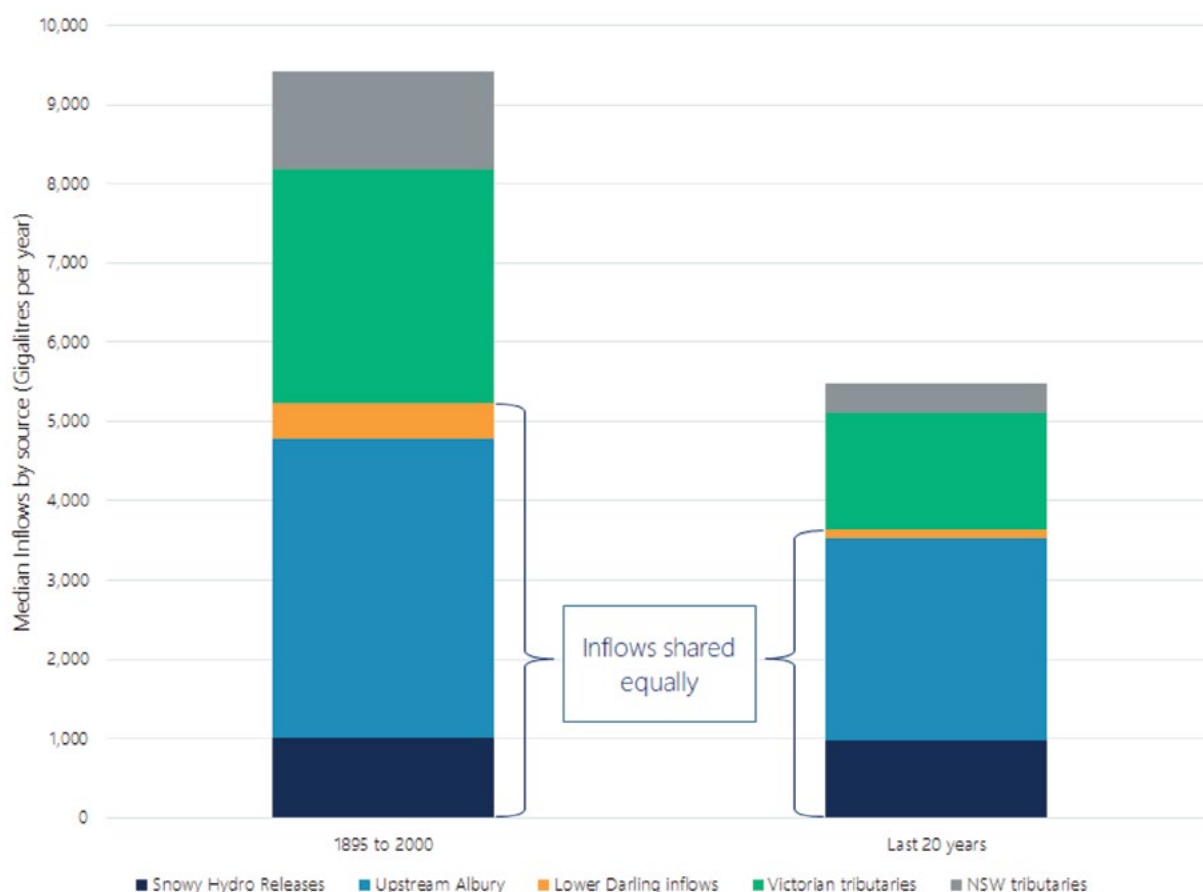
1129 Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray-Darling Basin Agreement*, 2020, at https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf, viewed 25 June 2020.

1130 SunRice, *Submission to Murray-Darling Basin water inquiry issues paper*, February 2020, p. 6–7; Coleambally Irrigation Co-operative Ltd, *Submission to Murray-Darling Basin water inquiry issues paper*, February 2020.

1131 Greater Shepparton City Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020; Murrumbidgee Valley Food and Fibre Association, *Submission to Murray-Darling Basin water inquiry issues paper*, January 2020, p. 2

Wales, where median inflows from the states tributaries over the last 20 years are approximately 65% lower than the previous century (in grey in figure 15.4 below). The IIG Report also identified that dry periods in the Darling and the Murray are increasingly occurring at the same time.¹¹³²

Figure 15.4: Change in River Murray system inflows, by source, 1895 to 2000 and last 20 years



Source: Interim Inspector General of Murray Darling Basin Water Resources.¹¹³³

Similar findings about declining inflows are included in subsection 3.2.1 of this report. Figure 3.10, examined the long term reductions in rainfall across the Murray–Darling Basin, and noted annual rainfall has been declining over the period 1980 to 2019, with 20–40mm decreases per decade for much of the Basin.

Understanding the effects of climate change on water availability will be critical for understanding the evolution of entitlement reliability. The climate of the Basin is changing and the future is forecast to be warmer, drier and involve more frequent droughts and extreme weather events.¹¹³⁴ Further, climate will likely increase some of the key drivers of conveyance losses, such as temperatures and reduced soil moisture.¹¹³⁵ This will require better modelling, discussed in more detail in subsection 15.3.1.

¹¹³² Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray–Darling Basin Agreement*, 2020, p. 7 at https://www.igwc.gov.au/sites/default/files/2020-09/iig_final_report.pdf, viewed 04 February 2021.

¹¹³³ Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray–Darling Basin Agreement*, 2020, based on MDBA data.

¹¹³⁴ Murray Darling Basin Authority, *The 2020 Basin Plan Evaluation*, <https://www.mdba.gov.au/sites/default/files/pubs/bp-eval-2020-full-report.pdf>, accessed 18 January 2021.

¹¹³⁵ MDBA, *River Murray System Summary of River Operations 2019–2020 Water Year*, November 2020, <https://www.mdba.gov.au/sites/default/files/pubs/river-murray-system-summary-of-river-operations-2019-20.pdf>.

15.1.4 Water market architecture concentrates the impacts of reduced water availability upon low reliability entitlement types

A fundamental implication of the priority water rights regime is that reduced water availability most directly impacts the supply for holders of low reliability entitlements.¹¹³⁶

In Victoria, low reliability water shares almost never receive an allocation. This means that the impact of reduced water availability is likely to be shared among the high-reliability water share owners. However low-reliability water shares would become even less likely to receive any allocation.

In South Australia, a single reliability level exists for water access rights for irrigation use, in the form of class 3a entitlements. South Australia's entire 1,850 GL entitlement, generally supplied equally by New South Wales and Victoria, tends to be guaranteed, except in very dry conditions. These factors mean that class three entitlements' reliability is generally unlikely to be affected as much as other entitlement types, though increasing occurrence of severe drought may lead to increasing likelihood of less than full allocations.

In contrast, due to the water entitlement framework across New South Wales regulated river water sources, general security water holders effectively receive 'what's left' of the state's share of available resources after higher priority commitments have been met. This means general security holders will bear the brunt of climate change related impacts on water availability, as well as any effect of increased conveyance, storage losses, and utilisation (leading to reduced forfeitures). In both the Murrumbidgee and NSW Murray, where conveyance entitlements are held by IIOs, allocations for these conveyance entitlements are linked to allocations for general security entitlements, meaning these impacts are shared among holders of both entitlement types.

Only during periods of extremely low water availability do high security entitlements not receive a full allocation. Therefore it would take very large reductions in entitlement reliability for these entitlement types to begin regularly experiencing reduced allocations. NSW Department of Planning, Industry and the Environment (DPIE) has acknowledged the burden being felt by low security entitlement holders:

To the extent that water availability reduced over time, this would be borne by lower priority products. However, the water sharing plans do account for climate variability.

As part of the National Water Initiative, Basin States agreed that entitlement holders were to bear the risk of any reduced entitlement reliability associated with seasonal or long-term changes in climate. In accordance with the terms of reference of this Inquiry, the ACCC's focus is on water markets in the Basin. Therefore the ACCC has not assessed the broader appropriateness of state entitlement frameworks or the water sharing arrangements under the Murray-Darling Basin Agreement, except where there are direct interactions with water markets. However, the National Water Initiative states governments will bear the risk of reductions arising from changes in government policy.¹¹³⁷

Australian Bureau of Agricultural and Resource Economics and Science's (ABARES) submission in response to the ACCC's Interim Inquiry Report suggested that priority water access rights are a legacy of the pre-trade and pre-carryover era, and that in the presence of low transaction cost water markets, offer limited gains in efficiency relative to proportional sharing. ABARES concluded given the small efficiency gains and the large potential adjustment costs, removal of priority rights may not be justified, though it was not unprecedented in the Basin.¹¹³⁸

The ACCC notes the potential indirect effects of the third party impacts and the impact on the relationship between storage volumes and allocations outlined in subsection 15.1.7. Analysis of the impact on entitlement reliability of conveyance losses (subsection 14.2.3) and the use of carryover

1136 Priority water rights regime is allocated according to a top-down hierarchy based on historical entitlement decisions such as High priority and general security entitlements.

1137 *Intergovernmental agreement on a National Water Initiative 2004*, Between the Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/water/Intergovernmental-Agreement-on-a-national-water-initiative.pdf>.

1138 ABARES Submission, *Submission to the Murray-Darling Basin inquiry Interim Report*, 18 December 2020.

reducing the volume of water forfeited back to the common pool (subsection 15.2.4) will be considered in more detail in other sections of the report.

15.1.5 The specifics of allocations policies are not always well understood by stakeholders and can lack transparency

Stakeholders raised concerns about the declining reliability of allocations. It was commonly alleged that the NSW Government had changed their allocation policies to become more conservative by setting more water aside for future years.¹¹³⁹ A number of stakeholders also called for improved transparency of allocation approaches. H2OX argued for more frequent water allocation announcements with a more transparent methodology.¹¹⁴⁰ Aware Water Group also called for increased transparency of water allocation decisions.¹¹⁴¹

Despite significant efforts by Basin States to publish information about water availability and allocations, there are still gaps in transparency. This is reducing market confidence, and an increasing distrust of the organisations responsible for managing water resources and markets. Distrust and lack of confidence in market processes can result in poor business decisions, and a lack of willingness to invest, which may result in reduced allocative and dynamic efficiency.

Lack of clarity over the level of discretion has seeded distrust in New South Wales allocation policies

When requesting access or an explanation of the operational rules or process guidelines directing New South Wales decision making for allocating resources, NSW Department indicated ‘water allocation assessments and announcements are market sensitive therefore access to real-time assessment data and information prior to public release is strictly limited.’ As such, the ACCC has not effectively been able to assess whether or how the NSW Department has implemented changes to the processes, calculations and inputs they apply in making allocation decisions within the framework established by water sharing plans.

Within these processes, ‘there is some professional judgement associated with seasonal catchment conditions and outlooks, particularly in determining how much of each incremental resource improvement can be safely allocated to general security entitlement now, and how much is required to be set aside for high priority year 2 commitments as required by the water sharing plan’. The ACCC considers that the NSW Department has not effectively communicated how this professional judgement is applied. This has led some stakeholders to assume that low allocations are the result of water managers shifting the balance to prioritise future year commitments.¹¹⁴² This view has likely also been influenced by changes in communication approach, outlined below.

Discretion that is not understood by water market participants will result in uncertainty and can undermine the ability of water users to plan effectively. Uncertainty regarding government decisions can be just as damaging to market confidence as misconduct by participants. A shift towards prioritising future year commitments, all other things being equal, will safeguard higher reliability entitlement holders at the expense of lower reliability holders. Such a change in government policy would amount to an erosion of property rights, and is a risk that should, under the National Water Initiative, be borne by governments.

The ABARES submission in response to the ACCC Interim Report raised similar concerns about the level of discretion. ABARES highlighted the variability in allocation levels made to Murrumbidgee water users for varying levels of water availability and argued that ‘uncertainty can be created even under a fixed water sharing plans given the complex and ‘fuzzy’ nature of water sharing rules.’¹¹⁴³

1139 Coleambally Irrigation Co-operative Ltd, Submission to the Murray–Darling Basin water inquiry Interim Report, February 2020; Murrumbidgee Valley Food and Fibre Association, *Submission to the Murray–Darling Basin water inquiry Interim Report*, January 2020, p. 2.

1140 H2OX, *Submission to the Murray–Darling Basin water inquiry Interim Report*, 13 November 2020, p. 7.

1141 Aware Water Group, *Submission to the Murray–Darling Basin water inquiry Interim Report*, 13 November 2020, p. 2.

1142 Year two commitments refer to water set aside to cover high priority needs in the following year.

1143 ABARES Submission, *Submission to the Murray–Darling Basin water inquiry Interim Report*, 18 December 2020.

A change in communication approach has contributed to perceptions of a change in allocation policies

The ACCC has analysed water resources assessments back to 2015–16 to examine trends in New South Wales' allocation policies in the Murray and Murrumbidgee.¹¹⁴⁴ In the NSW Murray (figure 15.5) and Murrumbidgee (figure 15.6), this analysis appears to indicate a drastic increase in the volume of water set aside for future year's allocations,¹¹⁴⁵ both as a total volume and a proportion of available. This increase is at least in part, due to a change by New South Wales in the presentation of water allocation statements from 2017–18 to add the item water for 'future high priority water needs'.¹¹⁴⁶ This item did not appear in the resource assessment table in water allocation statements until December 2017 in Murrumbidgee and March 2018.¹¹⁴⁷

The NSW Murray water allocation statements do not adequately explain this change in communication approach. Significantly, the notes explaining the definition of total available resources in these water allocation statements were unchanged from previous statements. In correspondence with the ACCC, NSW Department indicated that 'water has always been needed and set-aside to meet future high priority needs'. In response to the specific changes to water allocation statements in 2017–18, the Department explained 'rather than set the 220 GL [of future high priority commitments in the Murrumbidgee on 15 December 2017] aside and exclude it from 'Total Available Resource', as occurred historically, the Department has begun, in response to public calls for improved transparency, to explicitly recognise the need to build resource in the current year, to ensure that as a minimum, high priority commitments can be met on 1 July, in accordance with the water sharing plan.'

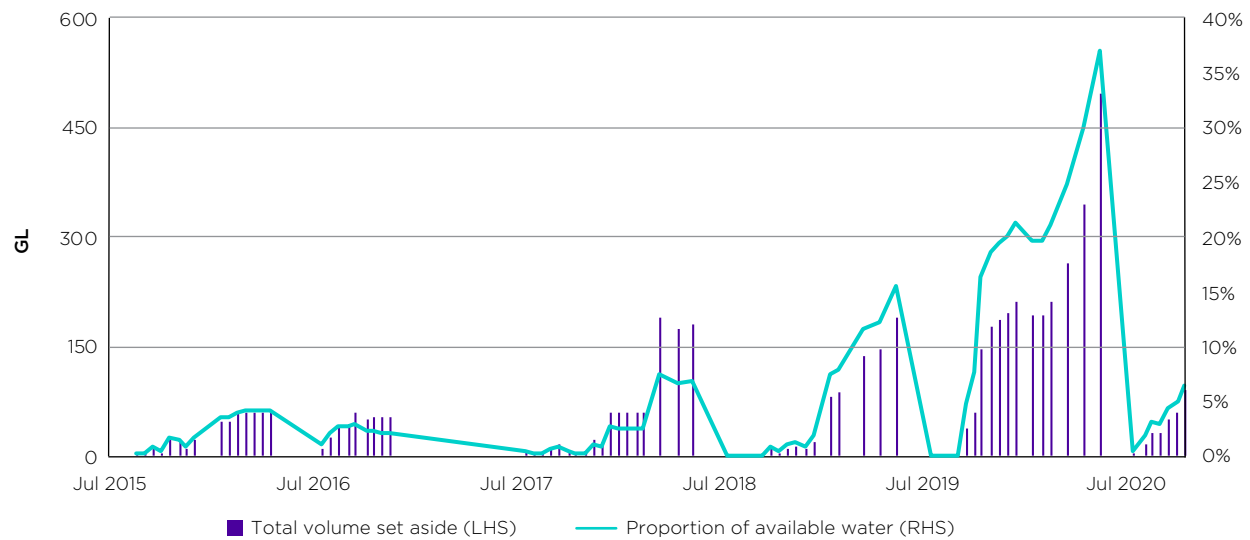
1144 Due to time and resource constraints, the ACCC was unable to extend its analysis beyond these water sources, and focussed on the NSW Murray and Murrumbidgee given stakeholder concerns in these sources. Since July 2015, New South Wales has improved the depth and extent of data provided in water allocation statements in response to public demand. As such, ACCC data analysis has only extended back to July 2015 when this more detailed data became available.

1145 Water 'set aside' is defined in NSW Murray as the sum of reserves, high priority requirements for following year and temporary reserves. In Murrumbidgee, water 'set aside' is the sum of reserves and high priority requirements.

1146 The note explaining this item states 'at this time of year, it is necessary to look ahead to ensure there is sufficient resource set aside to meet high priority needs on 1 July 2018. This additional volume has been assessed as needed to guarantee 1 July commitments, including potential carryover'. In the Murrumbidgee, this note was similar but went further to state 'any further improvements in resource will first accrue to this requirement'.

1147 Murrumbidgee water allocation statement, NSW Department of Industry, published 15 December 2017, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0006/149811/WAS-Murrumbidgee-Valley-171215.pdf, viewed 1 February 2021; NSW Murray water allocation statement, NSW Department of Industry, published 15 March 2018, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0009/149832/WAS-NSW-Murray-and-Lower-Darling-180315.pdf, viewed 1 February 2021.

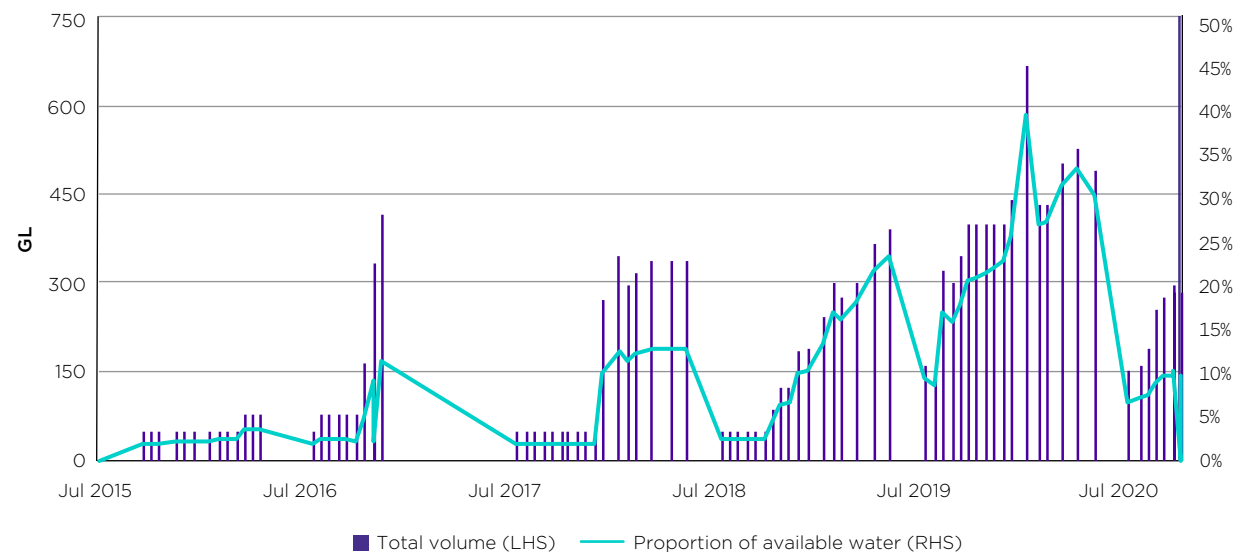
Figure 15.5: Volume and proportion of available water ‘set aside’ for future year’s allocations, NSW Murray, 1 July 2015 to 15 October 2020



Source: ACCC analysis based on NSW Murray water allocation statements from 1 July 2015 to 15 October 2020. Water allocation statements available here <https://www.industry.nsw.gov.au/water/allocations-availability/allocations/statements>.

Note: Water set aside includes reserves, high priority commitments for next year, and temporary reserves.

Figure 15.6: Volume and proportion of available water ‘set aside’ for future year’s allocations, Murrumbidgee, 1 July 2015 to 15 October 2020



Source: ACCC analysis based on Murrumbidgee water allocation statements from 1 July 2015 to 15 October 2020. Water allocation statements available here <https://www.industry.nsw.gov.au/water/allocations-availability/allocations/statements>.

Note: Water set aside includes reserves, and high priority commitments for next year.

The ACCC accepts that the statutory Water Sharing Plans guiding allocation policies have not changed and that these require New South Wales to set water aside for the following year. The ACCC found that insufficient communication by the NSW Government has contributed to stakeholder angst and distrust of the decision making process.¹¹⁴⁸ Based on the water allocation statements, which are the primary New South Wales allocation communication tool, it is reasonable that water users would perceive there to have been a shift in New South Wales allocation policies.

¹¹⁴⁸ A particular example is explained in subsection 13.2.2 of the Interim Report, whereby unclear communication in water allocation statements appeared to contribute to angst and confusion from NSW general security holders regarding their zero allocations received during the 2017-18 and 2018-19 water years.

The ACCC also observed that the reserving of high priority commitments commences at different times in different years (starting in July 2020 in Murrumbidgee and October in NSW Murray), and reached different volumes (which were higher in 2019–20 than previous years). The NSW Government explained this was a function of conditions and outlooks at the time, as well as the available volume of water for high priority commitments. However, without a transparent methodology, it is not clear how much these decisions were influenced by the risk appetite of New South Wales water managers, and whether the same outcome would result from similar conditions in the future.

The ACCC believes that the NSW Government should improve the transparency of its allocation decision making processes, by clarifying the level of discretion offered to water managers and how this is applied. This could be achieved through the publication of operational processes and calculations applied in these decisions. The ACCC acknowledges the significant amount of information the NSW Government publishes, however only publishing the information about the inputs and outputs of decisions does not effectively reduce the uncertainty about the decision making process itself.

There is a trade-off between flexibility and certainty in allocation policies

Forecasts of inflows and weather are inherently uncertain. It is difficult for water managers to confidently provide exact predictions of allocation levels, and there will always be a level of risk that anticipated water availability (upon which allocation decisions are made) will not eventuate. This uncertainty means that there is a benefit for water managers having a certain amount flexibility in their allocation decisions to apply professional judgement while models are not adequately accurate or rapid. However, the trade-off of increased flexibility is additional uncertainty for water users, as seen in the example in the box below.

Box 15.1: Zero general security allocations in the NSW Murray during 2017-18 and 2018-19

Stakeholder concerns about allocation policies often cited the fact that the general security holders in the NSW Murray had not received an allocation during 2018-19 and most of 2019-20. Apart from extremely dry conditions, this reflects the New South Wales Government's approach to water allocation policies (outlined in subsections 15.1.1 and 15.1.2) of allocating out a greater proportion of water in the current year increasing the risk of not being able to meet all commitments in the following year if inflows are lower than expected.

Lower than expected inflows in the New South Wales Murray led to a 125 GL deficit in the volume of water necessary to meet 'high priority commitments' for the 2018-19 water year. This meant additional available water resources needed to be allocated to 'conveyance entitlements' before general security. This carried through into 2019-20 with a 145 GL deficit occurring from 1 July 2019. In mid-May 2020, the deficit was erased and New South Wales Murray GS entitlement holders started receiving allocations.

The effect of the deficit resulted in New South Wales Murray stakeholders raising concerns that general security entitlement holders had not received an allocation following good autumn rains. These concerns were linked to a view that greater volumes of water were being held in reserves than in previous years, which the ACCC has not been able to disprove.

These circumstances were coupled with the publication of water allocation statements from late 2017-18 and early 2018-19 that, in the ACCC's view, failed to explain this deficit explicitly and sufficiently clearly. While the 1 July 2018 water allocation statement did indicate that conveyance entitlement holders would receive a reduced allocation and be the first priority for allocation as new water became available, it did not explicitly state there was a deficit in water needs, or unpack the implications for general security entitlements.

The ACCC does not consider it reasonable to assume that all general security entitlement holders would have a detailed understanding of the workings of allocation rules for other entitlement types and would check the allocation made to conveyance entitlements to extrapolate what that meant for their chance of receiving an allocation in the year ahead. As the reality of the water availability situation was not explicitly explained to them, this likely contributed to the discontent felt by some general security entitlement holders who did not understand why resource improvements were not allocated to them.

Water users' business decisions, such as which crops to grow and whether to invest in infrastructure upgrade, are based on water supply expectations. Water users will always face the risk of making 'wrong' business decisions based on actual changes in supply, but an increase in uncertainty of supply due to government decisions, will further inhibit the ability of users to make efficient decisions. When water users feel their ability to predict outcomes is diminished, their confidence will likely be reduced, further impacting business decisions (for example, by reducing willingness commit to longer-term investments).

The ACCC has found that there is a lack of clarity and understanding of the level of discretion and professional judgement awarded to water managers within allocation policies. The result of this is reduced market confidence, which may be inhibiting market participants' ability to make long-term business plans and investment decisions. This impact is noted by ABARES, who writes:

Given the complexity of water sharing plans rules, frequent rule changes, and discretionary input from water agencies, this system lacks transparency and creates additional uncertainty for water users (over and above uncertainty already faced due to climate variability).¹¹⁴⁹

¹¹⁴⁹ ABARES Submission, *Submission to the Murray-Darling Basin inquiry Interim Report*, 18 December 2020.

15.1.6 Information about how ‘extreme events’ will be managed is difficult to find and interpret

The ACCC is concerned about the lack of clarity and transparency surrounding the management of extreme events (such as water shortages).¹¹⁵⁰ During consultation, stakeholder concerns about issues relating to managing water shortages were concentrated in New South Wales and this is where the ACCC’s analysis has focused.¹¹⁵¹ In New South Wales minimum inflow assumptions do not rely on the most up-to-date data, (discussed in more detail in subsection 15.1.8) – in this case, it is especially important for information about how water shortages will be managed to be transparent and well-understood.

The New South Wales’ Extreme Events Policy, supported by Incident Response Guidelines, meets the requirements under section 10.51 of the Basin Plan 2012 and outlines the framework under the *Water Management Act 2000* (NSW) for managing extreme events in the state. The NSW Government can suspend Water Sharing Plans wholly or in part to ensure supply of critical human water needs and high priority needs can be met. The ACCC considers there is a lack of clear information about the operation of the policy and, in particular, when Water Sharing Plans will be suspended which creates uncertainty for water users. Certainty about changes to potential water sharing arrangement due to severe drought should be maximised, as this will give the community confidence that critical human water needs will be met and will assist water users in weighing up their risks and making their own business decisions.¹¹⁵²

A lack of certainty may result in perverse incentives and outcomes for other water users. For example, regional councils and those responsible for town water supplies may delay politically unpopular restrictions on town water use, if they understand that the NSW Government is likely to implement ‘contingency’ emergency measures in the event of shortages. There is an argument that a more efficient approach would be to enable councils to go to the water market in the event of shortages. Increasing access and participation in water markets by regional councils may lessen the need for contingency measures.

The ACCC is also concerned that locating and interpreting Incident Response Guides for NSW water sources is difficult for water users, with the localised policy framework for managing extreme events not sufficiently obvious to the ordinary water user. Incident Response Guides for Basin water sources are listed as schedules to the relevant water resource plan, and so are located near the bottom of the relevant page on the MDBA website.¹¹⁵³ However, many guides do not appear on the New South Wales website, which instead includes a deeply buried link to the relevant MDBA locations. An ‘Incident Response Guides’ link on the NSW Government’s website redirects to a page about water resource plans from which several navigation steps are required to be directed to the appropriate MDBA webpage.¹¹⁵⁴ While searching for the guides by name, either on the MDBA or NSW Government website or via a search engine, will yield results, this requires knowledge of the plans’ existence in the first place.

Further, the incident response guides are lengthy, legalistic documents which are not easy to interpret.¹¹⁵⁵ The ACCC does not believe that information available to water market participants in New South Wales adequately explains in plain terms how extreme events, such as critical water shortages,

1150 The Basin Plan 2012 requires water resource plans to describe how the water resources of the water source will be managed during extreme dry periods, extreme water quality events, and events that result in the suspension of a statutory regional water plan.

1151 ACCC, *Murray-Darling Basin water markets inquiry public forum – Dubbo*, published 18 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20Dubbo%20public%20forum.pdf>, viewed 1 February 2021.

1152 NSW Extreme Events Policy Policy framework for the management of NSW Murray– Darling Basin water resources during extreme events, *NSW Department of Industry*, https://www.industry.nsw.gov.au/___data/assets/pdf_file/0008/187703/Extreme-Events-policy.pdf, viewed 1 February 2021.

1153 For example, see schedule G to the Macquarie–Castlereagh – Water resource plan, *MDBA*, 2020 <https://www.mdba.gov.au/publications/mdba-reports/macquarie-castlereagh-water-resource-plan>, viewed 1 February 2020.

1154 Extreme events, *NSW Department of Planning, Industry and Environment*, <https://www.industry.nsw.gov.au/water/allocations-availability/droughts-floods/extreme-events>, viewed 5 December 2020.

1155 For example, Macquarie–Castlereagh Surface Water Resource Plan Incident Response Guide: Schedule G, *Department of Planning Industry and Environment*, published August 2019 <https://www.mdba.gov.au/sites/default/files/pubs/nsw-macquarie-castlereagh-wrp-schedule-g-macquarie-castlereagh-surface-water-resource-plan-incident-response-guide.pdf>, viewed 1 February 2021.

will be managed. This leads to uncertainty for water users, exposing them to a greater risk of making poor business decisions, and inhibits market confidence.

Stakeholders raised concerns, in particular, about the imposition of temporary restrictions on the access of general security water remaining in accounts in the Macquarie-Castlereagh system in 2018-19.¹¹⁵⁶ In August 2018, general security water users on the Macquarie Regulated River were restricted from accessing 30% of the volume of water in their accounts, because the record low inflows meant that there was insufficient water in storage to deliver account water. This restriction was increased to all (100%) of account water on 1 July 2019 and eased to 60% on 1 July 2020, until it was finally lifted on 14 August 2020, as water availability increased.

The NSW Government undertook a number of approaches (text messages, website and media release updates, publications in government gazettes and local print media) to announce the restriction following its implementation. While the NSW Government undertook stakeholder consultation as part of developing incident response guides,¹¹⁵⁷ it is clear not all stakeholders understand how and when measures to manage extreme events will be implemented.

Water resource plans outlining how extreme events will be managed can be found for relevant water sources in Victoria, South Australia and Queensland. While the specifics and the phrasing of the provisions varies between state legislation, the relevant Minister in each of these states essentially has the power to reduce or restrict water use during extreme events.^{1158 1159 1160} Water corporations can also impose restrictions in South Australia and in Victoria (in unregulated and groundwater systems only).¹¹⁶¹ Generally, the provisions, and the explanation of the triggers for extreme events in these states, are broad and relatively non-specific.

The ACCC urges New South Wales in particular, and all other Basin States, to publish accessible and easy to understand guidance explaining how states will manage periods of extreme dry conditions and low water availability to improve confidence and better inform water users about when it may be necessary to trade water.

15.1.7 The relationship between storage volumes and allocations has changed

The relationship between storage volumes and allocations have changed, which may be contributing to views that allocation policies have changed. Water users have historically relied on information about total storage volumes to estimate or forecast likely announced allocations. If relationships between storage volumes and allocations change and users are not aware of this, users are likely to misestimate allocations which could lead to inefficient outcomes.

Equivalent storage volumes have coincided with lower allocations in recent years in New South Wales.

This lends further weight to the argument that Basin State governments should improve transparency of allocation decisions by publishing the operational procedures and calculations. Water users need to be informed that past assumptions about certain levels of storages corresponding to particular allocation levels may no longer be accurate.

1156 Murray-Darling Basin water markets inquiry public forum – Dubbo, 18 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20Dubbo%20public%20forum.pdf>, viewed 13 February 2021.

1157 NSW Extreme Events Policy Policy framework for the management of NSW Murray– Darling Basin water resources during extreme events, NSW Department of Industry, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0008/187703/Extreme-Events-policy.pdf, viewed 1 February 2021.

1158 Northern Victoria Water Resource Plan, s10.2.2 https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage-files/8415/4820/5913/VNM_WRP_CR_Chpt10.pdf, viewed 1 February 2021.

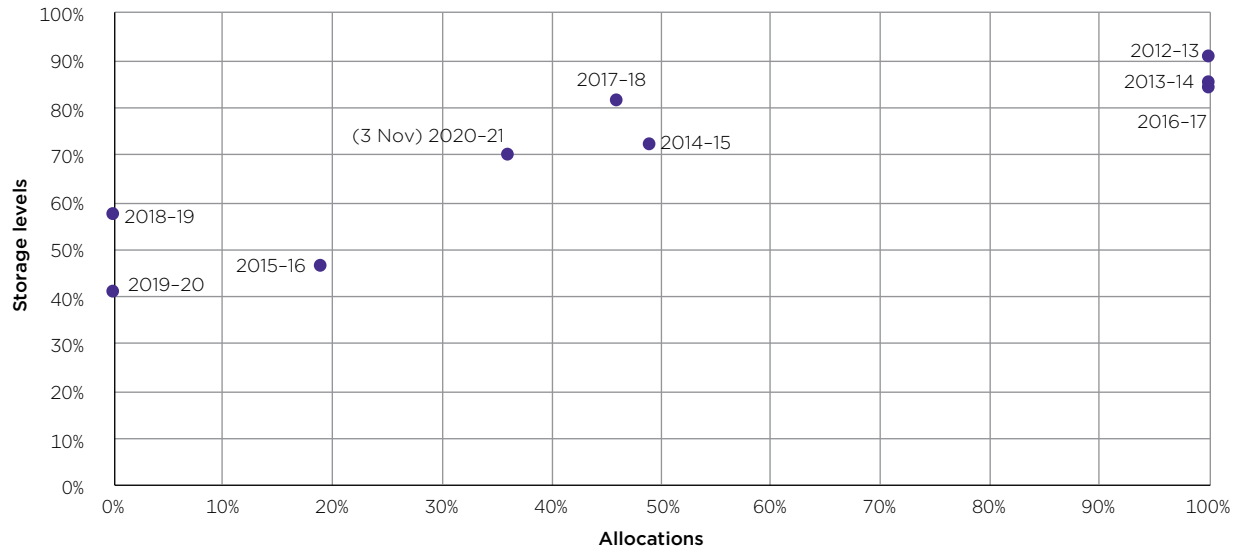
1159 South Australian Murray Water Resource Plan, p. 142–144, https://www.mdba.gov.au/sites/default/files/pubs/sa-river-murray-wrp-12-august-2019_0.PDF

1160 South Australian River Murray Water Resource Plan, *South Australian Department for Environment and Water*, published 12 August 2019, https://www.mdba.gov.au/sites/default/files/pubs/QLD-condamine-balonne-water-resource-plan-2019_1.pdf, viewed 1 February 2021.

1161 Temporary Qualification of rights to surface water, *Department of Environment, Land, Water and Planning*, https://www.water.vic.gov.au/_data/assets/pdf_file/0029/406658/Temporary-Qualification-of-Rights-Guidelines-for-Water-Corporations-1.pdf, viewed 1 February 2021.

Figure 15.7 reveals that in the NSW Murray, while the volume of water in storages in 2018-19 was actually higher than in 2015-16, there was no general security allocation in 2018-19 compared to a 19% allocation in 2015-16. Similarly, despite higher storage volumes in 2017-18 than in 2014-15, allocations were actually higher in the earlier year.

Figure 15.7: Storage volumes compared to general security allocations, NSW Murray, as at 31 December, 2012-13 to 3 Nov 2020-21

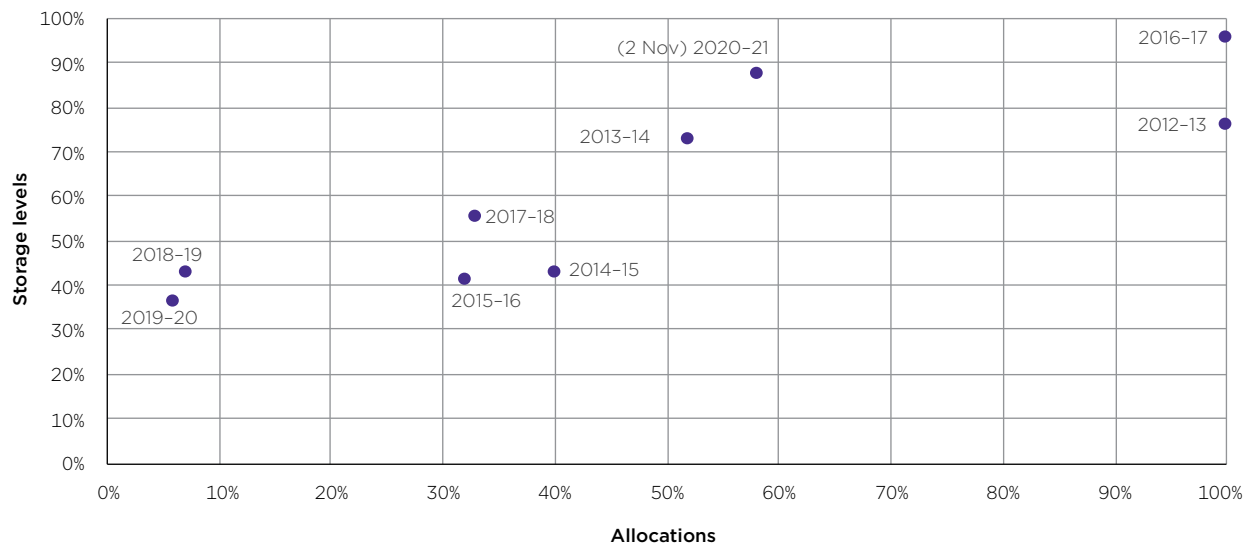


Source: ACCC analysis based on Waterflow data.

Note: Storage volumes do not take into account proportion of NSW state share of Murray resources.

A similar story emerges from figure 15.8 for the Murrumbidgee. General security allocations on 31 December of 2018-19 and 2019-20 were 7% and 6%, respectively, while the allocation in 2015-16, for a similar storage volume was 19%. Likewise, an additional 14% of storage volume in 2017-18 compared to 2015-16 corresponded to an additional 1% of general security allocations.

Figure 15.8: Storage volumes compared to general security allocations, Murrumbidgee, as at 31 December, 2012-13 to 2 Nov 2020-21

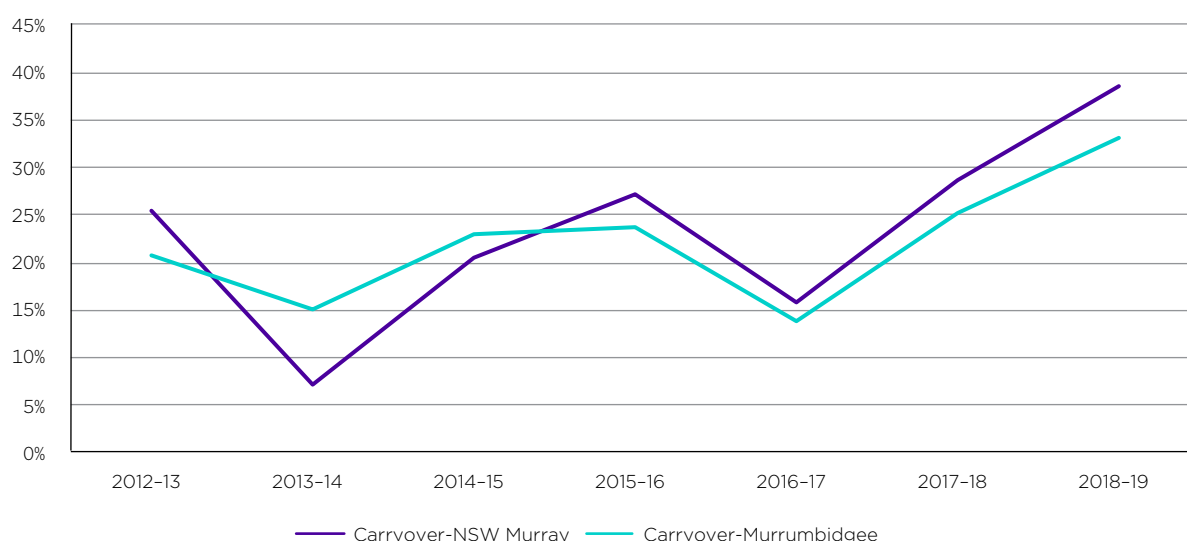


Source: ACCC analysis based on Waterflow data.

The ACCC performed similar analysis for the Victorian Murray and the Goulburn river systems for high reliability water share allocations on 30 September.¹¹⁶² However, despite a somewhat similar trend identified in the Victorian Murray when comparing 2015-16 and 2018-19, the ACCC did not find any strong evidence that storage volumes were corresponding to lower allocation levels than in the past in these systems.

These differences are likely, at least in part, because of the fact that a higher proportion of available water in the Murrumbidgee is being held as carryover. Figure 15.9 reveals a slight upward trend in the proportion of available water held as carryover over time and reveals that carryover holdings were comparatively greater in 2017-18 and 2018-19 than in 2014-15 and 2015-16, for both the NSW Murray and the Murrumbidgee.

Figure 15.9: Volume carried over from last year relative to available water in current year, Murrumbidgee and NSW Murray, 2012-13 to 2018-19



Source: ACCC analysis of NSW General Purpose Water Accounting Reports, NSW Murray and Murrumbidgee

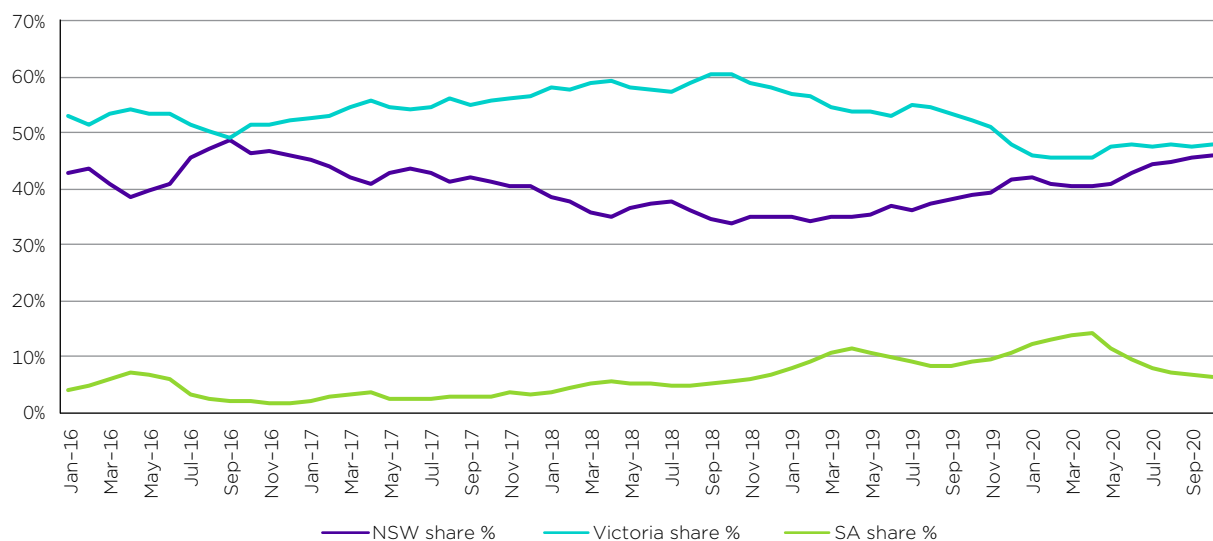
Note: Carryover is represented by the opening balance of water accounts at the start of the water year. Available water is taken as the sum of the opening balance, available water determinations and trade into the source. At time of preparation, 2019-20 general purpose water accounting reports were not available.

Another possible factor in the NSW Murray is a reduced proportion of the available water in the Murray system being held by NSW Government as part of its 'state share'. Water resources in the Murray are shared between Victoria and the New South Wales, though the proportion held by each state can vary based on the pattern of inflows into the system, usage and interstate trade and will affect the amount of water available to each state for allocating to their entitlement holders.

Figure 15.10 below, only goes back to January 2016, however this likely serves as a close enough proxy for 31 December 2015 to allow comparison to later years. The New South Wales' share of the combined Murray resources was higher in January 2016 (at 42.9%) than in December 2018 (38.9%) or December 2019 (41.5%). This also offer some explanation for the reduction in allocations compared to storage volumes in these later years. The ACCC notes the NSW Government has included the New South Wales share of Murray storages in its allocation statements from August 2018.

¹¹⁶² The ACCC chose to analyse allocations on 30 September rather than 31 December in these systems because allocations had generally reached 100% by 31 December in these systems.

Figure 15.10: State shares as a proportion of total Murray resources, January 2016 to October 2020



Source: ACCC analysis based on MDBA data.

Note: Total Murray resources are defined to be storage volumes in Hume, Dartmouth, Lake Victoria, and when under control of the MDBA, Menindee Lakes.

Despite being partially explained by changes to volumes held in carryover and shifts in the state share, it is possible that the change in the relationship between allocations and storage volumes may also be influenced by a reduced risk appetite among New South Wales water managers. It is important for allocation policy decisions to become more transparent, in order to provide certainty to water users.

There may also be value in Basin States encouraging water users to more closely consider inflow data rather than storage levels data when trying to predict future allocations. The ACCC notes water allocation announcements already appear to be moving in this direction.

15.1.8 The timing of water allocation improvements does not appear to be getting later for most entitlement types

Stakeholders, most commonly in New South Wales, indicated concerns that announcements to increase water allocations had been getting later in recent years. They stated that the lack of water allocations early in the season was impacting their ability to make business decisions, pushing them to increase their reliance on carryover and undermining their ability to access finance.¹¹⁶³ In response to the ACCC's Interim Report, Boundary Bend noted 'allocations, more than ever, seem to be drip fed to entitlement holders (even in years of high storage volumes) creating less supply early in the season.'¹¹⁶⁴

The ACCC's analysis of the timing of allocation improvements revealed that while allocations to many entitlement types have been significantly lower in recent years (because of low water availability), there is no clear evidence that allocation improvements are occurring later in the year for most entitlement types; with a few notable exceptions. The data indicates that climatic conditions and overall water availability are the most significant factor in the timing of allocation improvements, with long waits or no allocations in drier years.¹¹⁶⁵

Figure 15.11 represents how long it has taken allocations to reach 25% and 50%, respectively, for general security holders (in terms of average number of days from 1 July) in the period 2004-05 to 2011-12 compared to 2011-12 to 2019-20). The figure indicates there is no clear evidence for the argument that water allocations are taking longer to improve in recent years for most valleys. The majority of valleys that exceeded 25% allocations in these years did so with the years' opening allocation, though reaching 25% at all has become less likely in recent years with prevailing drought conditions. Only the Lower

¹¹⁶³ Murrumbidgee Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

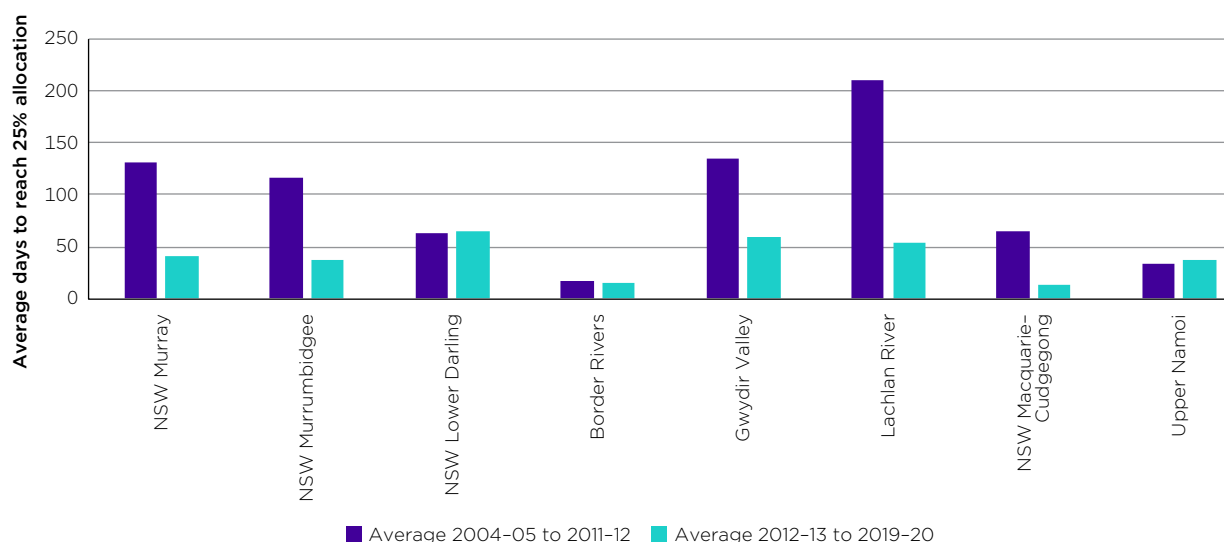
¹¹⁶⁴ Robert McGavin, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

¹¹⁶⁵ ACCC analysis of Waterflow data.

Darling and the Upper Namoi experienced slight increases in average wait, driven mainly by 2019-20. The NSW Government has indicated that, based on stakeholder preferences, they attempt to allocate water to general security users upfront (rather than via incremental improvements) to allow them flexibility in how they use water.¹¹⁶⁶

The ACCC repeated this analysis for high security water entitlement types with a 50% trigger. Of the 11 water sources in figure 15.12, only the New South Wales Lower Darling experienced an increase in average wait times to receive a 50% allocation based on the periods 2004-05 to 2011-12 and 2012-13 to 2019-20.

Figure 15.11: Average number of days taken for New South Wales general security water allocations to reach 25%, 2004-05 to 2011-12 compared to 2012-13 to 2019-20



Source: ACCC analysis of Waterflow data.

15.1.9 Some allocation policies are designed to rely on out-of-date information, rather than being adaptive

The ACCC found that water allocation policies in the New South Wales Murray and Lower Darling, Murrumbidgee and Lachlan systems (and the Hunter, outside the Basin) are designed to ensure that minimum inflow assumptions remain determined by outdated data. The data that these policies is based on was from 2003, when the first water sharing plans were established.¹¹⁶⁷ Most other plans maintain a constant base for the duration of the plan, but update the assumed minimum inflows based on the latest available information at the commencement of each plan (generally every 10 years).

Updating inflow data for these plans would likely impact the timing and volume of water allocations to water users in these catchments, and necessitate a greater proportion of water being held in reserves (particularly early in the water year). Delaying allocation improvements until later in the year would inhibit water users' ability to plan for the upcoming season and could prevent users from planting spring crops.

¹¹⁶⁶ New South Wales Government, *Drought Community Consultation – What we heard from drought-affected communities*, December 2019, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0005/285404/community-drought-meetings-what-we-heard-october-november.pdf, viewed 26 June 2020.

¹¹⁶⁷ *Water Sharing Plan for the Lachlan Regulated River Water Source 2016* (NSW); available at <https://www.legislation.nsw.gov.au/#/view/regulation/2016/365>; *Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources 2016* (NSW), available at <https://www.legislation.nsw.gov.au/#/view/regulation/2016/366>; *Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016* (NSW), available at <https://www.legislation.nsw.gov.au/#/view/regulation/2016/367>; As at 18 June 2020, the New South Wales Legislative Council referred a draft bill for review to the *Portfolio Committee No. 4 – Industry* which seeks to address stakeholder concerns by allowing the updating of flow information in water sharing plans. *Water Management Amendment (Water Allocations – Drought Information) Draft Bill 2020* (NSW), at <https://www.parliament.nsw.gov.au/bill/files/3755/First%20Print.pdf>, viewed 19 June 2020.

In correspondence with the ACCC, NSW Government noted that ‘the ‘design’ standard [of inflow assumptions] effectively establishes the risk-based balance between water for productive use versus reserving water for security – two mutually exclusive objectives’ and that [a more] stringent design criteria (Millennium drought, or even something more severe) would adversely affect productivity and communities. Instead, the government decision at the time was to use contingency arrangements to underpin critical water needs rather than adopt the lower inflow assumptions and keep more water in reserves. Relying on outdated inflow assumptions may place increasing pressure on water managers to become more conservative, or risk over-allocating water when forecast assumptions do not eventuate.

As a matter of good policy design, the ACCC considers policy instruments should generally seek to rely on and, at appropriate intervals, incorporate current and accurate information. Preventing water allocation policies from ever updating as new data becomes available would undermine the robustness and appropriateness of these policies. If the observed trend of declining inflows¹¹⁶⁸ continues, allocation policies that do not update risk increasing uncertainty and variability of allocations. There is an increasing likelihood that actual inflows fail to exceed assumed minimums for the year, potentially resulting in another suspension of a Water Sharing Plan, as occurred in the NSW Macquarie-Castlereagh system during the 2018–19 water year. The ACCC appreciates that updating would likely negatively impact general security holders, but considers that an iterative approach to adjusting water sharing plans and allocations, is preferable to having to make large adjustments at some future point in time.

As climate change increasingly drives hotter and drier weather conditions (discussed further in subsection 15.1.3), it is likely that inflows will continue to decrease raising the likelihood that minimum assumptions are not met. Maintaining constant inflow assumptions will mean it is vitally important that users understand how these contingency measures will be used (as outlined in subsection 15.1.4).

15.1.10 Reform options to improve allocation policies range from immediate transparency improvements to major restructures of entitlement frameworks

The ACCC’s scope for undertaking this Inquiry has been to consider issues with relevance to water markets, rather than those with more broad water management significance. While actual state decisions on entitlement frameworks and allocation decisions are not technically market decisions, they are intrinsically linked to the market by establishing the supply of water available to users and traders. ACCC analysis of issues and reform options as relates to supply has been limited to those which will enhance market functioning and boost the market confidence of users. The ACCC has not considered, and will not make recommendations relating to re-specification of Basin State water sharing arrangements or entitlement frameworks more generally.

The ACCC recommends that Basin States increase transparency in relation to water allocation decisions. Basin States should also improve stakeholder understanding about how entitlement reliability, allocations and carryover policies work.

Investigation of capacity sharing and continuous accounting as long term reform options which, among other benefits, would offer significant improvements to the transparency of allocation announcements.

1168 Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray–Darling Basin Agreement*, 2020, https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf.

15.2 Managing the efficient use and trade of available storage capacity

Storage refers to the dams, weirs and other infrastructure or assets (natural or manmade), used to capture water from rain or inflows, for later use. States are responsible for setting storage policies, resulting in different rules across states. 'Carryover' refers to policies, rules and other mechanisms or arrangements that allow holding or 'banking' of water allocations issued in one water year for use or trade in subsequent water years. This occurs at a point in time, at the end of the water year. Carryover arrangements allow water users to save their unused water from wet years for use in dry years, providing water users with a key tool to manage water availability risk (see table 15.1 for a summary of state carryover policies).

ABARES has found that increased use of carryover has important allocation market implications by reducing price volatility. Carryover water is generally accumulated during wet years, resulting in increased prices during those years, but reduces prices in dry years as users draw down on their carryover reserves.¹¹⁶⁹

While carryover is used to allocate out storage capacity in the Southern Basin, some Northern Basin valleys have water accounting rules that remove the need to carry over water at the end of the year. For example, the Lower Namoi Regulated Water source in New South Wales uses continuous accounting for general security entitlements. Under continuous accounting, the entire general security account balance carries forward from month to month, subject to a maximum account volume limit (200 per cent of entitlement), without the need for the 'account reset' – and calculation of an allowed carryover volume – seen at the start of each water year in systems with annual accounting. These accounts are subject to maximum volume limits, spill risks are controlled by account limits and all losses are centrally managed.

The Macintyre Brook and St George water supply schemes in Queensland use a system largely akin to capacity sharing (known as continuous sharing), in contrast to an annual allocation system. This establishes a water account based on a proportional share of the total conceptual storage volume for the scheme which is updated on a daily basis to reflect inflows, water orders, and estimated storage and delivery losses deductions. Reconciliations between physical storage volumes and user storage accounts occur monthly. The water account is reconciled monthly based on recorded data. The St George water supply scheme also provides for a Queensland water allocation to be managed under a bulk share water account which makes water available through an 'announced allocation' system.

¹¹⁶⁹ N Hughes, M Gupta, K Rathakumar, *Lessons from the water market: The southern Murray-Darling Basin water allocation market 2000-01 to 2015-16*, Department of Agriculture, ABARES 2016.

Table 15.1: Carryover rules summary, by Basin State

State	Carryover rules
Queensland	Border Rivers, Macintyre Brook and St George water supply schemes allow water to be carried forward through the water year rather than at the end of the water year, and do not reset at the start of the water year. All these systems use either continuous share accounting (for Border Rivers) or capacity sharing (in the latter two). ¹¹⁷⁰
New South Wales	Carryover is mostly available for general security entitlements. There are different rules for each water source but invariably restrictions apply. These restrictions differ from each river system. Examples of restrictions include how much a person can carryover from year to year, how much water they are allowed to have stored on their entitlement, or how much water they can use in a year. ¹¹⁷¹
Victoria	<p>Carryover and spill rules differ between water systems based on the hydrology and storage capacity of each system. In Victoria's smaller systems (the Broken, Loddon and Bullarook systems), entitlement holders are limited in the amount of dam space they can use. The 100% rule means entitlement holders can only hold carryover and new allocations that add up to 100% of their entitlement volume in any given season.</p> <p>In Victoria's larger systems (Murray, Goulburn and Campaspe), an entitlement holder can carry over up to 100% of their water share volume for both high and low reliability water shares. Spillable water accounts allow these entitlement holders to make use of space in the dams when it is available to store water above 100% of their entitlement volume.</p> <p>When the stored volume exceeds 100% of entitlement volume, it is quarantined in spillable accounts until a low spill risk is declared. When the dam spills, water is forfeited proportionally across entitlement holders' spillable accounts. This rule has been in place since 2010 to ensure inflows that support new allocations can be captured in the dams.</p> <p>Victoria also deals with evaporation losses on carryover by deducting 5% of water carried over.¹¹⁷²</p>
South Australia	<p>South Australia has recently completed a review into its carryover policy. The new policy now includes a 5% reduction for evaporation loss on carryover water at a bulk level (rather than deducting 5% from an individual's carryover volume, as per the previous policy) as well as now allowing entitlement holders to roll over excess volumes above 100% for future dry years when allocations reach 100%.</p> <p>Private carryover will be granted when minimum opening irrigation allocations in April are 50% or less. Private carryover is allowed for up to 20% of the volume of Class 3 water access entitlements held. A final water meter reading must be provided by 31 July to be eligible for carryover.</p> <p>After carryover has been announced, if conditions improve and allocations increase to 100%, total allocation (against entitlements plus carryover allocation) cannot exceed 100%. If there is not enough water available in storage to meet the total carryover demand for all eligible water users, the volume of water granted to an individual will be reduced proportionally.¹¹⁷³</p>

The Australian Capital Territory manages its water resources via the *Water Resources Act 2007* and does not mention carryover in its legislation.¹¹⁷⁴

The volume of carryover has increased since its introduction, though varies from year-to-year as water availability and specific policy settings change (figure 3.15 in Chapter 3). Different levels of carryover utilisation between states also reflects differences between states' policies. Trends in carryover are covered in subsection 3.2.1.

1170 Queensland Water Markets Product Information, MDBA, 2020, www.mdba.gov.au/managing-water/water-markets-trade/water-markets-product-information/qld, viewed 1 February 2021.

1171 NSW Water Markets Product Information, MDBA, 2020, www.mdba.gov.au/managing-water/water-markets-trade/water-markets-product-information/nsw, viewed 1 February 2021.

1172 Victorian Department of Environment, Land, Water and Planning, 2020, Carryover factsheets, www.waterregister.vic.gov.au/water-entitlements/carryover/carryover-factsheets, viewed 25 March 2020.

1173 South Australian Department for Water and Environment, *South Australian Private Carryover*, 2020, www.environment.sa.gov.au/topics/river-murray/about-river-murray/water-allocation-and-carryover/south-australian-private-carryover, viewed 27 March 2020; Government of South Australia, 2020, *Water Allocation Plan for the River Murray Prescribed Watercourse Private Carryover*, www.naturalresources.sa.gov.au/files/sharedassets/sa_Murray-Darling_basin/water/allocation_plans/river_murray/2020_river_murray/rm-wap-consultation-private-carryover-march-2020-fact.pdf, viewed 23 June 2020.

1174 *Water Resources Act 2007* (ACT), www.legislation.act.gov.au/View/a/2007-19/current/PDF/2007-19.pdf.

15.2.1 Some stakeholders have called for carryover to be abolished, while others strongly supported its retention

Some stakeholders have called for carryover to be abolished, as they allege that it reduces allocations for lower security entitlement holders.¹¹⁷⁵ The reduction in allocations for low security entitlements is discussed in more detail in subsection 15.1.3.

The ACCC found that carryover may have a small negative impact on allocations, which the ACCC found to be outweighed by the benefits. Furthermore, the ACCC views water that is carried over no differently to water that has been allocated out in the same year to be used or traded. If carryover did not exist, this would likely result in more use of water within the year, rather than leading to significant forfeiture which would increase the pool of water available to be allocated out in the following year.

There have been calls by stakeholders to prevent water from being traded more than once, to prevent carryover parking trade.¹¹⁷⁶ The ACCC disagrees with these calls, as trade can allow the most efficient use of storage, provided that externalities and third party impacts are adequately taken into account. Carryover is also only necessary due to the accounting constraints of the water year. If continuous accounting and capacity sharing were to be adopted, carryover would no longer be needed.

Stakeholders have also highlighted that carryover is an important risk management tool for businesses to be able to access water early in the season.¹¹⁷⁷ goFarm highlights that:

Carryover is a critical risk management tool; it helps water users manage water supply-side parameters, and in doing so helps to smooth out price peaks and troughs as well as facilitate short and medium-term investment certainty. In the absence of carryover, the market could become more volatile and a 'use it or lose it' approach could see water applied to inefficient uses.¹¹⁷⁸

15.2.2 Carryover parking is rapidly increasing

The right to store water between water years, remains bundled with entitlements. Its value to water users as a risk management tool has resulted in demand for carryover above what people are allowed on their entitlement. This has led to the development of a market for trading to access carryover, or carryover parking. Carryover parking refers to water that has been traded between accounts, either within or between trading zones. This can be between accounts owned by the same person (intraparty), or for carryover parking between accounts with different owners (interparty).

The different carryover policies across states and valleys encourage water users to trade allocation in order to access the more generous carryover provisions into certain states and valleys. The ACCC has analysed trade data provided by the Basin States to identify what the ACCC believes to be carryover parking trades, however as detailed box 15.2, in the ACCC's methodology may not pick up all carryover trades.

1175 Gavin Dehne, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

1176 Jodie Hay, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

1177 Renmark Irrigation Trust, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020; Lislea Lodge Pty Ltd, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

1178 goFARM Australia Pty Ltd, *Submission to the Murray-Darling Basin inquiry*, January 2020, p. 2.

Box 15.2: Carryover parking classification methodology

As there is limited data on trade for carryover parking, the ACCC developed a methodology to identify carryover parking trades.

The ACCC assumed that carryover parking trades were below \$100 per ML and were traded out in June with 90 to 100% of the original volume returned to the original party in the following July, in part to capture the effect of evaporative loss factors applied in Victoria. Where the carryover parking involved multiple trades, the total volume of water traded (in both directions) was used to determine if the group of trades represented carryover parking. Depending on the nature of the individual trades, not all instances of carryover parking involving multiple trades may have been included in the figures. Because the classification criteria are narrowly defined, the figures below almost certainly underestimate the amount of carryover parking occurring.

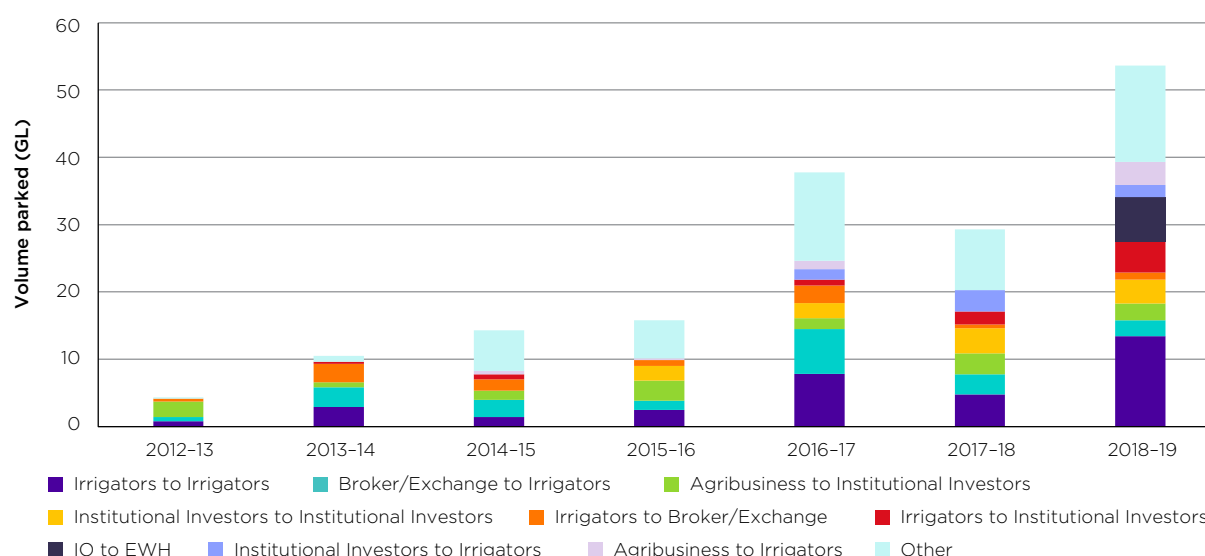
As seen in figure 3.5, trades approved in June 2017, 2018, and 2019, were more than 15% of the total number of trade within each respective year. Note that the analysis conducted in subsection 5.5.2 on investor carryover parking behaviour is based on actual investor data and therefore more accurately captures carryover parking trades, although it does not include all investor data.

In the future, there will be better data on carryover parking trade due to New South Wales and Victoria's upgrades to identify trades for carryover parking.¹¹⁷⁹

Figure 15.12 below shows carryover parking is growing over time. The ACCC found that the majority of carryover parking trade was between different participants, but this may be due to the ACCC's methodology.

The ACCC has also analysed who is leasing and using carryover parking. The largest groups are irrigators for both those who are leasing their dam space and who are using others' dam space. The largest category pair in the figure below, was irrigator to irrigator at 20% in 2018-19. These reflect the value irrigators place on accessing storage to firm up their allocations, either in anticipation of dry years or to access water early in the season.

Figure 15.12: Volume of water traded for carryover parking annually by market participant type pairings, lessee to lessor, 2012-13 to 2018-19



Source: ACCC analysis based on NSW and Victorian governments' responses to voluntary information requests.

Note: Other refers to all other identified trades. IO refers to irrigation operators and EWH to environmental water holders.

¹¹⁷⁹ Introduction of reason for trade for online allocation trades, *Victorian Water Register*, media release, 27 August 2020 <https://waterregister.vic.gov.au/about/news/327-introduction-of-reason-for-trade-for-online-allocation-trades>, viewed 2 February 2020; WaterNSW, *FAQs - Water Trading*, n.d., <https://www.waternsw.com.au/customer-service/ordering-trading-and-pricing/trading/faqs-water-trading#stay>, viewed 2 February 2021.

15.2.3 More information is needed about trade for carryover and its impact on the market and the entitlement framework

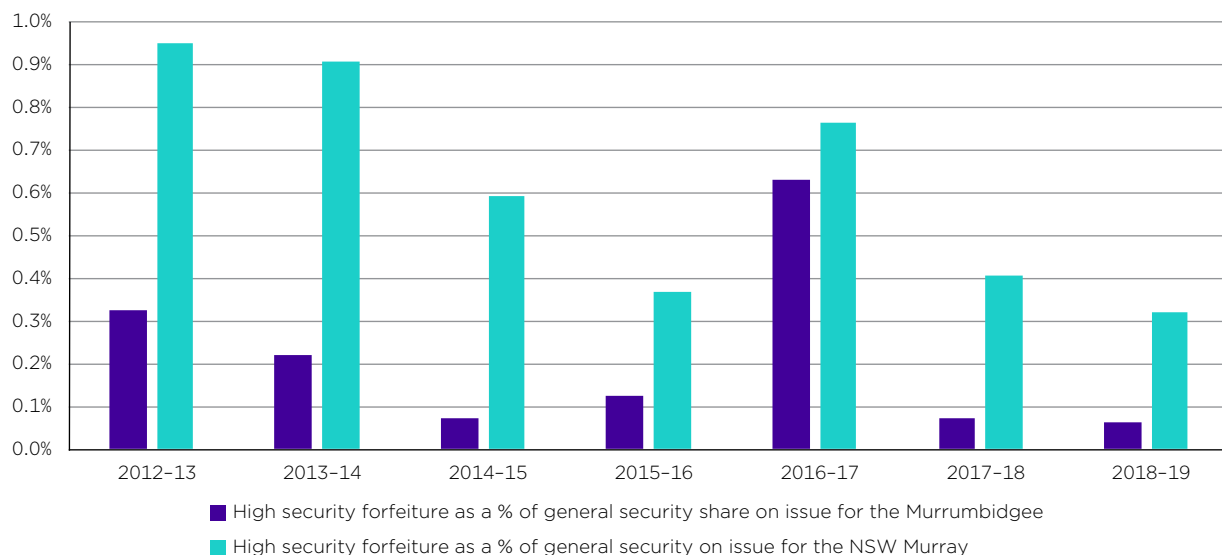
Currently, carryover parking does not make up a large amount of trade flows, however it has the potential to increase and start impacting the opening and closing of trade limits. This may occur because water traded from one valley to another to take advantage of different carryover provisions may increase or decrease IVT account balances until they reach their limits.

Of the carryover parking trades that the ACCC has identified, 56% of carryover parking occurs within the same water access licence type and within the same zone. 6% of carryover parking involved interstate trade (4% New South Wales to Victoria, 1% SA to Victoria), with 36% of trades involving intervalley trade within the same state.¹¹⁸⁰ Although these figures are currently small, if interstate or intervalley carryover parking trades continue to grow, then there is the potential that carryover parking may start to impact trade limits.

Stakeholders also indicated that they are concerned with high security entitlement holders in New South Wales (who do not have access to carryover due to the high reliability of their entitlements) accessing carryover by trading water to general security holders and reducing lower security entitlements' allocations.¹¹⁸¹ This is because stakeholders allege that water that would have previously been forfeited by high security entitlement owners (and so reallocated to the consumptive pool the following year) is now being parked as carryover on general security accounts. Stakeholders alleged that this forfeited water would have formed part of the consumptive pool and resulted in higher allocations. This is discussed in more detail in subsection 15.2.4.

The ACCC examined the high security forfeiture in the Murrumbidgee and the Murray as a percentage of general security entitlements (figure 15.13). The analysis shows that the volume of high security forfeiture (even prior to carryover parking becoming more widespread in recent years), was less than 1% of the volume of general security entitlements on issue in all years.¹¹⁸² This means the impact on general security entitlement reliability from carryover parking's impact on forfeitures is very small. However stakeholders may still have equity concerns around high security entitlement accessing carryover as these entitlement types already effectively receive a full allocation every year.

Figure 15.13: High security forfeiture as a percentage of general security entitlement volume, 2012-13 to 2018-19



Source: ACCC analysis based on NSW government's response to voluntary information requests.

1180 ACCC analysis based on NSW and Victorian governments' responses to voluntary information requests.

1181 Robert Campbell, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

1182 ACCC analysis based on NSW Government's responses to voluntary information requests.

Carryover parking is changing the impacts on water users. If New South Wales general security entitlement holders park carryover for someone else, this can impact on their allocations in the following year due to account management rules. For example, rules in the Murrumbidgee valley limit water allocation that can be credited to a license to 100% of users' entitlement volume minus any water carried over, to reduce third party impacts. This means that if a user carries over 30% of water on their account, this reduces their allocations in the following year to a maximum of 70% of their entitlement. It is not clear if all users parking water on their accounts are aware of the implications of these trades; a side effect of carryover parking being an 'informal' rather than a formal market.¹¹⁸³ New South Wales Government should improve its communication of these impacts (see recommendation 15).

South Australia should amend its register and trade forms to allow 'carryover parking' to be identified as a 'reason for trade'.

15.2.4 Individual users should bear the risk and costs of carryover, rather than socialising these across other users

The decision of water users to store their water for another year (via carryover provisions), while offering substantial benefits, is not without its costs. If not effectively managed through good policy design, decisions to carry over water could potentially increase the spill risk faced by all entitlement holders in a water source, and increase evaporation losses associated with water storage. These are both potential third party impacts which may reduce entitlement reliability, particularly for holders of low reliability entitlement types. However, while there may be a small reduction in the volume of water forfeited at the end of the water year due to the ability to carry water over, this should not be considered a third party impact as it merely has the same effect as if that water had been used within the season.

In the Southern Basin, water resource managers are required to anticipate and assure that carryover commitments can be met before new allocation is provided to general security entitlements in the new water year. Over the course of the water year, resource managers don't have to allocate new inflows to carryover, because there should already be water in storage for that, given it was already allocated in the previous year. But the total resource assessment does of course have to account for carryover before any new allocations can be made.

A return to no carryover would also likely lead to inefficient usage of water, and reduce some entitlements' value. In discussion with irrigators, it has been speculated that without carryover, New South Wales Murrumbidgee general security entitlements would halve in value, as a large part of their value comes from the underlying characteristic of being able to carryover water. The ACCC speculates that this impact would likely be far more significant than the corresponding increase in value arising from possible additional forfeiture and the resulting extra allocation of this water to general security entitlements.

Long term policy solutions in respect of storage rights are continuous accounting and capacity sharing which allow more accurate and dynamic allocating of risks and costs to individual users. These are discussed more in chapter 16, subsection 16.3.2. The primary advantage is that they more accurately mimic what is occurring in the system in terms of inflows, evaporation and storage capacity at the individual level, allowing users to make assessments on what risks, costs and benefits are best for them. These approaches to water accounting are more widespread in the Northern Basin.

Spill risk

Spill can refer to either a physical spill, where water is released from the dam, or a 'paper' or accounting spill.

A physical spill refers to water being lost from storage because it is required to be released (because of inflows exceeding the available storage capacity and/or dam safety requirements).

A paper spill occurs when water is not physically released from the dam but is 'lost' to a party when a limit is reached for an entitlement or account and the water is then socialised or reallocated to other

¹¹⁸³ ACCC analysis based on NSW Government's responses to voluntary information requests.

water users. For example, for individual users this is often referred to as forfeiture and occurs at the end of the water year (discussed in the next section).

Stakeholders in the Southern Basin are concerned that carryover, by increasing the amount of water in the dam, increases spill risk.¹¹⁸⁴ This is a valid concern, though it's worth noting that all water (including current year allocations, traded water and water held in reserves) also contribute to spill risks. Most states adequately manage the increased spill risks of carryover at the end of the year, by a variety of limits imposed on carryover volumes and account balances. Spill risk, trade and IVT limits are discussed more in subsection 14.1.3.

South Australia, New South Wales and Victoria manage their increased spill risks from carryover in different ways. As South Australian deferred water is the first to spill, it addresses spill risk by only allowing carryover in years where projected opening allocations in April are 50% or less, capping carryover at 20% of entitlement and water use at 100% of entitlement.¹¹⁸⁵ This means that carryover is only available in very dry years when spill risk is low.

Victoria only allows the volume of allocations in a person's account to exceed 100% of entitlement volume in river systems where there is access to larger storages. The water carried over above 100% of a user's entitlement enters a 'spillable water account' and is the first to spill if the dam spills and there has been no low risk of spill declaration.¹¹⁸⁶ Access and ability to trade water held in a spillable account is also restricted until a, low risk of spill, declaration is made. There may be a small risk that this additional carryover water may cause spills that impact other water users if Victorian river operators declare a, low risk of spill, and a dam later spills.

New South Wales manages spill risk (and other third party risks) by having maximum account and use limits.¹¹⁸⁷ Water users can choose to maximise their carryover, but this reduces their potential allocation in the following year as allocation plus carryover is capped by the account limit.

The ACCC finds that spill risk is generally adequately managed by Basin States policies, and appropriately balances the benefits of carryover for individuals with the risk for third party impacts. However there could be long term benefits and increased efficiency in moving to continuous accounting and capacity sharing.

Evaporation

Water stored in a dam results in evaporation. Generally, the longer water is stored in a dam and the greater the surface area of the water being stored, the greater the evaporation. Note that evaporation will not necessarily increase linearly with the volume of water held in the dam, so determining the additional evaporative losses from storing an additional ML of water is particularly difficult.

In principle, all users should individually bear evaporation costs for all water that is stored, including allocated water for the period it is stored in the dam. Currently, predicted evaporative losses are accounted for through water resource assessments and socialised across entitlement holders (figure 15.1 shows this for bulk water sharing in the Murray). This does not take account of timing of water use within that year, and hence how long that water spent in storage. Victoria has moved to applying an individual evaporation loss for water carried over, though this is only applied at an annual basis (rather than a more granular measure of the time water spent in storage). Without continuous accounting (which would allow a more granular costing of evaporation losses), carryover rules are the main mechanism that is used to attribute evaporation losses on an annual basis to individuals in the Southern Connected Basin.

1184 Greater Shepparton City Council, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

1185 Department of Natural Resources (South Australia), *Private carryover – issues and options Amending the 2019 Water Allocation Plan for the River Murray Prescribed Watercourse*, 2019, https://www.naturalresources.sa.gov.au/files/sharedassets/sa_murray-darling_basin/water/allocation_plans/river_murray/2020-january/rmwap-private-carryover-issues-options.pdf.

1186 Victorian Water Register, *Carryover rules*, <https://waterregister.vic.gov.au/water-entitlements/carryover/carryover-rules>, Carryover rules, viewed 2 February 2021.

1187 ACCC analysis based on NSW Government's responses to voluntary information requests. NSW explained that the risk of third-party impact, particularly in the context of carryover, is managed by account limits, with carryover water notionally spilling from full accounts as allocations improve and limits are reached rather than carryover being debited from accounts in response to physical spill from storage. Email from DPIE to ACCC.

In table 15.2 below, annual net evaporation is shown as a percentage of storage capacity. Note that due to the high evaporation losses, river operators avoid leaving water for long periods in Lake Victoria which is located in SA on the Murray. In contrast, as Menindee is the main storage on the Lower Darling, river operators do not have a choice in storing water there to meet demand in the Lower Darling.

Table 15.2: Annual net evaporation as a percentage of storage capacity, 2012-13 to 2018-19

	Lake Dartmouth	Lake Hume	Lake Victoria	Menindee Lakes
2012-13	0.22%	3.44%	22.60%	105.31%
2013-14	0.25%	2.35%	21.91%	70.12%
2014-15	0.27%	2.10%	22.27%	22.91%
2015-16	- 0.46%	1.60%	17.52%	39.11%
2016-17	0.03%	2.55%	20.52%	97.85%
2017-18	0.45%	3.73%	22.56%	52.71%
2018-19	0.42%	3.19%	24.68%	15.90%

Source: ACCC analysis based on MDBA responses to voluntary information requests.

Note: Evaporation losses are net figures and can be reduced below zero by things like rainfall over the dam.

SA and Victoria both deal with evaporation losses on carryover by deducting 5% of water carried over, although Victoria applies this to private accounts and South Australia does so at a bulk level.¹¹⁸⁸ In New South Wales, evaporation is not costed to individual users of carryover and is socialised across all users.¹¹⁸⁹

The ACCC is concerned in New South Wales that evaporation losses are not taken into account, there are third party impacts and these losses are socialised reducing the consumptive pool. Water users in this instance do not face the full cost of their water use and storage decisions. Similarly, South Australia's policy of applying loss factors at the bulk level also means that the costs of carryover will not be reflected back to water users, and the impact of losses will be socialised across all users.

Conversely, Victoria's loss factors may be too high. Theoretically, a more accurate and variable loss would result in improved outcomes. However the ACCC appreciates that 5% was chosen to prevent negative third party impacts, to give certainty to users, and for administrative simplicity. The ACCC believes that having an evaporation cost to individuals is more efficient than having no cost, where the costs are less distortionary than externalities would be.

Evaporation losses in Lake Eildon (the major storage in the Goulburn system) were estimated at 2.6% in 2017-2018 and 2.3% in 2018-19.¹¹⁹⁰ Meanwhile, losses from Lake Dartmouth and Lake Hume didn't exceed 0.47% and 3.73% respectively, from 2012-13 to 2018-19. All of these figures are lower than the 5% losses applied to carryover, suggesting that Victoria's 5% evaporation loss may be too high in the Goulburn and Victorian Murray systems. The Victorian Department of Environment, Land, Water and Planning informed the ACCC that Victoria's approach to applying a deduction for evaporation is based on average evaporation across years – as assessed through the Northern Region Sustainable Water Strategy. This allows for certainty up front for entitlement holders when they choose to carry over water.¹¹⁹¹

The ACCC recommends that Basin States design carryover rules and policies to appropriately account for third party impacts such as evaporation losses from storing water in a dam, and attribute them to

1188 Victorian Water Register, *Carryover rules*, <https://waterregister.vic.gov.au/water-entitlements/carryover/carryover-rules>, viewed 2 February 2021; Water Allocation Plan for the River Murray Prescribed Watercourse, *South Australian Murray-Darling Basin Natural Resources Management Board*, https://www.naturalresources.sa.gov.au/files/sharedassets/sa-murray-darling-basin/water/allocation_plans/river_murray/2020_river_murray/river-murray-wap-adopted-150420-plan.pdf, viewed 2 February 2021.

1189 ACCC analysis based on NSW Government's responses to voluntary information requests. NSW explained that the risk of third-party impact, particularly in the context of carryover, is managed by account limits, with carryover water notionally spilling from full accounts as allocations improve and limits are reached rather than carryover being debited from accounts in response to physical spill from storage.

1190 Victorian Water Accounts 2017-18, Victorian Department of Environment, Land, Water and Planning, <https://waterregister.vic.gov.au/images/documents/Victorian-Water-Accounts-2017-2018.pdf>, viewed 15 February 2021; Victorian Water Accounts 2018-19, Victorian Department of Environment, Land, Water and Planning, <https://waterregister.vic.gov.au/images/documents/Victorian-Water-Accounts-2018-2019.pdf> viewed 2 February 2021.

1191 DELWP, email to ACCC, 9 February 2021.

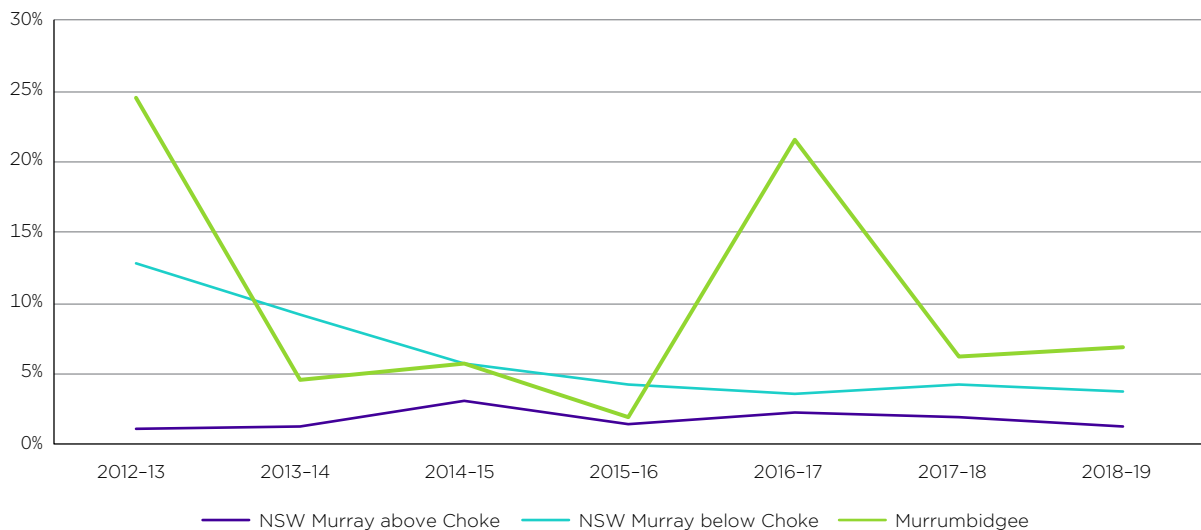
the individual. Longer term reforms such as continuous accounting or capacity sharing could allow for more accurate evaporation costs.

Forfeiture

Stakeholders expressed concern that carryover has reduced the volume of unused water forfeited at the end of the year, which previously would have been returned (or socialised) back to the consumptive pool for the following year.¹¹⁹² There is a view, particularly among general security entitlement holders in New South Wales, that this reduction in forfeitures is having a sizeable effect on entitlement reliability. As stated earlier in subsection 15.2.1, the ACCC's position is that water being forfeited has the same effect on available water resources as water being used.

The ACCC has found that in New South Wales water sources, water is still being forfeited in flood years (such as 2016–17) as seen in the figure below. This may be less than what has been experienced with similar years prior to carryover, but a decrease in forfeiture could reasonably be expected even without carryover, due to the value of water increasing. Figure 15.14 below shows a downward trend in forfeiture in the NSW Murray Below Choke, though the trend appears stable in the NSW Above Choke and the Murrumbidgee.

Figure 15.14: Water forfeited at the end of the year for New South Wales Murray above and below Barmah Choke and Murrumbidgee as a proportion of water account debits, 2012–13 to 2018–19



Source: ACCC analysis based on NSW government's response to voluntary information requests.

Note: This data excludes forfeitures by supplementary entitlement holders.

The ACCC understands that end-of-year forfeits of water are rare in the Victorian Murray due to Victoria's carryover policy (discussed above).

¹¹⁹² David Morrison, *Submission to the Murray–Darling Basin inquiry issues paper*, 30 January 2020, pp. 2–3; ACCC, *Murray–Darling Basin water markets inquiry public forum – Kerang*, published 12 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20Kerang%20public%20forum.pdf>, viewed 1 February 2021; ACCC, *Murray–Darling Basin water markets inquiry public forum – Shepparton*, published 13 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20the%20Shepparton%20public%20forum.pdf>, viewed 1 February 2021.

There seems to be a common assumption among stakeholders that all water carried over in a season or all water carried over by high security entitlement holders through carryover parking arrangements, would be forfeited.¹¹⁹³ The ACCC disagrees with this assumption as water market participants are much more aware of the value of water than in the past and would use the water rather than forfeit it without carryover. NSW Government also expressed this view when it stated:

The expected result of NSW water reforms, namely increased water use efficiency and water migrating to higher value usage, means less likelihood that water users are willing to forfeit their water. Therefore, the forfeiture of unused water and subsequent socialisation between years is reducing.

The Victorian Government determined that utilisation impacts on allocations were acceptable, as this is the same effect as if individuals used their allocation during the season, as they are entitled to do. The Victorian Government concurred with NSW Government on the low likelihood that significant forfeitures would occur in the absence of carryover:

Given the high value of water since unbundling, it is not expected that entitlement holders would simply forfeit their water if carryover did not exist. It is more likely that users would use or trade their water in that season.

NSW and Victorian governments have both indicated that forfeitures are not assumed to contribute to allocation policy decisions, as resource assessments in both these states assume full utilisation of allocated water. NSW Government stated that 'To assume forfeiture, is to assume a risk in allocating water that may not be available. This could be disastrous for water users'.

The ACCC does not consider that the additional water allocations that would accrue to entitlement holders as a result of water forfeitures should be considered to be part of an entitlement holders' property right. Relying on forfeited water for allocations is relying on other water users to sacrifice valuable financial assets for a perceived 'social good'. The additional allocation from water forfeitures should instead be seen as a windfall to entitlement holders. Further, given the changing value of water and shifts in market participant behaviours are likely to have a greater impact on forfeiture than the impact of carryover itself.

15.2.5 Harmonising carryover policies is not straightforward

Differences between states and valleys carryover policies have resulted in some stakeholders calling for harmonisation of carryover rules across the Southern Connected Basin.¹¹⁹⁴ However there are a variety of reasons for these differences, including the relative volume of storage capacity and entitlements on issue in each water source, and each state's entitlement and accounting frameworks.

States' choices in setting carryover rules and account management rules seek to balance entitlement holders' ability to smooth their allocation profile to manage risks with the increased spill risk to that storing extra water in storages brings. This choice is also linked to allocations and the underlying entitlement framework, discussed in more detail in subsections 15.1.1 and 15.1.2.

South Australia has a stricter carryover policy in response to less reliable access to storage space compared to Victoria and New South Wales.¹¹⁹⁵ The Murray–Darling Basin Agreement in schedule G, allows the private carryover of South Australian water in upstream storages¹¹⁹⁶ on the condition it must not adversely impact New South Wales or Victorian water availability by increasing spill risk for these states.¹¹⁹⁷

1193 Greater Shepparton City Council, *Submission to the Murray–Darling Basin water inquiry Interim Report*, 13 November 2020.

1194 SunRice and the Ricegrowers' Association of Australia, *Submission to the Murray–Darling Basin water inquiry Interim Report*, 13 November 2020.

1195 Storage arrangements are set out in Schedule G of the Murray–Darling Basin Agreement – this sets out that if water spills from storage then South Australia's deferred water for private carryover spills first.

1196 Private carryover, *South Australian Department for Environment and Water*, 2020, <https://www.environment.sa.gov.au/topics/river-murray-new/information-for-industry/south-australian-private-carryover>, viewed 2 February 2021.

1197 Interim Inspector General of Murray Darling Basin Water Resources, *Impact of lower inflows on state shares under the Murray–Darling Basin Agreement*, 2020, p. 18 at https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf.

If South Australian carryover water is stored in dams on South Australian accounts, this takes up space that could otherwise be used to capture inflows for other states, increasing spill risk. Therefore, South Australian deferred water is the first to spill when storages in New South Wales and Victoria fill. This, combined with South Australia's more conservative approach to allocations, results in more reliable allocations and in turn, a more restrictive carryover policy.¹¹⁹⁸ These stricter carryover rules do not prevent South Australian users from engaging in trade to access carryover parking in Victoria. This division between South Australian water stored on South Australian accounts and South Australian water stored on Victorian accounts is an artificial split due to the carryover arrangements and the lack of a separate storage right.

In the River Murray system, Victoria and New South Wales have a 50–50 split of the Hume and Dartmouth reservoirs, giving them more reliable access to storage compared to South Australia. This access is reflected in their carryover policies allowing higher and more frequent (but also different) levels of carryover. However, significant differences exist between the policies of these states.

New South Wales specification of a 50% carryover limit in the NSW Murray works in conjunction with account management rules to mitigate spill risk caused by increased use of carryover. Meanwhile, Victoria's approach of a 100% carryover limit and the use of spillable water accounts more directly mitigates the third party impacts associated with spill risk, by attributing the impact of a spill directly to those with volumes of carryover greater than the volume of their entitlement holding. So, while individual decisions in Victoria to hold large volumes of carryover might increase overall spill risks, because the cost of these risks are borne by the relevant individual, these are of less concern when considering market efficiency.

Some stakeholders have suggested that carryover should be 100% of entitlements across all valleys, to prevent trade for carryover.¹¹⁹⁹ However, because of the differences in accounting approaches outlined above, this is likely not feasible without creating significant risk of third party impacts in New South Wales. The New South Wales approach of managing spill risk with account management rules means that lower carryover limits are necessary to prevent the generation of externalities. Meanwhile, higher carryover limits in Victoria are facilitated by Victoria's approach to 'internalise the externality' of spill risk onto those whose individual carryover decisions increase the risk.¹²⁰⁰

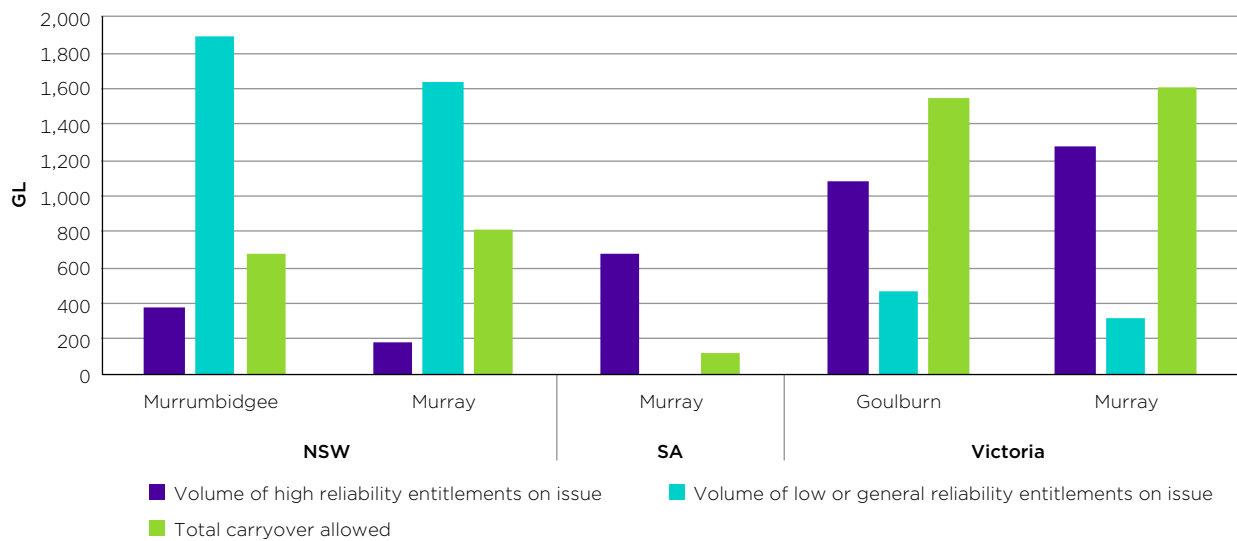
Figure 15.15 shows the amount of maximum permitted carryover compared to entitlements on issue by valley. Victoria allows more carryover than New South Wales due to the ability to directly attribute spill risks to those with carryover volumes in excess of their entitlement volume.

1198 Private carryover, South Australian Department for Environment and Water, 2020, <https://www.environment.sa.gov.au/topics/river-murray-new/information-for-industry/south-australian-private-carryover>, viewed 2 February 2021.

1199 Select Harvests, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 November 2020, p. 4.

1200 It should be noted that access to water in spillable water accounts is limited until the Northern Victoria Resource Manager makes a declaration of low spill risk which does add an additional risk factor. Should a spill occur after a low spill risk declaration, the impact of a spill would be shared across all Victorian entitlement holders in that zone.

Figure 15.15: Maximum permitted carryover and entitlements on issue, by water source



Source: ACCC analysis based on the Bureau of Meteorology.

Notes: Entitlements on issue includes the following: for South Australia River Murray High reliability: Class 3, 3b, 4, 7, 8, 9 entitlements; for Victorian regulated water sources: High and Low reliability water shares; for NSW Murray and Murrumbidgee: High Security, General Security (classed as low or general reliability). NSW Murray = NSW Murray Regulated River Water Source; Murrumbidgee = Murrumbidgee Regulated River Water Source.

To show total carryover allowed in each valley, carryover policies were applied to the relevant entitlements. For NSW, the 30% in the Murrumbidgee and 50% Murray available to carryover on general security entitlements was applied.

In Victoria, 100% carryover limit of high and low reliability water shares was applied. Spillable water accounts are not shown as these are a restriction on the ability to use or trade water in the new season as a result of an entitlement holder's carrying over of water, and it does not alter the limits on how much an entitlement holder can carry over.

Note for South Australia, carryover only occurs in dry years (see section 15.2 for details) and the 20% carryover limit to class 3 entitlements is applied.

Within New South Wales, there is a wide range of different carryover rules depending on the water source and entitlements issued. The majority of New South Wales water sources allow water to be carried over only on general security entitlements,¹²⁰¹ because of their lower reliability and higher percentage of entitlements on issue. The ACCC understands that the 30% carryover limit in the Murrumbidgee (compared to 50% in the New South Wales Murray) stems from the lower relative volume of accessible storage compared to the volume of carryover-eligible (that is, general security) entitlements in the valley. This drives the need for a lower carryover limit in the Murrumbidgee to mitigate the threat of increased spill risk if greater volumes of water were maintained in storages in the Murrumbidgee.

The implication of these factors is that harmonising carryover arrangements cannot be achieved by simply aligning carryover limits. Instead, harmonising these policies across the southern connected Basin would require more significant tweaks to the underlying regimes for the use and rationing of storage capacity. While there may be benefit in the introduction of spillable water accounts across the Southern Connected Basin, the ACCC considers capacity sharing (or continuous accounting) represent the best practice alternative to the current regime of carryover policies. For this, subsection 16.3.2 recommends capacity sharing be considered as part of the long-term roadmap of market architecture reforms.

¹²⁰¹ ACCC analysis of New South Wales carryover policies found in Water Sharing Plans.

15.2.6 If third party or trade impacts are unable to be dealt with, then more substantial reform such as capacity sharing could be required

Currently carryover policies appear to be working reasonably well and, for the most part, are managing third party impacts from carryover. However many of the current rules were written prior to carryover parking and therefore focus on controlling carryover and use only within a zone, rather than more directly managing third party impacts as capacity sharing and continuous accounting would.

At present carryover parking appears to be limited, but will likely expand as water becomes more valuable and water holders reduce their forfeiture risk by using carryover parking. Once carryover parking starts triggering IVT or other trade limits, carryover parking impacts can no longer be managed internally within carryover policies. This may trigger the need for a more fundamental change to continuous accounting and capacity sharing.

Capacity sharing and continuous accounting move both water property rights and water accounting closer towards what is occurring hydrologically in the system. Capacity sharing is where each water user is allocated with a share of storage capacity and a share of water inflow.¹²⁰² Continuous accounting operates in a similar way to an annual allocation system, except with more frequent water use accounting. The concept of a water year becomes irrelevant, except where it is used to enforce a use limit.¹²⁰³ These allow market architecture to better reflect what is occurring in the river system in terms of limited storage capacity and more accurately pricing losses, and helps users to make better choices that result in more efficient outcomes. Furthermore, these enable harmonisation of access to storage, by converting current carryover rights to ML rights, as a share of dam capacity.

Continuous accounting and capacity sharing are discussed in more detail in subsection 16.3.2, as part of a suite of policies that would more fundamentally address the issues discussed in this chapter.

15.3 Modelling, metering, measuring, and accounting for use supports a robust market

A 'cap and trade' system such as underpins Basin water markets relies upon robust monitoring of water use, with adequate enforcement of compliance. Robust monitoring requires the installation of metering technology or the use of alternative measurement technologies, and the collection of timely usage data. This enables the reconciliation of water usage data against account balances in order to detect overuse or unauthorised taking of water.

Accurate use data, shared in a timely manner, will also allow river operators to better predict when and how to meet demand, and run the river more efficiently within the river's hydrological constraints.

1202 "A capacity sharing approach to water property rights and markets includes the following key features:

- Water rights defined as percentage shares of system inflow and storage capacity
- Continuous (i.e., daily) water accounting with periodic reconciliations to ensure physical water supplies match user accounts
- User carryover subject to storage capacity (account) limits and 'internal spills'
- User level delivery capacity rights and delivery loss factors.."

ABARES, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 18 December 2020.

1203 ABARES, N Hughes, C Gibbs, A Dahl, D Tregeagle and O Sanders, *Storage rights and water allocation arrangements in the Murray-Darling Basin*, 2013.

15.3.1 Improved modelling capability and real time usage data is needed to help water resource managers and river operators develop new tools and plan for risks

The MDBA, other river operators and water resource managers rely on a variety of models to support decision-making and manage water in the Basin. Models are used to understand the operating outlook and assess deliverability, determine water availability and assess compliance with water use limits, inform river operation and assess the effects of water releases, inform response management for river salinity and water quality issues, and test policies and strategies for improving water management. Modelling also plays an important role in establishing and adhering to ecological tolerances in river operations, discussed more in section 14.2.4.

Inaccurate modelling can have dire consequences. Although the fish deaths in the lower Darling River in 2018–19 were largely due to climactic conditions, inaccurate river models were also found to contribute to these events.¹²⁰⁴ Better modelling will improve how river operators can plan for the use of water for the environment.¹²⁰⁵

Following the Murray-Darling Basin Water Compliance Review, the MDBA published a Model Improvement Program for Hydrological Models.¹²⁰⁶ Despite significant existing modelling capability in the Basin, there is a need to continually improve and update models, as better data and modelling technologies becomes available.

To understand impacts at a Basin scale, catchment models need to be integrated with one another, which means models need to be developed on a compatible basis, particularly in the Southern Connected Basin where there is widespread trade. The ACCC understands that models for the River Murray (from the MDBA) and the tributaries (from the states), operate on different assumptions and platforms, which has resulted in significant variation in the currency and fidelity of individual sub-Basin models.

The MDBA's submission to the ACCC's Issues paper highlighted that:¹²⁰⁷

These river system models have been collaboratively developed by Basin States and the MDBA. Hydrological models calibrated and validated during the late 1990s may not be reflective of current irrigation practices and farmer behaviour, and consequently may have poor predictive capacity for low-flow periods.

To be effective, models need to accurately reflect the current settings to provide a basis for comparison with scenarios that test different elements of the system. Better integration of actual water user behaviour would help increase the accuracy of long term forecast models. Improved modelling, and including crop type forecasting and behaviour of water users (and in particular environmental water holders), will likely improve management of delivery shortfall risks and help understand conveyance losses. ABARES has the capability to model irrigator behaviour, and better integrating ABARES models with the Integrated River System Modelling Framework would likely increase accuracy. However, further improvements can also be made to ABARES models via regularly updating underlying data and assumptions.¹²⁰⁸

1204 The river modelling at the time had a tendency to overestimate stream flows during dry sequences, underestimating the impacts of extractions during dry times. Australian Government, *Independent assessment of the 2018-19 fish deaths in the lower Darling*, 2019, https://www.mdba.gov.au/sites/default/files/pubs/Final-Report-Independent-Panel-fish-deaths-lower%20Darling_4.pdf.

1205 Water resource modelling, MDBA, 2020, <https://www.mdba.gov.au/water-management/river-operations/water-resource-modelling>, viewed on 2 February 2021.

1206 MDBA, *Model improvement program for MDBA hydrological models Responding to Action 2 of the Murray-Darling Basin Water Compliance Review*, August 2018. <https://www.mdba.gov.au/sites/default/files/pubs/Model-improvement-program-MDBA-hydrological-models.pdf>.

1207 MDBA, Submission to the Murray-Darling Basin inquiry issues paper, 13 February 2020, p. 11.

1208 As noted in Chapter 3, the current model is based on the climate sequence from 2006 to 2019 which was drier than the long term average. The modelling assumes current farms use current capital and technology, and does not allow for long-term adaptation or structural adjustment, and commodity prices are also fixed to observed values in 2018–19. ABARES, *Future scenarios for the southern Murray-Darling Basin: Report to the Independent Assessment of Social and Economic Conditions in the Basin*, <https://www.agriculture.gov.au/abares/research-topics/water/future-scenarios-smdb-independent-assessment-socialeconomic-conditions>, viewed 22 June 2020.

There is a need to better incorporate climate change modelling in a standardised and holistic way across the Basin. While operational models are looked at on a yearly basis to incorporate aspects such as additional losses in a changing climate, the MDBA's ability to incorporate climate change forecasts into forward planning models is currently limited, and work should be done to develop a common approach between the MDBA and Basin States for considering whole-of-Basin climate change impacts. Current work underway in the Basin to improve modelling and the MDBA states that:¹²⁰⁹

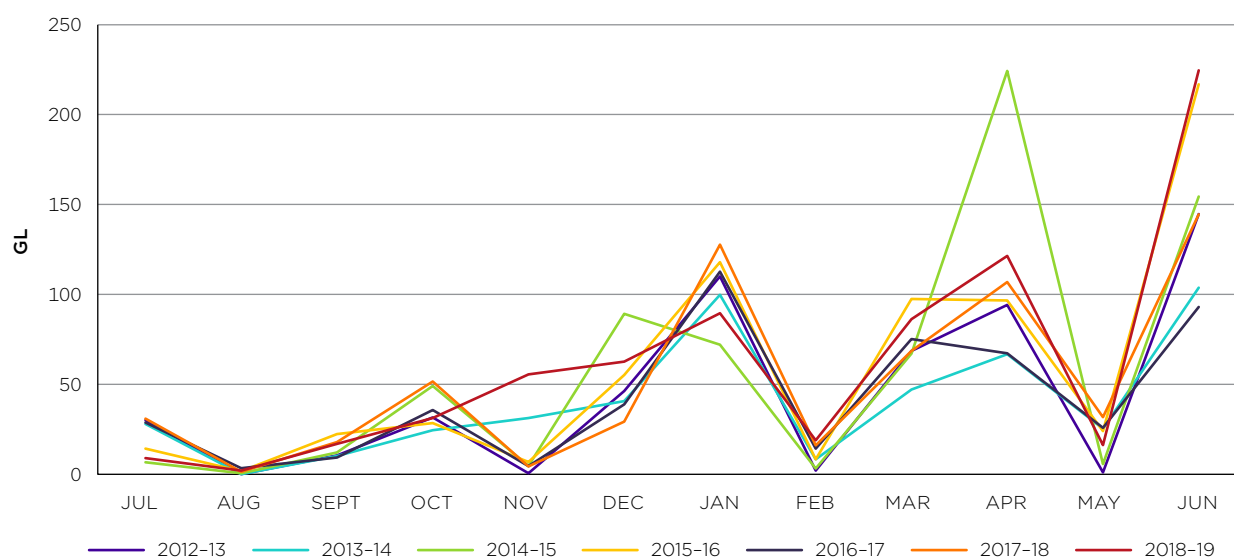
The MDBA is working closely with the [Bureau of Meteorology] in exploring the use of dynamic streamflow forecasts based on global climate models, to complement and enhance baseline information from historical inflow sequences, for use in future planning.

Modelling is only as accurate as the data that is fed into the model. As discussed in section 15.3.4, without telemetry, limitations on current time of use data result in large time lags between when water is used and when it is recorded.

Time of use data shortcomings are most notable in South Australia. This is illustrated in the water use data in figure 15.16. The chart shows significant spikes at regular intervals and at the end of the water year for SA water users. This reflects South Australia's policy of quarterly meter reads and annual reconciliation, rather than actual water usage patterns. Although quarterly meter reads and annual reconciliation is consistent with current Basin-wide commitments under the Basin Compliance Compact, the usage data is insufficient to identify changes or trends in the timing of water use. Although Victoria and New South Wales have more real time use data due to higher levels of telemetry and stricter usage reporting requirements, their data is also still not generally granular enough in geographic breakdown or comprehensive enough to help water managers undertake scenario planning and shortfall management.

Data needs to be more granular (in both smaller time periods and smaller geographical areas) and shared in a timelier manner to be useful in managing shortfalls, for example. This will assist models in predicting if or when a delivery shortfall would occur, given shortfalls are likely to be time constrained to days or weeks rather than quarters. Data related issues are discussed more in Appendix G and sharing of information in chapter 11.

Figure 15.16: South Australian total consumptive water use (GL) by month, from 2012-13 to 2018-19



Source: ACCC analysis of South Australian information request response

¹²⁰⁹ MDBA, *River Murray System Annual Operating Outlook 2020-21 water year 1 June 2020 – 31 May 2021*, July 2020 <https://www.mdba.gov.au/sites/default/files/pubs/River%20Murray%20System%20Annual%20Operating%20Outlook%202020-21.pdf>, viewed 13 February 2021.

15.3.2 The Basin Compliance Compact has delivered more harmonised metering arrangements but comprehensive, risk-based monitoring of water take is not yet available

Metering standards are set at the state level. In recent years, Basin states have improved metering standards via the Basin Compliance Compact. In the Basin Compliance Compact in 2018, Basin States agreed to a range of measures to update their metering requirements and accelerate the roll out of updated technologies, with subsequent updates to state policy frameworks. Improvements are still in the process of being rolled out by states.

The ACCC commends Australian and Basin State governments for the goal of requiring all take via water entitlements to be metered by June 2025, and all new and replacement meters to comply with AS4747 including pattern approval and verification, by no later than June 2025.

The ACCC understands that New South Wales, Queensland and South Australia are now operating on extended timeframes due in part to difficulties validating meters in drought conditions.¹²¹⁰ Victoria has completed Victoria's metering commitments under the Basin Compliance Compact.¹²¹¹

The ACCC is concerned that without an ongoing, public reporting mechanism, Basin States are not able to be held publically accountable to their goal of 'no meter, no pump' or 95% metering of water take per water resource area.¹²¹² The progress towards 95% of water take being metered is not currently included in the Murray–Darling Basin Compliance Compact Assurance Reports. At the time of writing, Murray–Darling Basin Compliance Compact Assurance Report 2020, had not been released.

15.3.3 Different meter technology and water use accounting requirements can undermine market integrity and confidence

Despite improvements to policies across the Basin, water users still face different metering and accounting requirements depending on where they are located. This may undermine confidence and market integrity, if users feel that these differences are not justified.

The ACCC received multiple submissions that were concerned, in particular, with the measuring of water take in the Northern Basin.¹²¹³ Measuring of flood plain harvesting and overland flows are discussed more in subsection 15.3.7. Many stakeholders also raised concerns about South Australia only having quarterly meter reads, discussed in subsection 15.3.1.

However, even with the Basin Compliance Compact's improvements listed in the previous section, there are still differences in metering requirements and technology for like users in and between states. For example, New South Wales does not require telemetry on groundwater use,¹²¹⁴ and upgrades have been rolled out inconsistently across states. Differences continue to undermine confidence in the market, notably, the absence of requirements for telemetry in South Australia (as discussed in subsection 15.3.4) and slower progress on developing frameworks for licensing flood plain harvesting and overland flows in the Northern Basin. The table below outlines the main differences between states metering policies.

1210 MDBA, *Murray–Darling Basin Compliance Compact Assurance Report 2019*, 2019 <https://www.mdba.gov.au/sites/default/files/pubs/murray-darling%20basin%20compliance%20compact%20assurance%20report%202019.pdf>.

1211 Victorian Department of Environment, Land Water and Planning, *Non-urban Water Metering in Northern Victoria: Annual Implementation Report 2020*, 2020, https://www.water.vic.gov.au/_data/assets/pdf_file/0037/492688/MeteringReport-NVic-201920.pdf, viewed 11 February 2021; MDBA, *Murray–Darling Basin Compliance Compact Assurance Report 2019*, 2019, <https://www.mdba.gov.au/sites/default/files/pubs/murray-darling%20basin%20compliance%20compact%20assurance%20report%202019.pdf>.

1212 MDBA, *The Murray–Darling Basin Water Compliance Review*, 2017, <https://www.mdba.gov.au/sites/default/files/pubs/MDB-Compliance-Review-Final-Report.pdf>.

1213 Green Dymension, *Submission to the Murray–Darling Basin inquiry issues paper*, 30 January 2020, p. 4; Citrus Australia, *Submission to the Murray–Darling Basin inquiry issues paper*, 30 January 2020, p. 16.

1214 NSW's decision to adopt this position was based on detailed assessment of groundwater monitoring requirements along with stakeholder consultation, explaining that the current framework will be reviewed in five years and the requirement for telemetry could be adjusted at that time. All data loggers installed under the new requirements must be telemetry capable, which will help reduce the cost of retrofitting telemetry should the telemetry threshold be adjusted down the track. Groundwater users can voluntarily choose to install a telemetry system. DPIE, email to ACCC, 8 February 2021.

Table 15.3: States' telemetry policies

State	Telemetry required?	Deadline
Victoria ¹²¹⁵	Yes , for sites pumping more than 10ML surface and 20ML ground water	June 2025
South Australia ¹²¹⁶	No , but requires that meters are able to have telemetry added	N/A
New South Wales ¹²¹⁷	Yes, for pumps larger than 200mm and not groundworks ¹²¹⁸	December 2023
Queensland ¹²¹⁹	No , but requires that meters are able to have telemetry added	Queensland is currently reviewing its non-urban metering policy

15.3.4 Metering and water accounting standards have been set primarily for water management

Metering and water accounting standards have been set primarily in terms of what is required for river operations and maintaining compliance with limits on authorised take, however these are no longer fit-for-purpose to deal with current and emerging issues. Increasingly river operations issues are related to timing of use, such as constrained delivery capacity and the risk of delivery shortfall, and increasing stakeholder concern around conveyance losses.

The current water accounting arrangements do not allow tracking of a particular parcel of water. This makes it difficult to determine when and where traded water is being used, and what contribution traded water and the water markets are having on conveyance losses and delivery risk. This is discussed in more detail in subsections 14.2.2 and 14.2.3.

The River Murray System Summary of River Operations 2018 – 2019 report also noted the need to update modelling to better incorporate the effects of climate change:

The effects of climate change are starting to be seen in a range of areas. It is becoming increasingly clear that history is no longer a guide to the future regarding water resources availability and temporal variability. IRORG is of the view that the MDBA needs to challenge its existing assumptions and operational norms and come up with a defensible approach to managing the system in response to a changing climate.

Conveyance losses and delivery risk are affected by the timing of when water (traded or non-traded) is being used.¹²²⁰ Because of this temporal aspect, timelier measuring of water demand would be likely to assist with managing these issues.

The MDBA stated to the ACCC:

Furthermore, real-time daily diversion data is still incomplete, particularly in the Murray, downstream of the Choke, and this is likely to be the priority in information collection around capacity issues and analysis.

¹²¹⁵ Department of Environmental, Land, Water and Planning (Victoria) – *Victorian Non-Urban Water Metering Policy*, 2020, at www.water.vic.gov.au/___data/assets/pdf_file/0030/459831/NonUrbanWaterPolicy_2020.pdf, viewed 26 May 2020, p. 5.

¹²¹⁶ Department of Environment and Water (South Australia) *Metering Improvement Plan*, 2019 at <https://www.environment.sa.gov.au/topics/water/water-licences-and-permits/metering-water-use>, viewed 28 May 2020, p. 12 and p. 17.

¹²¹⁷ MDBA, *Murray–Darling Basin Compliance Compact Interim Assurance Report 2018*, 2018 at <https://www.mdba.gov.au/sites/default/files/pubs/murray-darling-compliance-compact-assurance-report.pdf>, viewed 28 May 2020, p. 11.

¹²¹⁸ Department of Primary Industries – Office of water (NSW), *NSW metering implementation plan under the National Framework for Non-Urban Water Metering*, 2013 at www.water.nsw.gov.au/___data/assets/pdf_file/0003/547257/metering_nsw_metering_implementation_plan.pdf, viewed 26 May 2020.

¹²¹⁹ Department of Natural Resources, Mines and Energy (Qld), *Queensland interim water meter standard for non-urban metering*, 2019 at www.dnrm.qld.gov.au/?a=109113:policy_registry/qld-interim-standard-water-metering.pdf, viewed 28 May 2020, p. 5.

¹²²⁰ Conveyance losses are affected by climatic conditions (how hot or dry the river is) and river operator decisions which are driven by predicted water demand, discussed further in subsection 14.2.3. Delivery risk can be heightened due to demand concentrated within a time period. If water use were spread evenly throughout the year, the river system could deliver water without a shortfall. However current trends suggest an increasingly concentrated demand due to horticultural proliferation in the lower Murray, increasing the risk of a shortfall. See subsection 14.2.2.

Delivery risk and conveyance loss issues, due to their timing of use dimension, are not able to be adequately assessed using non-telemetered metering. Part of the reason why these issues and risks have been increasing is because they sit outside market arrangements. Reforming market architecture to internalise these risks is going to require significant investment in more accurate modelling, metering and water accounting.

15.3.5 Widespread telemetry is needed in water markets for compliance and enforcement, and to support longer term potential reforms

Telemetry is an important part of updating metering so that it can be monitored remotely and more frequently. Telemetry refers to meters that allow reading to occur remotely, with the data being sent to a centralised database for monitoring. Telemetry costs more than the Australian Standard AS4747 water meters currently required by all states, although AS4747 meters can all be retrofitted with telemetry if required.

Telemetry will provide multiple benefits to improve the efficiency of river operations. This could include helping to better understand conveyance losses and delivery shortfall risk, if paired with lifetime traceability of water allocations (discussed in subsection 12.4.4).

Telemetry will also be required for any of the longer term reforms for interregional trade that deal with timing of use issues, such as delivery rights, the water market operator, delivery rationing, or congestion charging. As discussed in subsections 14.2.2 and 14.2.3, better metering, modelling and water accounting are required to understand better the interactions between trade, use and what is occurring in the system before more widespread reforms are able to occur. It will also aid regulators to enact better enforcement and compliance regimes, reducing illegal water take.¹²²¹

Victoria has advised the ACCC that it has 67% of ground and surface water telemetered, with 19% unmetered.

South Australia currently has 1% of its meters that are AS474 compliant, with 96% of water take estimated to be metered.¹²²² South Australia has indicated to the ACCC that they will enact telemetry, subject to funding. South Australia has recently lodged a project proposal with the Australian Government's Department of Agriculture Water and Environment to upgrade to telemetered meters along the River Murray. This is currently being considered by the Australian Government.

New South Wales's new non-urban metering rules take effect from 1 December 2020, requiring licence and approval holders of surface water pumps 500mm or greater in size to have telemetry installed.¹²²³ The staged rollout will continue until 1 December 2023 when all surface water pumps with a diameter of 200mm or greater must have telemetry installed.¹²²⁴

Despite recently moving to require widespread telemetry, New South Wales has 19% of its total water take telemetered, with 46% of take flow metered and 32% of flow unmetered or measured by alternative means. A significant proportion of the unmetered or alternatively measured flow, is from environmental flows or water tagged for interstate use (14% of total take). New South Wales has also advised that other alternatively measured water take make up the majority of the unmeasured or alternatively measured take.¹²²⁵

1221 Telemetry to support NSW Non-Urban Water Metering Framework, *NSW Department of Planning, Industry and Environment*, n.d., <https://www.industry.nsw.gov.au/water/metering/telemetry>, viewed 2 February 2021.

1222 South Australia's progress regarding implementation of AS4747 compliant meters, *South Australian Department of Environment and Water*, n.d., <https://www.environment.sa.gov.au/files/sharedassets/public/water/metering/sa-as4747-progress-report-2018-19-rep.pdf>, viewed 2 February 2021.

1223 Overview of the non-urban water metering framework, *NSW Department of Planning, Industry and Environment*, October 2020, <https://www.industry.nsw.gov.au/water/metering/overview-of-the-non-urban-water-metering-framework#latest-updates>, viewed 2 February 2021.

1224 Overview of the non-urban water metering framework, *NSW DPIE*, October 2020, <https://www.industry.nsw.gov.au/water/metering/overview-of-the-non-urban-water-metering-framework#latest-updates>, viewed 2 February 2021.

1225 Other reasons for non-metered or alternative classification of water take is usage by irrigation corporations (to conveyance canals, channels and the like) with an added level of validation performed by river systems operators, or metered water with a secondary validation applied by WaterNSW staff as part of its routine, high-risk management of water take by users.

Basin States should continue to improve metering and monitoring

The Australian and Basin State governments, working with the MDBA, should strengthen their existing commitments to better metering and measurement of water take across the Basin. This should include committing to harmonising the metering standards and technology in use in the Southern Connected Basin, monitoring progress on the measurement and outcomes of overland flows/flood plain harvesting, continued improvement of approaches to handling usage data and improving compliance and enforcement programs. This could be achieved through extending and expanding the scope of the Basin Compliance Compact.

Telemetry should also be implemented across the Southern Connected Basin where technologically possible. In particular, South Australia should commit to upgrading its metering standards to require telemetry, so as to harmonise metering standards in the Southern Connected Basin and ensure that metering is fit for market and river operations purposes.

15.3.6 Alternatives technologies may fill gaps where telemetry is not appropriate

The Basin States metering policies are balancing the costs of installing new telemetry meters on water users, with the benefits of more timely and accurate measurement of take. The ACCC believes that the benefits of more widespread telemetry outweigh the costs, particularly in the Southern Connected Basin where from mid-2012 to near the end of 2018, parties traded about \$10.1 billion in permanent water access entitlements and \$2.2 billion of annual water allocations.¹²²⁶

However the ACCC acknowledges that telemetry is more expensive to install than the current Australian standard AS4747 meters and the overall cost of universal telemetry could be significant, especially for smaller users.¹²²⁷ Queensland estimates that installation costs for smaller meters are from \$8,000 (for meters below 200 millimetres), with very large meters (approximately 1,200 millimetres) costing up to \$100,000.¹²²⁸ NSW Office of Water estimated the average cost of new meter installations (including telemetry and associated works) would be \$12,000 to \$15,000.¹²²⁹ Initial estimates indicate that the cost to retrofit telemetry to an existing meter ranges from \$500 to \$5,000.¹²³⁰ Governments may wish to consider how the cost of universal telemetry could be shared between themselves and users, in order to balance the desire to satisfy user-pays principle while acknowledging the public benefit of such a move.

Telemetry also cannot be used in all situations, such as where lack of mobile telephone services limits the benefits of telemetry, as it may prevent real-time reporting of data being captured by telemetered meters. Other technology may also be better suited where water take is unable to be easily measured, such as for flood plain harvesting or overland flows. However there still needs to be accurate measurement of this water take to ensure that all water users are complying with rules and regulations.

There are significant difficulties in quantifying how much water has been taken by floodplain harvesting or overland flows, as it occurs intermittently in a variable climate and often covers vast low-lying areas.¹²³¹ The water accounting can also be complex, as on-farm storages are typically used to store water from multiple sources, such as water pumped from rivers or bores and floodplain harvesting, each with different conditions on use.

1226 ACCC analysis based on Bureau of Meteorology and Australian Bureau of Statistics responses to voluntary information requests.

1227 Cost estimates range from \$8,000 - \$12k0000 for small users, up to \$100,000 for large users.

1228 Rural Water management program: Proposals for strengthening non-urban water measurement, *Department of Natural Resources Mines and Energy (Qld)*, Consultation paper, 2019, www.dnrme.qld.gov.au/_data/assets/pdf_file/0007/1453849/proposals-strengthening-water-measurement.pdf, p. 14, viewed 22 January 2021.

1229 NSW metering implementation plan under the National Framework for Non-Urban Water Metering, *Department of Primary Industries – Office of water (NSW)*, 2013, www.water.nsw.gov.au/_data/assets/pdf_file/0003/547257/metering_nsw_metering_implementation_plan.pdf, p. 23, viewed 26 May 2020.

1230 Rural Water management program: Proposals for strengthening non-urban water measurement, *Department of Natural Resources Mines and Energy (Qld)*, Consultation paper, 2019, www.dnrme.qld.gov.au/_data/assets/pdf_file/0007/1453849/proposals-strengthening-water-measurement.pdf, p. 14, viewed 22 January 2021.

1231 Floodplain harvesting position statement Expectations from the Authority, *MDBA*, 2019, p. 3 at www.mdba.gov.au/sites/default/files/pubs/MDBA-position-statement-on-floodplain-harvesting.pdf, viewed 18 May.

15.3.7 Flood plain harvesting and take of overland flow are in the process of being brought into the license framework

Stakeholders are concerned that there is not adequate enforcement and measurement of take in the Northern Basin, and the impact that this has had on the environment and water flows into the Lower Darling system.¹²³² The Four Corners Pumped report alleged widespread water theft in the Northern Basin, and the following Ken Matthews' review raised awareness of the inadequacies of measurement in the Northern Basin.¹²³³

Concern was further escalated due to the fish deaths in December 2018 and January 2019. The *Independent assessment of the 2018-19 fish deaths in the Lower Darling* found that New South Wales and Queensland need to strengthen compliance with all metering requirements and overland flow extractions expeditiously.¹²³⁴ There was also a need for NSW and Queensland governments to improve their assessment of the hydrological impacts of floodplain harvesting.¹²³⁵

The ACCC acknowledges the significant progress of the New South Wales and Queensland governments in recent years in measuring and progressing licensing of take. Both states started from different places and therefore implemented these reforms differently. Although, there has been widespread confusion around whether irrigators in New South Wales are able to harvest floodplain water, given the rollback of floodplain harvesting legislation without replacement.¹²³⁶

Queensland has had a moratorium in place since 2000 on additional floodplain harvesting developments, and has stopped growth by using authorisations and licenses.¹²³⁷ Therefore Queensland only has to bring overland flow take into the licensing framework. Queensland has already issued licenses and implemented measurement programs in some places such as the Lower Balonne, and a third of the works are currently licensed in the Border Rivers.¹²³⁸

In contrast, New South Wales had not prevented growth in floodplain harvesting take, and has identified that there has been growth in some regions of water take above legal limits since 2000.¹²³⁹ Other experts believe this growth to be quite significant.¹²⁴⁰ Regardless, licensed take will need to be reduced to the legal limit,¹²⁴¹ and the NSW Government expects to have the licensing framework operational in all water sharing plans by 2021.¹²⁴²

In recent years, New South Wales has invested significant amounts to improve the measuring of non-metered take in the Northern Basin for its Healthy Floodplains project. New South Wales now has access to high-resolution light-detection-and-ranging (LiDAR) and remote-sensing technology to

1232 Murray Darling Association, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 13 November 2020.

1233 ABC Four Corners, *Pumped*, July 2017, available at www.abc.net.au/4corners/pumped/8727826, viewed 25 June 2020; Matthews, K, 2017, *Independent investigation into NSW water management and compliance*, New South Wales Department of Industry at www.industry.nsw.gov.au/_data/assets/pdf_file/0019/131905/Matthews-final-report-NSW-water-management-and-compliance.pdf, viewed 28 May 2020.

1234 Floodplain Harvesting Action Plan, *NSW Government*, 2019, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0015/272301/floodplain-harvesting-action-plan.pdf, viewed 2 February 2021.

1235 Floodplain harvesting position statement Expectations from the Authority, *MDBA*, 2019, p. 80 at www.mdba.gov.au/sites/default/files/pubs/MDBA-position-statement-on-floodplain-harvesting.pdf, viewed 22 January 2021.

1236 O Calver, 'DPIE advises landholders to seek legal counsel before floodplain harvesting', *The Land*, 18 December 2020, <https://www.theland.com.au/story/7061096/dpie-will-not-issue-embargo-for-gwydir-valley/>, viewed 2 February 2021.

1237 Floodplain harvesting and overland flows, *MDBA*, January 2021, <https://www.mdba.gov.au/basin-plan/sustainable-diversion-limits/floodplain-harvesting-overland-flows>, viewed 2 February 2021.

1238 Program to improve the measurement of overland flow, *Queensland Department of Natural Resources, Mines and Energy*, 2 November 2020, <https://www.dnrme.qld.gov.au/land-water/initiatives/rural-water-futures/projects/measurement-overland-flow>, viewed 2 February 2021.

1239 Floodplain harvesting and overland flows, *MDBA*, January 2021, <https://www.mdba.gov.au/basin-plan/sustainable-diversion-limits/floodplain-harvesting-overland-flows>, viewed 2 February 2021.

1240 M Condon, S Mabin & J Becker, 'Water diverted to on-farm storages via flood plain harvesting in northern NSW skyrockets since 1994, experts says', *ABC News*, 19 November 2020, <https://www.abc.net.au/news/rural/2020-11-19/flood-plain-harvesting-nsw-increased-into-on-farm-storages/12886642>, viewed 2 February 2021.

1241 Floodplain harvesting and overland flows, *MDBA*, January 2021, <https://www.mdba.gov.au/basin-plan/sustainable-diversion-limits/floodplain-harvesting-overland-flows>, viewed 2 February 2021.

1242 Floodplain Harvesting Action Plan, *NSW Government*, 2019, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0015/272301/floodplain-harvesting-action-plan.pdf, viewed 2 February 2021.

accurately measure of floodplain storage capacities.¹²⁴³ However these technologies do have limits, and New South Wales has acknowledge that telemetry will still have an important role to play for real time data, particularly in protecting first flow flushes.¹²⁴⁴

New South Wales' new floodplain harvesting measurement policy requires storages larger than 1,000 ML (as listed on a landholder's work approval) to have an approved meter by 1 July 2021. An approved meter includes radar and submersible storage sensors for floodplain harvesting measurement at on-farm storages.¹²⁴⁵

Queensland has committed to measuring overland flows in priority floodplains (including Border Rivers and Moonie floodplains) by 31 December 2022.¹²⁴⁶

After these policies have been implemented, there will be a need to continue to monitor the outcomes of these policies. These policies need to be monitored to ensure that they are achieving the outcomes intended, or if there is a need to move towards more widespread telemetry. This may be a role for the Water Markets Agency or an updated Basin Compliance Compact.

15.3.8 Compliance and enforcement action on metering and illegal take builds confidence in the market

Water users must have confidence that the rules are being applied to all other water users and enforced appropriately. Recent incidents and reports have undermined this confidence, particularly in New South Wales.¹²⁴⁷ Multiple levels of government have taken action since these allegations were made, with the Australian Government creating the role of the Interim Inspector General, and announcing its intention to split compliance functions from the MDBA, and Basin States increasing their compliance and enforcement activities.

In 2017 New South Wales created an independent regulator known as the Natural Resources Access Regulator (NRAR), responsible for enforcing compliance with metering requirements, licence conditions and water account limits, which has rapidly increased enforcement action in New South Wales. In 2019–20, NRAR issued 152 infringement notices and commenced 15 prosecutions.¹²⁴⁸ NRAR proactively detects and investigates breaches of overdrawn accounts, with support from WaterNSW.

Victoria has a zero tolerance policy for unauthorised take, and in 2019–20 commenced over 2,500 enforcement actions, including issuing 405 notices and recommending 23 cases for prosecution.¹²⁴⁹ However the ACCC is also aware of users in Victoria who have on repeated occasions, gone into negative balances. This is able to be detected due to Victoria's widespread telemetry monitoring of water take and accurate register.

To maintain an effective 'cap and trade' system adequate compliance, enforcement and investment in systems and personnel are also needed, in addition to accurate and timely measurement of water take. The ACCC supports Victoria's ongoing engagement work with stakeholders to ensure compliance, and

1243 Managing our floodplains using the latest technology, *NSW Department of Planning, Industry and Environment*, n.d., <https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/improvement-program-for-floodplain-harvesting-measurement-and-compliance/latest-technology>, viewed 2 February 2021.

1244 NSW Department of Planning, Industry and Environment, Assessment of take and protection during first flush flows in the Northern Basin, July 2020, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0014/316310/assessment-of-take-and-protection-during-first-flush-flows-in-the-northern-basin.pdf, p. ii.

1245 NSW Department of Planning, Industry and Environment, *Floodplain harvesting measurement policy*, July 2020, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0005/317093/floodplain-harvesting-measurement-policy.pdf, viewed 2 February 2021.

1246 Program to improve the measurement of overland flow, *Queensland Department of Natural Resources, Mines and Energy*, 2020, <https://www.dnrme.qld.gov.au/land-water/initiatives/rural-water-futures/projects/measurement-overland-flow>, viewed 2 February 2021.

1247 ABC Four Corners, *Pumped*, July 2017, available at www.abc.net.au/4corners/pumped/8727826, viewed 25 June 2020; Matthews, K, 2017, *Independent investigation into NSW water management and compliance*, New South Wales Department of Industry at www.industry.nsw.gov.au/_data/assets/pdf_file/0019/131905/Matthews-final-report-NSW-water-management-and-compliance.pdf, viewed 28 May 2020.

1248 The Natural Resources Access Regulator (NSW), *Progress Report 2019-20*, 2020, https://www.industry.nsw.gov.au/_data/assets/pdf_file/0009/324909/nrar-progress-report-2019-20.pdf.

1249 Victorian Department of Environment, Land, Water and Planning, *Water Compliance Report 2019-20*, 2020, <https://www.water.vic.gov.au/water-for-agriculture/taking-and-using-water/compliance-reports/water-compliance-report-2019-20>.

its recent 'zero tolerance on negative balances' policy, its focus on improving communication with users when their account balance is running low, its more timely enforcement processes so that large volumes can't be pumped when accounts are negative and its aim to reduce water theft to a target of less than 1% of the rural water volume.¹²⁵⁰

One of Queensland's compliance focuses for 2020–21 is unauthorised water take, but it is unclear if this extends to negative water balances.¹²⁵¹ Queensland is currently developing and implementing an assurance framework that enables it to report on its performance as a non-urban water resource manager and regulator by early 2021.¹²⁵²

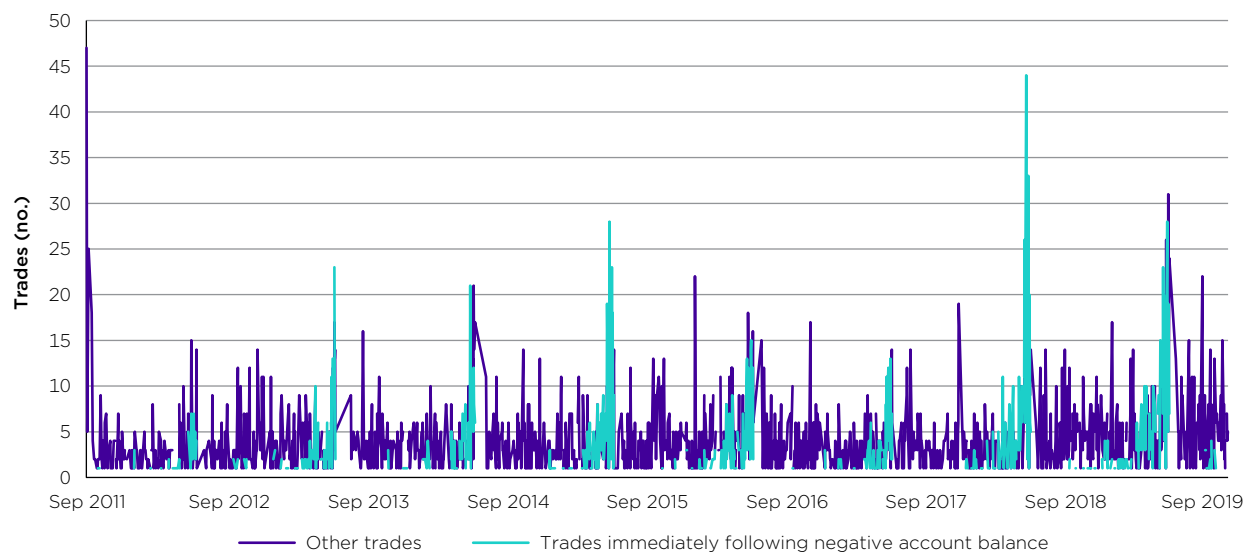
South Australia audited all River Murray Watercourse water accounts to measure compliance with the requirement to provide a quarterly meter reading(s) by the due date as per condition of water resource works approvals and found 94% compliance and issued 53 administrative sanctions or expiations.¹²⁵³

South Australian water users have long been prohibited from taking water without authorisation: that is, to extract water, licence holders are required to have water allocation on their water account at all times. In July 2019, South Australia brought in a new policy that increased the frequency of meter readings from annual to quarterly and applies an administrative penalty charge to all unauthorised water use on a quarterly basis.¹²⁵⁴ However, until South Australia is able to secure funding for telemetry and monitor usage in real time there is no guarantee that users cannot go into negative balances between meter reads.

The ACCC's investigation of South Australia's approach has found that water users were trading after having a negative balance in the lead up to the previously annual meter read (see annual spikes in the turquoise time series in figure 15.17).

Compliance and enforcement roles are discussed further in governance (chapter 17).

Figure 15.17: Trade into an account after a negative account balance, South Australian Murray, September 2011 to November 2019



Source: ACCC analysis on South Australian response to voluntary information request.

1250 Premier of Victoria, *Zero Tolerance To Water Theft In Victoria*, media release, 7 September 2020, <https://www.premier.vic.gov.au/zero-tolerance-water-theft-victoria>, viewed 2 February 2020.

1251 Queensland Department of Natural Resources, Mines and Energy, *Compliance Plan 2020–21*, 2019, https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0007/1512169/dnrme-compliance-plan-2020-21.pdf, viewed 2 February 2021.

1252 Queensland Department of Resources, *About the Rural Water Futures program*, <https://www.dnrme.qld.gov.au/land-water/initiatives/rural-water-futures/about-the-program>, viewed 2 February 2020.

1253 South Australian Department of Environment and Water, *Water Compliance Reporting and Planning 2019–2020*, <https://www.environment.sa.gov.au/files/sharedassets/public/water/water-compliance-activity-2019-20.pdf>

1254 Fees, charges and penalties, South Australian Department of Environment and Water, n.d., <https://www.environment.sa.gov.au/topics/water/water-markets-and-trade/fees-and-charges>, viewed 25 February 2021.

15.4 Anticipating market architecture issues in developing markets

15.4.1 Basin State governments have the opportunity to develop sustainable market architecture for groundwater and unregulated systems

Given the significantly greater scale of the markets and the prevalence of stakeholder concerns, this report has focused on surface water and regulated markets in the Southern Connected Basin. As such, the ACCC has not had the time and resources available to assess the water market architecture for groundwater, unregulated surface water and occasionally hydrologically connected systems in the Basin. Water markets for most regulated surface water systems are already relatively mature, with likely significant impacts associated with reforms.

However, for many water systems where markets are less developed, Basin States have an opportunity to pro-actively establish effective and sustainable water market architecture and regimes of property rights. This can be done before potentially inefficient market settings and participant behaviours become entrenched and change become more costly. Preventing issues developing by acting early and applying learnings from surface water markets will be easier and cheaper in the long-term than resolving issues as they develop. This should include establishing market architecture underpinned by sound property rights, designing trade rules which effectively address intended issues, creating effective regulatory frameworks, committing to transparent and accessible publication of market and other relevant information, and establishing effective rule making processes and bodies.

While third party impacts from flaws in market design may be negligible where volumes of trade are very small, as trade expands and market behaviours become more sophisticated, these impacts will likely grow. This is a major concern in groundwater systems where the long term environmental impacts of water take, and the interaction with other hydrologically connected surface and groundwater systems are not fully understood, particularly with the additional variable of climate change added in.

As surface water becomes relatively scarcer and water prices rise it is likely that water users will increasingly turn to groundwater usage to meet their water needs. This is already starting to be observed to a certain extent. The ACCC has heard reports that some water market participants in New South Wales are acquiring holdings with groundwater stock and domestic entitlements and converting the licence category to irrigation with limited regulatory oversight.¹²⁵⁵ At a small scale this is unlikely to be an issue, but if left without appropriate containment, it is an example of a potential flaw in market architecture that could create large issues over time if not addressed.

Likewise, the ACCC generally supports intervalley trade between hydrologically connected water sources where third party impacts are minimised. The ACCC encourages market arrangements to develop and facilitate these movements of water at appropriate times between intermittently connected water sources. However, appropriate arrangements should be put in place to ensure that private incentives align with social benefits and only trades that truly move water to its highest value use. Otherwise, third parties are going to be impacted and the net benefit will be reduced. Changes to address this will become progressively more difficult the longer this is left.

¹²⁵⁵ Presentation by Claire Smith, Clayton Utz, Annual Water Symposium.

16. Improving the transparency and design of market architecture

Key Points

- The Australian and Basin State governments should act now to address known problems by adopting a range of remedies which build on and improve existing arrangements, including:
 - committing to improved transparency for allocation determinations and publishing guidance about the management of extreme events
 - ensuring market participants more directly pay for the costs of carryover
 - continuing to more widely roll out improved technology for measuring water use, including telemetry, and harmonising the collection, storage and sharing of water use data, and ensuring compliance and enforcement regimes prevent water users' accounts going into negative balances
 - supporting improved modelling capability for water trade, delivery and use
 - refining river operations guidance to more effectively and transparently balance trade-offs
 - promptly formalising and publishing plans for managing delivery shortfalls
 - publishing regular information on conveyance losses and other delivery impacts
 - improving intervalley trade mechanisms, through fixing the 'fastest finger' problem and removing the grandfathered tags exemption from trade restrictions
 - implementing clear and integrated arrangements for delivering environmental water
 - reassessing the definition and configuration of geographic units, including trading zones, in the Southern Connected Basin.
- Work should also start now to assess how more ambitious market driven reforms could improve market and water management outcomes. These require information gaps to be filled which depends on investment in more sophisticated models, meters, coordinated registers and other technology. Many reforms which may theoretically increase market efficiency are likely to have high implementation costs and could increase complexity in the market, so will require considered assessment and stakeholder engagement, before being adopted.
- The Australian and Basin State governments should determine the likely costs and benefits of:
 - aligning water accounting with water delivery, to better understand delivery related issues
 - aligning water accounting to reflect dynamic changes in the system, through continuous accounting and/or capacity sharing
 - applying congestion or time-of-use charges, to support the use of water in off-peak periods
 - developing formal markets for rights to delivery capacity and / or water extraction, to allocate this scarce resource more efficiently
 - applying 'loss factors' to water trades to account for system losses
 - establishing an alternative market institution to improve the efficiency of water trading. This could be a 'water bank' to coordinate trading opportunities, a water market operator or 'smart market'. The 'smart market' could operate at least initially in the Southern Basin system and coordinate water delivery to users to integrate the market and river operations within the system's physical constraints.
- The Australian and Basin State governments can implement the recommendations for immediate action within existing governance frameworks. However, complementary changes to strengthen and enhance current governance arrangements will support the delivery of these recommendations and provide for more coordinated, strategic development of market architecture in future years.

This chapter outlines the ACCC's recommendations for market architecture reforms to improve the operation, efficiency, regulation, and transparency of the Basin's water markets. It describes some design principles, drawn from and updating the National Water Initiative objectives and principles, to guide future market architecture decisions and rule design.

16.1 Setting the direction for changes to market architecture now and over time

Because market architecture issues also concern broader questions of water management, in making the recommendations in this chapter the ACCC has focused on:

- assessing where water management arrangements are intersecting with market operations and inefficiently limiting trade opportunities
- identifying where there is greater potential in the design of the Basin's market architecture to use market mechanisms and improve price signals, thereby helping governments and water users to make efficient decisions and improve market outcomes.

The ACCC's assessment is that a range of changes should be made to strengthen current arrangements and build on governments' existing commitments to improve key elements of the existing architecture.

More significant changes to market design supported by changes to current governance arrangements could provide stronger foundations for efficient trade and resilient water markets. In section 16.3, a reform roadmap describes pathways for advancing robust, efficient and coordinated arrangements for managing trade and its impacts, and integrating market design with other water policies.

Some reforms could be progressed in the short term, while others will require detailed assessment and time to implement. The chapter outlines recommendations for immediate action in section 16.2. These actions will tackle urgent problems with current settings, and lay the groundwork for future improvements.

16.1.1 Benefits of reforms will need to be clearly demonstrated and costs assessed

In feedback on the Interim Report's market architecture options, stakeholders generally expressed caution about major reforms, favouring incremental improvements to current arrangements, although some individual submitters did endorse some more ambitious reform proposals (see section 13.3.4).

Making some relatively minor changes to the current market architecture will go some way to addressing the current issues with market functioning and negative water management outcomes identified earlier in the preceding chapters. However, policy makers and water users will need to explore more ambitious reforms to address the root causes of current issues and deliver enhanced outcomes from trade.

Current trends point to increased reliance on interzone trade to supply downstream use. If these trends continue, more wide-reaching changes to manage trade and delivery will be needed to ensure the associated costs and risks are appropriately reflected to market participants. Better specifying property rights so that the market sends appropriate price signals can improve market operations and help address externalities. More accurately accounting for the costs of moving, storing and using water will allow more efficient allocation of storage space, delivery capacity and water itself.

The ACCC has recommended governments explore these market design reforms with stakeholders because they offer in principle benefits. Likely benefits include more efficient allocation of trading opportunities or tools that enable costs of trading decisions to be better attributed to the trading parties. Policy makers will need to build support for the more significant changes. Engagement with water users and other stakeholders will need to give careful consideration to benefits and costs of changes, including the potential for dynamic interactions with other policies, behavioural impacts and perverse outcomes.

While offering considerable potential improvements to market efficiency, more substantial reforms may increase complexity in the market and may have high implementation costs, due to their potential to alter the characteristics of the underlying property rights and their requirement for detailed technical assessment and design. As such, more information is required in order to make decisions on which of these proposed options should be adopted.

16.1.2 Information improvements are the key to implementing reform roadmap

Governments and water users should invest in better infrastructure for the collection, sharing and use of reliable data, such as telemetered meters, information technology and registry capability, and improved hydrological and hydro-economic modelling capacity. Investing in these systems should be a priority, as it will support confidence in, and improved operation of, current rules and arrangements, and build the information base for future market design changes. The ACCC advocates for these changes within the current market architecture to be made within three years.

Improving information on the interactions between water trading, river operations and the wider environment, as outlined in chapters 14 and 15, is key to the success of long term reforms. Building this knowledge base will allow policy makers to develop more sophisticated, targeted and evidence based, and market based tools to better manage the impacts of trade and integrate market design with water management.

Determining which of the proposed pathways or combination of reforms offers the greatest net benefits at least cost will also depend on first investing in these necessary improvements to the information base. Support for these improvements should be confirmed now due to their importance in building reform capacity and the long lead times involved in making such investments. The ACCC advocates for these changes to coincide with the next Basin Plan review, in 2026.

16.1.3 Changes to governance processes will increase confidence in markets and improve outcomes for users

If the reform roadmap outlined in this chapter is to deliver the promised benefits, it must be supported by:

- clear leadership, and assignment of responsibility for market design
- coordination
- adequate resourcing
- enhancements to inter-jurisdictional decision making and implementation processes
- evaluation of policy performance and delivery.

The recommendations outlined below can be delivered within existing governance frameworks. At a minimum, Australian and Basin State governments should implement the proposed changes in unified or otherwise closely harmonised form, in consultation and coordination with each other. However, better outcomes will likely result if an appropriate body (or bodies) is given a mandate to design and deliver changes going beyond incremental improvements, and to be proactive rather than reactive in tackling existing and emerging problems. The ACCC has proposed the creation of a Water Markets Agency to perform this role (see recommendation 26, discussed in section 17.4.2).

Action on more ambitious architecture reforms should not rest on the creation of the Water Markets Agency. Basin governments should commit resources to implement changes, because the problems that they seek to address will not diminish with delay. As chapter 17 outlines, the ACCC's assessment is that Australian and Basin State governments can also improve the coordination, rigour, transparency and robustness of the process for making rule changes and market focused decisions and announcements. Recommendation 27 is discussed in the following chapter at section 17.4.5.

16.1.4 Clear market design objectives & principles should guide reforms

Basin States should be transparent and engage meaningfully with stakeholders about the trajectory that market architecture reforms need to take, and commit to shared principles that will guide reform decisions. The National Water Initiative and Basin water market and trading objectives and principles,¹²⁵⁶ underpin the current compact between governments and water users, and should continue to inform the development of market architecture reforms. The ACCC has distilled key elements of these National Water Initiative and *Water Act 2007* (Cth) principles to show how they can be specifically applied to guide the current iteration of Basin market architecture and rule design decisions (see box 14.1).

Box 16.1: Market architecture design principles

The ACCC considers the following market design principles should guide the design of Basin water market architecture:

- develop market architecture with a Basin-wide perspective
 - consider impacts on water markets, and impacts of water markets in decisions about water management and river operations, including for decisions that affect water users in other parts of the Basin
- develop rules, charges and tradeable water rights that:
 - better ensure water holders face the full costs of their use and trading decisions
 - appropriately recognise the physical constraints and hydrological connectivity of the Basin's water resources and infrastructure
- harmonise existing policies, rules and decision making processes
 - reduce or eliminate inconsistencies that are, or have the potential to, distort or constrain water market activity away from efficient outcomes
- build the capacity of water holders to make well-informed decisions about water use and trade
 - simplify, and improve the communication of information about, key market architecture elements
- improve decision making and market design by investing in water data, accounting, monitoring and modelling capabilities
 - fill information gaps, build understanding of interdependencies, improve capacity to model rule changes and market design.

16.2 Enhancing the efficient operation of current arrangements

The following recommendations identify actions that the Australian and Basin State governments should undertake now to strengthen current arrangements, and build on governments' existing commitments to improve their systems. They propose tackling urgent problems with current settings, and lay the groundwork for future improvements. The ACCC advocates for these changes within the current market architecture, to be made within three years.

¹²⁵⁶ *Water Act 2007* (Cth), Schedule 3.

16.2.1 Increase the transparency of allocations decisions and the drivers of water availability

► Recommendation 15

Increase the transparency of allocations decisions and the drivers of water availability

Basin States should increase the transparency of inputs, assumptions and administrative decision making involved in determining allocation announcements by:

- publishing in detail the steps taken and factors considered by relevant authorities
- explaining calculations and how assumptions or inputs, such as conveyance losses and forfeiture rates, have varied over time
- communicating how authorities apply discretion based on their risk appetite.

Basin States should publish accessible and easy to understand guidance, or similar, explaining how states will manage periods of extreme dry conditions and low water availability. This guidance should include the triggers for when special provisions occur and how water access will be affected – that is, how, when and on whom temporary water restrictions will be imposed.

Australian and Basin State governments should help entitlement holders better understand the changes in, and drivers of, entitlement reliability and allocations (including the role of carryover arrangements). A key part of building this knowledge of changing drivers will involve improving the transparency and understanding of how water allocated to different water access right categories is influenced by accounting for conveyance losses, carryover policies and use, and climate variability. Building knowledge in this regard should also be an element of the proposed Water Market Education Program (see recommendation 13).

This information and improved transparency will help stakeholders to interpret market information and understand the drivers of changes, likely supporting improvements to market confidence.

State entitlement frameworks and allocation decisions are water management (not market) decisions, but they significantly influence the market by governing access to and supply of water. Stakeholders are concerned about interactions between allocations policies and other elements of market architecture (carryover, treatment of conveyance losses) and, specifically, the potential for concentration of trade related impacts on low reliability entitlement holders. The ACCC has focused on its recommendations on addressing issues relevant to these stakeholder concerns.

The ACCC recommends that Basin States take a more proactive approach to ensuring water users understand their allocation rules, decisions processes and the trends in, and drivers of, changes in reliability. Targeted communication and greater transparency will improve consistency of access to information, with smaller water users particularly likely to benefit. Currently, sophisticated market participants hold a competitive advantage because they can dedicate greater resources to understanding complex allocations information, enabling them to make more accurate predictions. Improved information would help build predictability and confidence, which should translate to improved efficiency, as water users make more informed decisions.

Improve understanding of how entitlement reliability, allocations and carryover policies work

Rules and policies have evolved significantly over the last several decades, along with other substantial shifts in water availability and the agricultural sector more broadly. The rules are also complex, vary greatly between regions and states (the reasoning for which is not always well understood), and simple explanations are not always readily accessible.

The ACCC believes the benefits of improving transparency would be greatest in New South Wales, due to widespread stakeholder concerns about a range of water sharing, entitlement and allocation related

issues. New South Wales should also ensure that stakeholders are aware of the interaction between carryover and carryover parking, and account limits.

Basin States should make attempts to eliminate and reduce the proliferation of myths, misconceptions and conspiracy theories. The best way of doing this is through improved transparency.

Improve transparency of decision-making on allocations

The ACCC acknowledges that Basin States already make significant efforts to publish information about the inputs used in determining allocation announcements. However, stakeholders still feel that the decision making methodologies are insufficiently transparent. In particular, it can be unclear to water users how much discretion is afforded to water managers in making allocation decisions, how this discretion is being used and whether this is changing over time.

The 2018–19 report from the Independent River Operations Review Group (IRORG) proposed a particular avenue for how transparency improvements could be made:

IRORG observes that if states are using ‘informal’ assessments for water allocation determination or seasonal outlook advice, it may be appropriate for [Water Liaison Working Group] to review the agreed schedule and processes for provision of resource assessments to ensure accurate information is available in a timely manner to support market sensitive water announcements.

In Queensland, the relevant department¹²⁵⁷ has published allocation calculations in some valleys and improved the transparency of decision making. The Operations Manual for the Upper Condamine Water Supply Scheme includes the specific calculations undertaken in determining announced allocations.¹²⁵⁸ The department also publishes a downloadable calculation spreadsheet which demonstrates the relevant formulas involved in determining allocation levels for the Pioneer groundwater system.¹²⁵⁹

The ACCC acknowledges that operational processes, modelling and calculations for large and complex surface water systems in the Southern Basin are likely to be more complex than for simpler schemes, such as the Pioneer groundwater system. However, until Basin States commit to taking a less ‘black box’ approach to allocation decision making, water users will continue to mistrust decision makers, and lack confidence in their decisions, with flow on effects for accurately estimating short and long term supply expectations. Basin States should also observe recommendation 9 in this report, about implementing prescribed rules and process for water market announcements.

Publish simple guidance on the management of ‘extreme events’

Periods of extreme water shortages have historically occurred intermittently, but their occurrence is predicted to increase with climate change. Basin States will sporadically have to deviate from their usual approach to water sharing to manage these circumstances. This is particularly true in water sources where water sharing decisions are based on inflow assumptions that are held constant, and not updated with climate change.

Consultation revealed that some water users do not appear to understand the rules and decision-making processes associated with how New South Wales manages periods of severely reduced water availability.¹²⁶⁰ New South Wales is authorised under incident response guides to temporarily restrict water access (most commonly through restricting carryover access). However, for a user not already aware of these guides, identifying and locating them through the NSW Government website would be difficult. Ministers in other Basin States also have powers to restrict water access in similar circumstances.

¹²⁵⁷ Until 12 November 2020, responsibility for water in Queensland sat with the Department of Natural Resources, Mines and Energy. It now sits with the Department of Regional Development, Manufacturing and Water.

¹²⁵⁸ Department of Natural Resources, Mines and Energy, *Upper Condamine Water Supply Scheme Operations Manual*, 2019, https://www.mdba.gov.au/sites/default/files/pubs/qld-upper-condamine-water-supply-scheme-operations-manual-2019_1.pdf, viewed 21 February 2021.

¹²⁵⁹ Queensland Department of Resources, *Announced entitlements and announced allocations*, <https://www.business.qld.gov.au/industries/mining-energy-water/water/authorisations/announced-entitlements>, viewed on 28 January 2021.

¹²⁶⁰ ACCC, *Murray-Darling Basin water markets inquiry public forum – Dubbo*, 18 November 2019, <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20Water%20Markets%20Inquiry%20-%20Summary%20of%20Dubbo%20public%20forum.pdf>, viewed 7 February 2021.

Basin States should build awareness of the management arrangements that will apply in periods of extremely low water availability, the implications for water users, and how and when users will be informed of triggers being met. The ACCC considers this information should take the form of simple and plain English ‘fact sheets’ explaining how water sharing conditions will change during extreme events. Further, the existence and role of the New South Wales guides needs to be more effectively communicated to stakeholders. These could be centralised on the the proposed Water Market Information Platform (recommendation 12).

The ACCC also recommends long term reform options in the form of capacity sharing and continuous accounting be assessed on their merits and potential to offer significant improvements to the transparency of allocation announcements. This is discussed in section 16.3.2.

16.2.2 Improve efficiency in accounting for the costs of carryover

► Recommendation 16

Improve efficiency in accounting for the costs of carryover

New South Wales and South Australia should update carryover rules and policies to appropriately account for evaporation losses associated with storing water in a dam beyond the year in which that water was allocated, and attribute those losses to the individual.

South Australia should update its registers and trade forms to be able to identify carryover parking trades.

Once robust data on trade for carryover parking is available, Basin States or the proposed Water Markets Agency (if established in time) should assess whether demand for storage space (as measured by carryover parking trade) is such that carryover is generating externalities (such as opening or closing trade barriers) which cannot be adequately managed through carryover policy or rule design.

This is to ensure that individual users face the full costs of their decisions, such as evaporation losses, and the water accounting more accurately reflects the hydrological realities of the system, to drive more efficient decisions by individuals about use of available storage capacity and water.

Basin States should seek to harmonise arrangements for accounting for evaporation losses, both for new allocations and for carryover, and should move towards individual attribution of losses, as far as current accounting mechanisms permit. States’ different approaches to accounting for evaporation losses for water carried over create an uneven playing field, and introduce incentives for users to trade to arbitrage between different arrangements.

Some carryover policies – and water allocation policies – take the approach of socialising evaporation losses amongst water users. With respect to new water allocations, water is set aside to cover predicted evaporation losses before allocations are made to entitlement holders. With respect to water being carried over, Basin States each take a different approach to accounting for evaporation losses, as outlined in section 15.2.5.

Generally, the ACCC found that carryover policies work well in offering a risk management tool, smoothing prices across water years and allowing water users to access water earlier in the year. However, where carryover costs are socialised – that is, not internalised to the person using carryover – they could lead to inefficient outcomes and reduce other water users’ allocations. The ACCC found that spill risk is generally well accounted for by carryover policies or account limits.

Victoria’s policy of deducting 5% from individual volumes carried over comes closest to the ideal of individual attribution; although this policy still does not account for how long carryover water actually remains in storage within the new water year. Also, as identified in section 15.2.5, the ACCC considers that the 5% deduction rate may actually exceed likely true evaporation, and as such may need to be revisited.

Ideally, accounting for evaporation losses would occur at the level of individual entitlement holders, taking into account the actual length of time that water is held in storage. However, the ACCC acknowledges that current accounting arrangements – particularly the inability to track water parcels from the time they are issued as new water allocations to the time they are used – currently prevents such an individualised approach to attributing evaporation costs. The ACCC has recommended Basin States develop the ability to ‘track and trace’ allocations – see recommendation 11. Improving accounting mechanisms, including the ability to ‘track and trace’ allocations, and more frequent accounting reconciliation (such as continuous accounting, discussed in section 16.3.2), would enable a move towards more individualised attribution of evaporation costs, over the longer term.

The ACCC understands that South Australia is currently investigating opportunities to amend trade application forms to capture carryover as one possible ‘reason for trade’ and record this data as part of the Water Management Solutions project. Victoria and New South Wales have already implemented changes to their trade forms and registers to identify ‘carryover parking’.¹²⁶¹ Improvements to the ability to identify carryover parking trades (see recommendation 6 – reasons for trade) will have multiple benefits, including helping market participants with carryover parking price discovery, facilitating more informed trading behaviour. They will also help river operators better understand the delivery implications of traded water (that is, whether water traded will actually be used in its new location or will be traded back to its original location).

Even though carryover parking is a “paper” trade, and the water remains sitting in the dam, this can still have implications for river operations, trade rules, account limits and other accounting mechanisms. Capturing better data on the demand for carryover parking and demand for storage access will also permit more accurate assessment of the market impacts of carryover parking. Current volumes of carryover parking appear to be small. However if carryover parking grows, it may result in trade flows that affect the broader market, including by opening and closing trade limits. Once there is adequate data, the proposed Water Markets Agency (see recommendations 25 and 26) or, in its absence, Basin States could examine whether the impact of carryover parking on trade limits, water accounting and river operations, is great enough to justify the transition towards capacity sharing and continuous accounting.

1261 Victorian Department of Environment, Land, Water and Planning, *Victorian Water Register – Introduction of reason for trade for online allocation trades*, <https://waterregister.vic.gov.au/about/news/327-introduction-of-reason-for-trade-for-online-allocation-trades>, viewed 28 January 2021; WaterNSW, *FAQS – Water Trading*, <https://www.watnsw.com.au/customer-service/ordering-trading-and-pricing/trading/faqs-water-trading#stay>, viewed 28 January 2021.

16.2.3 Strengthen metering and monitoring

► Recommendation 17

Strengthen metering and monitoring

Australian and Basin State governments, and the MDBA should strengthen existing commitments to better metering and measurement of water take across the Basin through:

- continuous improvement and harmonisation of the metering standards and technology in use in the Southern Connected Basin. In particular, South Australia should commit to upgrading its metering standards to require telemetry where cost effective
- implementation of telemetry across the Southern Connected Basin, where technologically possible and cost effective
- monitoring progress on the measurement and outcomes of overland flows/flood plain harvesting. In particular, Queensland and New South Wales should continue efforts to more accurately measure overland flows/floodplain harvesting using new technologies; and to bring these forms of water take into the licensing framework
- Basin States, in consultation with the MDBA and the proposed Water Markets Agency should implement a consistent approach across jurisdictions and reporting agencies for the collection, storage, transmission and reporting of usage data. This should be consistent with existing Basin Compliance Compact commitments on the automation of reporting of water take, and with any relevant proposed Water Market Data Standards (see recommendation 7)
- Basin States should improve compliance and enforcement programs and invest in systems to identify and prevent water users being able to go into negative balances by extracting more water than is available in their account.

This could be achieved by extending and expanding the scope of the Basin Compliance Compact.

These measures will provide a foundation for good management of markets and water resources, increase the confidence and trust of market participants and water users generally, and support other improvements to market architecture, modelling and water information.

The Basin Compliance Compact has driven major improvements in metering policies by the Basin States in recent years, and the ACCC commends states for their considerable progress against their commitments. However, Basin States risk not meeting their commitments under the Compact within the given timeframes. The ACCC sees a need for the extension and expansion of these commitments.

Accurate measurement of extraction supports the effective operation of water markets by maintaining the value and integrity of trade and entitlement frameworks, and helps to ensure water take remains within sustainable diversion limits. Additionally, more comprehensive use data – obtained through metering and other technologies to measure water take – will support better understanding of water movements, water use and the relationship between trade and delivery, improving river operations decisions and tools to manage water delivery and conveyance losses.

In particular, telemetry will facilitate more robust compliance and enforcement monitoring, allowing easier prosecutions for water theft (which are challenging due to the highly technical nature and high burden of proof required) and the collection of real time usage data. Addressing stakeholders' concerns that some states' metering policies can allow users to go into negative balances due to the lag in reporting of usage will build confidence in the market and improve market integrity. For South Australia, this will likely require widespread telemetry and more timely use data.

16.2.4 Improve modelling of delivery and trade

► Recommendation 18

Improve modelling of delivery and trade

Australian and Basin State governments should improve modelling of water use, delivery and trade across the Basin, including through improving linkages between models. Specifically, this can be achieved by working with and supporting:

- the MDBA, and relevant industry and academic bodies, to continually improve hydrological and river modelling capability and research
- the MDBA, the Australian Bureau of Agricultural and Resource Economics and Science (ABARES), the Bureau of Meteorology, and relevant industry and academic bodies, to improve hydro-economic modelling¹²⁶² capability and research.

This will help policy makers better understand and predict the impacts of water trade and associated changing patterns of usage on conveyance losses and delivery risks; improve and update water user behavioural assumptions; and strengthen the capability to forecast and incorporate trends in crop mixes and climate change scenarios.

Modelling capability is a significant influence on the quality and timeliness of water management decisions and their acceptance by stakeholders. Modelling and information gaps presently impede the assessment of trade's contribution to emerging problems. They inhibit water managers' ability to assess the merits and proportionality of potential longer term reforms to market architecture. With more accurate use information and model enhancements, water managers will be able to undertake more accurate and sophisticated scenario planning, which may help run the river more efficiently within its hydrological constraints and ecological tolerances.

Noting the significant existing modelling capability across the Basin, Australian and Basin State governments nonetheless need to commit to supporting continual improvements to modelling capabilities, in particular for river operators and water managers. Improvements to hydrological and hydro-economic models will support more efficient markets by helping water managers evaluate risks and assess the costs of current market architecture flaws, and informing the development of better design options for Basin market architecture.

Models need to continually improve the way they represent trade and water user behaviours in order to accurately reflect the current settings to provide an up-to-date basis for comparison with scenarios that test different elements of the system. A better ability to represent how water users behave will put river operators and policy makers in an improved position to manage long term risks and assess policy options to manage issues at lowest cost.

The ACCC is aware of the significant modelling capability of the ABARES, including ongoing work on the behaviour of water users in accessing carryover. There may be a role for ABARES, the Bureau of Meteorology, and other industry or academic bodies to assist in the development of more accurate water use behavioural profiles and forecasts of crop types.

The ACCC also understands that some progress is being made by the MDBA and Basin States in developing consistent modelling software which allows for the effective linking and interaction between different Basin State and MDBA models. However the MDBA submitted that:

All Basin States have committed to transitioning their river systems models to a SOURCE modelling platform. However, progress to this transition and consequent revisiting of model calibrations, especially for low flow periods such as millennium drought, has been slow.

¹²⁶² Hydro-economic modelling combines economic management concepts with an engineering level of understanding of a hydrologic system. Hydro-economic models integrate spatially distributed water resources, economic values, infrastructure, and management policies. Models optimize water allocation between different uses across time and space taking into account various physical, economic, environmental and institutional constraints. Food and Agriculture Organisation of the United Nations, *Hydro-economic modelling for the basin management of the Senegal River*, 2018, <http://www.fao.org/3/CA1968EN/ca1968en.pdf>, viewed 15 January 2021.

Key water management, sharing and compliance decisions are based on these models. As such, it is important that these models are recalibrated using a contemporary modelling platform; and that the models are made publicly accessible for transparency, and available to the research community for furthering science and improving predictive capability.¹²⁶³

This work will be crucial to establishing a common modelling framework for assessing the effects of policy changes, climate impacts and other developments on Basin water markets. Aligning various Basin models will help improve the consistency of information released to the market, with likely benefits for market confidence. For these reasons, supporting work to improve the compatibility and integration of Basin models should continue, with the long term aim of building a current, consistent, transparent and fully integrated Basin hydrological model.

Understanding the impact of climate change is also going to become increasingly significant. There is a need to better incorporate climate change modelling in a standardised and holistic way across the Basin. The MDBA's ability to incorporate climate change forecasts into Basin-wide forward planning models is currently limited, and work should be done to develop a common approach between the MDBA and Basin States for considering whole-of-Basin climate change impacts.

The MDBA stated in 2019 that it needs to 'understand specifically what climate change is likely to mean for the hydrology of our rivers, the way we operate them, the effect on water quality and water-dependent ecosystems and how water markets and trade will operate in the future'.¹²⁶⁴ The ACCC acknowledges and supports the ongoing work between the Bureau of Meteorology and the MDBA, to incorporate more dynamic streamflow forecasts based on global climate models.¹²⁶⁵

16.2.5 Formalise and communicate plans for managing shortfalls

► Recommendation 19

Formalise and communicate plans for managing delivery shortfalls

Basin States and the MDBA should move promptly to:

- formalise their arrangements for managing shortfall events, including how they will enforce those arrangements
- publicly release plans, or a joint plan, that clearly and with consistent messaging, describe:
 - the delivery risks faced by water users, and how these will be communicated to users in a timely fashion
 - how a shortfall would be managed by authorities, including the mechanisms and approaches that will be used to ration water use
 - how water users can take steps to mitigate their own risks or potential impacts of shortfall events based on their location in the river system.

This will give irrigators more certainty about how water deliveries will be managed in times of high demand and potential shortfall. This will help irrigators make decisions about, for example, whether they invest in water storages on their farms.

In recent years, the MDBA as river operator has had to manage an increasing risk of delivery shortfall¹²⁶⁶, driven by multiple factors including changes in water use due to trade. Trade restrictions, which are used as a proxy to manage delivery obligations, do not directly manage shortfall risk.

1263 MDBA, *Submission to Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 11.

1264 MDBA, *Climate change and the Murray-Darling Basin Plan MDBA Discussion Paper*, February 2019, <https://www.mdba.gov.au/sites/default/files/pubs/Climate-change-discussion-paper-Feb-19.pdf>, viewed 28 January 2021.

1265 MDBA, *River Murray System Annual Operating Outlook 2020-21 water year 1 June 2020 – 31 May 2021*, July 2020, <https://www.mdba.gov.au/sites/default/files/pubs/River%20Murray%20System%20Annual%20Operating%20Outlook%202020-21.pdf>, viewed 13 February 2021.

1266 Delivery shortfall arise when demands for water unexpectedly spike in the short term because of a period of hot weather and these demands are unable to be fully met requiring short-term (temporary) restrictions to deliveries.

Shortfalls are likely to manifest quickly and require rapid responses. A major shortfall event occurring in the absence of well-defined processes to manage it, will likely result in significant impacts on the environment (as extractions exceed environmental tolerances) and unequal impacts on water users (such as greater impacts on those further downstream).

Rights to on-river water delivery are generally not separately defined or capped in the Southern Connected Basin, and the conditions on, and rights contained in works licences are not defined in a way that would enable them to be readily used for rationing or sharing if a shortfall occurred. The specifics of how rationing mechanisms would be imposed are not well specified or communicated to the market. Further, it is not entirely clear how operational measures could be used to complement the use of rationing arrangements.

The Frontier Economics' report proposed options including formalising how extractions will be managed or controlled during a shortfall, communicating how shortfall events will be managed, and investigating further the significance of the risk of system shortfall across the Southern Connected Basin.¹²⁶⁷ The Independent Panel for Capacity Projects Review came to similar conclusion and stated that 'communication needs to be planned carefully with a view to providing stakeholders and communities with the best available information on the current understanding of system and delivery shortfall risk and a clear pathway for input into decisions on management options'.¹²⁶⁸

This recommendation focuses on improving information about delivery risks and the steps that will be taken by water managers in a shortfall event to give additional certainty to irrigators around their delivery reliability. This will enable irrigators to better determine whether they should have more on-farm storage to reduce shortfall risks given the nature of their operations and water holdings. Strengthening modelling capability and committing to further investigation of the proportional impact of water trade on delivery risk, will help develop the evidence base for considering whether more significant reforms are needed.

While the proposed recommendations do not address the underlying drivers of increased delivery risk, they help clarify how risks will be mitigated and the impacts of a shortfall shared, rather having those losses borne largely by water users of particular types or in particular locations.

The ACCC also recommends investigation of longer term reforms to address the underlying flaws in market architecture to address delivery issues, such as time-of-use charging, further unbundling of on-river delivery rights and investigation of alternative market models. These are outlined in section 16.3. More substantial reforms to fix underlying flaws in the market architecture would be costly, add significant complexity to the market and require pre-requisite reforms to be implemented first (such as mechanisms for tracking allocation trade).

The ACCC is supportive of the work being done and the options being investigated by the Independent Panel for Capacity Projects Review.¹²⁶⁹ The ACCC does not purport to make recommendations about the operational and infrastructure based options being considered by the panel (supported by the Capacity Policy Working Group). Nevertheless, many of these offer promising solutions that will help alleviate delivery issues over the medium term. It should be noted that infrastructure solutions (such as to expand the delivery capacity of the Barmah Choke, or building bypasses) will not address the underlying flaws in the market architecture.

Likewise, the ACCC understands that there would significant benefit to alleviating delivery pressures from progressing the constraints management strategy. While the ACCC appreciates the sensitivities and challenges of progressing this work, it is likely that doing so will significantly reduce the risk of environmental water and consumptive water use competing for channel capacity and generally assist with the delivery of environmental water, helping to reduce shortfall risks.

1267 Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 26 October 2020, available at: <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/accc-commissioned-research>, p. 65.

1268 J Doolan, D Davidson, D Harriss, T Hillman, P Simpson & G Turner, *Independent Panel for Capacity Project Review, Report to Murray-Darling Basin Ministerial Council*, 17 December 2019, <https://www.mdba.gov.au/sites/default/files/pubs/ipcpr-minco-final-report-2019.pdf>, viewed 22 February 2021, p. 20.

1269 J Doolan, et al., *Independent Panel for Capacity Project Review, Report to Murray-Darling Basin Ministerial Council*, 17 December 2019, p. 15..

16.2.6 Refine river operations guidance to more effectively and transparently balance trade-offs

► Recommendation 20

Refine river-operations guidance to more effectively and transparently balance trade-offs

River operations guidance should be refined, to more effectively and transparently balance trade-offs. Specifically, that the MDBA and Basin States, through Basin Officials Committee, should work together to:

- update key governance documents and operational guidance to clarify how important 'trade-offs' between operations, market activity, trade opportunity and the impacts on third parties and environmental risks will be managed
- better integrate consideration of impacts on and of trade and market design into operational decision making
- establish ecological tolerances within which to operate in the Southern Connected Basin, and enshrine these in whole-of-system operational guidance for river operators
- ensure that reviews of river operations also include a section which analyses the market effects of river operation decisions and the way decisions are announced.

This is to improve guidance to river operators and policy makers on how to manage operational, environmental and market trade-offs, more effectively integrating and improving understanding of the interaction between water management and water markets and the management of connected systems in an integrated way.

River operators face conflicting objectives and trade-offs in trying to maximise delivery reliability, minimise conveyance losses and protect the environment. They must assess and decide how to manage these trade-offs, which mean that some impact on users or the environment will be inevitable. While avoiding trade-offs is impossible, formalising and communicating the guidance and processes for managing these trade-offs through more transparent decision making will help river operators when making trade-offs and give users more certainty about how decisions will be made.

The scheduled review of Schedule D to the Murray-Darling Basin Agreement (due to be completed 2022) offers an opportunity to focus on how best to align and formalise linkages between Schedule D protocols and the River Operations Objectives and Outcomes documentation.

Revised guidance may involve specifying more prescriptive and risk-based parameters for balancing conflicting objectives, through the review and amendment of these key governance documents. Changes need to continue to provide some flexibility and ability for river operators to make 'emergency' decisions in exceptional circumstances, but overall should offer improved transparency and predictability to the market, which will likely improve market confidence.

A similar idea was raised in the IRORG 2019-20 report:

IRORG recommends that the MDBA consider adopting a more quantitative risk assessment approach to provide improved clarity and assist in making complex river operations trade-off decisions¹²⁷⁰

Volumes of intervalley trade (IVT) have grown to a substantial volume, far beyond what was initially anticipated when markets were established. Expanding the scope of river operations guidance to better and more holistically incorporate handling of traded volumes of water (such as intervalley trade) will help integrate water management with water market. This will help address some third party impacts and provide more certainty to the market. River operators also need to be aware of the potential market

¹²⁷⁰ Independent Review of River Operations Group, 2020, *Review of performance against objectives and outcomes – 2019/20*, viewed 28 January 2021, <https://www.mdba.gov.au/sites/default/files/pubs/review-of-performance-against-objectives-and-outcome-2019-20.pdf>, p. 21, viewed 22 February 2021.

impacts of river operations decisions (such as calling out IVT water, which opens up trade opportunities) and take this into account when making announcements around actions being taken (these announcements could potentially fall within the scope of proposed recommendation 9 – Implement prescribed rules and process for water market announcements).

Changes to guidance should also be supported by further work to establish ‘ecological tolerances’ of the Southern Connected Basin, including how these will vary with climate change.¹²⁷¹ While the Victorian Government has been clear about the 940 ML/day threshold for environmental impacts in the Goulburn, the NSW Government stated it has not considered it necessary to undertake a similar formal assessment for tributaries in New South Wales. The case for incorporating ecological tolerances, or sustainable flow limits, into river operations guidance is made in the 2018-19 IRORG report:

This highlights the sometimes conflicting objectives in the [River Operations Objectives and Outcomes] document, and the difficulties inherent for operators in trying to meet a range of objectives when the sustainable flow limits through key parts of the system are not well codified. [Basin Officials Committee] may also need to determine which outcome(s) should be the higher priority when such conflicts occur and set clear limits for acceptable river operations where appropriate.

The MDBA recently decided to publish the Annual Summary of River Operations and IRORG’s Review of Performance against Objectives and Outcomes for 2019-20 on its website. The decision to publish these reports is a significant and valuable contribution to improving transparency of river operations, which will benefit the market through improved confidence and participant understanding. The annual publishing of these reports would reinforce these benefits.

The ACCC believes a useful addition to IRORG annual reports would be an assessment of how river operations decision making, and the communication of these decisions, affected water markets. To improve predictability and market confidence, river operators should communicate clearly, transparently and as early as possible about the actions they are taking which may influence markets (such as by influencing trade opportunities or highlighting expectations of increased shortfall risk). Including this assessment in annual review documentation will help improve the understanding of how operational actions affect markets, and inform better communications to market participants in the future, leading to improved market confidence and business decision making.

Recommendations to improve modelling capability (see section 16.2.4) will also assist river operators to manage trade-offs between competing objectives by allowing improved understanding of conveyance loss impacts and delivery risks. Similarly, formalised plans for managing shortfall events (section 16.2.5) will improve operational flexibility, by better positioning water managers to mitigate the impacts of a shortfall if one does materialise.

¹²⁷¹ In this context, ecological tolerances refer to the limits of what the river system can withstand without sustaining unacceptable environmental damage.

16.2.7 Improve transparency of conveyance losses and other delivery impacts

► Recommendation 21

Improve transparency of conveyance losses and other delivery impacts

The MDBA and Basin States should improve the transparency of conveyance losses and other delivery impacts. Specifically, that the MDBA should commit to the active and ongoing monitoring, and communication about trends and drivers, of conveyance losses through the annual publication of the 'River Losses in the River Murray System' report, in a timely manner following the finalisation of each water year. Basin States should also consider releasing similar reports to explain the nature and drivers of conveyance losses in other rivers where concerns are present, such as the Murrumbidgee.

This will help water users and their communities better understand the relevant issues and operational considerations, and provide further evidence to water managers in considering potential avenues for revising how these losses are accounted for within the market architecture.

The 2019–20 IRORG Report called for the MDBA to continue to focus on enhancing the monitoring, analysis and reporting of losses in the River Murray system, noting 'a good understanding of losses and the drivers of loss in river systems will assist in better forecasting the volumes of water needed to cover losses and improve system management'.¹²⁷²

In March 2019, the MDBA released the Conveyance Losses in the River Murray System 2018–19 report, which has proven to be an informative and useful resource shedding light on how conveyance losses are monitored, calculated and influenced. The ACCC understands the MDBA was planning to update this report for the remainder of the 2018–19 water year, and to release subsequent report on an annual basis. However, no further reports in this series have been published at the time of writing. There would be value in these reports becoming a regular and timely annual release. Similarly, the ACCC considers release of similarly focused reports explaining the nature and drivers of conveyance losses in other rivers where concerns are prevalent, such as the Murrumbidgee, would help improve understanding of the drivers of changes.

The ACCC also notes that other recommendations listed in this chapter will assist with transparency and understanding of conveyance losses including increased transparency of allocation policies (section 16.2.1), strengthened metering (16.2.3), changes to river operations guidance (16.2.6), and reviewing geographic units (16.2.10).

Improved modelling (16.2.4) will also strengthen the evidence base for the appropriate long term solutions to managing conveyance losses. It is extremely unlikely that modelling will ever be able to accurately calculate the conveyance losses associated with every individual water use decision. However, there is scope for additional scenario analysis to be undertaken to help reduce information gaps about the aggregate impact of trade on conveyance losses.

The ACCC also recommends investigation of conveyance loss factors that could be applied to water trade and delivery as more direct long term options of better attributing conveyance losses to those that incur them. This is discussed in section 16.3.2.

¹²⁷² Independent Review of River Operations Group, 2020, *Review of performance against objectives and outcomes – 2019–20*, p. 24.

16.2.8 Improve intervalley trade mechanisms

► Recommendation 22

Improve intervalley trade mechanisms

Basin States and the MDBA collectively and, where required, Victoria and New South Wales separately, should improve and harmonise the operation of the rules governing intervalley trade and trade through the Barmah Choke, by:

- improving the efficiency and equity of access to the opportunity to trade, which are currently largely 'first in, first served'
- removing the exemption in Basin Plan water trading rule 12.23 for 'grandfathered' tagged water access entitlements, because it affords a small number of market participants an inequitable exemption from restrictions on trade
- considering if current 'rolling' intervalley trade limits can be replaced with 'dynamic limits' – to develop trade rules that better match opportunities to trade with the constraints of the physical system.

Revising intervalley trade arrangements so that trade opportunities more accurately reflect the benefits, costs and risks of water use and delivery will encourage market participants to make efficient usage, trading and investment decisions. Dynamic limits that change to increase trade opportunity at times when there are fewer impacts on the river system, such as during late winter in alignment with natural flow patterns, and to reduce trade when there are negative impacts on the river system, such as at times of peak demand in summer, will help with this. Removing exemptions that undermine effective operation of limits will also improve market operation and outcomes.

The ACCC found that the current market architecture of the Southern Connected Basin does not strike an appropriate balance between encouraging trade opportunities, accounting for impacts on the other parties and protecting the environment. In particular, the ACCC is concerned about two key imbalances:

- Current mechanisms for interzone allocation trade and delivery of traded water are allowing localised environmental impacts in the river system, which are not adequately controlled in the current system.
- Current mechanisms for interzone allocation trade and delivery of trade are causing third party impacts in the form of increased delivery risk to water users. This risk is inadequately communicated to users, and (as outlined in section 14.2.2) Basin State policies for managing shortfall events are not well specified and poorly communicated to the market, contributing to further uncertainty.

The ACCC is aware that Victoria and New South Wales have considered IVT issues recently, including discussing them in the intergovernmental Trade Working Group. A first step may be for Basin States to more formally task and resource this committee to continue to advance these issues, prior to transferring this work to the proposed Water Markets Agency.

The ACCC considers that the following objectives should guide reform of intervalley trade rules:

- rules should be dynamic – that is, not designed for an assumed pattern of water availability, use or trade
- rules should allow equitable access to intervalley trade opportunities
- rule design should aim to maximise opportunities to trade, subject to physical constraints and environmental limits
- rules should allow users to more directly experience the costs and benefits of their own (trading and use) actions and not to shield them from shortfall risk, as occurs under current policies
- rule design should be robust:
 - rules should not allow some users to operate outside the mechanism, especially in ways which undermine the integrity of that mechanism
 - rules should effectively manage environmental impacts through timely and responsive actions to limit damage.

Proposed reforms to intervalley trade arrangements have three main dimensions: improving efficiency of allocation of trade opportunity; removing the exemption for grandfathered tags that hampers the fair and efficient operation of water markets, and considering if rolling IVT limits can be replaced with dynamic limits.

Improve the efficiency and access to trade between valleys and through the Barmah Choke

Current IVT operation results in inefficient outcomes. The opportunities for intervalley trade operates on a ‘first come, first served’ queuing system. This favours well-resourced participants and trades may occur that are not efficient. There is also widespread concern that IVT operation is not transparent, and may be unfair or inequitable.

The ACCC recommends use of a market based mechanism for allocating the capacity for trade through IVT restrictions and the Barmah Choke. This is likely to be more efficient, as well-functioning market based mechanisms will allocate the capacity to those who value it most. Gaining access to IVT allows parties to purchase water in one zone and sell it in another. Market forces would be expected to value this right at the price difference between the source and destination trading zones.

The objective of using a market mechanism to allocate IVT opportunities is to ensure that only ‘efficient’ trades take place (that is, trades that provide a net benefit to society). In addition, by ensuring that these rights are allocated through a price based mechanism – not first come, first served – the incentives to invest to obtain the ‘fastest finger’ should be eliminated.

Under the ‘first come, first served’ approach, considerable time and resources may be spent by multiple parties – even those who are unsuccessful – in attempting to gain access to IVT opportunities. For example, multiple brokers might all invest in information technology hardware or algorithms in an attempt to be at the front of the queue. This expenditure is inefficient; those resources would be better off devoted to something else.

The ACCC does not recommend a ballot or lottery to allocate the trade opportunity as, this mechanism does not provide certainty for water users. It is also less ‘efficient’ in that it awards a windfall gain of the opportunity to trade on a random basis, not via a mechanism such as a market-determined price, which takes into account supply and demand factors, including individual valuations of intervalley trade opportunities.

The ACCC acknowledges that applying a pure market mechanism to IVT openings means allocating IVT opportunities to those who are prepared to pay the most for them. The ACCC’s view is that efficient allocation of IVT opportunities is an appropriate objective, and is consistent with the National Water Initiative.

However, it is worth noting that equity considerations are also relevant. Currently, IVT opportunities are rationed using time and resources. The market participants who are able to gain successful get access to the intervalley trade opportunity are those that can afford to have a full time staff member or

program to constantly check the trade opportunities. This highlights the difference between the ideas of ‘equity of access’ (where all market participants have equal ability to bid for trade opportunities) and ‘equity of outcome’ (where all market participants would receive an equal share of trade opportunities).¹²⁷³ The ACCC notes that market mechanisms can be designed to incorporate equity considerations, but it is a matter for governments to clearly identify how these considerations should be addressed in design of the allocation mechanism.

The ACCC notes there are various different kinds of mechanisms that could be adopted in preference to current arrangements:

- an auction mechanism, where IVT capacity is auctioned off at a specific time
- a ‘water bank’ or ‘water market operator’ who moves water from sellers in the source zone, and auction off water to buyers in destination zones. A more comprehensive version of this which redesigns how all water moves (not just traded water), is discussed within option 6, in section 16.3.2).

Removing the exemption for ‘grandfathered’ tagged water access entitlements

Because the current arrangements for ‘grandfathered’ tagged water access entitlements afford a small number of market participants an inequitable exemption from restrictions on trade, the ACCC recommends that the Australian and Basin States governments work collectively to remove the current exemption, with legislative amendments to be made as soon as possible.

Conclusively removing the exemption would require amending the Basin Plan Water Trading Rules 12.23. Amending an aspect of the Basin Plan is a significant process requiring the MDBA to consult with stakeholders; and to seek ACCC advice.¹²⁷⁴ If the necessary legislative changes are delayed, the process for removing the exemption should be rolled into the scheduled review of the Basin Plan in 2026 at the latest.

In the meantime, Basin States should consider whether there are alternative steps available to address these issues under State water management law in a way which is not inconsistent with Rule 12.23. Specifically, the ACCC recommends that the Basin States consider whether all water entitlements for which grandfathered tagging has been claimed are, in fact, entitled to the benefit of Rule 12.23(2). For example, the ACCC understands that this question has been raised in relation to the transfer of water onto a number of tags in the Murrumbidgee water source that are related to ‘zero-share’ Water Access Licences, because they are not subject to a water allocation. The ACCC recommends that the Basin States and MDBA seek advice about the validity of these and other grandfathered tags to consider the question of whether the tagging is consistent with Schedule D of the Murray–Darling Basin Agreement.

Review whether current ‘rolling’ intervalley trade limits can be replaced with ‘dynamic limits’

As explained in section 14.1, water authorities use IVT accounts to track the bulk movement of water between systems – what one river ‘owes’ to the other – and to ‘ensure there is sufficient supply as a result of a sale to meet the purchaser’s demand’.¹²⁷⁵ The use of IVT limits as a water delivery and trade management mechanism, and their current numerical values, are routinely justified on the grounds of protecting the environment and providing ‘appropriate protection of third party interests’.¹²⁷⁶

The ACCC recommends that the Basin States, particularly New South Wales and Victoria, review whether these current ‘rolling’ intervalley trade limits can be replaced with ‘dynamic limits’, to develop

¹²⁷³ Note that higher willingness to pay of market participants does not constitute a lack of equity of access, as long as market participants are equally able to enter their bids and trade applications.

¹²⁷⁴ This inflexibility prompted Frontier Economics to recommend consideration of moving the water trading rules out of prescriptive, inflexible legislative instruments. Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 26 October 2020, p. 97.

¹²⁷⁵ For more detail on current Victorian IVT issues, see Victorian Government, *Changes to the Goulburn to Murray trade rule - Consultation paper*, 2020 https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/5915/8388/7812/Goulburn_to_Murray_trade_rule_review_consultation_paper.pdf. For an explanation of the fundamentals of the Murrumbidgee IVT, see NSW Government, *Murrumbidgee Inter-Valley Trade account (IVT) - Fact Sheet*, n.d., https://www.industry.nsw.gov.au/__data/assets/pdf_file/0018/209412/murrumbidgee-ivt-fact-sheet.pdf.

¹²⁷⁶ *Murray–Darling Basin Plan 2012* (Cth), Schedule 5 – Water Trading Rules, Objective s5.05 (1e).

trade rules that better match opportunities to trade with the constraints of the physical system and third party impacts.

If IVT limits are retained as a mechanism for managing intervalley trade and delivery, Basin States should investigate using more dynamic IVT limits that align with changing system conditions to allow beneficial trades while restricting harmful trades. This could involve:

- allowing different monthly, seasonal or quarterly figures for IVT account balance limits, depending on what risk the IVT limit is controlling
- using improved water accounting such as tagged allocation trade or lifetime tracing, to allow water to be traded when it does not contribute to the risk that the IVT is controlling for, and place the limit on the delivery. For example, if the IVT is primarily to limit spill risk, trade of water for immediate delivery could be allowed, as this kind of movement would not exacerbate spill risks in the origin valley. If the IVT was being used to limit delivery capacity (at the time the traded water would be delivered), then this trade would be refused as it would contribute to worsening this issue.

16.2.9 Implement clear and integrated mechanisms for delivery of environmental water

► Recommendation 23

Implement clear and integrated mechanisms for delivery of environmental water

Basin States, in collaboration with the MDBA and the Commonwealth and State environmental water holders, should better integrate environmental watering arrangements into trading arrangements and market design, including by:

- ensuring that trading and delivery arrangements are not contingent on the intended use of the water, including by making available arrangements currently only open to environmental water holders to consumptive water users, where possible, and ensuring neither consumptive or environmental users are given preference over the other
- committing to explicitly assess and address likely impacts on water markets, landholders or the environment, of any new trading or delivery arrangements developed in future
- clearly and consistently accounting for environmental trade and delivery across Basin States
- developing a transparent policy position on how and when environmental water holders, and consumptive users, should use trade mechanisms to move water, and clearly articulating how movements of water within and outside of the trading framework affect trade opportunities, particularly for interzone trade opportunities governed by restrictions.

This will contribute to developing arrangements and tools to deliver environmental water in ways that help improve transparency and confidence, and alleviate system congestion.

Concerns with how effectively the EWHs' delivery needs are being met – and with the transparency of trade (and other mechanisms) used by EWHs to deliver water – signal the need to assess how the operating framework and trade arrangements manage environmental water. This is in keeping with the ACCC's view that it is timely to reconsider the arrangements for interzone trade more broadly. It would be appropriate for this assessment to be conducted ahead of the review and development of the next Basin Plan in 2026.

As outlined in section 14.2.5, environmental water is delivered by river operators within the same operating framework that applies to all types of water deliveries. Environmental watering strategies have evolved since the main elements of the market architecture were established.¹²⁷⁷ EWH holders have different needs to extractive water users and require some unique delivery services, reflecting that

¹²⁷⁷ MDBA, *Managing Delivery Risks in the River Murray System*, 2020, Canberra, <https://www.mdba.gov.au/publications/independent-reports/deliverability-risk-river-murray-system>, p. 13, viewed 4 February 2020.

environmental water stays in (or returns to) the river instead of being extracted.¹²⁷⁸ River operators and EWH have reported encountering issues with delivering environmental water due to the prioritisation of consumptive water deliveries.¹²⁷⁹

The operating framework has been incrementally adapted, as environmental watering strategies and arrangements for the trade and delivery of environmental water have evolved. EWHs have identified the need for the continued evolution of the operating rules that manage deliveries and enable water use to ensure arrangements can meet the needs of all water users.¹²⁸⁰ As noted above at 16.2.5, progress on the constraints management strategy would assist with alleviating the risk of environmental water and consumptive water use competing for channel capacity and generally assist with the delivery of environmental water, helping to reduce shortfall risks.

In 2020, the ACCC provided advice to MDBA on the operation of section 12.02 of the Basin Plan, which provides an exemption from certain Basin Plan water trading rules for trades of environmental water (when the relevant tests for the exemption are met). In that review, the ACCC identified that there is a lack of clarity about whether some of the new arrangements being developed for delivery of held environmental water should, or should not, be considered a trade of environmental water. Developing a transparent policy position on how and when environmental water holders, and consumptive users, should use trade mechanisms to move water will help provide improved transparency of arrangements and build stakeholder understanding of and confidence in these arrangements. Clearly articulating how movements of water within and outside of the trading framework affect trade opportunities, particularly for interzone trade opportunities governed by restrictions, will also help.

16.2.10 Assess whether the current configuration of geographical units remains fit-for-purpose

► Recommendation 24

Assess whether the current configuration of geographical units remains fit-for-purpose

Basin States, together with the MDBA, should assess the appropriateness of the current set of, and spatial definitions of, geographical units used in water management and river operations and as the basis for trading zones.

This is to ensure that the spatial boundaries of geographical areas relied upon to manage water remain fit for purpose; assess whether new geographical units may be required; and to assess whether and how the current spatial definitions may need to be formalised and aligned across agencies.

Stakeholders expressed concerns that conveyance losses are being incurred as a result of trade within some of the longer trading zones in the Southern Basin, such as the Murrumbidgee and the New South Wales and Victorian Murray below Choke zones. Further, some stakeholders considered that trades *between* certain trading zones have non-negligible impacts, and therefore ought to be more restricted than they currently are.¹²⁸¹

Trading zones¹²⁸² have been used to define areas within which there is generally no restriction on changing the location at which water available under the tradeable water right may be taken.

1278 CEWO, 2020, *Response to questions submitted by Aither on behalf of the Interim Inspector-General of Murray-Darling Basin Resources*, <https://www.environment.gov.au/system/files/pages/dca287c3-73bd-4ec1-a3b1-c29dd5cf95f9/files/response-questions-submitted-aither-iig.pdf>, p. 11, viewed 4 February 2020.

1279 CEWO, 2020, *Response to questions submitted by Aither on behalf of the Interim Inspector-General of Murray-Darling Basin Resources*, p. 11.

1280 CEWO, 2020, *Response to questions submitted by Aither on behalf of the Interim Inspector-General of Murray-Darling Basin Resources*, p. 11.

1281 ACCC post-Interim report consultation with stakeholders, 26 October 2020.

1282 Trading zones were established to 'simplify administration of a trade ... so that trade can occur within and between zones without first having to investigate and establish the details and rules of the system in each zone'. *Water Act 2007* (Cth), schedule 3.

Interzone trade, in contrast, is often subject to restrictions. The logic underpinning this approach is that while interzone trades may change the relevant location at which water may be taken, trade restrictions should ensure they do so in a way that impacts arising from this change are sufficiently small. Conversely, the assumption is that intrazone trades have negligible impacts on third parties or the environment. This is a somewhat artificial distinction, as in practice a trade involving two locations in adjacent trading zones may involve a smaller change – and less third party impacts – than a trade involving two locations at opposite ends of a single trading zone.

Basin States should consider whether current definitions of trading zones remain fit-for-purpose for managing all the potential third party impacts of trade.

The Basin has also been broken up into other smaller geographic units for water management and related purposes, sometimes overlapping, sometimes aligning, including water sources (defined largely by the location of storages and inflows and generally aligned with trading zones, with some exceptions), water resource plan areas, statistical units, and various other specifications of river reaches with a range of purposes.

In New South Wales, water supply works approvals provide locational information to water managers which allow them to track usage by river sections within a water source.¹²⁸³ These river section definitions are used to report usage data for regulated water sources on the Department's Water Usage Dashboard¹²⁸⁴ and the WaterNSW WaterInsights portal¹²⁸⁵ and can be used for declaring when users can access supplementary water.¹²⁸⁶ In Victoria, extraction shares are also expressed on works licences, and issued for sections of the river on a finer scale than trading zones. Borders of these river sections appear to be defined variously by towns, gauges, weirs and other landmarks.

While the ACCC has not been able to conclusively establish the magnitude of trade-related impacts, because impacts of trades which involve a change in location may not be constant (for example, evolving rates of conveyance losses due to climate change), a revised or new regime of spatial boundaries may help with creating instruments to better manage impacts of trade and delivery. For example, 'sub-zones' are in place in some systems in Queensland like St George and Macintyre Brook. The sub-zone a user is located in is based on their distance from the storage and influences the volume that can be taken against an allocation (that is, subject to loss factors). Similarly, the creation of new geographic units based on delivery considerations could facilitate the introduction of an administrative time-of-use delivery charge which vary by location to address externalities of delivery (such as conveyance losses, environmental impacts and delivery congestion), or other mechanisms to manage deliverability issues in specific locations.

Work to consider the most effective definitions of these geographical units and to establish more consistent and formally applied definitions of river sections will be an important step in preparedness for managing delivery shortfalls. The impacts and management of delivery shortfalls will vary considerably based on users' location relative to their water source's storages and inflow points, weirs and other infrastructure that can regulate the river, and other water users. As noted in section 14.2.2, during delivery shortfall events, restrictions on water extraction may need to be imposed on users at a geographical scale finer than current trading zone definition, however the spatial boundaries that would be used for this are not well established.

The ACCC also understands that the current regime of geographical units used to divide the river system poses challenges for modelling and the assessment of the impact of trade in the Southern Basin. Currently, there is some inconsistency in the spatial definitions used for the trade and use data

1283 "River section: a portion of a (usually) Regulated Stream which is controlled by artificial means, such as between two Weirs for instance. It often – but not necessarily – correlates to a Metering Section. It is a fundamental entity within River Operations. Also referred to as Stream Section." WaterNSW, *Glossary of Water Terms*, <https://www.watarnsw.com.au/customer-service/service-and-help/tips/glossary>, viewed 7 February 2021.

1284 See NSW Department of Planning Industry and Environment, *Water Usage Dashboard*, <https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/usage-dashboard>, viewed 11 February 2021.

1285 See WaterNSW, Water Insights Portal, <https://www.watarnsw.com.au/waterinsights/water-insights>, viewed 11 February 2021.

1286 NSW Department of Planning Industry and Environment, *Water Usage Dashboard*; For example, WaterNSW, *Supplementary announcement – Namoi Valley Supplementary Access*, published 7 January 2021, https://www.watarnsw.com.au/_data/assets/pdf_file/0018/164304/Namoi-Supplementary-Announcement-A-B-class-7-Jan-2021.pdf, viewed 28 January 2021.

reported to the MDBA by Basin States, with some data provided at a bulk 'valley' or 'water source' level, and other data reported at a finer scale (noting that some water sources comprise multiple trading zones). The ACCC understands that, as the water market and water management needs evolve and new informational requirements arise, somewhat ad hoc spatial definitions have been applied to group data by location on an 'as needs' basis. The MDBA has indicated that the changing patterns of irrigation development in the Murray (such as the significant growth in horticulture in Sunraysia), has prompted it to revise the resolution of the geographical units used in modelling water use. Having a more formally defined, and universally used regime of geographical units would assist with modelling of trade and use, and coordination between States and the MDBA.

16.3 Determine the best paths for the long term development of efficient, resilient water markets

The recommendations outlined above will go some way to addressing current inefficiencies in the operation of the Basin's market architecture. But recent trends point to the impacts of trade intensifying and, without intervention to improve current arrangements, foreshadow deteriorating efficiency of market operations and outcomes.

The ACCC recommends that the Australian and Basin State governments work together to assess, develop and implement a roadmap for more wide-reaching changes to market architecture, to improve price signals, create appropriate incentives and develop tools to facilitate trade that more closely aligns with the physical characteristics, while managing the negative risks it can pose.

The ACCC has developed recommendations on the basis that its role is to:

- encourage a stronger emphasis on markets and trade opportunities in consideration of the Basin's architecture, as it is not clear that market considerations are sufficiently embedded into existing governance arrangements and market design processes
- identify issues where water management arrangements are intersecting with market operations
- identify important decisions that governments need to make in this area; and promote preferred options.

The ACCC's intent is not to promote market concerns above water management more generally, but to encourage a systems thinking approach. This approach involves the impacts of water management on markets being considered, and appropriately recognising the usefulness of market-based mechanisms as tools for delivering efficient water management.

The tools and approaches explored in the following sections draw on economic theory about how to design market mechanisms that work efficiently in practice. There is an opportunity to make greater use of market mechanisms, which could, in theory, bring significant efficiency gains if successfully implemented.

However, the ACCC recognises that the costs of developing and delivering these reforms may offset many of the potential benefits. Considering interactions with other water management policies and allowing for stakeholder engagement in the decision process will resolve likely barriers to successful implementation and operation.

This roadmap builds on work already underway but also requires governments to test new ways of thinking about market arrangements. Due to the time required to assess and – if appropriate – implement these measures, the Australian and Basin States governments should start work on developing these solutions now. The ACCC advocates for these changes to coincide with the next Basin Plan review, in 2026.

16.3.1 Developing new tools will require better information and water accounting, and will be complex to implement

There needs to be careful consideration of the nature and magnitude of changes, the costs, and to consider intended and potential unintended consequences. These decisions need to be made collaboratively by the Australian and Basin State governments in close consultation with all affected parties. This is likely to entail:

- the appropriate policy agencies (including the proposed Water Markets Agency) undertaking detailed and rigorous assessments of the feasibility and merits of adopting potential solutions
- the Australian and Basin State governments together resolving which measures to implement; and doing so.

A number of these proposed reforms would potentially alter existing water users' property rights, meaning modelling would be required to ensure any impacts from changes were identified, understood and appropriately managed in policy design. For example, for delivery focused recommendations, Frontier Economics notes that:

Without further investigating the significance of the risk of system shortfall across the [Southern Connected Basin] it is difficult to identify where specifically in-river delivery rights could be valuable.¹²⁸⁷

Assessing the feasibility and benefits of these measures is difficult in the face of existing information gaps. The current state of registers, metering and operational models means Basin States, approval authorities and river operators do not have information necessary to undertake such assessments with confidence. This is particularly so when it comes to determining the contribution of traded water versus general water deliveries to the underlying problems. For example, river operators and approval authorities do not have a consolidated, 'real time' daily water use data set for the Southern Connected Basin. Implementing the recommendations outlined in sections 16.2.4 and 16.2.7 and elsewhere in this report will improve the information available to decision makers.

¹²⁸⁷ Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 67.

16.3.2 Designing a reform roadmap for efficient markets now and into the future

► Recommendation 25

Develop a reform roadmap for designing and operating efficient markets now and into the future

The proposed Water Markets Agency should work with the Australian and Basin State governments and the MDBA to undertake a work program to progress a long term reform roadmap that better integrates water market design with water management and aligns market architecture with the hydrological realities of the natural system.

This work program should consider how more fundamental reforms of the market architecture may drive improved market efficiency, such as through creating appropriate market based incentives and reducing generation of externalities. Informed by improved information gathering stemming from other recommendations in this report, this should include assessing the feasibility and merits of adopting new market mechanisms, pricing measures or complimentary policies within the Southern Connected Basin or across the whole Basin, as appropriate. Potential mechanisms to explore include, but are not limited to:

- applying water accounting that better aligns with the physical transfer of water, such as through ‘tagged allocation trade’
- applying congestion or time-of-use charges
- developing formal markets for rights to delivery capacity and/or water extraction (for example, ‘constraint rights’, ‘on-river delivery rights’, ‘extraction shares’)
- applying ‘loss factors’ to water trades in the Southern Connected Basin
- adopting ‘capacity sharing’ – where each water user is allocated with a share in storage capacity and a share in water inflows – in the Southern Connected Basin, including its potential to offer long term alternatives to intervalley trade account-balance limits
- considering the potential use of ‘water banks’ to fulfil roles like coordinating particular trading opportunities, such as allocating out IVT capacity, and holding and redistributing water rights as a ‘safety net’ in the markets
- developing a water market operator / smart market to operate the Southern Basin water markets and co-ordinate water delivery to users as one integrated system, matching bids for water with offers of supply, within the physical constraints of the system.

Developing the roadmap and considering longer term reform options will provide pathways and timeframes for continued improvement of markets through improved design and integration of the rules and arrangements for trade across the Basin.

Section 16.3.2 sets out some information on the possible paths or mechanisms listed above.

Option 1 – Align accounting with delivery

The Australian and Basin State governments should investigate water accounting that better aligns with the physical transfer of water. There is currently no link between the time of water trade and the time of delivery, meaning trade rules are ineffective mechanisms for managing many delivery issues, such as shortfall risk, environmental degradation and conveyance losses.

Under current conventional water allocation trade between zones in the Southern Connected Basin, such as between the Goulburn River and a Murray zone, water moves:

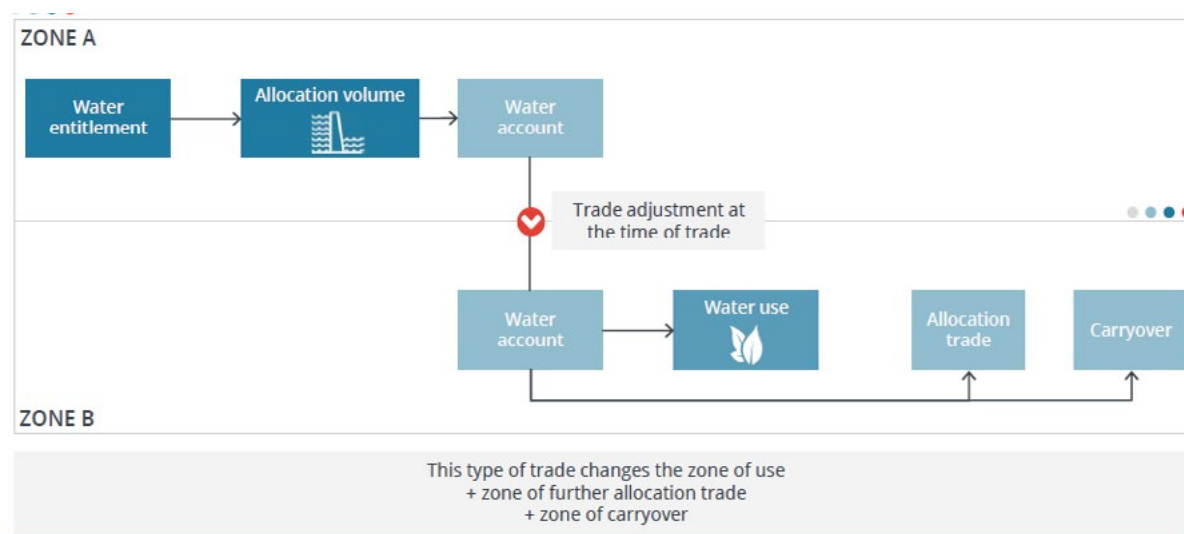
- ‘on paper’, in accounting terms, the water moves on to the accounts of the destination zone by effectively being cancelled in the source zone, and reissued in the destination zone. In this way, with regard to intervalley trade, the transaction will be added to the IVT account balance and may

contribute towards closing IVT, until it is drawn down when the river operators calls water out of the IVT account for delivery

- ‘in the real world’, in physical terms, the notional amount of actual water may not be delivered at the time of recording the transaction; and may remain in the origin storages or wider source.

Figure 16.1 represents this. The diagram also notes that the water takes on the ‘characteristics’ of the destination zone, such as its carryover rules. The diagram highlights that the retail trade adjustment (when the volume in accounts on state registers are updated) occurs at the time of trade. The MDBA accounts for trades at a bulk level by making adjustments to intervalley and state transfer accounts on a monthly basis. In this way, traditional allocation trade is a factor in the ‘disconnect’ explained in section 13.1.3.

Figure 16.1: Interregional trade via conventional allocation trade



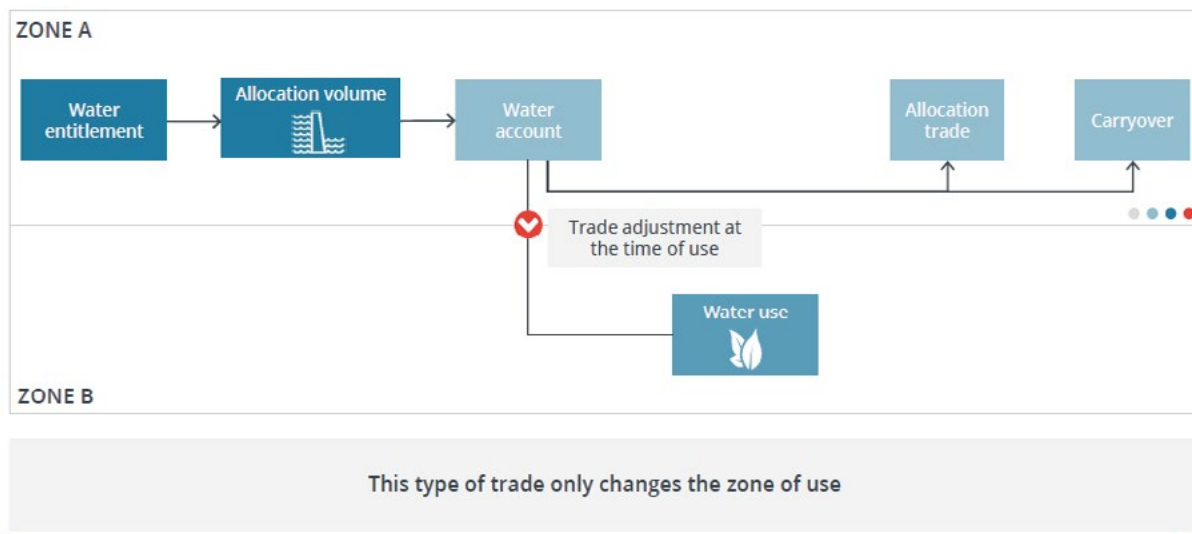
Source: Frontier Economics.¹²⁸⁸

Basin water market architecture needs water accounting that better aligns with the physical transfer of water. Currently, with no link between the time of water trade and the time of delivery, trade rules are inefficient, ‘blunt’ and badly calibrated mechanisms to managing the delivery issues they are ostensibly intended to address. Further, the inability to track water trades and link the time of trade to the time of use prevents the implementation of other reforms to market architecture aimed at addressing delivery issues.

One option may be to conduct all Southern Connected Basin interzone trade as what is called ‘tagged allocation trade’, where the allocation issued in the origin zone is ‘tagged’ for use in a destination zone. The key differences between the current model and the tagged allocation trade model are that in the latter, water allocations do not ‘move’ in accounting terms to the destination zone until they are delivered there. They also maintain the characteristics of the source zone, such as the source zone’s rules for carryover. Figure 16.2 represents this, noting the trade adjustment would occur at the time of use.

¹²⁸⁸ Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 26 October 2020, p. 35.

Figure 16.2: Interregional trade via the tagged allocation trade model



Source: Frontier Economics.¹²⁸⁹

This change of accounting practice would involve changes to registry arrangements and, most importantly, to how market participants trade.

While there are various different approaches that could be followed to operationalise this trade, one option would be expanding the scale of arrangements used to give effect to the movement of water between tagged entitlements. This would likely require all water users who wished to trade water between zones to have established a water account (a water access licence in New South Wales, or an Allocation Bank Account in Victoria) in both zones prior to trading. This additional administrative burden may act as a barrier to trade, which would be undesirable. Frontier Economics flagged these concerns:

A more far-reaching reform option would be to rely on tagging as the primary (or only) mechanism for enabling trade between zones. Our concern is that doing this prematurely would jeopardise the economic benefits from interregional trade – especially trade between resources in different States – because the processes to administer interstate tagging are not sufficiently developed.¹²⁹⁰

The ACCC notes such concerns from market participants. New South Wales Irrigators' Council submitted to the ACCC in response to the interim report that it would be unworkable to introduce reforms that include traded water remaining in the seller's catchment account until it is physically delivered at the destination.¹²⁹¹ The ACCC caveats this recommendation to apply water accounting that better aligns with the physical transfer of water with a requirement that authorities adopt a regime that facilitates the opportunity to trade, on long term sustainable foundations that adequately take into account the impacts of trade on third parties and the environment (see section 16.1.4 above).

The ABARES submission to the Interim Report also contemplates a tagged allocation model, flagging such a regime could potentially replace the existing system of IVT limits and instead allow river operators to be responsible for determining interregional trade flows at all times. In contrast to the Frontier Economics' proposal, ABARES' conceptualisation of this model would be that the trade adjustment occurs at the time of physical delivery of the water.¹²⁹²

Victoria's Department of Environment, Land, Water and Planning (DELWP) has previously considered the plausibility of various different models of tagged allocation trade. These assessments identified

¹²⁸⁹ Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 26 October 2020, p. 36.

¹²⁹⁰ Frontier Economics, *Water market architecture: Issues & option, Input into ACCC market architecture assessment*, 26 October 2020, p. 55.

¹²⁹¹ NSW Irrigators Council, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020.

¹²⁹² ABARES Submission, *Submission to the Murray-Darling Basin water inquiry Interim Report*, 18 December 2020, p. 20.

that tagged allocation trade is ‘fundamentally more robust’ than current arrangements, as it links the applied carryover and spill rules to the water system in which the allocation is actually stored rather than effectively transferring these rules to a remote storage, as is the case under current arrangements. This means the risk of a loss of resources from storage spills would be more directly assigned to the individuals directly involved in these trades, rather than socialised across all water users. It could also enable more consistent treatment of all forms of trade, and may assist in achieving full compliance with Basin Plan rule 12.23.

However, advice to DELWP acknowledged the complexity and likely cost of adopting such a reform. In addition to the increased complexity for market participants outlined above, identified barriers to implementation included the need for southern Basin States to cooperatively adopt the new model and for modifications to be made to water register functionality.

The ACCC recognises that moving to a tagged allocation trade model will not directly resolve all of the issues with the way water market architecture currently accounts for trade, and handles the delivery of water. However, moving to a tagged allocation trade model would provide the basis for introducing additional mechanisms, if further analysis demonstrates these are justified. This includes issues such as loss factors and trade restrictions which more effectively target the delivery related impacts of these trades.

Given the potentially long lead times associated with designing and implementing this kind of reform, that work should commence immediately so adoption can occur as soon as the necessary pre-requisites (such as updated register capability) have been achieved. Addressing pre-requisite steps and ensuring adoption is collaborative between the States will minimise the risk that a tagged trade model will ‘jeopardise the benefits of trade’.

Complementary to the tagged allocation model is the recommendation, discussed in chapter 12, that Australian and Basin State governments implement lifetime traceability for water allocations when implementing the proposed Digital Messaging Protocol (see recommendation 14). Lifetime traceability will improve the information base about where water is moving to and from, where it is currently being held, and when and where it is being used. This information is valuable, and will help differentiate allocated water, intrazone and interzone trades’ impacts on the river system and water users. It may also assist with the implementation of potential instruments to address delivery impacts, such as a conveyance loss factor.

However, moving to a tagged allocation model would go a step further, completely reforming how intervalley trade operates and providing the basis for the implementation of rules to more directly manage the delivery of water (by applying interzone restrictions to interzone delivery, rather than interzone trade).

Option 2 – Reform storage rights and water accounting to be directly linked to what is occurring in storage space and inflows

The ACCC recommends that Basin States and the MDBA investigate continuous accounting and capacity sharing to better align water accounting with what is occurring hydrologically in the system. Capacity sharing and continuous accounting both align property rights and water accounting closer towards what is occurring hydrologically in the system. This reduces the likelihood that third party impacts will arise, and helps users to make better choices that result in more efficient outcomes.

Capacity sharing

Capacity sharing, already in place in the St George and Macintyre–Brook water systems, is where each water user is allocated with a share in storage capacity and a share in water inflow.¹²⁹³ Currently the right to inflows and storage space are bundled together in water entitlements. Splitting these two different rights into different products would result in more transparency in allocations, more efficient use of storage space and less trade restrictions.

Capacity sharing would function in place of current carryover and allocation policies, addressing concerns around the complexity and opaqueness of allocation policies and a lack of predictability of allocations. The changing relationship between storage volumes and allocations, and a lack of clarity over the allocation decision making is inhibiting effective business planning. Capacity sharing of inflows would more directly link inflows to allocations, resulting in more transparent and intuitive allocations.

The 2019–20 IRORG report also makes this argument in stating ‘in such a dynamic environment, there is a high need for adaptive, responsive capacity sharing solutions that provide sufficient flexibility to meet the changing needs of water users in an equitable manner’.¹²⁹⁴

ABARES, in response to the Interim Water Inquiry Report submitted:

Under a capacity sharing approach, water users receive a percentage share of system inflows (as recorded in official stream flow gauges). This closer connection between user allocations and physical water supply, helps to reduce uncertainty and improve transparency. In practice, system inflows can be defined as an aggregation of multiple inflow sources (i.e. dams and or tributaries), with various allowances for fixed environmental or human water needs, such that the approach can be applied in complex water supply systems.¹²⁹⁵ Inflow sharing also requires a system of periodic reconciliations to ensure total user water allocations continue to match physical water storage.¹²⁹⁶

ABARES notes the potential welfare effects (such as changes in entitlement reliability) of such a reform, though notes it has been achieved previously. They note that a more ‘modest’ reform could be making allocations using simpler and more transparent functions of physical water availability, similar to continuous accounting in northern New South Wales. ABARES goes on to state:

There is a significant body of evidence, including both modelling and real-world observation to establish capacity sharing as a ‘best practice’ approach to water property rights in storage-controlled water supply systems.¹²⁹⁷

Carryover parking (or trade to access carryover) may create a need to move towards capacity sharing. The use of carryover parking represents a ‘missing market’ where users demand a trading product which does not formally exist under current market architecture (that is, trading for storage space). If carryover parking trades start to impact trading restrictions (which are already predicted to become more binding), this demand may not be able to be met efficiently within current market architecture. This may provide the impetus for moving to a capacity sharing model which allows trade and/or leasing of dam space in a more direct manner.

1293 “A capacity sharing approach to water property rights and markets includes the following key features:

- Water rights defined as percentage shares of system inflow and storage capacity
- Continuous (i.e., daily) water accounting with periodic reconciliations to ensure physical water supplies match user accounts
- User carryover subject to storage capacity (account) limits and ‘internal spills’
- User level delivery capacity rights and delivery loss factors..”

ABARES Submission, *Submission to the Murray–Darling Basin inquiry interim report*, 18 December 2020, p. 9.

1294 Independent Review of River Operations Group, 2020, *Review of performance against objectives and outcomes – 2019/20*.

1295 In the context of the Southern Basin, for example, individual users on the Murray need not have explicit shares in storage capacity and inflows of specific dams (as is the case with state level water sharing arrangements, between NSW and Victoria). Rather end-users could have shares in the total available Murray inflow and storage capacity of their respective state.

1296 ABARES Submission, *Submission to the Murray–Darling Basin water inquiry interim report*, 18 December 2020, p. 10.

1297 ABARES Submission, *Submission to the Murray–Darling Basin inquiry water interim report*, 18 December 2020, p. 9.

In a journal article, academic Donna Brennan highlights the issues that carryover policies will face in light of increasing trade:

This analysis demonstrates the nature of the missing markets problem. There are third party effects from broadening the spatial scope of trade when the entitlement system is based on centrally planned storage decisions, rather than a storage market. Existing entitlement holders are currently the beneficiary of 'residual storage', which underwrites the reliability of entitlements. The introduction of broader spatial trade exacerbates the problem of the missing market because it creates greater opportunity for current season use. In contrast, the introduction of clearly defined property rights to storage would allow for the development of a storage market which would then allow for the gains from trade – in both spatial and temporal dimensions – to be achieved.¹²⁹⁸

Further, a major benefit of capacity sharing would be removing trade limits that currently control for spill risk related to trade, such as IVTs. If delivery and timing of use and conveyance loss issues are dealt with by a mechanism which directly limits these issues, then IVT and state trade limits could potentially be removed. This would be done by moving the spill risk currently managed by IVT limits, to individuals who would need to have appropriate dam capacity to store the water (if it were not being used immediately).

Capacity sharing would likely result in more efficient use of dam space and reduce the risk of spills from dam as well as more trade. Capacity sharing allows individuals to manage their spill risk rather than shutting the IVT account to manage it at a wholesale level.

However given the large transition costs and questions of feasibility in an interconnected and complex system such as the Southern Connected Basin, the ACCC is not recommending transitioning towards this model at this point in time. The ACCC is recommending further investigation into implementing capacity sharing in the Southern Connected Basin and merits of refashioning entitlements into shares of the capacity of specific storages or water sources. Capacity sharing could also make the market more complex by adding a new product or may simplify the market by changing differing carryover rules into one product.

Continuous accounting

Continuous accounting operates as an annual allocation system with an allocation account limit and no carryover limit, just with more frequent water use accounting. Under continuous accounting, the concept of a water year becomes irrelevant, except where used to enforce a use limit.¹²⁹⁹

In the Southern Connected Basin, water accounting largely occurs on a yearly basis. Previously, this meant water that remained in water users' accounts at the end of the year was forfeited. However, this was inefficient as it created an artificial time constraint on how water users were able to use their water, resulting in inefficient use of water at the end of the water year as users adopted a 'use it or lose it' mentality. Carryover was introduced to allow water users access to water earlier in the season, though is only required because of the artificial constraint of the water year.

Water accounting has primarily been used for river operations and water management but with increasing trade there is a need for more timely data to prevent users over-drawing their water accounts. Continuous accounting would better align water accounting with what is occurring in the river system and allow more granular costing of evaporation losses across all water held (rather than just at the end of the year) and potentially conveyance losses. This would require investment in telemetry and investment in registers.

Option 3 – Congestion or time-of-use charges

The ACCC recommends that the Basin States work together to investigate implementation of a time-of-use charging regime in the Southern Connected Basin which reflects the relative costs of water delivery to different locations and at different times of the year and the relative scarcity of on-river

1298 D Brennan, 2008, *Missing markets for storage and the potential economic cost of expanding the spatial scope of water trade*, Australian Journal of Agricultural and Resource Economics, 52(4), pp. 471–485.

1299 N Hughes, M Gupta, K Rathakumar, *Lessons from the water market: The southern Murray-Darling Basin water allocation market 2000–01 to 2015–16*, Department of Agriculture, ABARES, 2016, p. 22.

delivery capacity to those locations at those times. The ACCC envisages this could be achieved through revision of the current suite of bulk water charges imposed by Basin State governments upon water users in their jurisdiction.

The current charges imposed on water users in the Southern Basin do not incorporate timing factors such as congestion and the physical costs of delivering water (in the form of conveyance losses and environmental damage). As such, they do not send effective price signals to encourage users to incorporate these into their decision making. Currently, charges set by Basin State governments in New South Wales, Victoria and South Australia generally include a mix of variable charges (for example, per ML of use) and fixed charges (for example, per ML of entitlement) in addition to various transaction charges (see chapter 10). While these charges vary between sources and zones, they do not currently vary based on the location of a water user within a particular zone, or the time of year extraction occurs.

The introduction of a time-of-use charging regime would create water use charges that are higher during 'peak' times of the year (such as November to April), when relative scarcity for on-river delivery infrastructure and the potential for impacts (such as conveyance losses, environmental damage, and shortfall risks) are highest. Additionally, water users extracting water in reach of the river system which are located further from storages (increasing conveyance losses), or in more constrained reaches of the system (where delivery capacity is most scarce) would also face higher per unit costs for water use than other water users.

Short term impacts of such a charging regime may be small but in the long term, the aggregate effect (all other things being equal) would likely be for some irrigation developments to shift further upstream and above constraint points. Where possible, usage would also shift away from peak times (either through changed business practices, like increased use of on-farm storage, or changes to the cropping mix towards uses like dairy which are less aligned with the summer peak). The impact of any change to the charging regime would likely only affect businesses operating at the margin.

The ACCC acknowledges that government-imposed administrative charges are more rigid and less likely to accurately reflect the true cost of certain impacts, or the true value of delivery capacity, than a market mechanism such as a cap and trade regime for on-river delivery rights.

However, given the difficulties with introducing a regime of on-river delivery rights (see option 4), the ACCC proposes that this kind of charging regime should be considered as an alternative solution. The ACCC considers that even if the administrative charges are not fully accurate, they will almost certainly be more efficient than the status quo, where charges remain constant temporally and spatially (within zones). These charges could also be revised over time. Frontier Economics articulates the challenges here:

A challenge with this option comes in setting the charge so that it ensures peak spot demand does not exceed the maximum desirable level of extraction in locations through the network. To get this right the level of the charge would ideally be readily adjustable. This can cause concerns for users who understandably want certainty in terms of the charges they face. Ultimately, a balance would need to be reached between balancing supply and demand through the network and providing charging certainty for diverters.¹³⁰⁰

Frontier Economics also found that the introduction of peak delivery charges would 'result in more efficient outcomes... because extractors would be required to internalise the impact of their ordering decisions.'¹³⁰¹ However, Frontier ultimately concluded 'on balance there is unlikely to be sufficient benefit in acting immediately to creating in-river delivery rights or [introducing] peak delivery charges [as] they would be complex to define and implement and could create significant administrative costs in an attempt to address third party impacts that are poorly understood and hard to define ex ante.'¹³⁰²

1300 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 69.

1301 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 69.

1302 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 71.

Basin State investigation of this option should consider the issues and challenges outlined above, and the magnitude of identified externalities so as to devise the most accurate regime of charges, if and when the pre-requisite reforms are implemented. Basin States will need to work together to ensure the implementation of charging regimes would be harmonised and not create market distortions. Alternatively, Basin States could take the intermediate step of implementing just one half of this recommendation, and revise charging arrangements to vary *either* by time or by location.

Option 4 – Formal markets for rights to delivery capacity and/or water extraction

The ACCC recommends that Basin States and the MDBA investigate the development of a regime of property rights for the delivery of water through on-river infrastructure which are to be unbundled and operate separately from water access rights (entitlements). These property rights should be tradeable and capped at a level that reflects the sustainable delivery capacity of the on-river delivery infrastructure.

The ACCC considers that further work is needed to investigating the feasibility and possible avenues to implementation, for a regime of separate property rights for the on-river delivery of water in the Southern Basin. This would involve further unbundling of existing water rights, given the right to have water delivered on-river is currently still bundled in with water access entitlements. The ACCC considers this would essentially take the form of a ‘cap and trade’ regime for delivery capacity, similar to the regime of water delivery rights that exist in off-river IIO networks. Frontier Economics explains the differences between water delivery rights in off-river networks and potential on-river rights.¹³⁰³

As noted in chapters 13 and 14, there are limited mechanisms to effectively and efficiently ration and allocate the scarce and valuable capacity for water to be delivered through the network of on-river delivery infrastructure, which includes natural river channels and man-made canals. The ability to have water delivered through particularly constrained reaches of the river, such as the Barmah Choke or through the Lower Goulburn into the Murray is particularly valuable, but also prone to potential externalities where sustainable flow rates are exceeded for long periods of time.

In order to set the ‘cap’ of volumes that could be delivered through any point of the river, the issuing authority would need to limit the number of delivery rights offered to the market for a given time period, likely between a day and a month. In order to have water delivered to an on-river extraction point, water users would need to hold the corresponding volume of delivery rights for that section of the network at that time or face substantial penalties. Water users could enter the market to purchase additional delivery rights from water users who have surplus rights.

The ACCC notes that delivery rights would not need to be defined for the entire network and for every month of the year. Rather, delivery rights could be defined for locations on the network and times of the year when flow constraints are binding, such as during peak irrigation months. The issuing authority would need to have some flexibility to vary the volume of delivery rights on issue between years (and possibly within year), based on prevailing conditions across the system. This would require sufficient transparency and communication would be needed to provide relative certainty to the market.

The establishment and enforcement of water delivery rights would have several benefits. These include internalising the delivery costs, improving the efficiency of water trade and water use decisions, eliminating third party impacts in the form of environmental damage and increased delivery risk, and allowing for the elimination of administrative constraints on water delivery. It is possible that on-river delivery rights could be combined with a mechanism to account for conveyance losses as well.

In addition to the above, delivery rights would provide water users with a mechanism to manage their own delivery risks. Those users whom most highly value ensuring they will be able to have water delivered during a particular time of year (such as permanent plantation operators) will be able to enter the market to sure up their delivery rights ahead of time, assisting with planning. As long as the cap is set at an appropriate level, the value of these rights should, as a result of market forces, reflect the true value of delivery capacity.

1303 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, pp. 67–68.

Frontier Economics discussed the significant complications of defining a system of on-river delivery rights, stating 'it may not be possible to clearly define an in-river delivery right as a share of flow in a segment of the network or a share of capacity in a weir pool, lake or choke. Put another way, determining the actual flow/capacity at which the level of extraction may be creating a shortfall risk for other users would be challenging.'¹³⁰⁴ Frontier also notes that a network of delivery rights would require water users to be manage the timing of their water ordering and their approach to delivering it through the network. Frontier argues '*it is not clear that individual water extractors are best placed to do this*'.¹³⁰⁵

In addition to these considerations is a fundamental concern that introduction of on-river delivery rights would add substantial complexity to a market already perceived by many to be excessively complex to understand and navigate. This added complexity could potentially present a barrier to participating in the market for some users and possibly increase the competitive advantage for sophisticated water users.¹³⁰⁶ South Australia's Department for Environment and Water expressed concern over the feasibility of such a model.¹³⁰⁷

There are a number of significant considerations which would need to be resolved in order to effectively, and fairly, implement such a regime. These include:

- How would southern Basin States share the delivery capacity through constrained reaches? The ACCC understands that Victoria and New South Wales have different views on the potential sharing of the delivery capacity of the Barmah Choke and are working on achieving a resolution.
- How would on-river delivery rights be allocated in the first instance? Some options include allocating them pro-rata based on water access entitlement holdings, or via an auction.
- How could trade for delivery rights operate efficiently? Relevant governments would need to consider how water registries and trade approval processes would need to be set up, while also limiting 'excludability'¹³⁰⁸ of water delivery rights.
- How would environmental water holders would fit into this regime given their fundamentally different delivery demands to consumptive users?
- How would the time of use effectively translate to the time of delivery through constraints given the lags in delivering water downstream and the nature of aggregated bulk water deliveries?

Extraction rights

An alternative to on-river delivery rights could be a cap and trade regime for extraction rights. Rather than directly allocating a share of available delivery capacity in a specified segment of a river or other delivery channel, this would provide holders the right to extract a certain volume of water, at a certain location, over a given period of time. This final point is significant, as a simplifying assumption of establishing tradeable water access rights has been that water use can occur at any time of year and delivery will in general be guaranteed. An extraction right would aim to indirectly cap and define the volume of water being delivered downstream through constrained river reaches at sensitive times, via capping the extractions downstream of these reaches in defined time periods.

The foundation for these rights already exists within Basin State legislation. Victoria has 'extraction shares' for on-river water users, expressed as a condition on a works licence. In New South Wales, the 'individual daily extraction component' or 'individual daily extraction limit' is a component of the water access licence, and is already used in unregulated systems to manage the timing of water take. However, in NSW regulated systems, the individual daily extraction component is generally specified

¹³⁰⁴ Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 66.

¹³⁰⁵ Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 67.

¹³⁰⁶ MDBA, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 12.

¹³⁰⁷ South Australian Department for Environment and Water, *Submission to Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 2.

¹³⁰⁸ To limit the potential for users to create water shortages and price increases downstream, one user owning but not utilising their delivery rights should ideally not prevent the delivery of water downstream.

in a manner which does not constrain take.¹³⁰⁹ In South Australian legislation, the ‘delivery capacity entitlement’ represents the ongoing right to access a proportion of the capacity of a water distribution system; however, South Australia to date has not yet defined these entitlements in practice, considering them an ‘optional’ water right provided under the *Natural Resources Management Act 2004* (SA).¹³¹⁰

As noted in section 14.2.2, extraction shares in Victoria have not been capped (until the recent decision by Minister Neville to directly review any works approval applications) and the volume on issue has outstripped the volume of water access entitlements on issue (figure 14.7 represents the growth in these rights). The implication of this is that there would likely be significant challenges for Victoria to reduce the extraction share on offer, and New South Wales and South Australia to implement an effective regime for allocating their respective instruments.

Option 5 – ‘Loss factors’ on water trades

The ACCC recommends that Basin States and the MDBA investigate the implementation of loss factors which would apply to traded water in the Southern Connected Basin, so as to attribute increased conveyance losses associated with water trades directly to those incurring them.

As flagged in the ACCC’s interim inquiry report, a number of stakeholders have called for the implementation of loss factors to be applied to water trades that increase conveyance losses.

The introduction of policy mechanisms such as conveyance loss factors applied to the movement of water in the Basin offer the potential to address flaws in the market architecture regarding the accounting and attribution of conveyance losses. As noted, applying a loss factor to all water delivery, applied at the point and time of extraction, is likely to offer the greatest efficiency gains. However, this would require a decision from governments on whether existing rights holders, or just those trading water downstream should be subject to a loss factor.

The magnitude of the impact of market driven trends on conveyance losses is as yet unknown. Section 16.2.4 notes the challenges to determining accurate conveyance loss factors for every individual water use decision, which would likely mean any factor would have to take the form of an estimate or average. Any consideration of these kinds of policy mechanisms should balance the challenges to, and market disruption of, their implementation against the potential efficiency gains they offer. Policy makers may also need to consider if some ‘second best’ policy approaches which are more practical, may be preferable to optimal but challenging policy solutions.

Conveyance loss factor – allocation trade

A proposed solution to deal with conveyance losses was through the introduction of conveyance loss factors onto allocation trades.¹³¹¹ Doing so, would essentially represent an exchange rate allocation trade, defined by Schedule 3 of the *Water Act 2007* (Cth) as the ‘rate of conversion to be applied to water to be traded from one trading zone and/or jurisdictions to another’.¹³¹² Note, that this differs to exchange rate *entitlement* trades.¹³¹³

Conveyance loss factors for allocation trade could theoretically be applied to water trades which would increase conveyance losses (by changing the location of extraction). This would involve one ML of water sold from an upstream water user converted to less than one ML received by the downstream

1309 For many water access licences in regulated systems, this component is specified as ‘Subject to conditions water may be taken at any time or rate’. ACCC analysis based on NSW Water Registers, <https://waterregister.watarnsw.com.au/water-register-frame>, viewed 2 February 2021.

1310 Government of South Australia, *SA Policy Statement: water access entitlements and consumptive pools*, policy statement, 15 May 2012, <https://www.waterconnect.sa.gov.au/Content/Publications/DEW/Policy%20on%20the%20Implementation%20of%20Unbundling%20Water%20Rights%20in%20South%20Australia.pdf>, viewed 2 February 2021. Note, the *Landscape South Australia Act 2019* commenced on 1 July 2020, repealing the *Natural Resources Management Act 2004* (SA).

1311 Murrumbidgee Valley Food and Fibre Association, *Submission to Murray–Darling Basin water inquiry issues paper*, January 2020; Goulburn Murray Irrigation District Water Leadership, *Submission to Murray–Darling Basin water inquiry issues paper*, January 2020.

1312 *Water Act 2007* (Cth), Schedule 3.

1313 A conveyance loss factor being applied to allocation trade is an exchange rate allocation trade, in that the temporary water traded from one zone to another is subject to a conversion rate. Note that this differs from an exchange rate entitlement trade, which is when a permanent right to water is traded between zones subject to a conversion rate; a method of intervalley trade which is no longer used by Basin State governments.

purchaser. The difference between the two amounts would reflect the proportion of water lost to conveyance. Doing so would more effectively attribute the incremental increase in conveyance losses as a result of changing water use activity to those who are benefitting from this change – those involved in trading water downstream.

Examples of this kind of conveyance loss trade factor exist in Queensland's St George Water Supply Scheme, where the official transfer volume is an 'at dam' value but where the volume of water debited or credited from the seller or buyer's account is an 'at farm' value. Under normal climatic conditions and where water is traded from one zone to another further downstream, a loss adjustment (generally 12%) is applied to the volume debited against the seller's account, providing the buyer's 'at farm' value.¹³¹⁴ Enacting these mechanisms in the St George scheme is administratively much simpler than in the Southern Connected Basin, as the scheme is characterised by one main water source and minimal other inflow points.¹³¹⁵

Further, there is significantly more trade in the Southern Connected Basin than in the Northern Basin, making conveyance loss factors more complex to implement. Frontier Economics outlined these difficulties in writing:

Imposing conveyance loss factors..for allocation trade in the Southern Connected Basin would be extremely challenging to implement in practice ... If loss factors were to be considered, research and communication would be required to identify the magnitude of the losses, and how they vary with trading behaviour. ¹³¹⁶

The MDBA and Basin States considered the introduction of conveyance loss factors for allocation trade traded from tributaries into the Murray in June 2018 as part of the Trade Adjustments Project. Simultaneously, the MDBA also considered the concept of a conveyance share which would have to be purchased by water users when purchasing water from upstream. Because of the challenges and complexities to implementation outlined above, the group recommended no change to the current treatment of conveyance losses.

ABARES considered:

At present, the inability to accurately measure losses in most cases makes practical implementation of loss factors/zones very difficult. There may be specific situations where loss factors could be considered: where average loss rates are known to vary dramatically in different parts of a catchment (on a consistent basis) and /or there is a genuine concern around long-term changes in irrigation development within the catchment (shifts toward higher loss zones). As such, adoption of delivery loss factors would be best considered on a case-by-case (region-by-region) basis.¹³¹⁷

Conveyance loss factor – delivery/extraction

Other stakeholders recommended the application of conveyance loss or 'freight' factors applied to all water that is delivered through the River Murray system (as opposed to water traded, as outlined above).¹³¹⁸ Theoretically, a loss factor or adjustment could be applied to the water held by water users in each water source, which would give them an adjusted value representing the volume of water they are allowed to extract. In doing so, water users would directly bear the costs of conveyance losses related to their water use.

Conveyance loss factors for delivery are also applied in the St George scheme. In addition to conveyance loss factors applied to interzone allocation trades, a loss factor also applies to water

1314 SunWater, *Application for Temporary Transfer of Water and/or CAP St George Water Supply Scheme*, 2009, p. 4 at https://www.sunwater.com.au/wp-content/uploads/Home/Customer/Forms/Temporary_Transfer_of_Water_and_CAP_St_George.pdf, viewed 14 May 2020.

1315 SunWater, *St George Water Supply Scheme Schematic Plan*, 2004 at <https://www.sunwater.com.au/wp-content/uploads/Home/Schemes/St-George/St-George-Schematic-Plan.jpg>, viewed 14 May 2020; SunWater, *St George Scheme*, 2019 at <https://www.sunwater.com.au/schemes/st-george/>, viewed 14 May 2020.

1316 Frontier Economics, *Water market architecture: Issues & options, Input into ACCC market architecture assessment*, 26 October 2020, p. 48.

1317 ABARES Submission, *Submission to the Murray-Darling Basin water inquiry interim report*, 18 December 2020, p. 14.

1318 Coleambally Irrigation Co-operative Ltd, *Submission to Murray-Darling Basin water inquiry issues paper*, February 2020.

extracted, and converts the water volume 'at dam' to an 'at farm' volume for extraction based on the distance of the water user's zone from the water's origin points (including within the trading zone).¹³¹⁹

From a market architecture perspective, this kind of loss factor is likely to offer the closest thing to a 'best practice' approach by applying the loss factor to all water delivery (rather than just traded water) at the extraction point itself. The primary concern of this approach would be that it would impinge on the established rights of water users by effectively reducing the volume of water that all downstream users can extract, which would reduce the value of those entitlements. The decision on whether established rights to access water¹³²⁰ should be impacted by changes to the attribution of conveyance losses, or whether just water subject to temporary trade should be, is a values based decision for governments.

Conveyance loss factors on delivery or extraction could be applied to current tagged entitlements, as loss factors could vary based on the actual time of water use.¹³²¹ Imposing a conveyance loss factor only on tagged entitlement holders, and no other water users, would create a clear market distortion and is not recommended. However, shifting to a tagged allocation trade model would allow conveyance loss factors to be applied to water use more universally in the Southern Basin.

Conveyance loss factors – bulk intervalley trade adjustments

A more administratively simple mechanism for accounting for conveyance losses than an individual loss factor applied at the retail level, could be for a loss factor to be applied at the bulk level to the aggregate volume of IVT in the account. This would mean that if, say, 100 GL had been traded from the Murrumbidgee to the Murray, that only 95 GL (for a 5% loss factor) would be available for calling out and delivering to water users in the Murray. The remaining five GL would be used to cover the additional cost of conveying the traded water through to the end of the tributary.

As this arrangement operates at the bulk level, buyers of IVT water would still receive the full volume they purchased, but the volume of water resource available to the Murray would be decreased. This would shift the burden of the additional conveyance losses from being borne wholly by water users in the tributary, to being borne by users in the Murray. This arrangement would also mean that the loss factor can be most accurately linked to the real rate of conveyance losses. This is because it would occur at the time the water is physically delivered through the system at the bulk level from the origin to the destination valley.

Which valley should bear this cost, be it the valley of the seller or the purchaser, is ultimately an equity decision which the ACCC considers is a matter for government. The biggest concern would be the impact on water users upstream in the Murray who are already concerned about the impact of conveyance losses traded downstream to the lower Murray, and who would now also be bearing a proportion of trade from the Murrumbidgee to the Murray.

Under current arrangements, the ACCC does not believe this regime would work for water being traded between NSW Murray zones or between Victorian Murray zones, because in each of these cases there are two zones within one water source, and there is no "owing" of water from one valley to another when water is traded between zones 10 and 11, or between zones 6 and 7; that is, the bulk water resource are shared for those zones. The ACCC acknowledges that this is only a partial solution, and still retains the assumption that is appropriate to socialise losses associated with transferring water between valleys.

Option 6 – Alternative market institutions and models

The ACCC recommends specific alternative models for market architecture be investigated further by the proposed Water Markets Agency. The ACCC urges the ongoing consideration of reforms that focus on delivering effective signals back to water users of the actual costs of use, storage and delivery decisions.

¹³¹⁹ SunWater, *Application for Temporary Transfer of Water and/or CAP St George Water Supply Scheme*, 2009, p. 4.

¹³²⁰ Note that this would include water rights historically associated with using water in particular reaches, as well as water access entitlements more recently traded into these reaches.

¹³²¹ *Murray-Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010* (Cth) Schedule 2 Processes – accounting for tagged allocations, step 3, cl. 3.

Long term, the most effective way to do this will be through price signals which accurately represent the real cost of individual water deliveries (incorporating externalities such as conveyance losses, environmental damage, network congestion and delivery risk). Determining the appropriate model for reflecting price signals back to users will require more work.

Currently in the Southern Connected Basin, the MDBA operates the interconnected tributaries and storages in conjunction with the Basin States, trading off different objectives to meet, at the end point, demand for water users. This works well as the MDBA has the best information about what is happening in the river system overall, including likely demands in the future.

However there are issues around these trade-offs and how they are made, discussed in section 16.2.6. There is finite capacity within the river system and third party impacts which are not currently taken into account in market architecture. In the above sections, the ACCC explored ways in which the individuals could be empowered to manage these issues. However, this may result in a market that could be very complex for users and may still not produce an optimal outcome.

The advantage of the following options is that it allows the user who has the most information about risks and what is occurring in the system at a wholesale level, to make the decision. This is similar to the current model, where the river operator makes these decisions, but uses market signals to make decisions about where and when water is most valuable within the constraints of the water market.

‘Water banks’

A water bank can be defined at its simplest, as a single intermediary acting between buyers and sellers of water rights, whether that transfer is temporary (spot) or permanent.¹³²² In effect, there are already water banks for the environment functioning in the Basin market in the form of the Commonwealth Environmental Water Holder and other environmental bodies that hold water entitlements. The ACCC is also aware of a small scale water bank operating out of Mildura.¹³²³ The Commonwealth Scientific and Industrial Research Organisation has recently studied the potential for groundwater banking, explored in more detail below in box 16.2.

The bank’s purpose could be the efficient reallocation of water between regions within hydrological constraints at a given point in time. However a water bank could go further and help manage risk related to water availability or to act as a safety net for farmers, either by buying water and reselling or selling futures to hedge risk. This would depend ultimately on how the water bank’s purpose is defined when setting up the bank. It is important to note that the water bank would not fix the underlying market architecture issues with delivery and timing of use, unlike the water market operator model, explained below.

Water banks have been used internationally, notably in the United States of America. The Californian Government has implemented water banks for droughts firstly in 1991–92 and 1994.¹³²⁴ A water bank set up in 2009 was deemed to be less successful, and droughts in 2014 and 2015 did not result in water banks being established.¹³²⁵

A water bank has also been used for interstate transfers in the USA, to manage the transfer of unused Arizonian water in the Colorado River to southern California. This water bank was created due to rules that had been put in place out of concern that southern Californian demand would result in less water for Colorado.¹³²⁶ This shows that water banks may also be able to help with concerns about water leaving geographic areas. The Arizona Water Banking Authority’s role has since expanded to include firming up of water supplies in Arizona.¹³²⁷

¹³²² N M. Montilla-López, C Gutiérrez-Martín and J A. Gómez-Limón, Water Banks: What Have We Learnt from the International Experience?, *Water*, vol. 10, issue 8, 18 October 2016.

¹³²³ Mildura Community Water Bank, *Submission to Murray–Darling Basin water inquiry interim report*, 13 November 2020.

¹³²⁴ Harvard Kennedy School, *California Drought Water Bank*, n.d., <https://www.innovations.harvard.edu/california-drought-water-bank>, viewed 7 February 2021.

¹³²⁵ N M. Montilla-López, et.al, ‘Water Banks: What Have We Learnt from the International Experience?’, *Water*, vol. 10, issue 8 18 October 2016.

¹³²⁶ M B LaBianca, ‘Arizona Water Bank and the Law of the River’, *Arizona Law Review*, vol. 40, no. 2, 1998, p. 659–680. <https://heinonline.org/HOL/P?h=hein.journals/arz40&i=700>.

¹³²⁷ Arizona Water Banking Authority, *Objectives*, <https://waterbank.az.gov/objectives>, viewed 28 January 2021.

Box 16.2: Case study – Commonwealth Scientific and Industrial Research Organisation study on groundwater banking which could be used as a drought protection measure¹³²⁸

Aquifers and groundwater are already being used to shore up supply in Australia due to the variable rainfall. In the last drought, they were crucial to farmers in Narromine in helping to alleviate severe lack of water.¹³²⁹ However there is still not a firm understanding as to how much water take is sustainable and what the rate of groundwater recharge is.¹³³⁰ There are also fears that groundwater sources are already being over-extracted, as farmers move towards a more reliable water source.¹³³¹

Better modelling and understanding of how the river system and groundwater system works, could allow for better drought prevention by using groundwater banking. This is already in use in Australia, with Perth using groundwater replenishment to firm up their water supplies.¹³³²

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) conducted a study on the Murray–Darling Basin to identify possible areas that could be used for groundwater banking.

The CSIRO report found that:

- across the Basin, this study identified 96,000 km² (almost 10% of the Basin's 1 million km²) where there was potentially suitable geological features for water banking to occur
- a water banking model with recharge and recovery triggered by water trading prices using 11 years of data gave a benefit-cost ratio of approximately two-to-one
- water availability for recharge was a tighter constraint on water banking than aquifer storage capacity at the location chosen
- groundwater banking could potentially be an alternative to Menindee Lakes to help reduce evaporation losses
- there is a need for more site specific work and there are gaps in current information, specifically Lachlan River, Upper Murray, and Murrumbidgee River catchments.

A Water Market Operator and a 'smart market'

As discussed in Options 3, 4 and 5, there are many complexities around establishing appropriate property rights for delivery. One of the key issues is the dynamic nature of what is occurring in the river system, which would be difficult to reflect without a complex property rights regime. Further, once rights have been established, if conditions were to change substantially, it would be difficult to change or revoke these property rights.

There is another more centralised option, which would add an explicit market dimension to river operations. Using price to identify demand and supply across different trading zones and across time, a market operator could move water around the river system to the highest demand, within set hydrological constraints. The advantage of this model is that it allows the operator to cap delivery dynamically depending on river constraints, and respond to changing conveyances losses, similar to the way river operators make these decisions to move bulk water around the system now. Appendix H explores how smart markets might offer potential long term solution for water trading in the Basin. This

1328 D Gonzalez, P Dillon, D Page and J Vanderzalm, 'The Potential for Water Banking in Australia's Murray-Darling Basin to Increase Drought Resilience', *Water*, vol. 12, issue 10, 2020, <https://doi.org/10.3390/w12102936>.

1329 M Achenza, Aquifers saved the day at Narromine during the dry, *The Land*, 4 July 2020, <https://www.theland.com.au/story/6816728/how-groundwater-helped-one-narromine-farmer-through-the-drought/>, viewed 28 January 2021.

1330 Murray–Darling Basin Authority, *National Centre for Groundwater Research and Training Strategic Groundwater Research Partnership Final Report 2015–2018*, 2019, http://www.groundwater.com.au/media/W1s1zIsIjIwMTkvMDcVMDIvMDdfNDBfNTdfNjgzX01EQkFfTkNHUIRGaW5hbFJlcG9ydC5wZGYIXV0/MDBA_NCGRTFinalReport.pdf, viewed 28 January 2021.

1331 Murray Darling Basin Commission, *Projections of Groundwater Extraction Rates and Implications for Future Demand and Competition for Surface Water*, 2003, https://www.mdba.gov.au/sites/default/files/archived/mdbc-GW-reports/2178_Projections_of_GW_extraction_rates_and_the_CAP.pdf, viewed 28 January 2021.

1332 Water Corporation (Western Australia), *Groundwater replenishment*, <https://www.watercorporation.com.au/Our-water/Groundwater/Groundwater-replenishment>, viewed on 28 January 2021 .

is one type of model that could be used, and there may be other models that are more appropriate. It still remains to be proven that there are large enough problems with the market operation to justify this reform.

This model also gives the party with the best information about the overall system (the operator), the decision making power on the trade-offs for running the system. In contrast, delivery rights require individual users (who may not have adequate information or the time to become informed) to understand the operation of the river system at a more granular level.

The aim of this model is to operate the Southern Connected Basin water markets and co-ordinate water delivery to users as one integrated system, matching bids for water with offers of supply, within the physical constraints of the system. This model aims to exhaust all potential gains from trade (within system constraints), have effective price signals for use, storage and movement of water across the system, and make individual profit maximising decisions consistent with overall social benefits.

The advantage of this model compared to the status quo is that it also allows users to signal their demand better than in the current system by pricing their demand. This then allows river operators to make better decisions about meeting demand across trading zones and time.

However this requires a key change for users, with all water users being required to engage with the market in order to access their water. Under this model, water users need to order their water in order to be able to extract it, and would no longer be able to take water passively. This allows the operator to better gauge supply and demand at a given point in time, in a given region. In theory, this could be done at a bulk level, however this would likely be less efficient.

Importantly and in contrast to delivery rights, an operator model allows water users to only need to care about their own demand for water at their location, and not about the path that water flows over the network.

All of this would require much more advanced modelling and telemetry than is currently present in the river system and water market at the moment. It would also likely need to decrease the sizes of trading zones to help manage conveyance losses and other capacity constraints.

16.3.3 These reforms require Basin-wide coordination

Many longer term reforms require coordination and harmonisation across state borders to gain the full benefits of implementation. Although there is collaboration between states, having an independent body that looks at policies across the Basin as a whole, will improve reform outcomes. The ACCC recommends the Water Markets Agency to be this independent body with a market focus, which is discussed in more detail in the next chapter.

06

Governance of the Basin water markets

This part comprises chapter 17, which reviews and evaluates the market governance arrangements in the Basin water markets. In particular, chapter 17 discusses specific market governance deficiencies identified by the ACCC and proposes specific solutions that aim to address them. Importantly, these solutions also provide institutional and procedural mechanisms to enhance the implementation of various solutions outlined in this final report.

17. Market governance

Key points

- Market governance in the Basin water markets is currently fragmented and complex. While the water markets involve significant trade between regions and across state borders, responsibility for managing water resources and trade is dispersed across a large number of Basin State and Australian Government bodies.
- This fragmentation has contributed to complex and duplicative regulatory and administrative frameworks that are difficult for market participants to navigate.
- The ACCC has identified four key shortcomings of the existing market governance arrangements that are impeding the fair and efficient working of the Basin water markets. These are:
 - insufficient prioritisation of water markets policy to ensure that the water markets operate efficiently and work well for their participants
 - insufficient focus on delivering administrative functions in a manner that makes it simple and easy for participants to engage in water markets
 - differences in rule-making processes and consultation requirements by Basin governance bodies
 - insufficient transparency over existing intergovernmental processes and responsibilities, which is limiting market confidence and investment.
- The ACCC recommends that the Australian and Basin State governments create an independent Water Markets Agency to consolidate and carry out the new functions that have been identified throughout this inquiry, as well as combining functions that currently sit with other bodies. This will help to reduce fragmentation of water markets governance.
- The ACCC considers the Water Markets Agency would be best established through a cooperative legislative scheme involving the Australian and Basin State governments.
- The ACCC also recommends the following procedural reforms to market governance:
 - the Australian and Basin State governments should implement a consistent and transparent process for reviewing and amending water trading rules and other decisions with significant impacts on water markets
 - the Australian and Basin State governments should incorporate a legislative requirement to obtain and have regard to advice from the Water Markets Agency prior to changing or making new water markets policies, rules and decisions
 - the Ministerial Council and the Basin Officials Committee should publish annual policy documents that detail its strategic objectives and priorities relating to water markets policy.
- These governance reforms would increase market confidence, improve market participant decision-making and trade, allow better use of scarce water resources, encourage on-farm investment and improve overall economic output.

17.1 Introduction

Effective market governance is especially important for the Basin water markets because of its inter-jurisdictional nature, which creates the need for some level of harmonisation between Basin State and Commonwealth regulatory and administrative frameworks. This in turn requires coordination between Australian and Basin State government agencies and decision-makers to ensure that spill over effects are managed and that the infrastructure that support the water markets meet the needs of its participants.

As NSW Farmers outlines, '[m]arket governance is the foundation to an effective water market ... Market participants require a robust governance system in which they can have confidence in and ensures that

trading rules and regulations are developed with a Basin-wide perspective.¹³³³ The ACCC agrees with this view and believes that a robust, fit-for-purpose market governance framework is needed to support fair and efficient water markets.¹³³⁴

However, the inquiry has identified significant shortcomings in the Basin's market governance arrangements and their relative importance within broader water management governance. In recent years, the Australian and Basin State governments have been occupied with important issues of broader water management, particularly the implementation of Sustainable Diversion Limits. As a consequence, the performance of water markets and their administration have not been sufficiently prioritised to deliver well-functioning water markets.

The existing market governance arrangements need reform to ensure due consideration is given to water markets issues, without overriding existing water management decision-making powers and processes.

In addition, decision-making and administrative roles relating to water markets policies are highly fragmented and rule-making processes differ across jurisdictions in ways that may be avoidable. This creates and heightens challenges for water users to understand, participate and have confidence in the Basin water markets, and in turn prevents the potential benefits of these markets from being fully realised.

This chapter details the key governance problems that are impeding the effective functioning of the Basin water markets and proposes solutions to resolve them, improve market confidence and deliver market benefits into the future.

17.2 Current market governance arrangements

17.2.1 Current frameworks are complex and fragmented

Market governance refers to the institutions, rules and processes through which decisions concerning the definition and trade of water products and associated services are made and implemented, and how the various actors in the system are held accountable.

Market governance in the Basin water markets is fragmented and complex. While the water markets involve significant trade between regions and across state borders, responsibility for managing water resources and trade is dispersed across various state and federal government bodies. This results in certain regulatory, administrative and governance differences and inconsistencies between state jurisdictions.

Basin States have primary responsibility for the management of water resources and trade within their respective jurisdictions. Their responsibilities generally include:

- water allocation decisions for state water users (e.g. allocation of state water shares)
- water accounting processes and systems (e.g. metering and water flow measurement)
- administrative functions to facilitate water trade (e.g. trade approvals, maintenance of trade registries)
- water management and planning activities (e.g. management of dams, locks, weirs and barrages and water saving projects)
- development and enforcement of local compliance with Water Resource Plans, including accounting for water taken from the river system
- enforcement and compliance activities (e.g. relating to water theft and meter tampering)

1333 NSW Farmers Association, *Submission to Murray-Darling Basin water inquiry interim report*, November 2020, p. 15.

1334 The National Farmers' Federation articulated a similar view in its submission. See National Farmers' Federation, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 22: 'Without broader consideration of basin governance, the NFF is not convinced implementation of ACCC recommendations will resolve key issues. ... The NFF recommends basin governments assess whether existing governance arrangements are appropriate to oversee a functioning water market and address, existing, emerging and future challenges.'

The *Water Act 2007* (Cth), the Basin Plan and the Murray–Darling Basin Agreement establish an integrated framework, which aims to achieve a sustainable balance between environmental and consumptive uses, and efficiently manage water resources.¹³³⁵ The Basin Plan coordinates certain water trading and management activities by establishing the framework for setting Sustainable Diversion Limits and Water Resource Plans. It also includes Water Trading Rules that aim to reduce restrictions on trade and to improve transparency and access to information. The Basin Plan Water Trading Rules are designed to encourage consistency, promote freer trade (within hydrological limits) and provide a basic level of transparency. It is the responsibility of the Basin States to set trading rules governing trade within and between their jurisdictions.

The government agencies involved in water management include the MDBA, the Australian and Basin State Government water departments, the Basin State water authorities and resource managers, and various regulators and compliance agencies, including the ACCC. In addition, some private bodies, including IIOs, investors and intermediaries, have their own processes that impact how they or their customers interact with water markets.

Significant intergovernmental coordination and cooperation is needed to achieve consistency in Basin management policies and their administration. In this complex framework with multiple actors, it is often challenging to reconcile diverging interests to reach a consensus that delivers the most beneficial Basin-wide outcomes. It is also challenging for market participants to navigate arrangements and access information to support efficient trade.

17.2.2 Strategic Basin-wide policy-making is mainly situated in the Ministerial Council forum

The Murray–Darling Basin Ministerial Council (Ministerial Council) and its various subordinate committees are intergovernmental forums for Basin State and Commonwealth Ministers and government officials to coordinate on policy issues of joint interest. While decision-making on specific Basin matters is dispersed across multiple institutions, strategic Basin-wide policy-making and implementation is mainly undertaken in these forums.

The Ministerial Council considers and determines outcomes and objectives on major policy issues of common interest to the Basin State governments. The Ministerial Council has policy-making and decision-making roles in water resource management, and comprises the relevant water policy Ministers from each Basin State and the Commonwealth.

The Basin Officials Committee (BOC) is composed of senior officials from each of the Australian and Basin State government water departments. BOC provides advice to the Ministerial Council and coordinates the implementation of their policy decisions. BOC is supported by a number of sub-committees which provide advice on particular aspects of Basin management, including river operations, interstate and inter-valley trade, and environmental water management.

17.3 The current market governance arrangements do not support fair and efficient water markets

Effective market governance would enhance the efficiency of the water markets by increasing market confidence, allowing better decision-making by water users, prompting better use of scarce resources, and removing impediments to on-farm investment.

The ACCC has identified several key characteristics of the existing market governance arrangements that impede the fair and efficient working of water markets. These are:

- insufficient prioritisation of water markets policy to ensure that the water markets operate efficiently and work well for their participants
- insufficient focus on delivering administrative functions in a manner that makes it easier for participants to engage in water markets

¹³³⁵ In the Northern Basin, the New South Wales–Queensland Border Rivers Intergovernmental Agreement (2008) established a role for the Border Rivers Commission to manage relevant water resources on behalf of NSW and Queensland.

- differences in rule-making processes and consultation requirements by Basin governance bodies, that cause confusion and an unequal playing field for market participants
- insufficient transparency over existing intergovernmental processes and responsibilities, which limits market confidence and investment.

These characteristics exacerbate the impacts of the fragmented nature of existing market governance arrangements. The ACCC recognises that some level of fragmentation is inevitable, and even desirable to the extent needed to ensure that localised conditions are appropriately accounted for. However, addressing the four identified governance issues listed above will mitigate the detrimental impacts of fragmentation, improve the fair and efficient working of water markets, and bring substantial benefits to market participants, regional communities and productivity.

17.3.1 Basin governance arrangements are not prioritising water markets issues

Market governance and broader water management governance are inherently and necessarily linked. Under current arrangements, critical water management issues are often prioritised. These water management issues are fundamentally important and should continue to receive significant attention. However, with the maturation of the Basin water markets, governance arrangements need to enable a focus on market issues in order to maximise their benefits, without detracting from existing water management decision-making powers and processes.

Insufficient prioritisation of water markets considerations at the intergovernmental level of policy-making is impacting the effectiveness of the Basin water markets. While the Ministerial Council has predominantly focused on important river operation matters, it has rarely addressed water markets issues.¹³³⁶ Indeed, even where water markets issues are considered, they are structurally overcrowded by broader water management considerations.¹³³⁷ This has contributed to a lack of strategic direction and consideration of water markets policy.

The prioritisation away from water markets considerations extends to the operational and administrative level. The MDBA's annual reporting of BOC's activities in recent years suggests that, at the operational level, BOC has had limited focus on water markets issues.¹³³⁸ The ACCC also understands that within some Basin State agencies, the areas responsible for water trade are often less resourced than those responsible for other water management matters.

A critical consequence of this limited prioritisation of market considerations in the existing Basin governance arrangements is an insufficient focus on market evaluation.¹³³⁹ As detailed throughout this Final Report, the Basin water markets are characterised by significant deficiencies, such as a perceived lack of market integrity (outlined in chapter 9) and inadequacies in certain types of market information (outlined in chapter 11). Market evaluation is important to proactively identify these issues and provide objective analysis of the impacts of specific policies, rules and conducts on the effectiveness of the Basin water markets. In turn, this analysis can help drive policy consensus that improves market confidence and broader economic welfare. Market evaluation also helps to ensure that water markets policies and reforms are informed by evidence. Without regular market evaluation, a feedback loop may

¹³³⁶ In a review of publicly available information on the Ministerial Council's activities since 2014–15, contained in various communiques (published on the MDBA 'Media Centre' webpage: <https://www.mdba.gov.au/media>) and the MDBA's annual reports (published on the MDBA's website: <https://www.mdba.gov.au/publications/mdba-reports/mdba-annual-report>), the ACCC did not find significant consideration of water markets issues by the Ministerial Council.

¹³³⁷ For instance, the ACCC notes that the sub-committee under BOC that is responsible for considering inter-jurisdictional trade matters, the Trade Working Group, is administratively a lower tier sub-committee. The ACCC has heard from some Basin State officials that trade matters are difficult to elevate to BOC's crowded agenda and that resources are generally not prioritised for consideration of trade matters in their day-to-day work.

¹³³⁸ In a review of publicly available information on the Basin Officials Council's activities since 2014–15, contained in the MDBA's annual reports (published on the MDBA's website: <https://www.mdba.gov.au/publications/mdba-reports/mdba-annual-report>), the ACCC did not find significant consideration of water markets issues by the Basin Officials Committee.

¹³³⁹ The Victorian Government commissioned a review of the effectiveness of the Victorian water markets, which was completed in 2018. See Aither, *Effectiveness of Victoria's water markets*, February 2018. However, while state-based reviews are useful, whole-of-market evaluation is still required to ensure that spill over effects are managed across the system, that there is a level playing field for market participants regardless of their location, and that overall efficiency and benefits to broader Australia are maximised.

be created where water markets considerations are not prioritised because there is insufficient evidence for them to be actioned confidently.

The ACCC does not seek to downplay the importance of critical water management issues. However, as water markets continue to mature, they will only operate efficiently if the governance arrangements enable market issues to be sufficiently prioritised. As Basin Plan implementation moves to its final stages, it is important to ensure that water markets issues and necessary market reforms receive appropriate attention. This will require market governance bodies to be resourced, structured and aligned with objectives that prioritise having the water markets operate efficiently.

17.3.2 Market administration does not prioritise making the market work for market participants

The Basin water markets are supported by a range of functions, including the processing of trade applications, maintenance of water registries and information portals, and enforcement of trading rules and market conduct laws. However, the current administration of these functions has not sufficiently prioritised improvements to ensure they work well for participants. For instance, trade approval processes in many circumstances can take several days or longer¹³⁴⁰ despite the practical urgency of timely water trade in times of peak seasonal demand. As a consequence, some water users may find the water markets bureaucratic and unfit for their needs.¹³⁴¹ This hinders the extent and quality of participation in the water markets, and reduces competition and efficiency in not only the water markets but also in dependent markets, such as those in irrigated agriculture.

There has been particularly inadequate attention given to market accessibility. Information on water management infrastructure, water markets policy decisions, and information on trade administration processes either do not exist or are spread across the websites of a large number of Commonwealth and Basin State agencies. Water markets remain obscure for many market participants. The NSW Irrigators' Council noted that 'many market participants have limited knowledge of market operations and processes, particularly what options are available to them'.¹³⁴² It further observed that '[t]he complexity of the system means that larger operators that are generally better resourced to have professional staff understanding the array of options, fare better than smaller operators without the same degree of knowledge'.¹³⁴³

This complexity, both real and perceived, creates an unequal playing field where market participants generally need to operate at substantial scale to effectively navigate and take advantage of the water markets while still managing their primary lines of business. This deters new entrants to irrigated agriculture and puts pressure on existing smaller businesses, not because of their lack of competitiveness in their primary lines of business, but because they do not have the scale or knowledge to navigate the water markets. Greater market accessibility is needed to address this problem. This can be achieved by aggregating and delivering market information through a 'single source of truth' (such as through the proposed Water Market Information Platform, see recommendation 12) and by providing broader market education.¹³⁴⁴ These solutions would substantially increase the accessibility of the water

1340 For example, while market participants can generally expect intra-state trades to be approved on the same business day or on the next business day in Victoria and NSW, they may need to wait several business days for trades to be approved in SA. However, in the case of inter-state trade approvals, market participants are likely to need to wait several business days regardless of the approving jurisdiction. See figure D.9 and figure D.10 of appendix D in this final report.

1341 See, for example, Murrumbidgee Valley Food and Fibre Association, *Submission to Murray-Darling Basin water inquiry interim report*, p. 2: '... many water users do not believe that the markets and key institutions are fair or working to the benefit of all water users.' SunRice Group and Ricegrowers' Association of Australia also note that '[t]he current system creates significant search costs for many growers, who depend on water markets but do not have the effort, time or ability to decipher complex water information from a range of fragmented sources'. See SunRice Group and Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 29.

1342 NSW Irrigators' Council, *Submission to Murray-Darling Basin water inquiry interim report*, October 2020, p. 31.

1343 *ibid.*

1344 These views seem to be supported by many in the industry. For example, SunRice Group and the Ricegrowers' Association of Australia advocates that '[a]ll water users – regardless of their level of sophistication – should be able to easily understand the formula for determining allocation. For example, water users should have access to information on inflows (dam and tributary) and recent use so that they can estimate with a degree of certainty what the level of allocations are likely to be in the near future'. See SunRice Group and the Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 22.

markets, and in turn, induce competition from new entrants and smaller market participants, improve their decision-making and therefore enhance overall market efficiency.

The current administration of regulatory functions has also restricted market confidence, which is highly influenced by the perceived integrity of the market. Harmful conduct should not only be addressed, but done so visibly to the broader market, so that such conduct is deterred, both in reality and perception. This is now being partly addressed, at least with respect to metering and water take, with the adoption of the Compliance Compact by Basin States and the creation of the Office of the Interim Inspector-General of Water Compliance. However, this Inquiry has found that there is a need for greater surveillance and regulation of market conduct.

The ingredients for water markets that work well for its participants require effective administration, with market considerations as a priority. They are unlikely to be achieved in a governance framework where market considerations are merely an adjunct to broader water management. Instead, it would be far more effective to have these functions administered by an independent market-focused body with a clear mandate to improve the efficiency of the water markets.

17.3.3 The processes for making and amending trading rules are inconsistent across the Basin, and lack transparency

The laws, rules, policies and arrangements that facilitate and govern the water markets (trading rules¹³⁴⁵) are defined in a multitude of instruments. Most of these are statutory instruments, but also include regulations, policies and plans (e.g. Basin State water resource plans), rules and guidelines (e.g. IIO network rules), and intergovernmental agreements.

With trading rules contained in so many different instruments, each the responsibility of a different entity and each with its own process for making and changing the rules, the task for water users of accessing and understanding the trading rules is complex and onerous.

Currently, different rules may be developed for the same function in different jurisdictions, resulting in unnecessary complexity and duplication. This has resulted in differences in trading rules and rule-making processes, causing significant complexity and duplicating administrative costs for government agencies and market participants. As Citrus Australia submits, this 'creates twice as much work for growers who live in border regions and farm on both sides of the river, whereby they must understand the cumbersome water trading rules made up by not just one government, but two or sometimes three.'¹³⁴⁶ SunRice Group and the Ricegrowers' Association of Australia also noted that the fragmentation of trading rules across multiple documents makes it 'extremely challenging for growers to meaningfully decipher how water markets work.'¹³⁴⁷

Chapter 13 (13.3.4) sets out the problems that arise when there are inconsistencies between states' rules and policies. For example, inconsistencies can undermine fairness and market confidence if some water users are subject to compliance obligations of different stringency. In addition, inconsistencies incentivise market participants to commit time to research and navigate them to make arbitrage gains, and this favours those who have the resources and scale to do so.

1345 Section 26 of the *Water Act 2007* (Cth) provides a useful description of the matters that may be the subject of trading rules:

- the rules governing the trading or transfer of tradeable water rights
- the terms on which tradeable water rights are traded or transferred
- the processes by which tradeable water rights are traded or transferred
- the imposition or removal of restrictions on, and barriers to, the trading or transfer of tradeable water rights
- restrictions on taking or using water from a water resource as a result of the trading or transfer of tradeable water rights in relation to that water resource
- the manner in which particular kinds of trading or transfer of tradeable water rights is conducted
- the specification of areas within which particular tradeable water rights may be traded or transferred
- the availability of information to enable the trading or transfer of tradeable water rights
- the reporting of the trading or transfer of tradeable water rights
- any matter dealt with in the schedules or protocols to the Murray-Darling Basin Agreement pertaining to trade.

While this section deals with matters that may be the subject of the Basin Plan Water Trading Rules, it is a useful definition for identifying trading rules in other relevant instruments.

1346 Citrus Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 3.

1347 SunRice Group and Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 29.

By no fault of the market participants, this is a problematic outcome because the resources they commit to arbitrating these inconsistencies is a net loss of resources for society. Rather than being committed to productive uses, these resources are instead committed to navigating an unnecessarily inconsistent and duplicative system. If the regulatory frameworks were consistent, such arbitrage opportunities would not exist, and these resources could have been committed to productive uses with benefits to broader Australia.

In addition, there is no systematic process for considering whether there are gaps in the trading rules and how to address these. Consistent oversight or input into rule design would promote increased harmonisation of trading rules over time (see proposed solution at 17.4.2).

There is no one clear process for making and changing rules. Many different entities are responsible for rule-making and rule-making processes can vary significantly depending on the entity making the rules. In many cases, the processes for making and changing market rules are slow, lack transparency and, as a result, undermine market outcomes.

Statutory rule-making processes are slow and inflexible, making it hard to change and adapt the rules over time. Many trading rules are contained in legislation rather than in subsidiary regulations, rules or guidelines. While this has advantages in terms of making rules well-defined and enforceable, it does mean they are more inflexible to change.

On the other end of the spectrum, rule-making processes for non-statutory instruments (especially those involving inter-governmental agreements) lack clearly defined processes or timeframes. There are often no clear requirements to consult with stakeholders or to have regard to formal advice from other government agencies.¹³⁴⁸

Processes for stakeholder consultation are also inconsistent between governance bodies. Rule-makers achieve better outcomes when their decisions are informed by a genuine consultation process that consider the real world impacts of policy options. Currently, consultation does not occur consistently, and does not allow for the involvement of all market participants. This is particularly problematic for stakeholders living outside the geographical remit of the jurisdiction undertaking the rule change. This results in an unequal playing field where market participants affected by particular governance arrangements are advantaged because they are better able to understand and engage in certain rule-making processes, resulting in rules that are better suited for their needs.

If an objective of rule-making is to improve the benefits delivered by the water markets, then market and industry impacts are critical inputs to the rule-making process. Assessment of market and industry impacts should therefore be an ingrained consideration of Basin rulemaking processes. This can be achieved by requiring industry consultation and public scrutiny as part of the rule-making process (potential solutions are discussed at 17.4.2).

Problems also arise when consultation processes permit some stakeholder access to information that isn't generally available. Information obtained during consultation may give some stakeholders an advantage over other market participants, especially where that information provides insight into the likely direction of up-coming government decisions or rules changes.

Chapter 11 (11.6.2) discusses the need to expand the scope of current inside information provisions to cover 'market moving' announcements more generally, including announcements made by non-government entities, and has recommended implementing prescribed rules and processes for water announcements (see recommendation 9). This is especially relevant for information relating to making or changing trading rules.

¹³⁴⁸ However, some stakeholders have submitted that similar problems around the transparency of Basin State deliberations exist. goFarm Australia noted that '[i]n New South Wales it remains difficult to access 'public' consultation documents or identify contact points at the multiple agencies (Department of Planning, Industry and Environment, WaterNSW) involved in water licencing and management. There remains ongoing regulatory uncertainty about how the New South Wales Water Minister will address future instances of groundwater over extraction in the Lachlan and Murrumbidgee Valleys, which risks undermining the confidence of irrigators to make long-term investment decisions. New WRPs do not clearly outline what steps will be taken by the Water Minister if extractions continue the historical trajectory and long-term average annual extraction limit (LTAAEL) thresholds are exceeded.' See goFarm Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 19 October 2020, p. 4.

17.3.4 The roles, strategic priorities and activities of the intergovernmental forums with respect to water markets policy are not transparent

The ACCC considers that there is insufficient transparency and accountability over how governance bodies approach and deal with water markets issues. While chapter 16 deals with this issue more broadly, this subsection focuses on the transparency over the decision-making processes of the Ministerial Council, BOC and its subcommittees.

At the most basic level, there is limited public transparency over the specific roles of the Ministerial Council, BOC and its various sub-committees with respect to water markets policy. The Claydon Review found a similar perspective among stakeholders in its consultation on water management:

All external stakeholders contacted were confused as to who has what roles and responsibilities, and 'who is in charge?', or 'is there no-one in charge?' They are especially concerned about the lack of inputs to, and the lack of transparency in, decision-making by the high level committees.¹³⁴⁹

The ACCC also found there is limited public information on the activities of the intergovernmental forums, particularly with respect to water markets policy. The available information is mainly limited to communiques detailing the outcomes of Ministerial Council meetings, and the summary overviews of the BOC's activities and current working agenda contained in the MDBA's annual reports.¹³⁵⁰ This information is likely to have limited value for water users given these documents are published after the relevant decisions and activities have already occurred. This means that affected parties are unlikely to be able to reliably plan ahead of such decisions and activities taking place. Where decisions have market impacts, this may prevent market participants from making informed and timely responses to these decisions.

Additionally, there is limited detail as to how intergovernmental forums deal with water markets issues and consider them in their broader water management decision-making. While the objectives and desired outcomes that govern how the MDBA deals with river operations matters are published and consistently updated,¹³⁵¹ no equivalent publication exists for the intergovernmental bodies that deal with water markets matters. As a consequence, there is limited clarity as to how water markets policy is applied and is likely to develop in the future.

This is particularly concerning as public decisions can impact market conditions and result in market distortions that are significant and enduring.

The potential for such decisions, especially given the lack of clarity over water markets policy, impedes market certainty and confidence, and would likely reduce participation and investment in irrigated agriculture.¹³⁵² Similar views were also voiced by market participants in their responses to the Interim Report. For example, Coleambally Irrigation Co-operative Limited advocated for greater transparency over BOC's decision-making process, noting that 'details of its deliberations are not available to industry and there is no transparency in their decision-making process'.¹³⁵³

The ACCC recognises that BOC has responded to the Claydon Review and is undertaking a number of measures to address its findings and recommendations. However, the ACCC considers that greater transparency over the various roles, activities and strategic priorities of the intergovernmental forums relating to the water markets is urgently needed. Transparency is particularly important for the Ministerial Council and BOC, given their standing as the key intergovernmental forums for the setting

1349 Greg Claydon, *Review of the Murray-Darling Basin joint governance arrangements: final report*, 18 March 2019, p. 2.

1350 However, such an overview was not provided in the MDBA's 2019-20 Annual Report, representing a move to even less transparency over BOC's activities since the Claydon Review.

1351 See MDBA, *Objectives and Outcomes for River Operations in the River Murray System*, 21 October 2020.

1352 Marianne Graham, in a submission highlighting the lack of transparency of governance agencies, noted a similar concern: 'If you are looking at the factors that create instability and issue in markets I don't believe you can leave out the non-transparency of the Govt entities which have a huge effect on prices in the market and recently are very unexpected.' See Marianne Graham, *Submission to Murray-Darling Basin water inquiry interim report*, 24 November 2020.

1353 Coleambally Irrigation Co-operative Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 6 October 2020, p. 21.

and implementation of whole-of-Basin strategic policy. Transparency at this level would provide considerable benefits to certainty and confidence over the strategic direction of water markets policy.

17.4 Governance solutions

Complementary governance reforms are necessary to address the governance problems the ACCC has identified. These include both institutional and procedural reforms to:

1. Establish a Water Markets Agency to consolidate and carry out new and existing trade related roles and functions.
2. Increase the transparency of decision-making processes and to enable the proposed Water Markets Agency to provide independent and expert advice on market issues to decision-makers (sections 17.4.2 and 17.4.3). The ACCC is not proposing changes in terms of who the decision-makers are, but recommends increased clarity and transparency in relation to existing processes, and increased consideration of the market implications of decisions.

This section discusses these proposed reforms and their benefits.

17.4.1 Water Markets Agency

The ACCC recommends establishing an independent Water Markets Agency as an expert market-focused body with a mandate to establish and support efficient and well-functioning water markets. The proposed Water Markets Agency would elevate water markets considerations in Basin management policy and administration, and focus on ensuring that the water markets work well for its participants, are competitive and deliver efficient outcomes.

The proposed Water Markets Agency would perform new functions that have been identified in this inquiry, and a number of existing functions that currently sit with other bodies. This would reduce fragmentation of water markets governance.

► **Recommendation 26**

Create a Water Markets Agency

The Australian and Basin State governments create an independent Basin-wide Water Markets Agency to consolidate and carry out new and existing trade-related roles and functions.

The ACCC considers the Water Markets Agency would be best established through a cooperative legislative scheme between the Australian and Basin State governments.

The key functions of the proposed Water Markets Agency would be:

- *Market regulation and surveillance functions* – ongoing monitoring of market activities and investigating allegations of potential market misconduct. This will address key regulatory gaps, such as in relation to water market intermediaries (see recommendations 1 to 3).
- *Market information functions* – provide a ‘one-stop-shop’ for water users to access market information, such as pricing and availability, water storage information, announced allocations and access to policy documents. (see recommendation 12).
- *Market evaluation function* – undertaking proactive whole-of-Basin market evaluation and reporting activities of trading market issues and cross-jurisdictional trade impacts. This would enable research and analysis in relation to market issues, including those set out in recommendation 25.
- *Advisory and advocacy functions* – providing expert and technical advice to the Australian and Basin State governments and advocate for the interests of water markets in broader policy discussions.

It is not proposed that any existing rule making functions be transferred to the proposed Water Markets Agency.

This will establish an organisation distinct from broader water management governance, so that there is a greater institutional focus on delivering important specific functions that support efficient markets. It would have a Basin-wide reach and a whole-of-Basin perspective.

The ACCC considers the Water Markets Agency would be best established through a cooperative legislative scheme between the Australian and Basin State governments. This would provide the needed mechanism for jurisdictions to work together to develop a harmonised regulatory framework and information data systems and standards to facilitate the efficient and fair operation water trading markets across jurisdictions.

The creation of the proposed Water Markets Agency would provide many immediate benefits. It would, for example, address regulatory gaps in relation to market conduct and provide market participants with easier accessibility to market information. However, the proposed Water Markets Agency would also deliver ongoing market review and evaluation functions that have not been prioritised by existing governance bodies. In doing so, it would equip Basin management policy-makers with a pathway to continue to develop and improve water markets policy into the future.

The ACCC considers that a long-term view must be taken to ensure that the supporting regulatory, governance and administrative frameworks are fit-for-purpose as the water markets continue to mature. Water markets currently lack much of the supporting regulatory infrastructure and informational services that exist in more mature markets, like the energy and financial markets. The ACCC considers that, given the water markets’ increasing maturity, this is a critical time to implement a comprehensive range of mechanisms to support water markets, and that the proposed Water Markets Agency is the appropriate vehicle to ensure they are delivered effectively.

The ACCC has considered some of the key issues relating to the implementation of this recommendation and reached the following views:

- The proposed Water Markets Agency should have mandatory information gathering powers for its enforcement and market surveillance functions. It should also be given discretion to self-initiate its

own reviews (with access to mandatory information gathering powers), subject to accountability safeguards such as consultation requirements.

- In terms of geographical scope, the roles and function of the Water Markets Agency should be, at a minimum, Basin-wide, although some of its functions will be focused on the Southern Connected Basin where risks of inaction are higher.
- A range of options exist for constituting the senior leadership of the proposed Water Markets Agency. Like other independent national agencies, the Commonwealth and the Basin States could play a role in the appointment of this senior leadership.

Overall, the ACCC believes that its proposal to create the Water Markets Agency as a market-focused independent body with regulatory and economic expertise would help to focus the existing market governance arrangements on developing water markets that work well for its users. The Water Markets Agency would do this by providing objective analysis that is informed by its markets expertise and understanding of industry perspectives. This analysis would not replace the decision-making of existing governance bodies but aim to improve and align them to a clear objective of facilitating well-functioning water markets. Therefore, the ACCC sees the creation of the Water Markets Agency as an important and necessary step to delivering meaningful and comprehensive reform to ensure the water markets meet the needs of its users, now and in the future.

The ACCC considers the proposed Water Markets Agency would deliver substantial benefits and efficiencies

Some stakeholders raised concerns about the costs of undertaking structural water markets reforms, such as the creation of new regulator or governance body. For example, the NSW Independent Pricing and Regulatory Tribunal highlighted the importance of undertaking cost-benefit analysis, minimising costs and considering how costs will be funded.¹³⁵⁴ Other stakeholders highlighted the failed implementation of the National Water Market System.¹³⁵⁵

The ACCC acknowledges these concerns and considered approaches for assigning the Water Markets Agency's proposed functions among existing agencies as an alternative option. However, the ACCC considers that the substantial benefits of having a dedicated expert body deal with issues specific to water markets would be lost under such an approach. Existing agencies do not have the necessary markets and industry expertise to deal with market concerns effectively. They would also be required to balance any additional water markets responsibilities against ongoing priorities and work programmes. This could result in water market issues not being prioritised to the extent they need to be if the water markets are to function well for its participants. It would also further add to fragmentation of roles, and increase regulatory and administrative confusion for market participants.

While the ACCC recognises that this recommendation may entail some upfront and ongoing costs, it firmly believes that the proposed Water Markets Agency would be far more effective and would deliver substantial cost efficiencies by undertaking its functions in combination. For instance, by assigning the Water Markets Agency with various market information functions, it would ensure that the Water Markets Agency has a focus on facilitating markets that work well for its users. It exposes the Water Markets Agency to industry and market participant perspectives that would add to its understanding of the water markets and their dependent industries, and ensures it has a balanced view from all such industries. This would then inform the Water Markets Agency's regulatory and market evaluation activities, including its prioritisation of activities to deliver the greatest benefits to market participants and broader Australia. Effective prioritisation is necessary given the scale and number of reforms needed for the water markets, as evidenced in this inquiry.

In addition, combining market surveillance and administration of data standards would allow the Water Markets Agency to collect market information and data that informs its regulatory, market evaluation and market information functions. This would remove duplicative administrative costs for the government agencies that collect this information and the market participants that provide it. Likewise,

¹³⁵⁴ Independent Pricing and Regulatory Tribunal, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 1.

¹³⁵⁵ See, for example, Central Irrigation Trust, *Submission to Murray-Darling Basin water inquiry interim report*, 28 August 2020, p. 6.

the undertaking of regulatory, market evaluation and market information functions by the Water Markets Agency would equip it with the broad knowledge and perspectives needed to provide robust advice to decision-makers to help them shape water markets to work better for their users.

Overall, the ACCC believes the creation of the proposed Water Markets Agency would provide substantial upfront and ongoing benefits. However, should this recommendation be adopted, the ACCC believes the implementation process should involve stakeholder consultation, particularly to consider the views of existing and potential market participants, to ensure that benefits and costs are appropriately framed, and that benefits are maximised relative to costs.

The proposed consolidation of Water Markets Agency functions addresses the fragmentation problem in water markets governance

The creation of the Water Markets Agency would also substantially address the coordination problem that exists in the current fragmented governance framework. Multiple governance bodies at the Commonwealth and Basin State level are currently responsible for aspects of market governance, but no single body has water markets as its core priority. Instead, not only do water markets considerations compete with other water management priorities within each governance body, these governance bodies must also coordinate with each other despite significant differences in their respective interests and resources. On top of this, there is a distinct absence of strategic direction at the inter-jurisdictional level on water markets policy, likely caused in part by a lack of market evaluation that could have otherwise helped to drive policy consensus.

This coordination problem has resulted in critical deficiencies in the water markets, as outlined in this chapter and elsewhere in this Final Report. In part this is because the market governance arrangements that support the water markets do not currently reflect the hydrological connectivity of the river system. However, this is needed if the Basin water markets are to operate efficiently and fairly. Therefore, to empower reforms that deliver water markets that work well for its users, the ACCC believes that some degree of centralisation and consolidation is necessary to alleviate this coordination problem.

Indeed, several stakeholders have expressed similar views. For example, SunRice Group and the Ricegrowers' Association of Australia submitted that '[o]ne of the key concerns is that no agency has centralised responsibility for water market reform, leading to a fragmented regulatory system with agencies unwilling to harmonise their water policies and rules. Without undertaking the crucial task of developing a strong water market governance framework where responsibilities are clearly delegated, it will be very difficult to engage in meaningful and comprehensive reform.'¹³⁵⁶ The ACCC agrees with this perspective and believes the proposed Water Markets Agency is necessary to support the ongoing development of the water markets and deliver key reforms.

Functions of the proposed Water Markets Agency

In earlier chapters, the ACCC identified a number of key functions that are required to support the fair and efficient operation of water markets, but which are missing from the current system. The Water Markets Agency would administer these new functions, along with consolidating some existing roles that support improved market governance. Table 17.1 sets out whether these are new or existing functions.

The ACCC does not recommend that broader non-market compliance functions, such as those administered by the Inspector General's office, be integrated into the proposed Water Markets Agency. This is because these are not specifically market administration functions, and the core benefits of the Water Markets Agency are achieved through having a market-focused agency.

The ACCC proposes the following functions for the Water Markets Agency:

- **Market regulation and surveillance functions** – Monitor market activities, investigate allegations of potential market misconduct (such as market manipulation and insider trading), and undertake enforcement action as required. The Water Markets Agency would also publicly report outcomes

¹³⁵⁶ See SunRice Group and Ricegrowers' Association of Australia, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 5.

of its surveillance and enforcement activities. This function would address existing regulatory gaps, such as those relating to intermediary conduct.

- *Benefits:* These functions would improve market integrity and create a more equal playing field for market participants, and thereby enhance market confidence. It would also enable the identification of any conduct that reduces market efficiency or causes harm.
- **Market information functions** – Provide a ‘one-stop-shop’ for water users to access market information, such as pricing and availability (timely historical data on approved trades as well as current bids and offers), water storage information, announced allocations and access to policy documents such as for carryover and trade allocation. In addition, it could provide water users with practical guidance on water trading matters, and undertake direct educational campaigns and community engagement.
 - *Benefits:* This would enhance the quality and accessibility of market information, which is critical to the efficient operation of markets as it enables participants to make informed decisions. This would improve market confidence, increase competition and encourage efficient allocation and use of water resources.
- **Market evaluation functions** – Undertake proactive whole-of-Basin market evaluation and reporting of trading market issues and cross-jurisdictional trade impacts. This would include researching complex trade issues and market design, with a focus on achieving greater cross-jurisdictional coordination and harmonisation. These functions would assist in identifying market issues and trends to inform the Water Markets Agency’s advisory, advocacy and regulatory functions.
 - *Benefits:* As water markets continue to develop, market evaluation would allow market problems to be identified, assessed and addressed before they lead to significant harm to markets or market participants. It would also enable the Water Markets Agency to identify opportunities to further improve how the water markets work for their users.
- **Advisory and advocacy functions** – Provide expert and technical advice to the Australian and Basin State governments to support and drive improvements to market architecture design and trade rules. The Water Markets Agency will also advocate for the interests of water markets in broader policy discussions.
 - *Benefits:* This is critical to ensure that water markets impacts are considered as part of the decision-making involving broader water management issues.

As highlighted earlier, these functions are interlinked, meaning the full benefit of one function can only be realised by combining it with other functions. For example, the proposed Water Markets Agency’s market evaluation functions would directly inform its advisory functions. Equally, the proposed Water Markets Agency’s information functions are necessary for taking regulatory actions where market misconduct arises.

The table below outlines the proposed and existing water market specific functions that the ACCC recommends should be carried out by the Water Markets Agency. The table specifies whether the function is new or whether it currently sits with an existing agency.

Table 17.1: Proposed market specific functions of the Water Markets Agency

Market function	Agency with current responsibility
Market regulation and surveillance functions	
Market conduct enforcement: Enforce new market conduct and integrity legislation to regulate behaviour of market participants in water trading markets (see chapter 9)	No agency is currently responsible for this function
Market surveillance: Monitor and report on market data trends and impacts of water trade from a Basin-wide perspective	No agency is currently responsible for this function
Data standards compliance: Administer new data and information collection standards across relevant organisations (e.g. IIOs and registers)	No agency is currently responsible for this function
Monitoring and enforcing regulated charges: Monitor and report on regulated charges and compliance with the Water Market and Water Charge Rules	ACCC

Market function	Agency with current responsibility
Enforcement: Enforce compliance with existing Water Market and Water Charge Rules	ACCC
Basin Plan trading rules: Ensure compliance with existing Basin Plan water trading rules (e.g. restrictions on trade are compliant, compliance by IIOs with their requirements etc)	MDBA
Market information functions	
Information infrastructure: Administer the proposed Digital Messaging Protocol (recommendation 10) and the proposed Backbone Platform (recommendation 11) to implement and enforce data collection, management and transfer standards across government and non-government water trade services providers (see chapter 12)	No agency is currently responsible for this function
Information platform: Administer the proposed Water Market Information Platform consolidating disparate information and data in one place for water market participants (see chapter 12)	Disparate information platforms at different State and Commonwealth levels
Data standards: Administer central water market data standards to ensure data held by trade approval authorities, water registers and exchange platforms is comprehensive, captured in the correct format and shared real-time (see chapter 12)	BOM has certain legislative powers to set mandatory National Water Information Standards, but have not issued any to date
Water trade lodgement facility: Administer the proposed Backbone Platform (recommendation 11), which intermediaries will connect to instead of establishing multiple links with different trade approval authorities (see chapter 12)	No agency is currently responsible for this function
Education and stakeholder engagement: Provide direct advice and guidance to the community and water users through education and engagement activities (see chapter 12)	No single body tasked with role. Ad hoc and disparate advice can be provided by a range of different bodies
Market evaluation functions	
Evaluation: Undertake proactive whole-of-Basin market evaluation and reporting activities of trading market issues and cross-jurisdictional trade impacts	No agency currently reviews trade issues from a whole-of-market perspective
Initiate reviews/research: Conduct whole-of Basin reviews and research into water management issues and behaviours that impact trade markets	No agency is currently responsible for this function
Advisory and advocacy functions	
Trade rule advice: Advise State and Commonwealth decision-makers on intra-state and inter-state water trading matters	No single body tasked with role. Ad hoc and disparate advice is provided by a range of different bodies
Water market rules advice: Provide advice to the Commonwealth Minister responsible for water on the Water Market and Water Charge Rules	ACCC
Progressing market architecture reforms: Undertake technical research into market design to inform policy considerations	No agency is currently responsible for this function. Can be undertaken by Basin States

Market regulation and surveillance functions

In chapter 9, the ACCC set out its recommendations to introduce new Basin-wide legislation to address regulatory gaps relating to market integrity and conduct, and to have the Water Markets Agency be the centralised market regulator responsible for enforcing these new laws. The ACCC further proposes that the Water Markets Agency be given access to trade data from the Central Information Platform to proactively detect, investigate and prosecute any misconduct. As part of this function, the Water Markets Agency would administer standards on how data is reported and collected in the Basin States to ensure they are fit-for-purpose for the Water Markets Agency's regulatory role. Surveillance and enforcement outcomes would also be publicly reported.

These proposals aim to deliver multiple benefits to the Basin water markets. Centralising market regulation under the Water Markets Agency would ensure that regulatory scrutiny of misconduct is consistent between Basin States. Meanwhile, the Water Markets Agency's whole-of-market perspective would equip it to investigate and enforce rules against misconduct with inter-jurisdictional scope, so that both inter-state and intra-state conduct are appropriately prioritised. These outcomes would help ensure that there is a level playing field for all market participants regardless of their location in the

Basin, and would thereby protect the fairness and integrity of the water markets.¹³⁵⁷ As a consequence, by undertaking the proposed market regulation and surveillance functions and powers, the Water Markets Agency would deter unlawful and harmful conduct and help to promote fair competition among market participants. In turn, this can encourage further investment and voluntary participation in the water markets and irrigated agriculture and increase productive output.

Market information functions

In chapter 12, the ACCC made several recommendations aimed at integrating multiple trade service and information portals into a single platform for market participants to easily access and use market information. The ACCC proposes that the Water Markets Agency would manage this single platform, and effectively provide a 'one-stop-shop' for key market information, such as on pricing and availability, water storage levels, announced allocations and access to policy documents (such as those concerning Basin State carryover and allocation policies). The ACCC also considers the Water Markets Agency could provide water users with practical guidance on water trading matters, and undertake educational campaigns and community engagement to improve broader water markets literacy among water users.

These functions would help to address information asymmetries and bring broader benefits to the water markets. By making information more accessible and better presented for water users, the Water Markets Agency could reduce the time and financial costs that water users incur to participate in the water markets. This can encourage additional participation and competition from existing and new market participants, and lead to more efficient water markets with greater liquidity on the demand and supply sides. Put another way, it would reduce the missed opportunities for mutually beneficial trades and beneficial investments that the prevailing confusion over how water markets work is likely to be causing.

Overall, by improving accessibility to market information and by improving broader water markets literacy, the Water Markets Agency would help ensure that market participants act on available information and behave more efficiently.

Market evaluation functions

As subsection 17.3.1 outlines, there is need for market evaluation to understand the impacts of policies, rules and conducts on the water markets, to inform future policy-making and ensure that the functioning of the water markets continue to be improved. The ACCC proposes that the Water Markets Agency undertake this market evaluation role, by applying its markets expertise to the trade data and other information it collects through its surveillance functions and information gathering powers. The Water Markets Agency would also be informed by its activities and experience in administering market information functions that aim to ensure the water markets work well for its participants.

Having the Water Markets Agency undertake market evaluation functions is likely to bring substantial benefits. By conducting research into complex market architecture and cross-jurisdictional trade issues, the Water Markets Agency can produce well-evidenced analysis to inform future water markets policy and even broader water management policy. Most critically, the Water Markets Agency would be uniquely-placed, given its roles in market surveillance and provision of market information, to identify and analyse emerging issues of concern to market participants for policy-makers' consideration. This would help to ensure that the water markets are not only functional and efficient, but are also fit-for-purpose for their ultimate users.

Advisory and advocacy functions

The ACCC considers that the Water Markets Agency, given its roles in market regulation, provision of market information, and market evaluation, would be uniquely placed to advise decision-makers on how the water markets can be improved for its users.

At a minimum, the ACCC considers that the Water Markets Agency could provide expert advice to Commonwealth, Basin State and intergovernmental decision-makers to support and drive reforms to

¹³⁵⁷ The National Farmers' Federation highlights similar benefits of an independent whole-of-market regulator, noting that it would 'provide visibility and allow participants to have greater confidence in the water market'. However, it also notes the need to assess the costs of such a solution. See National Farmers' Federation, *Submission to Murray-Darling Basin water inquiry interim report*, 30 October 2020, p. 13.

market architecture and trade rule design. More broadly, the Water Markets Agency could contribute to water markets policy discourse by providing economic analysis, markets data and information, and an understanding of industry behaviour and perspectives.

The benefits this would bring are immense. It would increase visibility over water markets concerns at the highest levels of Basin management policy-making, and provide expert advice that, while is cognisant of industry perspectives, is nonetheless based on independent and impartial analysis of market data and information. This would help resolve the concerns of the agricultural sector that their perspectives are not understood within the existing governance framework¹³⁵⁸ while ensuring that ultimate decision-making is informed by objective analysis, rather than being dependent on the view of any particular stakeholder.

The ACCC believes that the Water Markets Agency's proposed advisory roles would significantly improve confidence in the water markets. In the short term, market participants may feel better assured that their concerns will be understood and considered, without any particular stakeholder group being favoured. Over the longer term, the Water Markets Agency could help influence and harmonise water markets policy so that the water markets work better for users.

17.4.2 The ACCC recommends improvements to processes for the making and amending of water trading rules

In response to the problems identified in subsection 17.3.3, the ACCC recommends adjustments to the existing Commonwealth and Basin States processes for reviewing, amending and making water trading rules.

In particular, the ACCC recommends that rule-making processes in the intergovernmental context be amended to give greater clarity over the roles and responsibilities for making and changing rules, and the processes and timeframes that are involved. These processes should also involve public consultation, including with market participants. In addition, a sufficient level of evidence should be published as part of the consultation and broader rule-making process so that stakeholders can understand the possible impacts of proposed rule changes. This would allow stakeholders to provide informed feedback on the proposed changes, and contribute to a more robust rule-making process that is fit-for-purpose for the water markets.

These changes could be made while largely retaining the existing framework of rule-making responsibilities, and with only minor changes to place an obligation on rule makers to follow a standardised rule making process. At a minimum, there should be a consistent rule making process defined for all Basin State and Commonwealth trading rules.

In addition, the ACCC proposes that for certain types of rule changes, Commonwealth, Basin State and intergovernmental rule makers should be required to obtain and have regard to the advice of the Water Markets Agency before changing or making new trading rules. The rule-maker would not be bound by this advice but should publish how this advice did or did not influence its decision-making. The Water Markets Agency's advisory function would supersede the ACCC's current role in providing advice to the MDBA on changes to the Basin Plan Water Trading Rules, and to the Commonwealth Minister for Water on changes to the Water Market Rules and Water Charge Rules.

The ACCC believes that these recommendations would bring greater transparency, accountability and robustness to the processes associated with the reviewing, amending and making of water trading rules. By introducing obligatory consultation with market participants, water user perspectives would have a direct and more significant input into the rule-making process, and bring a greater focus to designing and implementing trading rules that are fit-for-purpose for water users. By introducing a consistent rule making process with clear division of roles and responsibilities, water users and

¹³⁵⁸ Many submissions to the interim report have noted the lack of industry expertise and input into current decision-making. See, for example, Coleambally Irrigation Co-operative Limited, *Submission to Murray-Darling Basin water inquiry interim report*, 6 October 2020, p. 21: 'CICL believes many of the issues which have caused interstate 'ad hoc' decisions are a result of the water market and where government policy makers have not anticipated industry's response to the market options available and have been slow to respond to the emerging problems. ... CICL believes the decision-making frameworks need to build a much better understanding of the implications of industry's behaviours on both the physical and third parties.'

the wider public would be better able to understand and contribute to consultation processes in a meaningful way.

Furthermore, requiring rule makers to obtain and have regard to advice from the Water Markets Agency prior to amending or making new trading rules, would ensure that the Water Markets Agency's institutional expertise on the water markets and whole-of-market perspective are considered in the rule-making process. This would improve the robustness and consistency of trading rules across the Basin, and ultimately make the water markets and the regulatory framework that supports them easier for market participants to understand.

Requiring rule-makers to undertake public consultation and publicly have regard to the Water Markets Agency's advice would not only improve the robustness of trading rules but also increase public accountability over the rule-making process. This accountability through transparency and consultation, would also increase confidence and trust that the water markets and their governing institutions work well for water users. This would in turn encourage greater financial and human capital investment in irrigated agriculture and water markets.

► Recommendation 27

Implement better rule-making processes

The Australian and Basin State governments should implement a consistent and transparent process for reviewing and amending water trading rules and other decisions with significant impacts on water markets.

Details about each review, including commencement of consultation, preliminary and final decisions, and any other stages in the process relevant to market participants should be published through the proposed water market announcements platform to be operated by the proposed Water Markets Agency (see recommendation 9).

This will improve transparency of decision making processes across the Basin and improve accountability and confidence in processes and outcomes.

It is not proposed that any existing rule making powers be transferred from their existing bodies.

► Recommendation 28

Have regard to advice from the Water Markets Agency

The Australian Government and Basin State governments should incorporate a requirement into applicable legislative frameworks to obtain and have regard to advice from the proposed Water Market Agency before making changes to trading rules and other decisions with significant impacts on water markets.

The proposed Water Markets Agency should also be given a mandate to provide advice in relation to broader reforms not subject to the proposed requirement, where it considers it necessary to highlight potential market impacts for decision makers.

This will ensure that policy makers understand the impact on markets of their decisions, and enable more adequate consideration of markets impacts in water policy.

17.4.3 The ACCC recommends the intergovernmental forums commit to greater clarity over their roles and strategic priorities in water markets policy

The ACCC recommends the production of, and commitment to, procedural documents outlining the roles and strategic priorities of the Ministerial Council, BOC and various subcommittees with respect to water markets policy. The ACCC envisions these documents should be published or updated regularly, and may be partly modelled on the MDBA's policy document outlining its objectives and

desired outcomes for river operations¹³⁵⁹ or the ACCC's annual compliance and enforcement policy and priorities.¹³⁶⁰ The documents should convey a broad framework or guidelines for how market issues are escalated and decided on.

The ACCC considers the production of such documents would bring greater clarity over how policy-makers interpret and aim to apply their mandate in water markets policy. It would also signal commitment by policy-makers to their stated priorities. This would give market participants and other stakeholders some certainty around the strategic direction of water markets policy and how it will be applied. It may also coordinate future discourse on water markets policy with a focus on improving the effectiveness of the water markets.

The production of such documents would also improve the public accountability of water markets policy-making and governance. By outlining the objectives and desired outcomes of water markets policy, market participants will be better able to understand the rationale for specific decisions. This would reduce the level of perceived arbitrariness that some market participants have raised in respect to past decisions.¹³⁶¹ This would also increase market confidence and encourage beneficial investment and participation in water markets and dependent industries, with corresponding economic efficiency gains.

► Recommendation 29

Increase transparency of roles and functions of intergovernmental committees

The Murray–Darling Basin Ministerial Council and the Basin Officials Committee should publish procedural documents to improve the transparency of the roles, functions and strategic priorities of its intergovernmental committees, with particular regard to how water trade matters are escalated and decisions are made.

This will deliver important information to stakeholders about how these governance arrangements work.

¹³⁵⁹ See MDBA, *Objectives and Outcomes for River Operations in the River Murray System*, 21 October 2020.

¹³⁶⁰ See ACCC, Compliance & enforcement policy & priorities, 25 February 2020, <https://www.accc.gov.au/about-us/australian-competition-consumer-commission/compliance-enforcement-policy-priorities>, viewed 28 January 2021.

¹³⁶¹ While not directly applying to the intergovernmental forums, Marianne Graham submitted an example of the perceived arbitrariness of water management decision-making. She noted that the greatest sources of opacity in the water markets are the 'unexpected announcements and non-transparency of the MDBA, WaterNSW, NSW DPIE and Victorian Water Authorities decision[s] ... These unexpected 'black swan' type events, cause massive jumps in the prices between markets and create a lot of instability and lack of integrity in the market. Whenever we try to engage with the MDBA or other entities, they seem to assume it's too complex and we have no transparency and it creates a lot of sudden changes for growers.' See Marianne Graham, *Submission to Murray–Darling Basin water inquiry interim report*, 24 November 2020.



07

Appendices



Appendix A – Irrigator engagement with water markets

Key Points

Entitlement trade

- Irrigators' engagement with entitlement markets in the Southern Basin (measured as having bought or sold an entitlement at least once) has been increasing over time. Between 2000–01 and 2015–16, the percentage of irrigators reporting at least one entitlement trade increased from less than 10% to just under 50%.
- However, as at 2016, approximately half of irrigators reported never having traded an entitlement, and only a small proportion (less than 10%) reported having bought and sold entitlements within the previous 5 years.

Allocation trade

- Irrigators' engagement with allocation markets in the Southern Basin (measured as having bought or sold an allocation at least once) has also been increasing over time. Between 2000–01 and 2015–16, the percentage of irrigators reporting at least one allocation trade increased from less than 15% to more than 75%.
- However, as at 2016, approximately 25% of irrigators reported never having traded an allocation, and only a small proportion (less than 15%) reported having bought and sold allocations within the previous 5 years.

Some key differences in irrigators' use of entitlement and allocation trade

- Irrigators in the Southern Basin are significantly more engaged with entitlement and allocation markets than irrigators in the Northern Basin. Between 2008–09 and 2017–18, Southern Basin irrigators were, on average, 4.8 times more likely to have conducted a water allocation trade, and 7.9 times more likely to have conducted a water entitlement trade compared with irrigators in the Northern Basin.
- The sale of water entitlements over 2006–07 to 2014–15, particularly by dairy farmers in the Southern Basin, has resulted in an increase in the proportion these irrigators relying on water allocation purchases from 2011–12 onwards as drier conditions returned.
- The flexibility of annual cropping irrigators, such as rice farmers, allows them to more easily switch from using/buying water allocations in wetter years, to not using/selling water allocations in drier years. These irrigators tend to demonstrate more variable and higher level of net allocation trade over time.
- In contrast, the more constant water needs of permanent plantings, such as nut and fruit plantations, means horticultural farmers have less flexibility to trade temporary water, and so demonstrate a more stable and lower level of net allocation trade over time.

Leases and newer water products

- Available evidence indicates that a small minority of irrigators across the whole Basin (less than 7% as at 2018) use water from leased entitlements. The evidence indicates that:
 - irrigators with larger holdings of permanent water rights are more likely to use leases than irrigators with smaller holdings of permanent water rights
 - where smaller irrigators use leases, they are more likely to lease from friends and relatives, their own self-managed super fund, or from other irrigators

- where larger and corporate irrigators use leases, they are more likely to use longer-term leases sourced from commercial operators, either as part of leasing land or as a stand-alone lease from an investor.
- Available evidence indicates that only a very small proportion of irrigators use carryover parking or forward contracts.

Irrigator views on the benefits of water trading

- Irrigators have become increasingly negative about water trading over the last 20 years. The proportion of irrigators believing that water trading was a 'good idea' or 'good for farming' has declined from 3 quarters of irrigators in the GMID in 1999 to less than 30% of irrigators in the Southern Basin by 2016.
- Over the same period, the proportion of irrigators believing that water trading was not a 'good idea' or not 'good for farming' has increased from just 14% of irrigators in the GMID in 1999 to over 50% of irrigators in the Southern Basin in 2016.
- A high proportion of irrigators (85% in 2016) in the Southern Basin disagreed with the idea that non-farm entities should be allowed to buy water, while almost half (48% in 2016) disagreed that retired farmers should be allowed to retain and trade water.

Irrigator views on the ease of trading and confidence in water markets

- Majorities of irrigators in 2015 and 2016 expressed positive views on the ease of making temporary and permanent trades, being able to access the information needed to trade, and feeling confident in trading water for their farm. However, relatively significant minorities of irrigators also expressed opposing views on each of these issues, with:
 - 12% to 18% of irrigators not agreeing that trading temporary or permanent water was easy
 - 17% to 19% not agreeing that the information needed to trade water was easy to access
 - 25% to 28% not agreeing that they felt confident in using water trading.
- Irrigators expressed low levels of confidence in the fairness of water markets, and water market rules in 2015 and 2016, with:
 - only 23% to 32% of irrigators agreeing that water markets were fair for all users
 - only 16% to 26% of irrigators expressing confidence in water market rules.
- Majorities of irrigators in 2015 and 2016 expressed confidence in the security of their water rights, while a quarter or more did not (32% and 24%). However, only a quarter or less of irrigators agreed that entitlements held by the government were subject to the same rules and charges as other participants' entitlements (13% and 26% in 2015 and 2016 respectively), while more than 4 in ten disagreed that these entitlements were treated equally.

Views held by irrigators who trade and do not trade

- Irrigators who engaged in water entitlement and allocation trade in the Southern Basin had significantly more positive attitudes to water trading, to investors owning water, to environmental water recovery and the Basin Plan, and less traditional attitudes to farming, relative to irrigators who did not trade.

This appendix describes:

- irrigator numbers across the Basin
- the type and level of irrigator engagement with different types of water markets, including water allocation and entitlement markets, leases and newer water products such as carryover parking and forward contracts
- irrigator attitudes to water markets and water trading, and possible associations between these attitudes and an irrigator's decision to trade or not trade water.

A.1 ACCC analysis of water trade, ownership and account data

The ACCC has undertaken an analysis of water trade, ownership and accounts data provided by the Basin States to construct a dataset on water ownership by each participant group in the different water sources which comprise the Southern Connected Basin (box A.1 provides an overview of the ACCC's methodology).

Box A.1: ACCC methodology to derive statistics on water ownership and trading activity by participant group

There is limited data publicly available on the type and quantity of permanent water rights owned by the participant groups, across the Basin or by trading zone or catchment. Similarly, there is little data publicly available on water market activity by participant group, with the exception of government environmental water holders.

The Inquiry has acquired registry data from Basin States and IIOs, and undertook work to classify water access entitlement owners, water account holders, and water traders into the participant groups identified in chapter 4 and this Appendix.

The following steps were undertaken to assign a participant group category to all water entitlement owners, allocation account holders, and water traders (buyers and sellers) appearing in Basin State registry data; and to water traders (buyers and sellers) appearing in IIO registry data:

1. First, use publicly available information to identify generate lists of known participants belonging to the following groups: EWHs, IIOs, Traditional Owners groups¹³⁶², Urban, Industrial and Recreational users and other government entities such as water authorities and shire or town councils.
2. Second, use information obtained by the inquiry to identify and categorise certain key participants, such as 'Institutional Investors' and 'Agribusinesses', and allocating all superannuation funds (except those already assigned to the 'Institutional Investor' category) to the category of 'non-Institutional Investors'. Note that the 'Agribusiness' category includes certain agribusinesses individually identified by the ACCC, and pastoral companies; agribusiness which use water but have not yet been specifically identified by the ACCC form part of the 'Other-water user' category.
3. Third, generate lists of identifying terms for inclusion in an algorithm; for example, 'School', 'City', 'Council' were some of the terms used to assign a name to the category of 'urban'; 'Department' and 'Minister' were some of the terms used to assign a name to the category of 'government'; 'aboriginal' and 'indigenous' were some of the terms used to assign a name to the category of 'traditional owner groups', etc.
4. Use water account data provided by Basin States to derive a 'water use' field, which records whether a participant has any usage recorded against their name.
5. Using the results of Steps 1-3, implement an algorithm to assign a category to all names.
6. Manual quality checking of initial algorithm assignments; iterative adjustment of algorithm to improve categorisation (based on expert judgement and key acceptance criterion such as all known IIOs, large investors, agribusiness, environmental water holders and government entities correctly assigned).

¹³⁶² Note that the 'Traditional Owners groups' category includes entities such as Aboriginal Land Councils, Aboriginal Associations, Tribal Councils and Aboriginal Corporations. No attempt has been made to identify individual persons as belonging to this group.

7. Noting the potential for a participant to appear in multiple Basin State datasets under slightly different names, and for a set of related parties with different names to participate in water markets effectively as a single unit, we designed a clustering algorithm to identify clusters of participants based on their entitlement and account holdings. For example, if Jane and John Smith co-held a water share in NSW, and the same John Smith had an allocation bank account in his name only, the algorithm would identify these 2 parties as a 'Smith' cluster.
8. Manual quality checking of clustering results; for example, manually breaking up very large clusters (relatively few of which occurred), and 'sense checking' where clusters involving names to several different categories appeared (for example, if a Cluster involved 3 names that had been assigned at Step 6 as 'investor', 'environmental water holder' and 'government', manual assessment of this result would occur, and the clustering results adjusted if needed, for example, by breaking apart that cluster into several sub-clusters.
9. Use trade and usage data to assign a category to the *cluster level*, by taking the individual level assignment from the final stage of Step 6, such that the category assigned at the *cluster level* is taken to be the category assigned to the name with the largest trade volume within the cluster.
10. Deploy the cluster categorisation to analyse market activity and entitlement ownership by participant group.

The ACCC acknowledges that this classification work involves uncertainty due to data issues and the exercise of expert judgement, and notes that all results arising from this work should be interpreted as indicative.

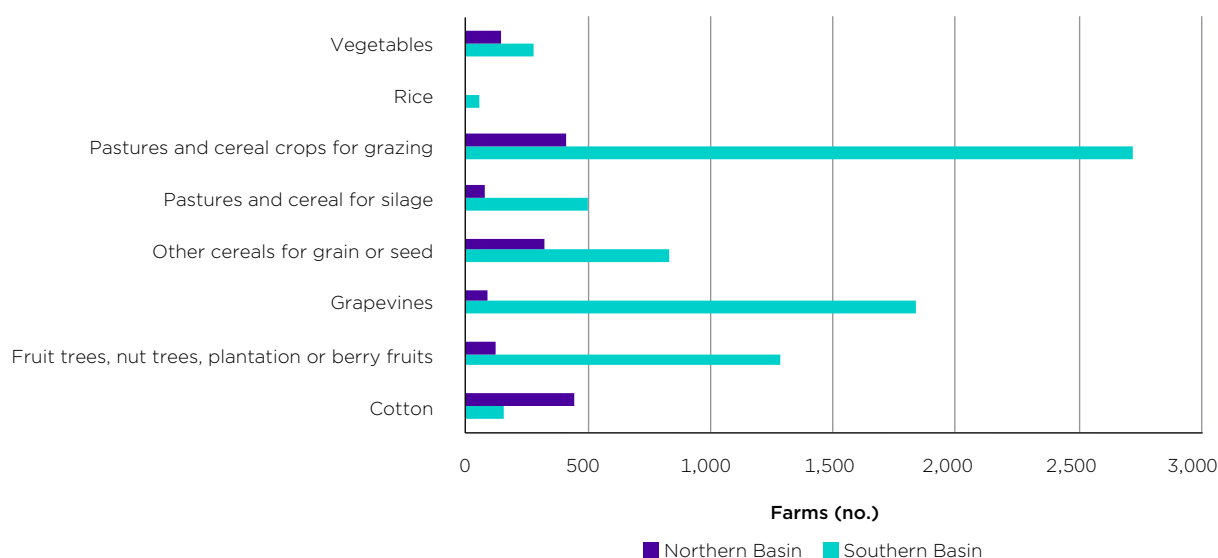
A.2 Snapshot of irrigator numbers across the Basin

In 2018–19 (the latest year for which ABS data is available), it is estimated there were just under 9000 agricultural businesses irrigating land across the Murray Darling Basin. Of these, an estimated 6785 operated in the Southern Basin and 1935 in the Northern Basin.

Figure A.1 compares the estimated number of farms irrigating different crops in the Northern and Southern Basins in 2018–19. It shows that almost one quarter of irrigated farms in the Northern Basin grew cotton in 2018–19 (444 of 1935 farms). This was significantly more than the 149 cotton irrigators in the Southern Basin. It also shows that approximately 21% of irrigated farms in the Northern Basin (411 farms) grew pasture and cereal crops for grazing, and 16% (318 farms) grew cereal grain and seed (including wheat, oats, maize. In 2018–19, no farms in the northern Basin grew rice; reflecting the poor water availability in that year.

In the Southern Basin, approximately 40% of irrigated farms (2716 of 6 farms) reported growing pasture and cereal crops for grazing in 2018–19. Approximately 27% (1838 farms) grew grapevines, 19% (1278 farms) irrigated fruit and nut tree plantations and berry fruits, and 2% (149 farms) grew cotton. Just 1% (52 farms) reported growing rice.

Figure A.1: Estimated number of farms irrigating in the Northern and Southern Murray-Darling Basin, by farm type, 2018-19



Source: ABS 4618.0 –Water Use on Australian Farms, 2018-19.

Note: This figure shows estimates for the number of farms producing each commodity. These figures are not additive as a single farm may produce multiple commodities.

Table A.1 reports the estimated numbers of farms in the Murray Darling Basin growing different crop types reporting to have irrigated land in 2018-19 by natural resource management (NRM) region. This table shows that the Condamine NRM region had the highest proportion of the Northern Basin's irrigated farms in 2018-19 (22% or 431 of 1935 farms in the Northern Basin). Irrigated farms in the Condamine NRM regions predominantly grew a mix of cotton, cereal grain and seed, and pasture and crops for grazing. The distribution of irrigated farms in the other Northern Basin NRM regions included:

- the North West New South Wales NRM region with 20% or 395 of all Northern Basin farms, most commonly growing cotton
- the Central West NRM region with 17% or 332 farms, growing a mix of cotton, cereal grain and seed, and pasture and crops for grazing
- the Queensland Murray Darling Basin and the Western NRM regions, with 12% and 15%, respectively (or 235 and 284 farms respectively). Farms in the Queensland Murray Darling Basin NRM regions most commonly grew a mix of cotton and horticulture, while farms in the Western NRM regions predominantly produced grapes and horticulture
- the Central Tablelands NRM region with 13% or 258 of all Northern Basin farms, predominantly irrigating permanent crops of fruit and nut trees, berry fruits and grapes.

In the Southern Basin, the Goulburn Broken NRM region contains the highest proportion of the Southern Basin's irrigated farms, with 25% or 1679 of the 6785 farms in the Southern Basin. In 2018-19 these most commonly grew pasture and cereal crops for grazing. The distribution of irrigated farms in the other Southern Basin NRM regions included:

- the South Australian Murray Darling Basin NRM regions with 17% or 1180 farms, irrigating mainly permanent plantings of grapevines and fruit and nut trees
- the North Central NRM region with 17% or 1135 farms of all Southern Basin farms, mostly growing pasture and cereal crops for grazing
- the Riverina NRM region with 15% or 1016 farms, predominantly irrigating permanent plantings but also growing a mix of cereals, pasture and cotton
- the Murray NRM region with 12% or 814 farms, mostly growing pasture and cereal crops for grazing, and cereal grains and seed
- the Mallee NRM region with 9% or 642 farms, predominantly irrigating permanent plantings of grapevines, fruit and nut trees and berry fruits.

Table A.1: Estimated number of farms irrigating in the Murray-Darling Basin, by crop type and NRM region, 2018-19

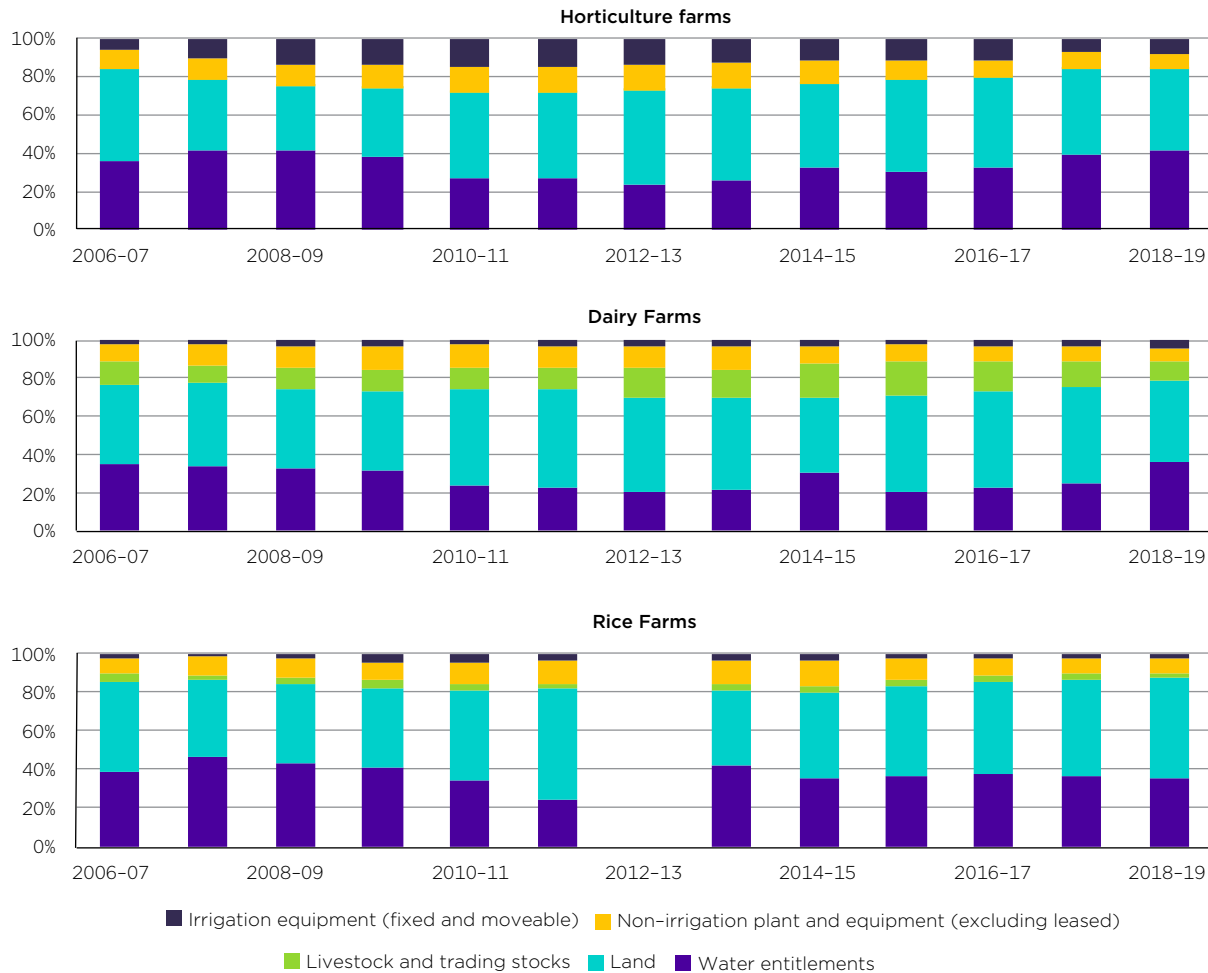
NRM Region*	Cotton	Fruit, nut trees, berry fruits	Grapevines	Cereal grain, seed (wheat, oats, maize)	Pastures & cereal crops for silage (d)	Pasture & cereal crops for grazing	Rice	Vegetables	Total no. of farms irrigating**
Northern Basin	444	123	89	318	79	411	-	142	1,935
Central Tablelands		51	70	16	9	65			258
Central West	86	4	2	63	13	118		86	332
Condamine	117	7		129	40	131		117	431
North West NSW	199	15	1	82	8	61		199	395
Queensland MDB	43	47	15	27	10	35		43	235
Western***									284
Southern Basin	149	1,278	1,838	828	499	2,716	52	278	6,785
ACT		3	1	1					8
Goulburn Broken		227	82	157	277	1,116		64	1,679
Mallee		110	486	9		21		31	642
Murray	8	23	45	289	64	472	18	19	814
North Central		86	83	129	111	711		80	1,135
North East		63	70	3	13	120		4	312
Riverina	141	318	284	233	24	163	34	22	1,016
SA MDB		449	786	5	10	114		59	1,180

Source: ABS 4618.0 – *Water Use on Australian Farms*, 2017-18.

Notes: NRM Region = Natural Resource Management Region. *NRM boundaries do not perfectly overlap with MDB Boundaries. NRM regions have been chosen to achieve the best matched based on geography and how well the sum of the NRM regions compare to the aggregate ABS "MDB" NRM Region. **Numbers across rows may exceed the total number of farms irrigating as some agricultural businesses report grow more than one food type. ***The "Western" NRM regions cut across the northern and Southern Basin, and is also partially outside the MDB. For the purposes of deriving estimates for Northern MDB and Southern MDB, 'Western' is treated as Northern MDB. The ABS has a minimum threshold (by value of operations) for reporting so some very small agricultural businesses who irrigate may be excluded.

Figure A.2 shows that water access entitlements comprise a substantial proportion of the capital assets of most irrigated farms, but this varies by sector (figure A.2). ABARES data shows that on average for the Southern Basin, water entitlements comprise around 41% of capital assets for horticulture farms, 36% for dairy farms, and 35% for rice farms, as at 2018-19. Importantly, for some farms, the value of entitlements held is equal to or even exceeds the value of land assets.

Figure A.2: Average proportion of capital assets by asset class, by farm type, 2006-07 to 2018-19



Source: ABARES irrigation survey.

Notes: Average per farm. For horticulture: average of 3 regions (Goulburn, Murray, Murrumbidgee); for rice: average of 2 regions (Murray and Murrumbidgee); for dairy: average of 2 regions (Murray and Goulburn-Broken). Data for rice not available for 2012-13.

A.3 The type and level of irrigator engagement with different types of water markets

Water market engagement generally refers to the extent to which an irrigator buys or sells a particular water product, including water access entitlements, water allocations, leases, carryover parking or forward contracts.

As noted in chapter 4, the type and level of water market engagement by an irrigator can vary depending on a diverse range of drivers, including:

- **market-based drivers:** including current and future trends or changes in commodity prices, demand for agricultural products, seasonal weather or longer term climate conditions etc. that can impact water use and water availability (demand and supply) and so drive a decision to buy and sell a water product at a given time

- **institutional and infrastructure drivers:** including trading and operational rules and physical constraints that can impact if, when and how an irrigator can buy or sell water
- **government policy drivers:** including policies governing access to carryover and interventions such as water buybacks or irrigation infrastructure subsidies that can alter the incentives for an irrigator to engage in certain types of water ownership and trade
- **an irrigator's individual circumstances and characteristics:** including the characteristics of the irrigator's business (for example, their farm type, size, location, profitability, debt levels, access to capital), the types of risks they face and their attitudes to managing risk, their access to and use of government programmes, and characteristics of the irrigator themselves, which can include:
 - their ability to collect, process and use market related information (that is, do they have the experience, skills and knowledge to trade, the time and money to meet the informational transaction costs of trading, or access to a water market intermediary to advise or act on their behalf?)
 - their future plans (that is, do they intend to expand, adjust or exit their business?)
 - their attitudes to and confidence in water markets and trading (that is, do they have confidence in water markets and the security of their water rights, or are they uncertain or expect the rules to change?).

Based on various measures outlined below, significant numbers of irrigators are engaging with allocation and entitlement markets across the Basin and the level of this engagement has increased significantly over time. However, the available data also indicates that a relatively significant proportion of irrigators either do not use allocation or entitlement markets at all, or uses them infrequently. Evidence also indicates that only a small proportion of irrigators used leases and even fewer irrigators use the newer water products such as forward contracts and carryover parking. This section summarises the extent to which irrigators engage and do not engage with water markets in the Basin. It makes findings on irrigator engagement with each type of water product and asks questions to inform further analysis.

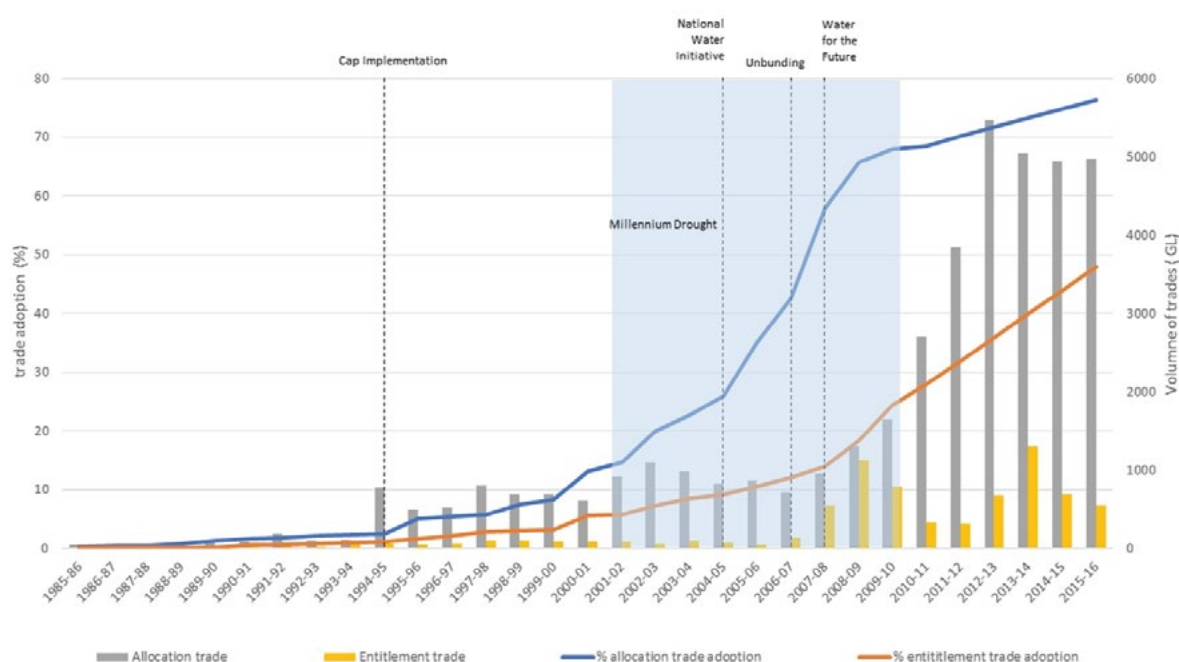
A.4 Irrigator engagement with allocation and entitlement trade

One of the highest level indicators of irrigator engagement with water markets is whether they have ever traded an entitlement or allocation. Figure A.3 reports the percentage of surveyed irrigators in the Southern Basin who stated that they had conducted at least one entitlement trade, or at least one allocation trade. The figure also shows the volume of entitlements and allocations traded over time.

Figure A.3 shows that a higher proportion of irrigators in the Southern Basin report having traded allocations than report having traded an entitlement in every year of the time series. It also shows that the proportion of irrigators reporting to have engaged in both types of trade has been increasing year on year. Between 2000–01 and 2015–16, the percentage of irrigators reporting at least one entitlement trade increased from less than 10% to just under 50%. Over the same time period, the percentage of irrigators reporting at least one allocation trade increased from less than 15% to more than 75%.

Figure A.3 shows that the proportion of irrigators reporting a temporary trade increased rapidly with the introduction of National Water Initiative reforms in 2004, while the proportion of irrigators reporting a permanent trade increased with the implementation of the Water for the Future program (water buyback scheme) in 2007–08.

Figure A.3: Irrigator participation in Southern Basin water markets, by proportion of irrigator who have conducted at least one market trade, by volume of trade, 1985 to 2015–16



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 2.1, p. 36.

Note: Graph constructed using historical irrigator survey datasets and various state water market registries.

Alternative indicators of water market engagement that measure irrigator trading behaviour over shorter periods of time can give additional detail on the level of irrigator engagement with allocation and entitlement markets.

Figure A.4 reports the proportion of irrigators in the Southern Basin who stated they had purchased or sold an entitlement or allocation, done both, or done neither, in the 5 years before being surveyed in 2007–08 and 2014–15.

Similar to figure A.3, figure A.4 shows that a higher proportion of irrigators reported trading (purchasing or selling) water allocations in the previous 5 years than reported trading (purchasing or selling) water entitlements.

For entitlement trade, figure A.4 shows that a higher proportion of irrigators reported selling an entitlement than purchasing an entitlement in both years surveyed. It also shows an increase in all types of entitlement trade between the 2 time periods (that is, the proportion of irrigators reporting to have purchased, sold, and purchased and sold an entitlement in the previous 5 years). Between 2007–08 and 2014–15, the proportion of irrigators reporting they had purchased an entitlement in the previous 5 years increased from 7% to 20%, the proportion of irrigators reporting they had sold an entitlement increased from around 8% to 34%, while the proportion who purchased and sold increased from 1% to 8%.

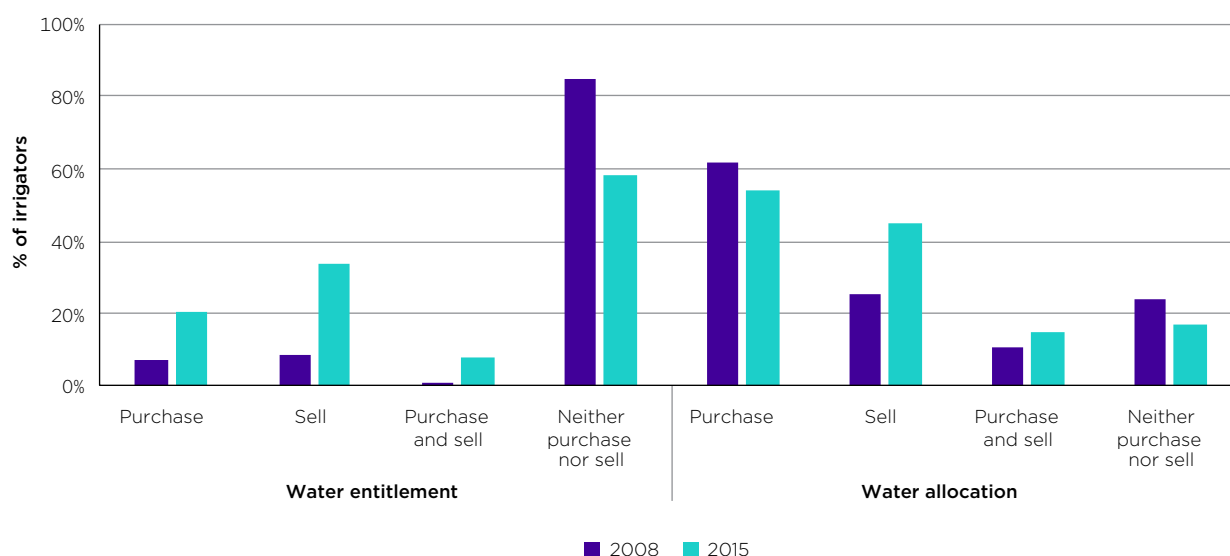
The increase in the proportion of irrigators reporting entitlements trade between 2008–09 and 2014–15 coincides with the end of Millennium Drought and the implementation of the government buyback of water entitlements under the Restoring the Balance Programme.

Corresponding to the increase in entitlement trade, figure A.4 also shows a decrease in the proportion of irrigators reporting no entitlement trade (neither purchasing nor selling) in the previous 5 years from 85% of irrigators to 58% between 2007–08 and 2014–15. While this data is indicative of irrigators' increasing their engagement with entitlement markets, it also highlights that as at 2015, almost 6 out of 10 irrigators in the Southern Basin reported not having bought or sold a water entitlement in the previous 5 years.

For allocation trade, figure A.4 shows that in both years surveyed, a higher proportion of irrigators purchased an allocation in the previous 5 years than sold an allocation. In addition, between 2007-08 and 2014-15, the proportion of irrigators who reported purchasing an allocation decreased slightly, while the proportion reporting selling an allocation increased significantly. This may be reflective of the fact that more irrigators had to enter the temporary market to buy water during the Millennium Drought period prior to 2008, compared with the 5 year period prior to 2015 where water was more available.

Figure A.4 also shows that the proportion of irrigators reporting to have purchased and sold allocations in the last 5 years increased from 11% to 15%, and that there was a corresponding decrease in the proportion of irrigators reporting no engagement with allocation markets (the proportion of irrigators reporting they had neither purchased nor sold an allocation in the previous 5 years falling from 24% to 17% of irrigators). As with the entitlement trade data above, while this is indicative of irrigators' increasing engagement with allocation markets, it also highlights that as of 2015, 17% of irrigators in the Southern Basin reported not having bought or sold temporary water in the previous 5 years.

Figure A.4: Trade in the last 5 years, (South Australia, Victoria) and Southern Basin



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 6.2, p. 129.

Note: The last 5 years is the 5 years before each survey date year in 2007-08 and 2014-15. The questions were: 'We are interested in the changes you have made to your farm operation during the last 5 years. Have you done any of the following: purchased water entitlements (permanent water rights); sold water entitlements; purchased water allocations (temporary/seasonal water); sold water allocations?'

Figure A.5 shows irrigator trade behaviour in the Southern Basin within a water year in 3 separate years. It reports the proportion of irrigators who stated they had purchased or sold an entitlement, an allocation, and used carryover in 2009-10, 2010-11 and 2014-15. It should be emphasised that there are many factors that can cause entitlement and allocation trade to change year on year and these results should be interpreted with caution.

Figure A.5 shows that a higher proportion of irrigators reported trading (purchasing or selling) allocations compared with entitlements within each of the 3 years surveyed.

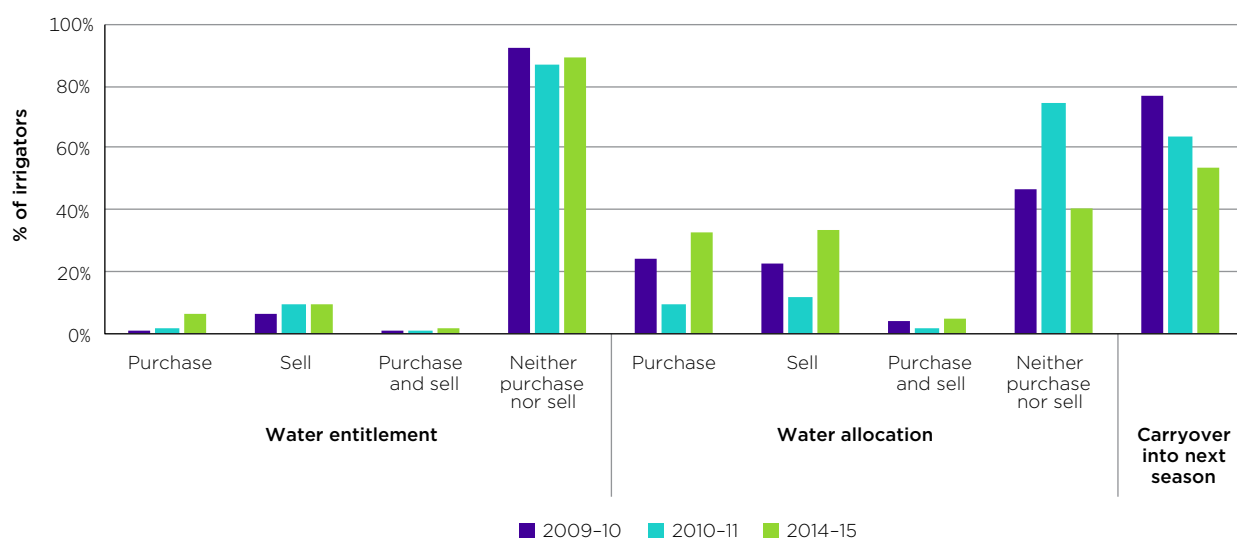
For entitlement trade, figure A.5 (consistent with figure A.4) shows that in each of the 3 years surveyed, a higher proportion of irrigators reported selling a water entitlement compared with buying an entitlement. It also shows that between 2009-10 and 2014-15, the proportion of irrigators who reported trading an entitlement increased (with the proportion reporting a purchase increasing from 1% to 6%, and that reporting a sale increasing from 6% to 10%). Only 2% or less of irrigators reported purchasing and selling an entitlement in any one of the 3 years surveyed.

The relative infrequency of irrigators engaging in entitlement trade is highlighted in figure A.5, with between 87% and 90% of irrigators reporting no entitlement trade within any one of the 3 years surveyed.

For allocation trade, figure A.5 shows that between 9% and 33% of surveyed irrigators reported purchasing an allocation in a given year, while between 12% and 33% reported selling an allocation in one of these years. 5% or less of irrigators reported both purchasing and selling an allocation in the same year, and between 41% and 75% of irrigators reported engaging in no allocation trade in any one of the 3 years surveyed.

The figure also shows a majority of irrigators reported carrying water over in each of the years surveyed. However, the proportion of irrigators reporting use of carryover declined from 77% in 2009–10 to 54% in 2014–15.

Figure A.5: Proportion of irrigators using trade or carryover in a given year, Southern Basin



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 6.1, p. 128.

A.4.1 Findings

Irrigators' engagement with entitlement markets in the Southern Basin has been increasing over time. Between 2000–01 and 2015–16, the percentage of irrigators reporting at least one entitlement trade increased from less than 10% to just under 50% by 2015–16. However, as at 2015–16, approximately half of irrigators reported never having traded an entitlement, and only a small proportion (less than 10%) reported having both bought *and* sold entitlements within the previous 5 years.

Irrigators' engagement with allocation markets in the Southern Basin has been increasing over time. Between 2000–01 and 2015–16, the percentage of irrigators reporting at least one allocation trade increased from less than 15% to more than 75% by 2015–16. However, as at 2015–16, approximately 25% of irrigators reported never having traded an allocation, and only a small proportion (less than 15%) reported having both bought *and* sold allocations within the previous 5 years.

Irrigators in the Southern Basin use entitlement and allocation trade much more than irrigators in the Northern Basin

Research compared the level of irrigator engagement with allocation and entitlement markets in the Northern and Southern Basin by measuring the average number of allocation and entitlement transactions per irrigation business from 2008–09 to 2017–18 (table A.2). They found that irrigation businesses in the Southern Basin were, on average, 4.8 times more likely to have conducted a water allocation trade, and 7.9 times more likely to have conducted a water entitlement trade.

Table A.2: Comparison of key factors influencing irrigator participation in entitlement and allocation markets in the Northern and Southern Basins, various time periods between 2006–07 and 2017–18

Factor influencing water market engagement	Northern Basin	Southern Basin
Annual average allocation trade rate per business	0.4	2
Average entitlement trade rate per business	0.26	0.51
Regulated Entitlements on issue	53%	85%
Unregulated Entitlements on issue	32%	4%
Groundwater Entitlements on issue	15%	11%
Share of Groundwater of Total Farm Water Extractions	17%	10%
Share of On-farm dam storage (floodplain harvesting) of Total Farm Water Extractions	32%	3%
Share of Irrigation channels of Total Farm Water Extractions	12%	64%
Share of Surface water of Total Farm Water Extractions	44%	25%
Number of irrigators	3,039	10,898
Annual irrigation water volumetric/usage charges per ML extracted	\$12	\$28
Area irrigated per business (ha)	124	84
Water extraction monitored	25–51%	77–84%
Cotton industry use of water	79%	6%
Cereals/rice industry use of water	13%	34%
Pasture industry use of water	6%	32%
Fruit/nut/vegetables industry use of water	1%	28%

Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, table 2.4, p. 42.

Notes: Based on means of a variety of years, depending on data available from ABS water use on farms, BOM data. 'Trade' means bought or sold an allocation/entitlement. See Wheeler and Garrick (2020) for exact time-periods, data sources and definitions used for the Northern and Southern Basin.

Wheeler and Garrick (2020) compared a range of institutional and demographic factors across the Northern and Southern Basin and identified a number of key differences that they propose explain this difference in north–south water market participation by irrigators (table A.2). These included:

- greater hydrological connectivity and storage in the Southern Basin
- greater amount of unregulated water entitlements in the Northern Basin compared with the Southern Basin (32% and 4% respectively)
- greater reliance on groundwater as an irrigation source in the Northern Basin compared with the Southern Basin (17% and 10% respectively)
- greater use of on-farm irrigation storage from flood plain harvesting in the Northern Basin compared with the Southern Basin (32% versus 3% respectively)
- higher water usage charges in the Southern Basin compared with the Northern Basin (133% higher per mega litre extracted in the south compared to the north)
- greater number of irrigators in the Southern Basin compared with the Northern Basin (3.6 times more)
- lower average irrigated area per business in the southern (a third less) than the Northern Basin
- higher monitoring of water extractions in the Southern Basin (77–84% of water extractions are monitored) compared to the Northern Basin (25–51% extractions are monitored)
- greater water use homogeneity in the Northern Basin (cotton industry uses on average 79% of extractable water) than Southern Basin (cereals/rice, pasture and fruit/nut/vegetables all extract around a third each of the total water) (Wheeler and Garrick 2020).

A.4.2 Findings

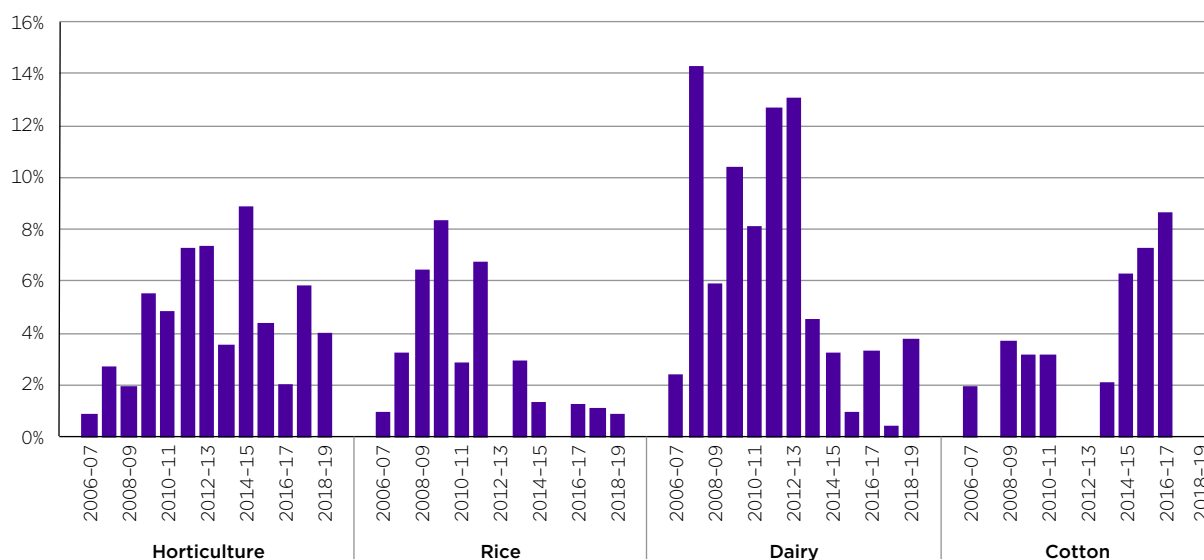
Irrigators in the Southern Basin use entitlement and allocation markets much more frequently than irrigators in the Northern Basin. Between 2008-09 and 2017-18, Southern Basin irrigators were, on average, 4.8 times more likely to have conducted a water allocation trade, and 7.9 times more likely to have conducted a water entitlement trade compared with irrigators in the Northern Basin.

Irrigator engagement in entitlement and allocation markets differs by farm type

Figure A.6 reports ABARES population estimates on the proportion of farms who reported selling water entitlements, by farm type from 2006-07 to 2018-19. This figure shows that from 2006-07 to 2018-19, a relatively small proportion of irrigators of all farm types in the Basin sold water entitlements each year. Dairy farmers, on average, had the highest proportion of reported entitlement sales per year while cotton farms had the lowest. An average of 6% of dairy farms, 5% of horticulture farms, 3% of rice farms and 4% of cotton farms sold entitlements each year.

The same ABARES survey data found that lower proportions of irrigators, on average, reported buying entitlements each year relative to selling. On average, 3% of dairy farms, 3% of irrigated broadacre farms and around 1% of horticulture farms bought entitlements each year.¹³⁶³

Figure A.6: Proportion of farms reporting sales of water entitlements, by farm type, Murray-Darling Basin, 2006-07 to 2018-19



Source: ABARES Murray-Darling Basin Irrigation Survey.

Note: Derived population estimates. Water trading data for cotton farms are not available for 2007-08, 2010-11, 2011-12, 2012-13, 2017-18 and 2018-19; or for rice farms in 2012-13.

Figure A.7 reports the estimated proportion of farms, by farm type, in the Southern Basin reporting *selling* temporary water in a given year, from 2006-07 to 2018-19. Figure A.8 reports the estimated proportion of farms, by farm type, in the Southern Basin reporting *buying* temporary water in a given year, over the same period of time.

These figures together show that the proportion of irrigation farms trading (buying or selling water allocations) tends to fluctuate closely in line with changes in water availability, with allocation trade lower in wet years (2009-10 and 2010-11), and higher in dry years (pre 2009-10 and post 2010-11), as water is increasingly reallocated to higher value uses as availability declines.

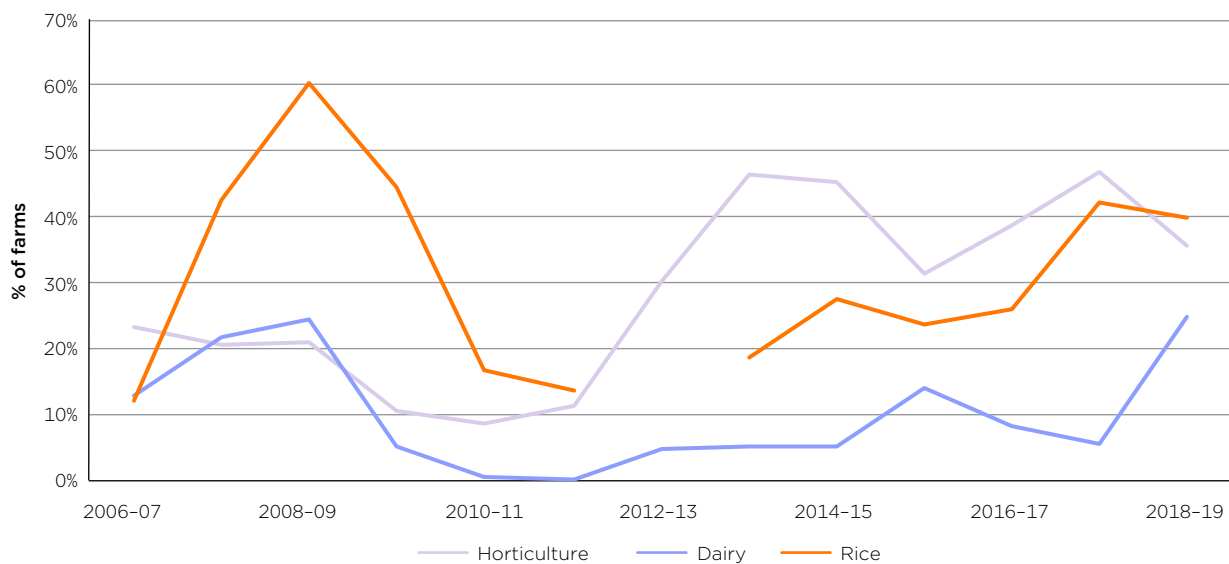
These figures also show how the type of water trading an irrigator undertakes can vary depending on the crop they are growing. From 2006-07 to 2008-09, as water became scarcer during the end of the Millennium Drought, the proportion of rice and dairy farms selling water allocations increased as these

¹³⁶³ ABARES, *Irrigated agriculture in the Murray-Darling Basin*, ABARES, Canberra, www.agriculture.gov.au/abares/research-topics/surveys/irrigation/overview#water-use-and-trade, viewed 30 June 2020.

farms increasingly reduced output and sold water to generate income (figure A.7), while the proportion of horticulture farms buying water allocations increased as they were needed to continue watering their permanent plantings (figure A.8). As water availability increased in 2009-10 and 2010-11, the proportion of irrigators of all farm types buying and selling water decreased as allocations accruing to their permanent water rights increased.

Further, figure A.8 provides some evidence of the longer term impact on allocation markets of the high rate of water entitlement sales by dairy farmers from 2007-08 to 2011-12 (as reported in figure A.6 above). The figure shows that from 2012-13 onwards as water availability in the Basin began to decrease again, the proportion of dairy farmers buying water allocations increased dramatically as dairy farmers who had previously sold their permanent water rights increasingly purchased water allocations on the temporary market. Figure A.8 shows that this impact on the allocation market has been ongoing, as the proportion of dairy farmers buying allocations from 2012-13 to 2018-19 remained above that of dairy farmers buying allocations during the last years of the Millennium Drought from 2006-07 to 2009-10.

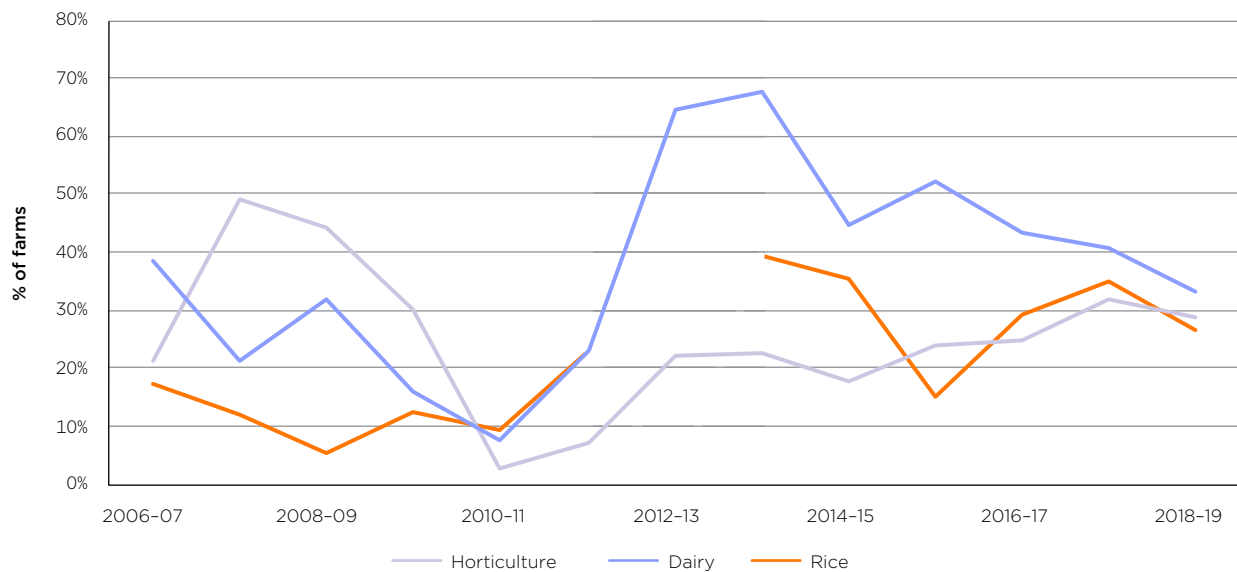
Figure A.7: Proportion of farms selling temporary water, by farm type, 2006-07 to 2018-19, selected Southern Basin regions



Source: ABARES Murray-Darling Basin Irrigation Survey.

Notes: For Horticulture: average of 3 regions (Goulburn, Murray and Murrumbidgee); for Rice: average of 2 regions (Murray and Murrumbidgee), no data for 2012-13; for dairy: average of 2 regions (Murray and Goulburn-Broken).

Figure A.8: Proportion of farms buying temporary water, by farm type, 2006-07 to 2018-19, selected Southern Basin regions

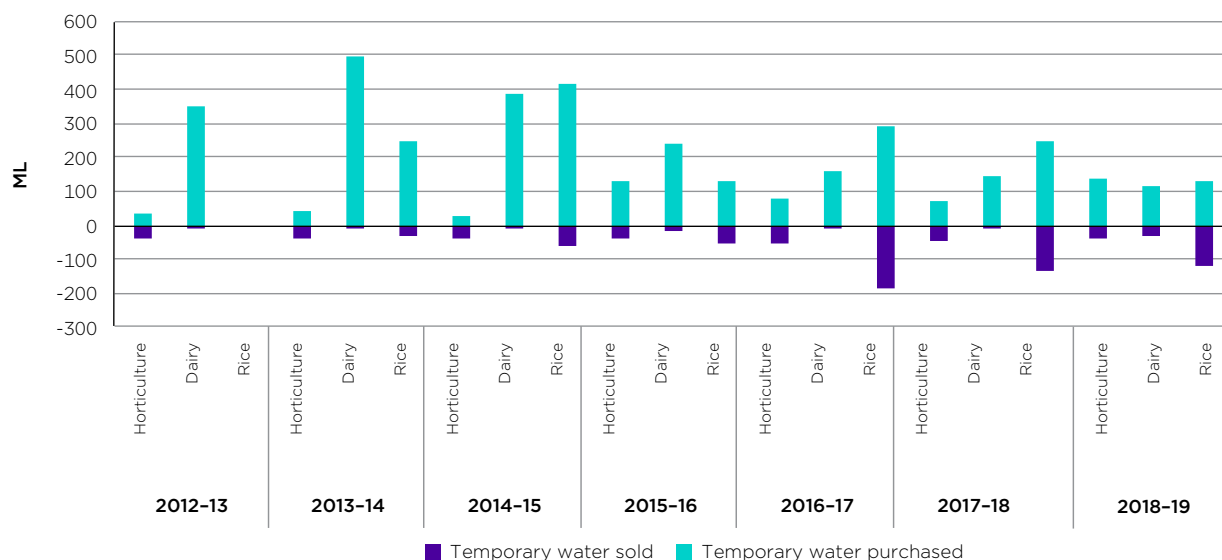


Source: ABARES Murray-Darling Basin Irrigation Survey.

Notes: Data for select Southern Basin regions. For Horticulture: average of 3 regions (Goulburn, Murray and Murrumbidgee); for Rice: average of 2 regions (Murray and Murrumbidgee), no data for 2012-13; for dairy: average of 2 regions (Murray and Goulburn-Broken).

Figure A.9, which reports the average volumes of water traded (sold and purchased) per farm, by farm type, in the Southern Basin in a given year, provides further evidence on how engagement with allocation market differs by farm type.

Figure A.9: Temporary trades, average per farm (ML), by farm type, 2012-13 to 2018-19, selected Southern Basin regions



Source: ABARES Murray-Darling Basin Irrigation Survey.

Notes: For Horticulture: average of three regions (Goulburn, Murray and Murrumbidgee); for Rice: average of two regions (Murray and Murrumbidgee), no data for 2012-13; for dairy: average of two regions (Murray and Goulburn-Broken).

Figure A.9 shows that over the 7 years surveyed, dairy farmers, on average, have been large net buyers of allocations in the Southern Basin. This is consistent with the analysis of figure A.7 and figure A.8

above, and submissions to the inquiry that state that dairy farmers have become more reliant on temporary water markets after sales of water entitlements in past years.¹³⁶⁴

Figure A.9 also shows that while rice farmers, on average, have also been net buyers of temporary water over the years surveyed, there has been an increase in average allocation sales in later years. This possibly reflects the ability of rice farmers to more easily respond to higher water prices by choosing to sell their water rather than producing. In contrast, horticultural farmers, on average, demonstrate the lowest level of net trade per farm and the least variability in trade, which could be indicative of the more stable and less flexible water demands of permanent plantings, or that these farmers adopt a more risk-averse strategy by choosing to hold entitlements which reflect their average water needs, rather than rely on markets.

A.4.3 Findings

The sale of water entitlements over 2006–07 to 2011–12, particularly by dairy farmers in the Southern Basin, has resulted in an increase in the proportion of some irrigators relying on water allocation purchases as drier conditions returned to the Basin from 2011–12 onwards.

The flexibility of annual cropping irrigators, such as rice farmers, allows them to more easily switch from using/buying water in wetter years, to not using/selling water in drier years. These irrigators tend to demonstrate more variable allocation trade behaviours over time.

In contrast, the more constant water needs of permanent plantings, such as nut and fruit plantations, means horticultural farmers have less flexibility to trade temporary water, and so tend to demonstrate more stable allocation trade behaviours over time.

A.5 Irrigators use of other water products

There is a range of water market products such as leases of water entitlements, carryover parking and forward contracts that can be useful tools for securing water while managing price and supply risks. Irrigators have been leasing entitlements from family, friends and other irrigators for many years. However, reforms to water ownership have facilitated the growth of non-landholding investors who hold portfolios of permanent and temporary water and sell a variety of water market products including carryover parking, single or multi-year leases and forward contracts.

There is limited data on the extent to which irrigators are making use of leases and these newer water market products. This section summarises the available information on the type and level of irrigator engagement with these water products.

A.5.1 Leases

Surveys of irrigators have found that only a small minority of irrigators use water from leased entitlements (less than 7% of irrigators across the whole Basin in 2018).¹³⁶⁵ Of all irrigators in the Basin surveyed in 2018 who reported using water for irrigation:

- 64% reported using only water sourced from their own entitlements
- 28% reported using water from their own entitlements and allocations purchased on the temporary market
- 1.4% reported using water from their own entitlements and from entitlements they leased from others
- 3.6% reported using water from own entitlements, leased entitlements, and allocations purchased on the temporary market

¹³⁶⁴ Australian Dairy Industry Council, Submission to Murray–Darling Basin water inquiry issues paper, 5 March 2020, p.1.

¹³⁶⁵ J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray–Darling Basin*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, table 8, p. 13. Basin irrigators using surface water (excludes those who rely solely on groundwater).

- 3.2% reported using no water from their own entitlements (all water from purchases on the temporary market and/or leased entitlements).

Information on irrigators' use of leases also comes from semi-structured qualitative interviews undertaken in 2018 with 64 key trade stakeholders in the Basin.¹³⁶⁶ These results suggest that:

- most irrigators and many agribusinesses did not use leases
- the use of leases was strongly associated with the amount of water owned, with smaller irrigators with less permanent water ownership being less likely to use leases than irrigators with larger water holdings
- where a smaller irrigator did use a lease, they are more likely to lease from friends and relatives, from their own self-managed super accounts, or from other irrigators
- larger and corporate irrigators who use leases are more likely to use longer-term leases sourced from commercial operators, either as part of leasing land or as a stand-alone water lease from non-landholder investors.¹³⁶⁷

A.5.2 Finding

A minority of irrigators across the whole Basin (less than 7%) use water from leased entitlements. The available evidence indicates that:

- irrigators with larger holdings of permanent water rights are more likely to use leases than irrigators with smaller holdings on permanent water rights
- where smaller irrigators use leases, they are more likely to lease from friends and relatives, from a self-managed super fund, or from other irrigators
- where larger and corporate irrigators use leases, they are more likely to use longer-term leases sourced from commercial operators, either as part of leasing land or as a stand-alone lease from an investor.

Carryover parking and forward contracts

Carryover parking involves the renting of carryover capacity to a counterparty from one water accounting period to the next, while forward contracts involve the sale of rights to future volumes of water at one or more specific dates at fixed prices. A forward contract may be for one or more years (that is, single-year or multi-year forwards).

There is limited data available on the level of irrigators' use of carryover parking and forward contracts. The ACCC's analysis of this limited data indicates that while relatively significant volumes of water are being transferred under carryover parking and forward contracts, the number of irrigators using these water products is likely to be very small.

ACCC analysis of trading activity undertaken by the water investors in Victoria in 2018-19 shows that these investors took in approximately 17GL of water from irrigators under carryover parking contracts and returned approximately 10 GL to irrigators that year. The same analysis showed that these same investors provided just over 50 GL of water under forward contracts in Victorian in 2018-19.¹³⁶⁸

¹³⁶⁶ S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, p. 142. The results, qualitative data and method are described further on p. 109 of the Consultant's Report and in Seidl, C, Wheeler, SA & Zuo, A 2020a, 'High turbidity: Water valuation and accounting in the Murray-Darling Basin', *Agricultural Water Management*, vol. 230, and Seidl, C, Wheeler, SA & Zuo, A 2020b, 'Treating water markets like stock markets: Key water market reform lessons in the Murray-Darling Basin', *Journal of Hydrology*, vol. 581, p. 124-399.

¹³⁶⁷ S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, p. 142 and Seidl, C, Wheeler, SA & Zuo, A 2020a, 'High turbidity: Water valuation and accounting in the Murray-Darling Basin', *Agricultural Water Management*, vol. 230, and Seidl, C, Wheeler, SA & Zuo, A 2020b, 'Treating water markets like stock markets: Key water market reform lessons in the Murray-Darling Basin', *Journal of Hydrology*, vol. 581, p. 124-39.

¹³⁶⁸ Chapter 5, figure 5.13.

Other analysis undertaken by ACCC consultants, of a sample of trade data from a large Southern Basin water broker¹³⁶⁹, found that over the 3 years from 2016–17 to 2018–19, the broker mediated a total of 40 carryover parking contracts and 48 forward contracts for irrigators supplied by various counter parties, including other irrigators, investors, IIOs other (unidentified) parties.¹³⁷⁰ This analysis, which indicates a relatively small number of carryover parking and forward contracts are being used by irrigators, has been supported by recent academic research on this topic.¹³⁷¹

A.5.3 Finding

ACCC analysis indicates that only a very small proportion of irrigators use carryover parking or forward contracts.

Chapter 5 includes analysis of the role of investors in providing these water products.

A.6 Irrigator attitudes to water trading and water markets

Stakeholders at public forums and in submissions have expressed to the ACCC a range of positive and negative views on issues directly and indirectly related to water markets and water trading.

Some of these attitudes relate to support or opposition to the idea of water trading in principle, the ease or difficulty of the trading process and the level of confidence people have in water markets and trading rules.

A range of attitudes have been expressed on the reforms that have been implemented over the years to create the current regulatory arrangements governing water ownership and trading. This includes reforms to separate water from land allowing water to be traded independently from land, the relaxing of trade restrictions on out-of-area trade, changes to allow non-land holders to buy and trade permanent and temporary water, and the compliance and enforcement mechanisms used by State and Commonwealth governments.

Stakeholders have also expressed divergent views on various government policies that indirectly impact water trading and water markets, including government reforms to establish the Basin Plan, the setting of the Sustainable Diversion Limits (SDL), and programmes to recover water for the environment through the buyback of water entitlements and on-farm infrastructure grants.¹³⁷²

The ACCC has commissioned analysis of data collected in a number of surveys undertaken across the Basin between 1998 and 2018 to gain a clearer and representative understanding of what views irrigators hold of water markets and trading.

The surveys were undertaken by researchers at the Centre for Global Food and Resources at the University of Adelaide, and the Health Research Institute at the University of Canberra (box A.2). These surveys, amongst other things, asked irrigators about their views and attitudes on:

- water markets
- the process of trading
- water market rules and regulations
- Basin water policy more generally.

This section presents some of the key results from the analysis of this attitudinal data. It also examines associations between attitudes and whether an irrigator engages or does not engage in water trading.

¹³⁶⁹ The broker was responsible for approximately 11% of all non-zero-price Basin allocation trade volumes in 2018–19.

¹³⁷⁰ S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, p. 142–144.

¹³⁷¹ Seidl, C, Wheeler, SA & Zuo, A 2020b, 'Treating water markets like stock markets: Key water market reform lessons in the Murray-Darling Basin', *Journal of Hydrology*, vol. 581, p. 124–39.

¹³⁷² Submissions to the inquiry can be found on the ACCC's water inquiry webpage at: www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/submissions

Box A.2: Water inquiry consultancies on irrigator engagement with water markets

The ACCC commissioned 2 consultants to undertake and report on analysis of data from surveys of Basin irrigators collected between 1998 and 2018. The aim of the work was to gain a clearer and more representative understanding of irrigators' water ownership and trading behaviours, and their attitudes to water trading and water markets.

The Centre for Global Food and Resources at the University of Adelaide has conducted various surveys of irrigators across the Basin from 1998 to 2016. These surveys, amongst other things, asked irrigators about their water ownership, water trading and farm management behaviours, and included a limited number of attitudinal questions.

The Health Research Institute at the University of Canberra undertakes an annual survey – the Regional Wellbeing Survey – of people in Australian regional areas. The 2015 and 2016 surveys, amongst other things, asked Basin irrigators about their water use, water ownership and water trading, and farm management behaviours. They also asked irrigators to indicate to what extent they agreed or disagreed with various statements related to the process of trading water, their confidence in water markets and water market rules, and the security of their permanent water rights.

The University of Canberra consultancy also identified the following ways in which future studies based on irrigator surveys could be improved, to better understand how irrigators and other water market participants engage in and experience water trade:

- Survey non-irrigator water market participants
- Examine use of greater diversity of market mechanisms
- Examine attitudes toward engaging in trade as well as recent trading history
- Include larger samples of specific types of traders
- Engage in more regular data collection
- Examine both the processes and outcomes of water trading
- Examine market participants' objectives for water trading.

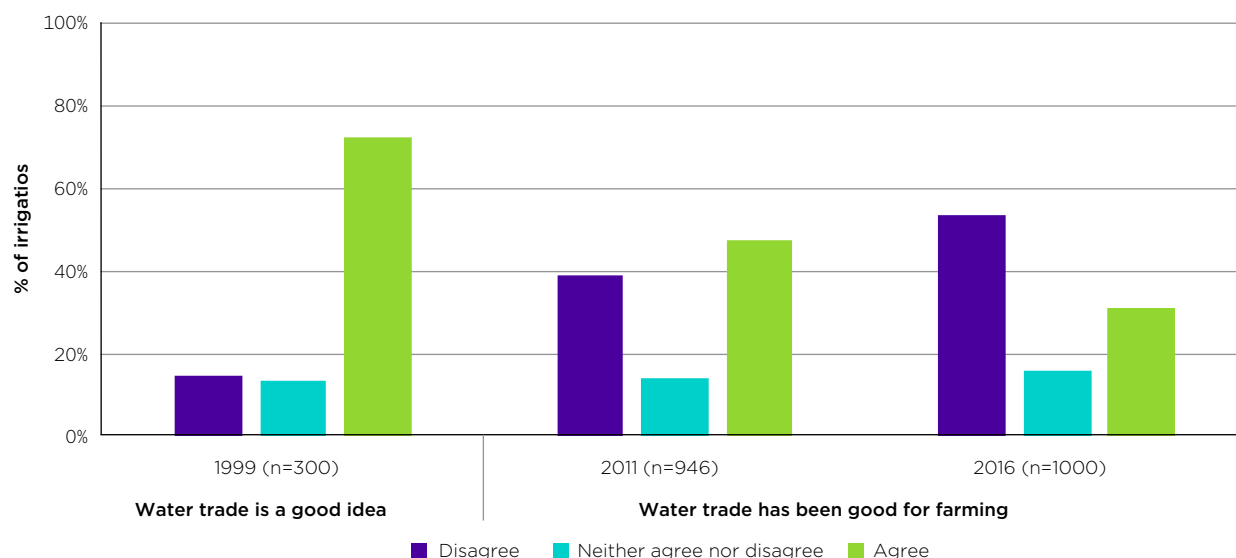
The ACCC has incorporated relevant data and analysis from the consultants' reports into its interim and final reports. The full consultant reports are available from the ACCC's website <https://www.accc.gov.au/focus-areas/inquiries-ongoing/murray-darling-basin-water-markets-inquiry/accc-commissioned-research>.

A.6.1 Irrigators' views on water trading

Researchers from the Centre for Global Food and Resources (CGFR) at the University of Adelaide have asked irrigators in various areas of the Basin for their views on water trading over a number of years.

Figures A.10 and A.11 present data from 4 questions asked in irrigator surveys conducted in Northern Victoria in 1999, and more widely across the Southern Basin in 2011 and 2016.

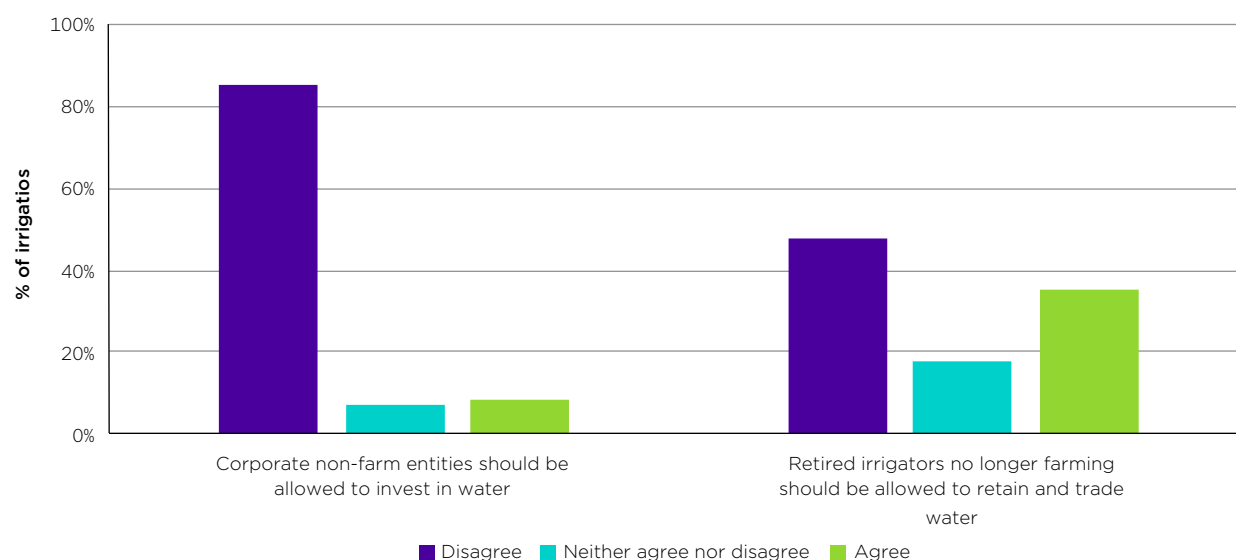
Figure A.10: Irrigators' attitudes towards water trading in 1999 (GMID), 2011 (sMDB) and 2016 (sMDB)



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 6.9, p. 150.

Note: The question for 1999 is 'Please indicate to which extent you agree with the statements using a 1 to 5 scale with 1 being strongly disagree and 5 strongly agree' and the statement is 'Water trade is a very good idea'. The question for 2010 and 2015 is 'Using the scale strongly disagree (1) to strongly agree (5) could you respond to the following?' and the statement is 'I believe water trading has been a good thing for farming'. For clearer illustration, Likert scale answers from 1 to 5 were converted to Disagree (1 and 2), Neutral (3) and Agree (4 and 5). GMID = Goulburn-Murray Irrigation District, Victoria. sMDB = Southern Basin.

Figure A.11: Irrigators' attitudes towards water trading and water markets, Southern Basin, 2016 (n=1000)



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 6.13, p. 153.

Note: The exact question is 'Using the scale strongly disagree (1) to strongly agree (5) could you respond to the following?' The statements are exactly the same as appeared in the figure. For clearer illustration, Likert scale answers from 1 to 5 were converted to Disagree (1 and 2), Neutral (3) and Agree (4 and 5).

Figure A.10 shows that almost 3 quarters of irrigators (73%) in the GMID in 1999 agreed (agreed or strongly agreed) with the statement that 'water trading was a good idea' while only 14% disagreed (disagree or strongly disagree). In 2011, less than half of irrigators (46%) in the Southern Basin agreed with the statement that 'water trading had been good for farming' while 41% disagreed. In 2016, the positive attitude to water trading declined further with only 28% of irrigators in the Southern Basin in

2015 agreeing that 'water trading had been good for farming' while a majority (56%) disagreed with that statement.

Figure A.11 shows that in 2016, the same year that a majority of irrigators in the Southern Basin expressed a negative view on the benefits to farmers of water trading, a strong majority of irrigators (85%) also did not support non-farm entities being allowed to buy water, while almost half of irrigators (48%) did not support retired farmers being allowed to retain and trade water.

A.6.2 Findings

Irrigators in the Southern Basin appear to have become more negative about the idea of water trading over time, with more than half of irrigators surveyed in 2016 believing that water trading had not 'been good for farming'.

A very high proportion of irrigators in the Southern Basin appear to not support the idea that non-farm entities (investors) should be allowed to buy water, with 85% of irrigators surveyed in 2016 not supporting the proposition.

Approximately half of irrigators in the Southern Basin appear to not support the idea that retired farmers should be allowed to retain and trade water.

Irrigators' views on the process of water trading and their confidence in water markets

In the 2015 and 2016 Regional Wellbeing Surveys, irrigators across the Basin were asked to select to what degree they agreed or disagreed with statements related to different aspects of water trading and water markets, including whether irrigators:

- found it easy to trade permanent and temporary water and access the information needed to trade
- felt that water markets were fair and they had confidence in market rules
- felt that environmental water entitlements were subject to the same rules as other entitlements
- felt that their permanent water rights were secure (figure A.12).

Figure A.12 Attitudinal statements in the Regional Well Being Survey

Thinking about your personal experience, do you agree or disagree that:	Strongly DISAGREE	Strongly AGREE	Don't know
My rights to access water (when it is available) are secure			
It is easy to trade temporary water if I want to			
It is easy to trade permanent water entitlements if I want to			
The water trade market is fair for all users			
I feel confident to use water trading as part of my farm management			
It's easy to access the information I need to make water trading decisions			
Water entitlements held by the government are subject to the same rules and charges as other participants in the water market			
Water market rules are stable			
What are the biggest challenges or issues you face when trading water, if any?			

Source: Health Research Institute, University of Canberra, Regional Wellbeing Survey 2015 and 2016.

Figures A.13 and A.14 present the results from of these surveys using 4 categorises of disagree, neither agree or disagree, agree, and don't know. Overall, the pattern of the views were similar in each year. Views were slightly more positive in 2016 compared to 2015 with the increase in positivity for some views being statistically significant.¹³⁷³ Key results from figures A.13 and A.14 are summarised below.

A majority of irrigators across the Basin in 2015 and 2016 agreed that trading temporary water was easy. However, some irrigators in both years did not agree that temporary trade water was easy:

- 65% and 71% of irrigators in 2015 and 2016 respectively, agreed that it was easy to trade temporary water
- 17% and 12% of irrigators in 2015 and 2016 respectively, did not agree that it was easy to trade temporary water.

A majority of irrigators across the Basin in 2015 and 2016 also agreed that trading permanent water was easy. However, some irrigators in both years did not agree that permanent trade was easy.

- 57 cent and 63% of irrigators in 2015 and 2016 respectively, agreed that it was easy to trade permanent water.
- 18% and 14% of irrigators in 2015 and 2016 respectively, did not agree that it was easy to trade permanent water.

¹³⁷³ J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray–Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, section 4, p. 25–7.

A majority of irrigators in 2015 and 2016 agreed that the information needed to trade water was easy to access. However, some irrigators in both years did not agree with this statement.

- 53% of irrigators in 2015 agreed that it was easy to access the information they needed to trade, while 59% and 64% of irrigators in 2015 and 2016 respectively, agreed that they knew how to access the information they needed to trade.
- 19% of irrigators in 2015 did not agree that information was easy to access, while 17% and 16% of irrigators in 2015 and 2016 respectively, did not agree that they knew where to access the information needed to trade.

Around half of irrigators in 2015 and 2016 felt confident in trading water as part of their farm management. However, a quarter or more of irrigators did not:

- 48% and 53% of irrigators in 2015 and 2016 respectively, agreed that they felt confident in using trade as part of their farm management.
- 28% and 25% of irrigators in 2015 and 2016 respectively, did not express confidence in using water trading as part of their farm management.

Less than a third of irrigators across the Basin in 2015 and 2016 expressed confidence in the fairness of water markets or in water market rules:

- Only 23% and 32% of irrigators in 2015 and 2016 respectively, agreed that the water market was fair for all users.
- Only 16% and 26% of irrigators in 2015 and 2016 respectively, agreed that market rules were stable, while 22% of irrigators in 2015 agreed that recent changes to rules had increased their confidence in water markets.¹³⁷⁴
- 48% and 37% of irrigators in 2015 and 2016 respectively, did not agree that water markets were fair for all users.
- 49% and 43% of irrigators in 2015 and 2016 respectively, did not agree that market rules were stable, while 48% in 2015 did not agree that recent rule changes had increased their confidence in water markets.¹³⁷⁵

While a majority of irrigators in 2015 and 2016 expressed confidence in the security of their permanent water access rights, between a quarter and a third of irrigators did not:

- 54% and 60% of irrigators in 2015 and 2016 respectively, agreed that their rights to access water were secure.
- 33% and 24% of irrigators in 2015 and 2016 respectively, did not express confidence in the security of their permanent water access rights.

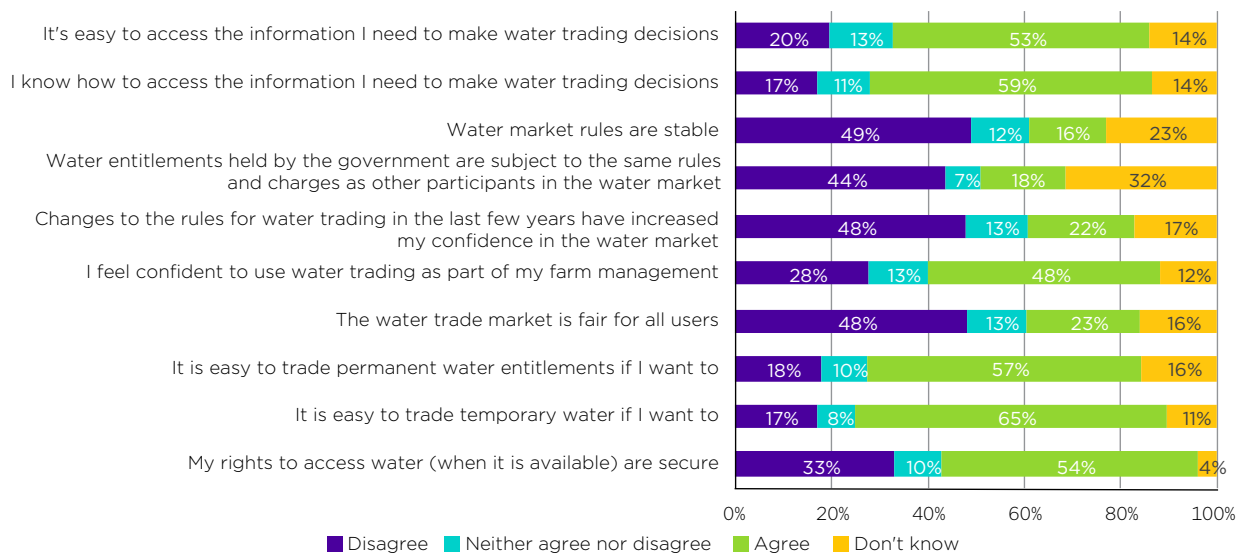
However, only a quarter or less of irrigators in 2015 and 2016 agreed that entitlements held by the government were subject to the same rules and charges as other participants' entitlements, while more than 4 in ten irrigators disagreed:

- Only 17% and 26% of irrigators in 2015 and 2016 respectively, agreed that entitlements held by the government were subject to the same rules and charges as other participants' entitlements.
- 44% and 41% of irrigators in 2015 and 2016 respectively, did not agree that government and non-government held entitlements received equal treatment.

¹³⁷⁴ This question was not asked in 2016.

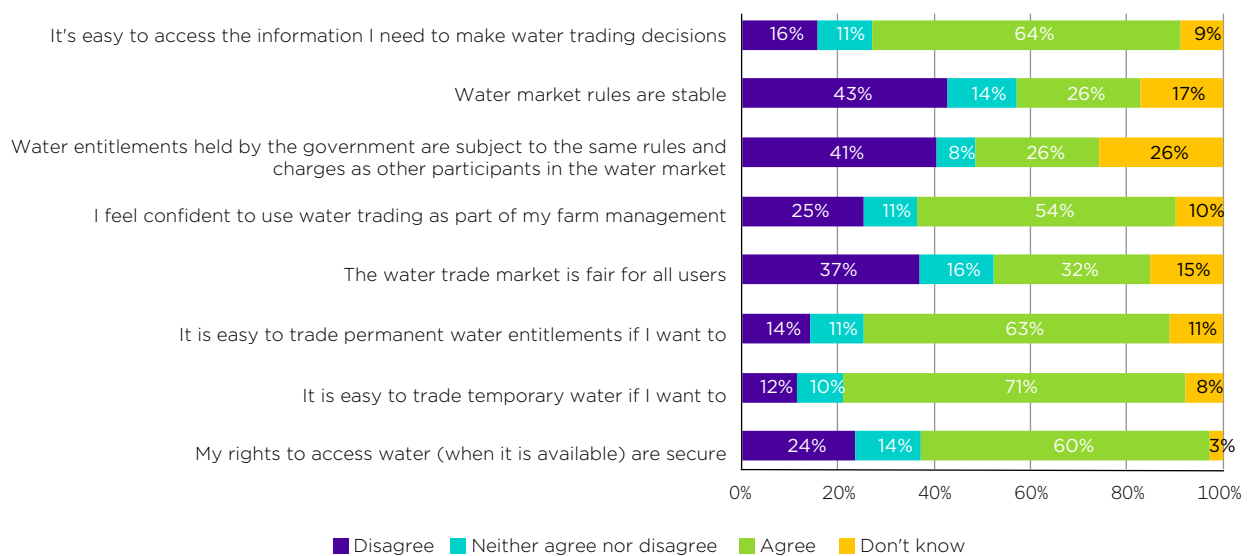
¹³⁷⁵ This question was not asked in 2016.

Figure A.13: Irrigator views about water markets – Basin irrigators, 2015



Source: J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, section 4, pp. 25-27.

Figure A.14: Irrigator views about water markets – Basin irrigators, 2016



Source: J Schirmer and D Peel, *Understanding participation in water trading by irrigators in the Murray-Darling Basin*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, section 4, pp. 25-27.

Note: In comparison to figure A.13, several questions were not asked in the 2016 survey.

A.6.3 Findings

Most irrigators expressed positive views on the ease of making temporary and permanent trades, being able to access the information needed to trade, feeling confident in trading water, and in the security of their permanent rights. However, some irrigators expressed opposing views on each of these issues, including:

- 12 to 18% of irrigators not agreeing that trading temporary or permanent water was easy
- 17 to 19% not agreeing that the information needed to trade water was easy to access
- 25 to 28% not agreeing that they felt confident in using water trading
- 24 to 33% not agreeing that their rights to access water were secure.

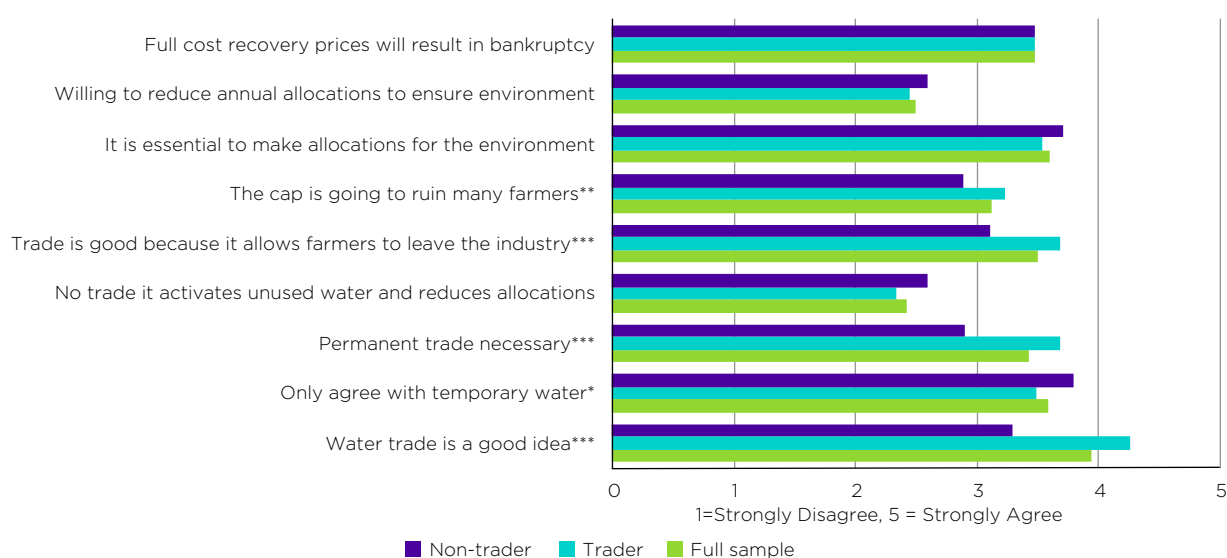
In contrast to the relatively positive views on the ease of trading permanent and temporary water, irrigators express low levels of confidence in the fairness of water markets, water market rules, and the treatment of government owned water entitlements, with only 23% to 32% of irrigators believing that water markets were fair for all users.

Some attitudes vary significantly between irrigators that trade and those that do not

There is limited data on if or how an irrigator's attitudes to water trading, water markets or water policy may affect whether they engage or do not engage in water trading. To examine this questions, the ACCC asked its consultants to analysed irrigator survey data from 1999 to 2016 to see if there were significant differences between the attitudes of trading and non-trading irrigators.

Figure A.15 compares various attitudes on water trading and water policy held by irrigators who traded and did not trade allocations in the GMID in 1999. The figure shows that irrigators, on average, who engaged in allocation trading held more positive attitudes to water trading. Allocation traders were, on average, significantly¹³⁷⁶ more likely to agree than non-traders with the statements that 'trade is good because it allows farmers to leave the industry', 'permanent trade is necessary' and 'water trading is a good idea'.

Figure A.15: Irrigators' attitudes in 1999 towards water trading and water markets, 1998–99, GMID



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 6.10, p. 151.

Note: *, ** and *** represents significant differences between trader and non-traders at the 0.10, 0.05 and 0.01 significance level, respectively. GMD = Goulburn-Murray Irrigation District, Victoria.

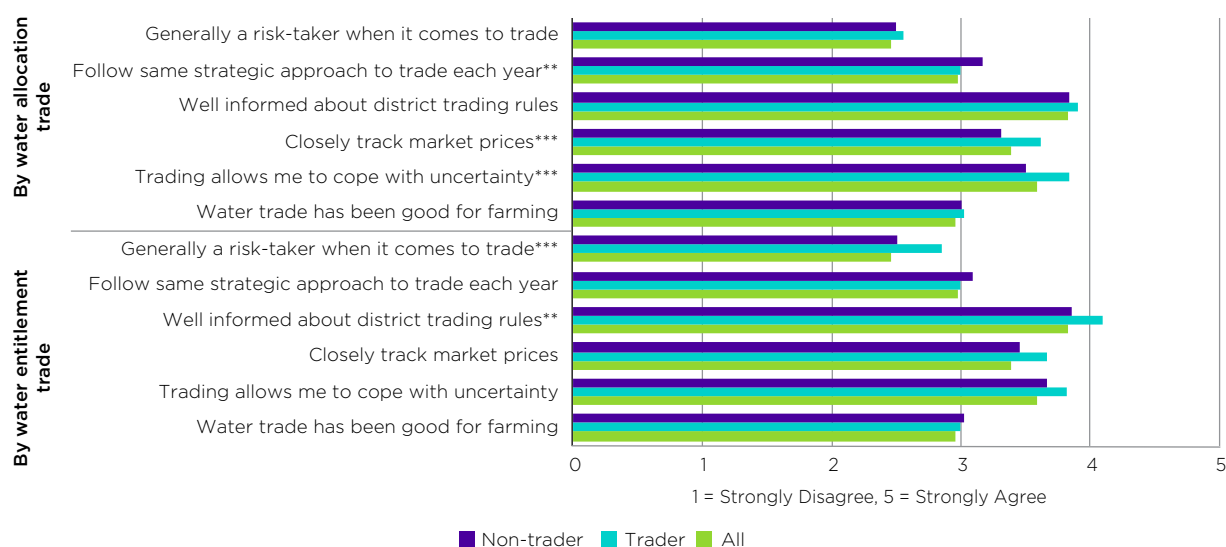
Figure A.16 compares attitudes towards water trading and behaviour held by irrigators in 2011 who traded and did not trade allocations and entitlements in Southern Basin in 2009–10.

The figure shows that, on average, irrigators who engaged in allocation trade held more positive attitudes to water trading. Allocation traders were, on average, significantly¹³⁷⁷ more likely to agree than non-traders with the statements that 'trading allows me to cope with uncertainty' and 'closely track market prices'. Irrigators who engaged in entitlement trade also held more positives attitudes to risk taking and about being well informed about trading. Irrigators who engaged in entitlement trade were, on average, significantly more likely to agree than non-traders with the statements that they were 'generally a risk taker when it comes to trade', and to a lesser extent, that they were 'generally well informed about district trading rules'.

1376 'Significantly' should be interpreted to refer to statistical significance to a 0.01 significance level, unless stated otherwise.

1377 'Significantly' should be interpreted to refer to statistical significance to a 0.01 significance level, unless stated otherwise.

Figure A.16: Irrigators' attitudes in 2011 towards water trading and behaviours, Southern Basin, 2009-10



Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, figure 6.12, p. 152.

Note: ** and *** represents significant differences between trader and non-traders at the 0.05 and 0.01 significance level, respectively.

The exact question is 'Using the scale strongly disagree (1) to strongly agree (5), could you respond to the following?' The statements related to this figure are 'I am generally a risk taker when it comes to allocation trades', 'I usually follow the same strategic approach to allocation trading each year', 'I am well informed about the trading rules in my district', 'I closely track water market prices to obtain maximised trade outcomes', 'Trading water allows me to cope with seasonal uncertainty', 'I believe water trading has been a good thing for farming'.

Tables A.3 and A.4 compare various attitudes expressed in 2016 by irrigators who traded and did not trade allocations and entitlements in the Southern Basin in 2014-15. Grey rows signify a statistically significant difference in the attitude score between traders and non-traders.

Table A.4 shows that in 2016 irrigators who traded allocations in the Southern Basin, relative to irrigators who did not trade, had a significantly:

- more positive attitude to water trading (that is, they agreed more than non-traders with the statement 'I believe water trading has been a good thing for farming')
- more positive attitude to investors (that is, they agreed more than non-traders with statements 'Retired irrigators no longer farming should be allowed to retain and trade water' and 'Corporate non-farm entities should be allowed to invest in water')
- more positive attitude to environmental water recover and the Basin Plan (that is, they agreed less than non-traders with the statements that 'The Commonwealth Environmental Water Holder belongs in the agriculture not the environment department' and 'I believe the Basin Plan should be suspended')
- less traditional attitude to farming (that is, they agreed less than non-traders with the statements 'Farming is the only occupation I want to do' and 'I could never imagine living anywhere other than this area').

Table A.5 shows that in 2016 irrigators who traded entitlements in the Southern Basin, relative to irrigators who did not trade, had a significantly:

- more positive attitude to water trading (they agreed more than non-traders with the statement 'I believe water trading has been a good thing for farming')
- more positive attitude to water investors (they agreed more than non-traders with the statement 'Corporate non-farm entities should be allowed to invest in water')
- more positive attitude to environmental water recovery and the Basin Plan (they agreed more than non-traders with the statements 'Most irrigators think increasing environmental water flows is a good thing', 'It is essential to make allocations to the environment otherwise irrigation will not be long-term

sustainable', 'The Murray–Darling Basin Authority is serious about helping our community to solve our own environmental flow problems' and 'More money should be spent on water buybacks by the Commonwealth', they agreed less than non-traders with the statements 'The Commonwealth Environmental Water Holder belongs in the agriculture not the environment department' and 'I believe the Basin Plan should be suspended').

A.6.4 Findings

In 2016, Irrigators who engaged in water entitlement and allocation trade in the Southern Basin, relative to irrigators who did not trade, had a significantly more positive attitude to water trading, to investors owning water, to environmental water recovery, and the Basin Plan, and less traditional attitudes to farming.

Table A.3: Attitudes of water allocation traders vs non-traders in 2016, NSW, VIC, SA Southern Basin survey (based on 2014–15 trading history)

Farm and farmer characteristics	<i>Non-water allocation trader (n=404)</i>	<i>Allocation trader (n=595)</i>	<i>2 sample t-test (p-value) ^a</i>
Farming is the only occupation I can imagine doing	3.84	3.65	0.03
Financial gain is the only reason for my involvement in farming	2.56	2.44	0.11
I am generally a risk taker when it comes to operating my farm business	3.10	3.04	0.48
I believe water trading has been a good thing for farming	2.22	2.70	0.00
I could never imagine living anywhere other than this area	3.49	3.24	0.00
Knowing about new technology that becomes available is important to me	4.12	4.22	0.10
We would be willing to have our seasonal allocations reduced to ensure sufficient water for the environment	1.59	1.58	0.95
Most irrigators think increasing environmental water flows is a good thing	1.93	2.03	0.19
Generally I feel optimistic about my future in this region	3.30	3.26	0.59
It is essential to make allocations to the environment otherwise irrigation will not be long-term sustainable	2.52	2.63	0.23
I want to continue farming for as long as I am able	4.25	4.18	0.21
I like to make my own decisions and not be too influenced by others	4.41	4.30	0.04
The CEWH belongs in the agriculture not the environment department	4.17	4.05	0.08
The water portfolio belongs in the agriculture not environment department	4.39	4.29	0.11
Corporate non-farm entities should be allowed to invest in water	1.52	1.69	0.01
Retired irrigators no longer farming should be allowed to retain and trade water	2.58	2.92	0.00
Water buybacks for the Basin Plan should be suspended	3.91	3.93	0.80
More money should be spent on on-farm irrigation infrastructure by the Commonwealth	3.88	3.75	0.08
More money should be spent on water buybacks by the Commonwealth	2.05	1.96	0.28
The Murray–Darling Basin Authority is serious about helping our community to solve our own environmental flow problems	2.44	2.44	0.92
I believe the Basin Plan should be suspended	3.60	3.43	0.06
Irrigation infrastructure money has been wasteful and inefficient	3.54	3.37	0.04
I would rather irrigation infrastructure money was spent instead on rural health and education services	2.72	2.66	0.39

Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray–Darling Basin Water Market Inquiry, 2020, table 6.5, p. 118–119

Notes: Attitudinal statements are measured by Likert scales from 1=strongly disagree to 5=strongly agree. a Two sample equal mean test (t-stat) for continuous and Likert scale variables were used. b 2 sample equal proportion test (z-score) for binary variables were used. c Pearson Chi-squared test was used for categorical variables.

Table A.4: Attitudes of water entitlement traders vs non-traders in 2016, NSW, VIC, SA Southern Basin survey (based on 2014-15 trading history)

Farmer attitude	Entitlement trade in 2014-15 (1=yes; 0=no)		
	Non-entitlement trader (n=864)	Entitlement trader (n=135)	2 sample t-test (p-value) ^a
Farming is the only occupation I can imagine doing	3.73	3.70	0.85
Financial gain is the only reason for my involvement in farming	2.48	2.54	0.60
I am generally a risk taker when it comes to operating my farm business	3.06	3.08	0.84
I believe water trading has been a good thing for farming	2.42	3.04	0.00
I could never imagine living anywhere other than this area	3.36	3.21	0.23
Knowing about new technology that becomes available is important to me	4.16	4.33	0.05
We would be willing to have our seasonal allocations reduced to ensure sufficient water for the environment	1.57	1.68	0.20
Most irrigators think increasing environmental water flows is a good thing	1.93	2.34	0.00
Attitude: Generally I feel optimistic about my future in this region	3.27	3.36	0.40
It is essential to make allocations to the environment otherwise irrigation will not be long-term sustainable	2.54	2.86	0.01
I want to continue farming for as long as I am able	4.21	4.22	0.86
I like to make my own decisions and not be too influenced by others	4.34	4.33	0.80
The CEWH belongs in the agriculture not the environment department	4.14	3.84	0.00
The water portfolio belongs in the agriculture not environment department	4.36	4.14	0.01
Corporate non-farm entities should be allowed to invest in water	1.59	1.80	0.03
Retired irrigators no longer farming should be allowed to retain and trade water	2.75	2.96	0.11
Water buybacks for the Basin Plan should be suspended	3.96	3.70	0.03
More money should be spent on on-farm irrigation infrastructure by the Commonwealth	3.79	3.86	0.53
More money should be spent on water buybacks by the Commonwealth	1.97	2.20	0.03
The Murray-Darling Basin Authority is serious about helping our community to solve our own environmental flow problems	2.38	2.79	0.00
I believe the Basin Plan should be suspended	3.55	3.15	0.00
Irrigation infrastructure money has been wasteful and inefficient	3.51	3.02	0.00
I would rather irrigation infrastructure money was spent instead on rural health and education services	2.70	2.53	0.08

Source: S Wheeler and others, *Water market literature review and empirical analysis*, Consultant report prepared for the ACCC Murray-Darling Basin Water Market Inquiry, 2020, table 6.7, p. 123-124.

Notes: Attitudinal statements are measured by Likert scales from 1=strongly disagree to 5=strongly agree. A Two sample equal mean test (t-stat) for continuous and Likert scale variables were used. b 2 sample equal proportion test (z-score) for binary variables were used. c Pearson Chi-squared test was used for categorical variables.

Appendix B – Overview of exchange platforms

In this report, the term ‘trade’ is generally used rather than ‘transfer’, and ‘trade’ is defined to include ‘transfer’.

B.1 H2OX

H2OX launched in 2015, with an aim to make water trading more transparent and financially secure. In particular, its objective was to bring all the intermediaries operating in the basin together so that trading was in one spot to provide price discovery and transparency.¹³⁷⁸ The intention was to take the financial and settlement administration side out of the brokers business to develop a central clearing house.¹³⁷⁹ H2OX operates an online real-time exchange for entitlements and allocations, including trading between a client’s own licences. Users of the exchange include water users, brokers and their clients, and non-irrigator market participants.

Users choose which offers they match with on the exchange platform (a ‘buy-it-now’ style matching service), providing flexibility for sellers and buyers to choose the trading zones they match with and to offer partial or full volume trades.

H2OX’s broker member agreements and trading rules do not allow brokers to be principal to a trade, and the exchange platform was designed to eliminate mark-up by brokers.¹³⁸⁰

H2OX also provides advisory services and can facilitate trading arrangements for other water products such as options, forwards, parking and leasing.

H2OX also provide services for managing client internal trades between zones affected by intervalley and Barmah Choke trade restrictions.

The H2OX exchange platform facilitates trade across New South Wales, Victoria and South Australia.

H2OX maintains an escrow account to facilitate trades and holds the buyer’s funds until trades are approved by relevant authorities, at which point the funds are released to the seller.¹³⁸¹

B.2 Waterexchange

Waterexchange offers automatic matching and listings with buy-it-now pricing. Waterexchange operates a live market and clearing house for trading in the Southern Connected Murray–Darling Basin, but has also extended trading to Queensland in recent years. Waterexchange has automatic matching, and where the platform finds a match it will automatically create a transaction and notify parties to the trade, and the rules do not allow a broker to act as a principal in a trade.¹³⁸²

Waterexchange was originally established in 1994¹³⁸³, and prior to 2017, Waterexchange was limited to Ruralco brokers.¹³⁸⁴

1378 S Locke, ‘A stock exchange for water trading as H2OX launches but irrigators say it is just another tool for trading’, *ABC News*, 5 August 2015, <https://www.abc.net.au/news/rural/2015-08-05/water-stock-exchange/6674982>, viewed May 2020.

1379 *ibid.*

1380 *ibid.*

1381 H2OX 2020, www.h2ox.com/how-much-can-i-save/, viewed April 2020.

1382 Waterexchange, *Client Registration Pack Terms and Conditions*, 2011, https://www.waterexchange.com.au/files/EULA_client_agreement_201111128.pdf, viewed 23 June 2020.

1383 WEX Water Pty Ltd, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 1.

1384 A Marshall, ‘Ruralco opens its water trading floodgates to wider market’, *Farm Online*, 19 July 2017, <https://www.farmonline.com.au/story/4799402/ruralco-opens-its-water-trading-floodgates/>, viewed 23 June 2020.

Waterexchange lists its customers as individuals, brokers and also approval authorities such as Sunwater, Murrumbidgee Irrigation and others. Both the buyer and seller are charged fees for completed trades.

Waterexchange facilitates spot allocation trades, entitlement sales, forward allocation agreements, entitlement leases and carryover capacity.

They provide services such as preparing contracts and lodging trade forms with the relevant authorities.¹³⁸⁵ Waterexchange also offers connection to local water brokers for brokerage services.

Waterexchange also provides services to a number of approval authorities, who are able to use Waterexchange to approve trades online.¹³⁸⁶

B.3 Waterfind

Waterfind operates an online real-time trading exchange platform for temporary and permanent water on spot and forward markets. Orders are matched on the exchange based on price, volume and tradability. The matching process is 'based on trading rules built into [the] exchange and amended from time to time when temporary restrictions are in place.'

Users of Waterfind's exchange platform include brokers, irrigators, investors, corporations, government and authorities. Waterfind offer water brokerage services to water market participants regardless of scale and whether government or corporate.

Waterfind can also facilitate arrangements for carryover parking and long-term leasing and provide brokerage, valuation, advisory and prospecting services. Waterfind also offers historical data on trade volumes and prices, allocations, storage levels, climate and commodity prices.

Waterfind facilitates trade in the Murray–Darling Basin across New South Wales, Victoria and South Australia.

Waterfind facilitates trading of temporary and permanent water in spot and forward markets on their exchange, and can arrange carryover parking and leases off-platform.

Waterfind operates a trust account that receives monies from buyers. Waterfind distributes payments to sellers after approval.¹³⁸⁷

Waterfind also precludes brokers from acting as principals in trades.¹³⁸⁸

B.4 Waterpool

Waterpool Trading operates a not-for-profit online trading exchange platform offering both a real-time regular trade room and a weekly pool for water trading. Participation in the weekly pool does not require any additional registration from sellers and is managed by an opt-out process. Traders include water users, agribusinesses and investors.¹³⁸⁹

While matching on the weekly pool is automated, the real-time trade room requires buyers and sellers to accept offers for sale or purchase that have been posted onto the exchange platform. Unmatched offers are subsequently included in the weekly pool. Trade can occur anonymously while information on historical trades and current offers is publicly available. Trades processed through the pooled exchange

1385 Waterexchange, *Client Registration Pack Terms and Conditions*, 2011, https://www.waterexchange.com.au/files/EULA_client_agreement_20111128.pdf, viewed 23 June 2020.

1386 WEX Water Pty Ltd, *Submission to the Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 1.

1387 Waterfind, *Trading Water in Queensland*, 2017, www.waterfind.com.au/wp-content/uploads/2017/05/2017-water-trading-in-qld-fact-sheet.pdf, viewed June 2020.

1388 ACCC, *Water market intermediaries: industry developments and practices*, December 2010, Canberra, p. 15. A copy of the report is available at: www.accc.gov.au/system/files/Water%20market%20intermediaries%20-%20industry%20developments%20and%20practices_0.pdf.

1389 Waterpool, 2020, <https://www.waterpool.org.au/content/about>, viewed May 2020.

are limited to Victoria. Waterpool Trading's exchange platform is limited to temporary and permanent water trading.

Waterpool operates a holding account that receives water purchase monies from buyers. Waterpool distributes payments to sellers following approval of the trade.¹³⁹⁰

B.5 Water Exchange (Murray Irrigation Limited)

Murray Irrigation Limited's (MIL) Water Exchange is an online real-time exchange platform that facilitates the trading of temporary water and water delivery rights on a spot market only. The trade of delivery rights is limited to members of MIL.

Users can submit sell offers and buy bids, which are matched by the exchange platform (lowest sell offer to highest buy bid). Buyers can also accept offers for sale that have been posted onto the exchange platform. Current offers and a daily aggregate of historical trades for the current water year are publicly available.

MIL's Water Exchange is limited to temporary water and water delivery rights.

MIL operates a separate non-interest bearing account for Water Exchange that receives commission fees, any applicable trade fees and water purchase monies from buyers. MIL subsequently distributes payments to sellers, less commission fess, any applicable external trade fees and any other debt owed to MIL.

The individual irrigation right account holder is responsible for paying the WaterNSW trade fee to WaterNSW, and MIL will credit/debit the irrigation right account after approval for the trade has been received from WaterNSW.

B.6 WaterMart (Coleambally Irrigation Co-operative Limited)

WaterMart Exchange is an online real-time exchange platform that facilitates the trading of temporary water within the Coleambally Irrigation network and provides CICL members with access to the Southern Connected Basin market. All market participants can register to trade on the exchange.¹³⁹¹

WaterMart does not offer brokerage services and does not offer any water market advice.

CICL describe the volumes of their trades as 'not significant' compared to the total transactions in the Murrumbidgee.¹³⁹²

WaterMart is limited to the trade of temporary water only.

In addition to the matching service, WaterMart also provides electronic invoicing, settlement and approvals. Buyers and sellers are charged the same flat fees when both parties are within CICL, and WaterNSW lodgement fees are paid to WaterNSW when CICL members use WaterMart to access the external market.

WaterMart provides electronic documents to approval authorities to facilitate real-time approvals.

¹³⁹⁰ Waterpool 2019, *Pooled Water Exchange & Tradersroom Trading Rules*, July 2019, <https://www.waterpool.org.au/data/resources/files/Policies/waterpool%20trading%20rules%20v6%20july%202019.pdf>, viewed May 2020.

¹³⁹¹ Coleambally Irrigation Co-operative Limited, *Submission to the Murray-Darling Basin water inquiry issues paper*, 13 February 2020, p. 4.

¹³⁹² Coleambally Irrigation Co-operative Limited, op. cit., p. 3.

B.7 Irrigation infrastructure operator intermediary services

A number of irrigation infrastructure operators (IIOs) have also indicated that they offer various brokerage or other intermediary services to their members. For example, such services involve maintaining a list of members wanting to sell water and a list of members wanting to buy water. In some cases, these services may be freely offered to customers, and they may not be specifically identified by the IIO as an intermediary service.

Appendix C – Monetary transaction costs

This appendix provides a summary of the fees charged by Basin State authorities, how these support Basin States' cost-recovery activities and the operating costs of Basin States' water registers and trade processing services.

The fees charged by irrigation infrastructure operators (IIOs) to process trades¹³⁹³ and the commissions charged by intermediaries (brokers and exchange platforms) are also included.

C.1 Basin State trade approval application fees

C.1.1 Allocation trades

Victoria and New South Wales have comparable fees in 2020–21 for allocation trades (\$47.50 for Victoria when submitted via their online system, \$49.37 for New South Wales) while South Australia's fee for allocation trades was almost six times greater (\$277). New South Wales also applies bulk rural water usage charges for interstate allocation trades, and also certain intrastate trades.¹³⁹⁴ In 2020–21, the charges are \$2.06/ML for allocation water purchased from the Murray Valley and \$3.57/ML from the Murrumbidgee Valley.¹³⁹⁵

While Victoria has a paper-based allocation trade submission option available, the \$89.50 charge is significantly greater than for online processing. This cost differential reflects the reduced labour costs associated with Victoria's automated online processing system.

South Australia's high fees reflect the relatively high labour costs for the trade approval authority to process trades. South Australia currently relies on labour to manage its paper-based system, but it is modernising its water registry¹³⁹⁶, which is expected to improve trade processing capability in the future.¹³⁹⁷

Figure C.1 shows trade approval fees have not changed significantly since 2015–16, except in New South Wales. Up to 2016–17, allocation trade fees in New South Wales comprised of a fixed cost (the minimum fee) and a variable cost for the volume of water traded, with a maximum fee in place. Since 2017–18, the trade fee has been a fixed cost regardless of the quantity of water traded.

1393 Includes transfers (that is, a trade that does not involve the payment of consideration).

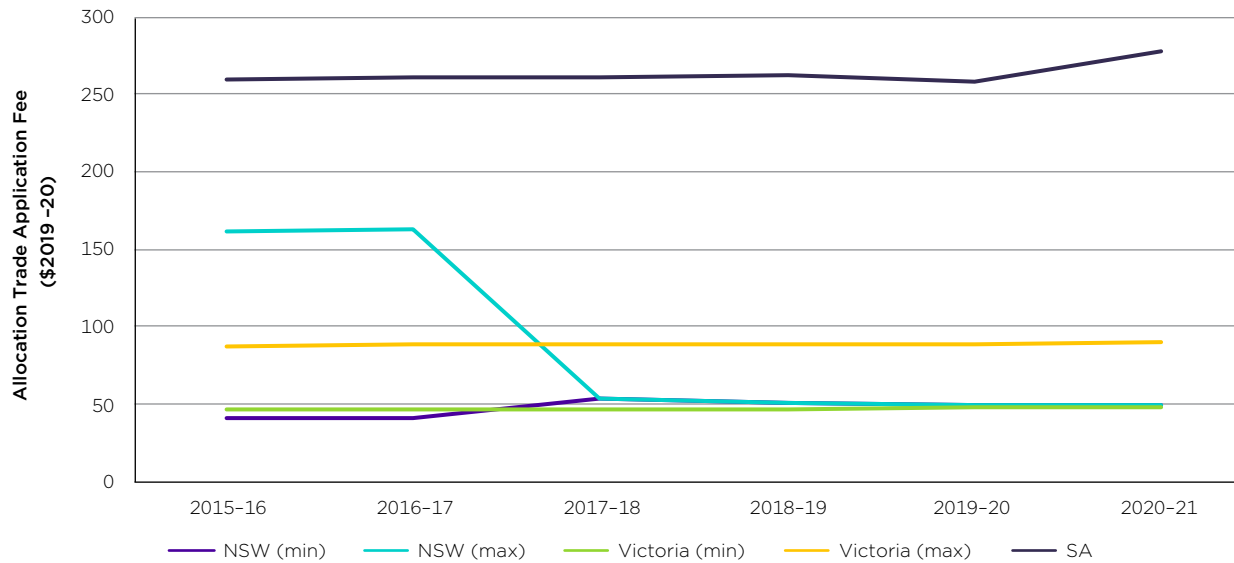
1394 This charge is applied to all allocation trades where the destination water access licence does not hold a New South Wales works approval, and so also applies to non-water users such as investors and certain categories of water users such as environmental water holders.

1395 These charges are determined by the New South Wales Independent Pricing and Regulatory Tribunal (IPART) as part of its economic regulation of monopoly providers of water services, such as WaterNSW.

1396 Department of Agriculture, *Submission to the Murray-Darling Basin water inquiry issues paper*, 30 January 2020, p. 10.

1397 Department for Environment and Water (South Australia), *2018–19 Annual Report*, 2019, p. 20.

Figure C.1: Trade approval application fees for allocation trade, by state and year

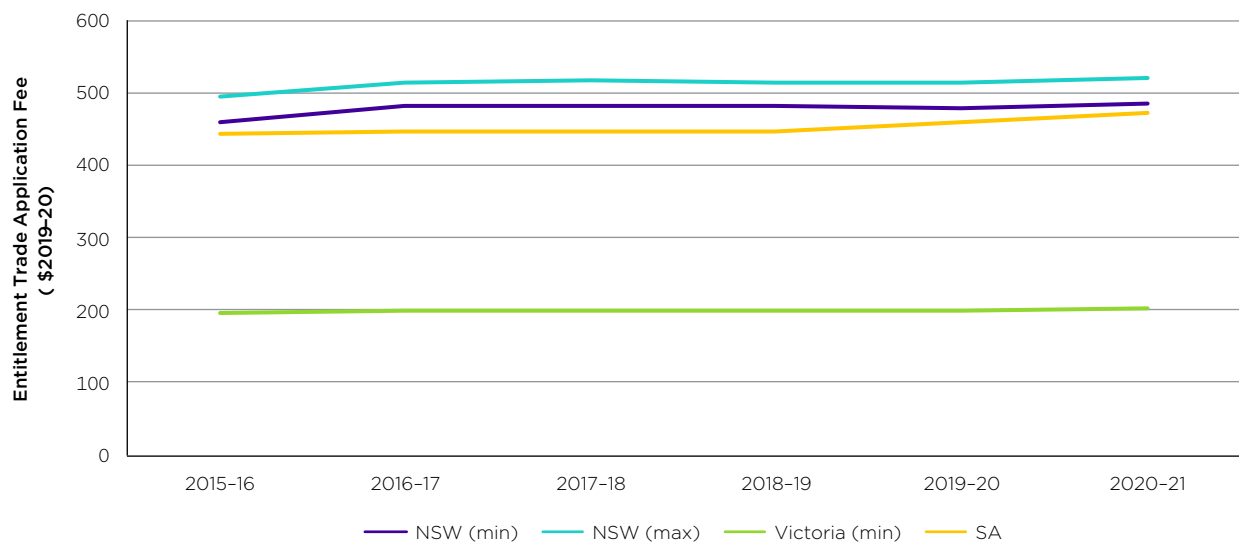


Source: ACCC analysis based on ACCC, IPART, Department for Environment and Water (SA) and Victorian Water Register.

C.1.2 Entitlement trades

Entitlement trade fees in each state are greater than allocation trade fees, although the difference is most significant in New South Wales where its \$518.25 fee (\$483.76 when submitted online) is about ten times that of its allocation trade fee. Entitlement fees for the other states ranged from \$201 in Victoria to \$471 in South Australia. Figure C.2 shows entitlement trade approval fees have increased only marginally in real terms since 2015-16.

Figure C.2: Trade approval application fees for entitlement trades, by state and year



Source: ACCC analysis based on ACCC, IPART, Department for Environment and Water (SA) and Victorian Water Register.

C.1.3 Trade approval authorities recover their costs through trade approval application fees

Under the National Water Initiative (NWI), the Australian, state and territory governments agreed to cost recover the administration and water resources management of the Basin, including the water accounting systems that facilitate water trading.¹³⁹⁸ Each Basin State is responsible for its spending and cost recovery, where fees charged to water users and traders should be closely linked to the costs of the activities.¹³⁹⁹ Water registry, accounting and management costs should be recovered from entitlement holders via entitlement fees while trading costs and specific trade-related registry functions should be recovered from traders via trade approval fees. Consequently, trade approval application fees vary by state, depending on the costs incurred to facilitate water trading and the number of trades that costs can be recovered from.

Table C.1 shows trade approval fees are a relatively small proportion of trade value in the Southern Connected Murray-Darling Basin (Southern Connected Basin). While some water market participants have called for a consistent approach to trade allocation fees, such changes will affect states' cost-recovery mechanisms.

Table C.1: Estimated revenue from trade approval authority allocation trade fees in the Southern Connected Basin, 2018-19 (\$million)

	Origin state fees	Destination state fees	Total fees	Total reported allocation trade value	Origin state fees as % of total	Total fees as % of trade value
NSW	0.154	0.035	0.188	141	81.9	0.13
Victoria	1.015	0.031	1.046	415	97.0	0.25
SA	0.316	0.144	0.459	72	68.8	0.64

Source: ACCC analysis based on NSW, Victoria and SA governments' responses to voluntary information requests, trading fees as published on WaterNSW, Department for Environment and Water (SA) and Victorian Water Register websites.

Notes: Values in 2019-20 dollars. Estimates based on the relevant trading fees and approved allocation trades only, including zero dollar trades. Destination state fees apply for interstate trades only. Excludes New South Wales's variable usage charges and zero Water Access Licence (WAL) set up costs. Data has been updated since the interim report.

Table C.2 shows Basin States' operating costs for their water registry and trade processing functions, although the scope of each state's services varies. For example, New South Wales's trade processing costs not only include trade approvals for surface water and groundwater in the Southern and Northern Basins, but also the costs of other water licencing and works approval functions.

¹³⁹⁸ Council of Australian Governments, *Intergovernmental Agreement on a National Water Initiative*, 2004, paragraphs 64 and 67(i).

¹³⁹⁹ *Water Act 2007* (Cth), Schedule 1 – Murray-Darling Basin Agreement, Schedule 2, s. 4(3).

Table C.2: Estimate of New South Wales, Victoria and South Australia's operating costs for maintaining water registers and processing allocation and entitlement trade, 2018-19 (\$million)

	Registry resourcing costs	Trade processing costs	Total Southern Connected Basin trade value	Trade processing costs as % of Southern Connected Basin trade value
NSW	0.356 ^a	8.911 ^b	300	2.97
Victoria	2.897	1.478	716	0.21
SA	0.741	1.511	105	1.44

Source: ACCC analysis based on NSW, Victoria and SA governments' responses to voluntary information request, NSW and Victoria governments responses to ACCC annual Water Monitoring Report Requests for Information, IPART and Bureau of Meteorology data.

Notes: Values in 2019-20 dollars. Registry resourcing costs include operating, capital and labour costs for each state's water registers. Trade approval costs are those incurred by agencies when performing their trade approval and registration functions.

(a) NSW registry costs reported by the Department of Planning, Industry and the Environment (DPIE).

(b) NSW trade processing costs, reported by the DPIE and WaterNSW, also include the issuing of licences and the administration of works approvals.

Trade value includes allocation and entitlement trades, including zero dollar trades (and as such, is likely an underestimate of the true trade value, see section 11.3.4). Data has been updated since the interim report.

While Victoria's operating costs for trade approval services are a much smaller proportion of trade value compared to other states (table C.2), this does not consider previous investments that have improved trading processes in the Victorian Water Register. Victoria's registry resourcing costs include licensing, water usage, compliance, and resource management functions. While some of the fixed costs of maintaining the Victorian Water Register are cost recovered from holders of Victorian water entitlements through an annual levy collected by Victorian water corporations¹⁴⁰⁰, there have also been investments of \$5.1 million from 2009-10 to 2011-12 from the Australian Government¹⁴⁰¹ and \$4.6 million from 2012-13 to 2015-16 from the Victorian Environmental Contribution levy.^{1402, 1403} These investments allowed for upgrades that benefitted water traders: allocation trades could be lodged online for a reduced fee¹⁴⁰⁴ and approval times were reduced¹⁴⁰⁵, without any changes to the paper-based application fees for trade approval that had been in place since 2009.¹⁴⁰⁶

1400 Department of Environment, Land, Water and Planning (Victoria), *Regulatory Impact Statement Proposed Water (Resource Management) Regulations 2017*, 2017, p. 18.

1401 COAG, 'Implementation Plan for Enhancements to Victorian Water Register Systems', *National Partnership Agreement on Water for the Future*, 2010; COAG, 'Implementation Plan for Enhancements to Victorian Water Register Systems (Stage 2)', *National Partnership Agreement on Water for the Future*, 2012.

1402 The Environmental Contribution Levy is collected from Victoria's urban and rural water businesses to fund water reforms and water-related environmental initiatives.

1403 Department of Environment, Land, Water and Planning (Victoria), 2019, <https://www.water.vic.gov.au/planning/environmental-contributions/third-tranche-of-the-environmental-contribution/water-entitlements-and-market-reform/enhancing-the-victorian-water-register>, viewed 8 May 2020; Victorian Auditor-General, *Administration and Effectiveness of the Environmental Contribution Levy*, 2014, p. 28.

1404 Water (Resource Management) Regulations Amendment Regulations 2013, S.R. No. 163/2013.

1405 Aither, '10-year evaluation of the Environmental Contribution', *A report prepared for the Victorian Department of Environment, Land, Water and Planning*, 2015, p. 84; Department of Environment, Land, Water and Planning (Victoria), 2019, <https://www.water.vic.gov.au/planning/environmental-contributions/third-tranche-of-the-environmental-contribution/water-entitlements-and-market-reform/enhancing-the-victorian-water-register>, viewed 8 May 2020.

1406 Trade approval fees in Victoria are set by legislation. The current Water (Resource Management) Regulations 2017 (Victoria) prescribe fees for entitlement trade applications as 13.57 fee units, and for allocation trade as 3.20 fee units through the automated lodgement process or 6.04 fee units through any other lodgement process. The revoked Water (Resource Management) Regulations 2007 prescribed the same fees for entitlement and allocation trade applications from 2009. The automated lodgement process prescribed fee came into effect following the 2013 amendments and was set at 3.20 fee units. In Victoria, fee units are automatically indexed.

C.2 Irrigation infrastructure operator trade approval application fees

C.2.1 Temporary trades

Water users located within irrigation networks are generally able to undertake temporary trades within the network of their irrigation infrastructure operator (IIO) or buy water from outside of the IIO and only incur a small trade approval fee of up to \$75 per trade from the IIO. However, trading water into and out of the IIO's network can incur more significant costs as these trades also attract Basin State trade approval authority fees. Further, certain IIOs also charge 'exit fees' for temporary trade, being a charge per ML of water traded outside the irrigation network. Combined IIO and trade approval authority fees (including exit fees) for a 100 ML trade can range from \$79.37 to \$1,309.37 (table C.3).

Table C.3: Irrigation infrastructure operator (IIO) fees for temporary trades within and external to IIO network, exclusive of Basin State trade approval authority fees for 2020-21

Irrigation infrastructure operator	Internal trade fee (\$)	External trade fee (\$)	Fee for 100 ML external trade (\$)	Fee for 100 ML external trade, including trade approval authority fees (\$)
NSW				
Coleambally^a	75.00	130.00	130.00	179.37
Hay	30.00	30.00	30.00	79.37
Jemalong^a	-	6.86 per ML ^b	686.00	735.37
Moira	-	90.00 + 8.0 per ML ^b	890.00	939.37
Murray Irrigation Limited^a	No charge	86.00	86.00	135.37
Murrumbidgee Irrigation Limited	No charge ^c	92.00	92.00	141.37
West Corugan^a	30.00	110.00 + 11.5 per ML ^b	1,260.00	1,309.37
Western Murray Irrigation	28.00	69.00	69.00	118.37
South Australia				
Central Irrigation Trust	No charge	62.00	62.00	339.00
Renmark^a	25.00 ^d	35.00 ^e	35.00	312.00

Source: ACCC analysis of data provided and published by irrigator infrastructure operators analysed for this report.

Notes:

- (a) Fees advertised inclusive of GST.
- (b) Per ML exit fees levied by Jemalong, West Corugan and Moira only apply to water transferred out of the irrigation network; water transferred in does not attract this charge. For Jemalong, water transferred in may also attract charges in relation to conveyance.
- (c) Murrumbidgee Irrigation Limited does not charge for the first five internal trades each season, but charges \$50 thereafter.
- (d) Renmark also offer a service where irrigation right holders can list buy and sell offers. Each offer is charged \$36 and includes approval once the offer is matched by another irrigation right holder (such that Renmark receives \$72 per pair of buy/sell offers).
- (e) Renmark offer a reduced charge of \$26 for external trades when a broker lodges the trade application form to the trade approval authority.

C.2.2 Entitlement trades and leases

Water users within IIOs are also able to permanently trade their irrigation rights. Fees range from \$70 to \$400 for each trade within their IIO's network (table C.2).

Permanent trading or leasing of irrigation rights outside of the IIO district is more complex as the irrigation right must be transformed into a water access entitlement. 'Transformation' is a process

that allows irrigators with an irrigation right against IIOs in New South Wales and South Australia to permanently transform their irrigation right into a water access entitlement in their own name.¹⁴⁰⁷

Fees charged by IIOs for permanent trade or leasing of irrigation rights outside of the IIO's network range from \$70 to \$550 (table C.4).

Trading the transformed irrigation right as an entitlement or lease outside of the IIO network also attracts Basin State trade approval authority fees. Irrigators in New South Wales without a water access licence are required to establish one prior to the transformation of their irrigation rights into entitlements, incurring an additional \$344.64 charge (\$308.56 online) to the \$518.25 entitlement trade fee (\$483.76 online). This water access licence establishment charge can be avoided if the irrigator sells their water right to a buyer who already has a water access licence and the transformation is processed directly into that licence. However, it is unavoidable for irrigators who do not yet have a licence and choose to hold the subsequent entitlement for leasing or trading allocations.

Table C.4: Irrigation infrastructure operator (IIO) fees for permanent trade within and external to IIO network for 2020–21

Irrigation infrastructure operator	Internal trade fee (\$)	External trade fee (\$)	External trade fee including maximum trade approval authority fees (\$)
NSW			
Coleambally ^a	250.00	250.00	1,112.89 ^b
Hay	-	350.00	1,212.89 ^b
Jemalong	400.00	400.00	1,262.89 ^b
Moirra	-	300.00	1,162.89 ^b
Murray Irrigation Limited ^a	316.00	393.00	1,255.89 ^b
Murrumbidgee Irrigation Limited	230.00	230.00	1,092.89 ^b
Narromine	70.00	70.00	932.89 ^b
West Corrugan ^a	385.00	550.00	1,412.89 ^b
Western Murray Irrigation	209.00	319.00	1,181.89 ^a
South Australia			
Central Irrigation Trust	375.00	375.00	846.00
Renmark ^a	36.00	335.00	806.00

Source: ACCC analysis of data provided and published by IIOs analysed for this report.

Notes: (a) Fees advertised inclusive of GST.

(b) This includes WaterNSW fees for establishing a zero share WAL and applying for share component trade approval, and registration of the approved dealing with NSW LRS. Fees can be reduced by \$70.57 if both applications with WaterNSW are lodged online. Fees quoted apply to regulated systems only.

C.3 Broker and exchange platform commission costs

Water brokers and exchange platforms provide a variety of advisory, matching and information services. While there are many intermediaries that can match buyers and sellers for allocation and entitlement trades, water market participants seeking to trade other products may need to incur some research transaction costs to choose a service provider that meets their needs.

Table C.5 provides an overview of broker and exchange fees as at April 2020. Simple bulletin board style services tend to have the lowest fees and clear guidance on the parties responsible for payment of trade approval authority fees. However, more complex trades are less-suited to bulletin boards and water market participants may prefer to use a broker rather than spend time and resources understanding trading rules, finding trading partners and negotiating the contract.

¹⁴⁰⁷ Transformation processes are governed by the Water Market Rules 2009 (Cth) and enforced by the ACCC, where Rule 22 provides for recovery of the amount of loss or damage suffered as a result of conduct, or an omission, of another person that contravenes the rules.

Table C.5: Sample of intermediary fees for allocation trades, forwards, options, entitlement trades, entitlement leases and carryover (as at April 2020)

Fee model	Buyer's fees	Seller's fees
Allocation trades		
Variable (volume-based) fee, parties charged equally but buyer pays all trade approval authority fees	\$2/ML, with a \$75 minimum plus all trade approval authority fees. ¹⁴⁰⁸	\$2/ML, with a \$75 minimum. ¹⁴⁰⁹
Variable (volume and value-based) fees, where buyer pays more but both parties pay trade approval authority fees	1.9% of trade value, with a \$100 minimum, additional fees of \$1.90/ML plus trade approval authority fees. ¹⁴¹⁰	\$2/ML, with a \$100 minimum, plus trade approval authority fees. ¹⁴¹¹
Combination of fixed and variable fees.	Fixed fee range: \$0–\$300.	
<i>Payment of trade approval authority fees to be negotiated between parties.</i>	Variable trade value fee range: 0.0–4.0%. Alternate variable volume fee: \$0.00–\$1.50 per ML.	
Forward allocation agreements		
Variable (annual volume-based) fee, parties charged equally but buyer pays all trade approval authority fees	1% per ML per annum plus all trade approval authority fees. ¹⁴¹²	1% per ML per annum. ¹⁴¹³
Combination of fixed and variable fees.	Fixed fee range: \$0–\$500	
<i>Payment of trade approval authority fees to be negotiated between parties.</i>	Variable trade value fee range: 0.0–5.0%. Alternate variable volume fee: \$0.00–\$1.50 per ML.	
Options		
Fixed and variable (value-based) fees.	\$275 establishment fee plus 1.1% of option premium (minimum of \$0.55 per option) and strike price. ¹⁴¹⁴	Not specified – provided by a private supplier. ¹⁴¹⁵
Entitlement trades		
Variable (value-based) fee, parties charged equally but buyer pays all trade approval authority fees	0.75% of value, with a \$750 minimum, plus all trade approval authority fees. ¹⁴¹⁶	0.75% of value, with a \$750 minimum ¹⁴¹⁷
Fixed and variable (value-based) fees, where both parties are charged equally and both pay trade approval authority fees	\$750 plus 3.5% of trade value plus trade approval authority fees. ¹⁴¹⁸	\$750 plus 3.5% of trade value plus trade approval authority fees. ¹⁴¹⁹
Combination of fixed and variable fees.	Fixed fee range: \$0–\$750	
<i>Payment of trade approval authority fees to be negotiated between parties.</i>	Variable trade value fee range: 0.0–4.0%.	

1408 H2OX 2018, www.h2ox.com/fees/, viewed 23 April 2020.

1409 *ibid.*

1410 Waterpool 2019, www.waterpool.org.au/data/resources/files/Forms/waterpool%20fee%20schedule_19_20%20season.pdf, viewed 8 April 2020.

1411 *ibid.*

1412 H2OX 2018, www.h2ox.com/water-products/forwards/, viewed 23 April 2020.

1413 *ibid.*

1414 H2OX 2018, www.h2ox.com/water-products/options/, viewed 23 April 2020.

1415 *ibid.*

1416 H2OX 2018, www.h2ox.com/fees/, viewed 23 April 2020.

1417 *ibid.*

1418 Waterpool 2019, www.waterpool.org.au/data/resources/files/Forms/waterpool%20fee%20schedule_19_20%20season.pdf, viewed 8 April 2020.

1419 *ibid.*

Entitlement leases		
Variable (volume or value-based) fee, parties charged equally but buyer pays all trade approval authority fees	1% per ML per annum (or \$1/ML for low reliability water) plus all trade approval authority fees. ¹⁴²⁰	1% per ML per annum (or \$1/ML for low reliability water). ¹⁴²¹
Combination of fixed and variable fees.	Fixed fee range: \$0–\$100	
<i>Lessee may become responsible for any fees associated with the entitlement being leased.</i>	Variable trade value fee range: 0.5-4.0% of trade value, although some individual brokers are moving to a variable volume charge.	
Carryover		
Variable (volume) fee, parties charged equally but buyer pays all trade approval authority fees	\$1/ML plus all trade approval authority fees. ¹⁴²²	\$1/ML. ¹⁴²³
Combination of fixed and variable fees.	Fixed fee range: \$0–\$300	
<i>Payment of trade approval authority fees to be negotiated between parties.</i>	Variable trade value fee range: 0.0–4.0%. Alternate variable volume fee: \$0.00–\$2.0 per ML.	

Source: Information from intermediaries' websites and s. 95ZK responses.

1420 H2OX 2018, www.h2ox.com/water-products/leasing/, viewed 23 April 2020.

1421 *ibid.*

1422 H2OX, 2018, <https://h2ox.com/water-products/carryover/>, viewed 23 April 2020.

1423 *ibid.*

Appendix D – Transaction costs in the Southern Connected Basin

This appendix provides an overview of the transaction costs associated with water trading.¹⁴²⁴ It considers how Basin State and irrigation infrastructure operator (IIO) approval processes, and intermediaries' lodgement processes, affect individual trade approval applications and the availability of information to the market.

D.1 Impact of trading fees on trade

D.1.1 Allocation trades processed by Basin State trade approval authorities

Analyses in this section only consider water allocation trades from 1 July 2017 to 30 November 2019 as Basin State trade approval authority fees did not materially change during this period (see appendix C).

Trading volumes across the Southern Connected Murray–Darling Basin (the Southern Connected Basin) varied significantly by state and trade type during 1 July 2017 to 30 November 2019.¹⁴²⁵ Briefly:

- Victorian water trade buyers undertook almost 40,000 allocation trades, where 96% were for water sourced intrastate.
- New South Wales buyers executed almost 9,000 trades, less than a quarter of Victoria's total number of trades, but only 83% of trades were for water sourced intrastate.
- South Australian buyers had the smallest number of trades and the smallest proportion of trades where water was sourced intrastate (65%).

Water volumes were another aspect of trading that varied for each of the states (figure D.1). Almost half of the Victorian trades were less than 25 ML and over 75% were less than 100 ML. While this could be attributed in part to Victoria's low trade approval fees, the distribution of volumes is markedly different in New South Wales (which is also has relatively low approval fees) where less than one quarter of trades were up to 25 ML and only about 50% of trades were less than 100 ML. South Australia, with trade approval fees that are six times the size of the other two states¹⁴²⁶, had a distribution that was closer to Victoria than New South Wales where over one-third of trades were for volumes up to 25 ML and almost two-thirds were for volumes up to 100 ML. This may be due to South Australia's high proportion of interstate trades, which it predominantly sources from Victoria.¹⁴²⁷ However, when interstate trades are excluded, buyers in Victoria and South Australia have similar buying patterns despite marked differences in trade approval charges (figure D.2).

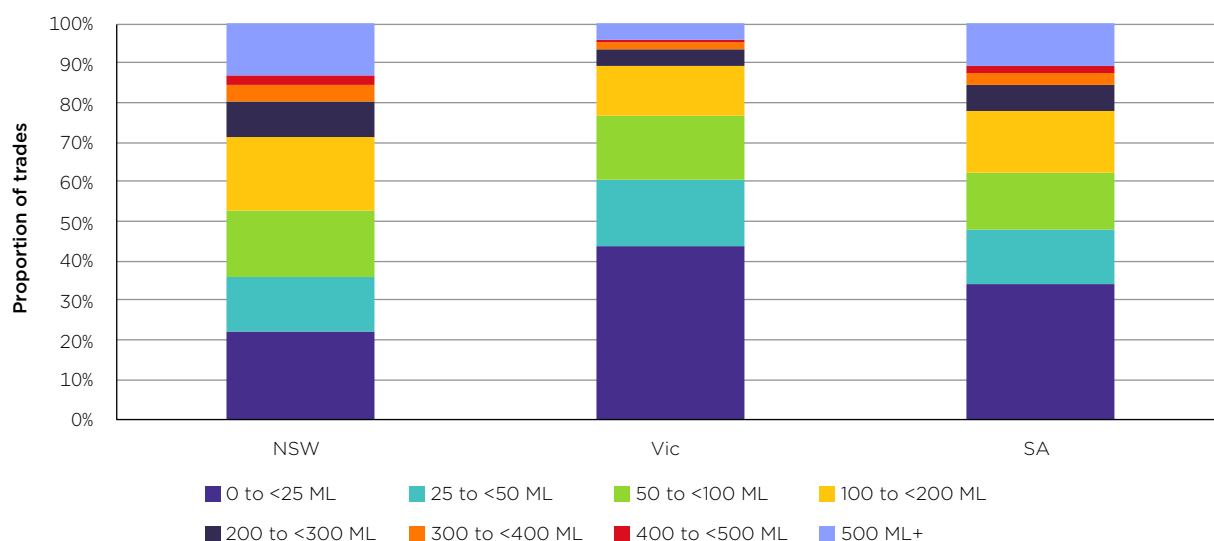
1424 Includes transfers (that is, a trade that does not involve the payment of consideration).

1425 See section 10.4.1.

1426 See appendix C.

1427 Aither 2019, <https://www.aither.com.au/water-markets-report-2018-19/>, viewed 8 May 2020.

Figure D.1: Relative proportions of interstate and intrastate trades volume traded, for buyers in New South Wales, Victoria, and SA from 1 July 2017 to 30 November 2019

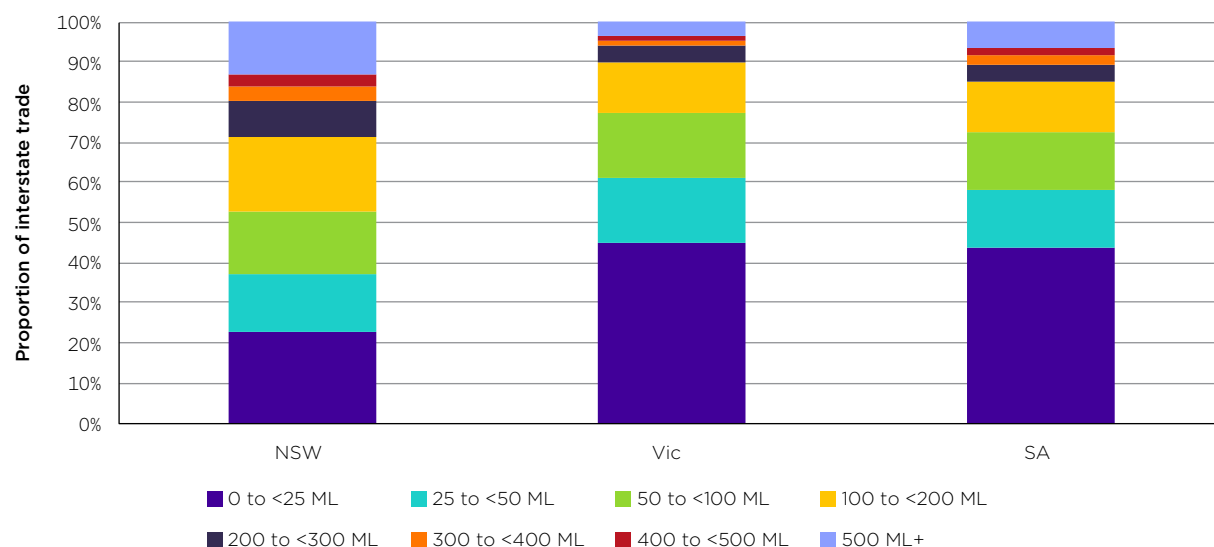


Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Includes zero dollar trades. Data has been updated since the interim report.

While Victoria and South Australia have marked differences in trade approval charges, buyers in these states have similar buying patterns (figure D.2).

Figure D.2: Relative proportions of intrastate trades by volume traded, for buyers in New South Wales, Victoria, and SA from 1 July 2017 to 30 November 2019



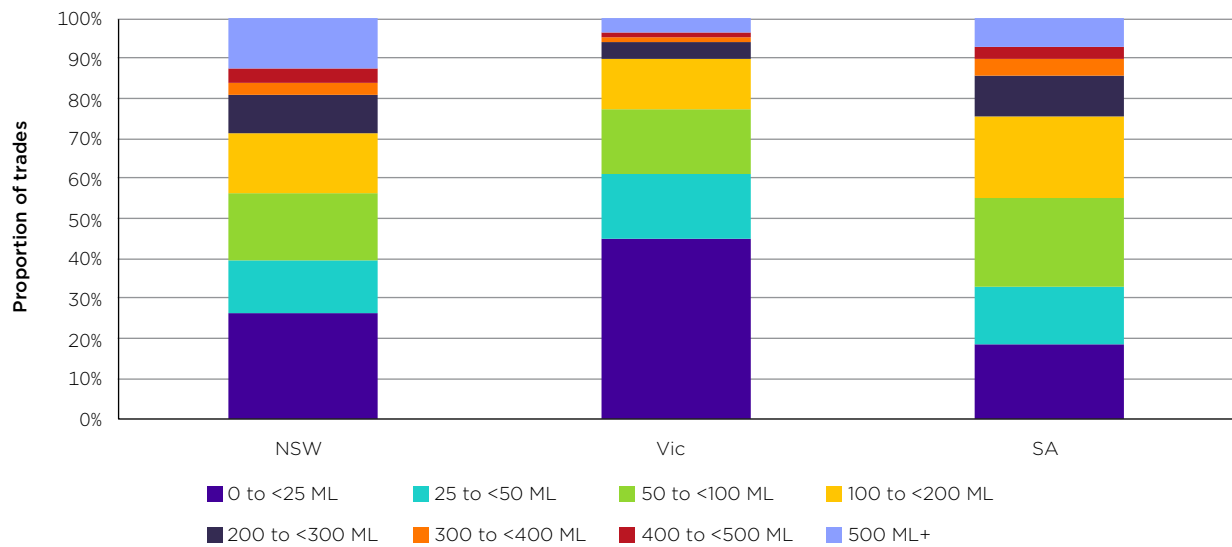
Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Includes zero dollar trades. Data has been updated since the interim report.

From a monetary transaction cost perspective, buyers are generally best off when they only purchase intrastate. Interstate trades are a small proportion of all trades for each of the Basin States in the Southern Connected Basin, particularly in Victoria and New South Wales. Victoria and South Australia had similar volume distributions for intrastate trades and both had more trades of at least 200 ML from interstate than from intrastate, indicating a tendency for interstate trades to be of higher volume than intrastate trades (figure D.3 and figure D.5). New South Wales buyers tended to purchase similar volumes from Victoria as intrastate, but tended to purchase more moderate volumes (50–100 ML) from South Australia (figure D.4). These trends towards higher volume interstate trades may suggest the

higher trade approval fees and increased complexity associated with interstate trade may be limiting interstate trade of low volumes.

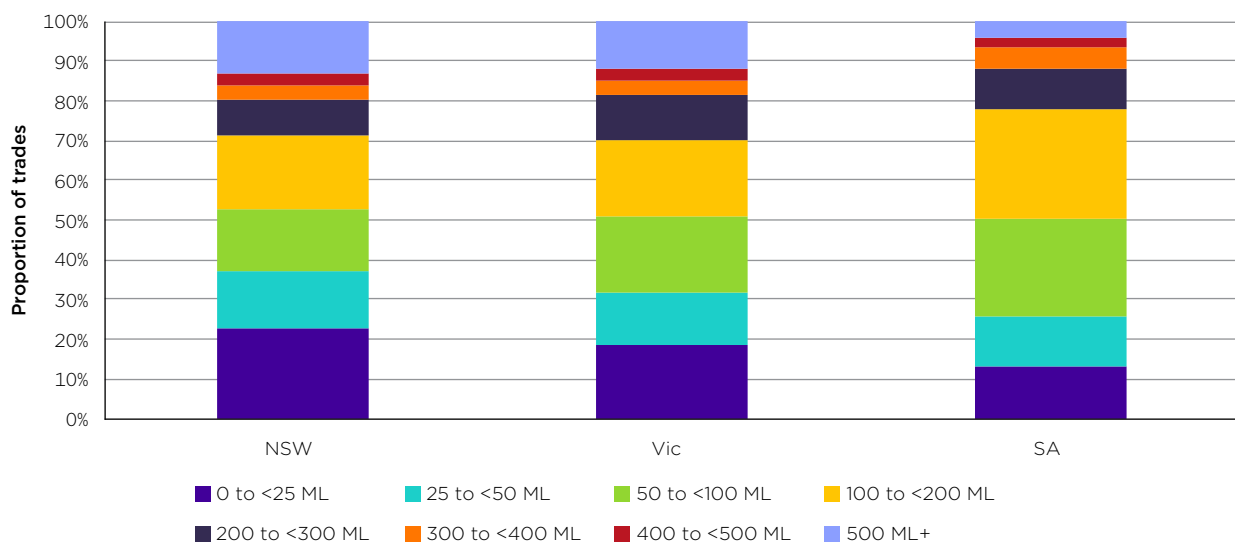
Figure D.3: Relative proportions of trades by volume traded purchased in Victoria, for water sourced from New South Wales, Victoria and SA from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Includes zero dollar trades. Data has been updated since the interim report.

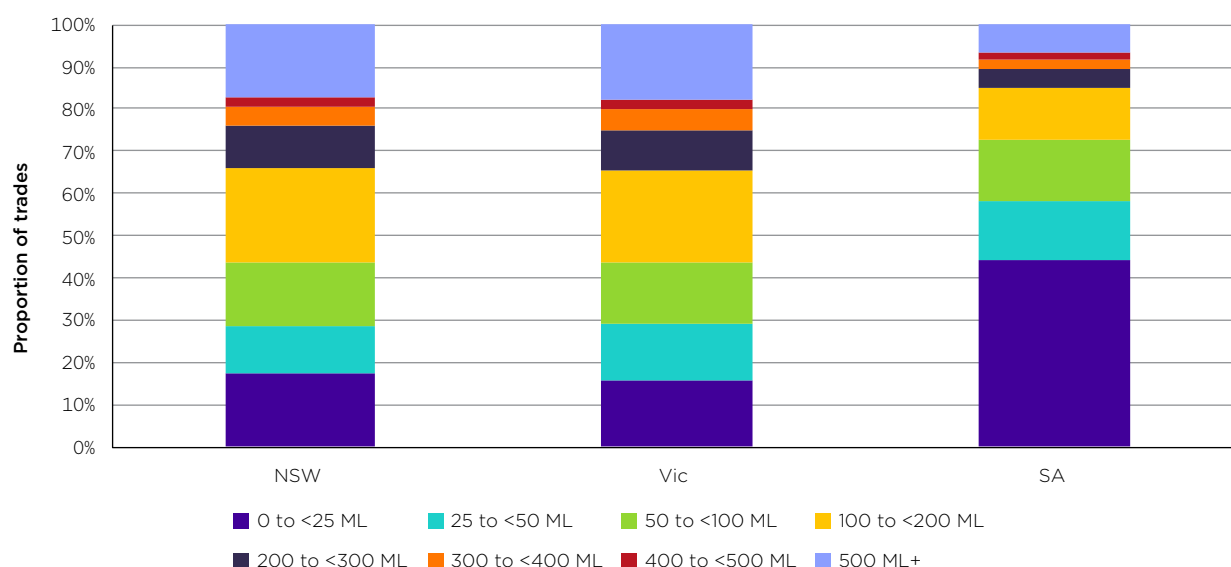
Figure D.4: Relative proportions of trades by volume traded purchased in New South Wales, for water sourced from New South Wales, Victoria and SA from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Includes zero dollar trades. Data has been updated since the interim report.

Figure D.5: Relative proportions of trades by volume traded purchased in SA, for water sourced from New South Wales, Victoria, and SA from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Includes zero dollar trades. Data has been updated since the interim report.

While inconsistent trade approval fees across the Basin States were an issue for a number of stakeholders¹⁴²⁸, they do not seem to be significantly influencing the water volumes being traded within each Basin State. Victoria and South Australia both had a high proportion of small (up to 50 ML) intrastate trades from 1 July 2017 to 30 November 2019 despite the significantly higher trade approval fees in South Australia compared to Victoria. However, intrastate trades in New South Wales and interstate trades across all the Basin States in the Southern Connected Basin have a greater proportion of larger volume interstate trades. It is unclear whether this is due to the complexity of interstate trades (due to intervalley transfer restrictions and/or the need to interact with two trade approval authorities) or difficulties in finding interstate trading partners for low volume trades.

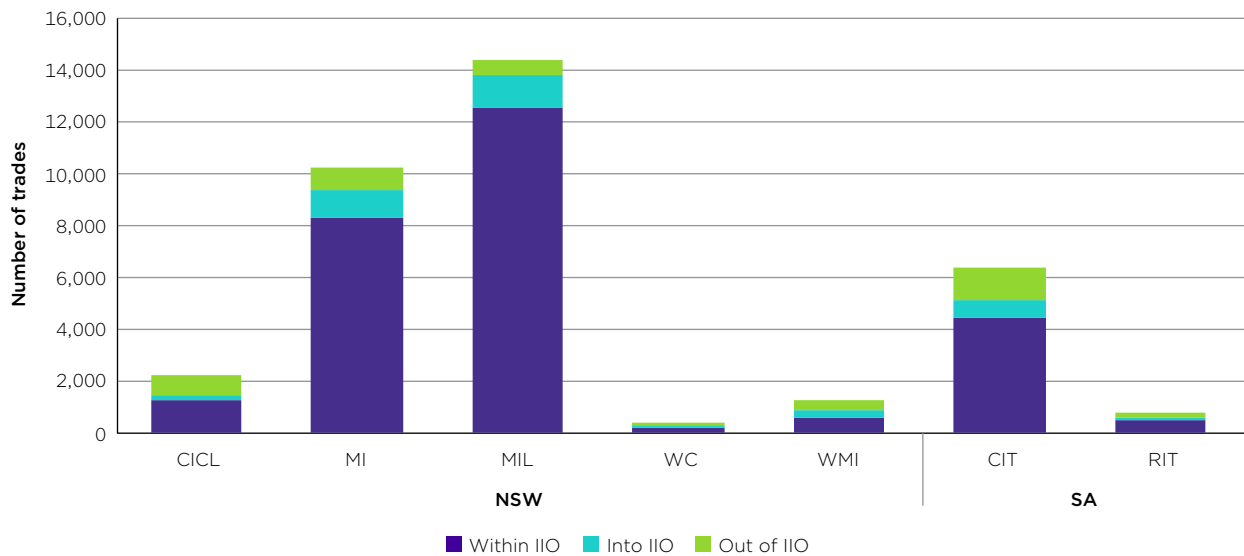
D.1.2 Temporary trades processed by NSW and SA IIOs

Analyses in this section are limited to IIOs that were able to provide data to the ACCC in a structured electronic form. As some of the datasets were very small, this section considers trades from a longer period than in the previous section (1 July 2016 to 30 November 2019).

Figure D.6 shows that while IIOs have significantly different numbers of temporary trades, ranging from under 250 (West Corugan) to over 14,000 (Murray Irrigation Limited), most trades were within each IIO's network (except for Western Murray Irrigation (WMI), where just under 50% of trades were internal). The ACCC considers that WMI's relatively low proportion of internal trades may be due to its small size and that its customers have access to the Murray Irrigation exchange platform.

¹⁴²⁸ H2OX, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 5; Murray Valley Food and Fibre Association, *Submission to the Murray-Darling Basin water inquiry interim report*, 13 November 2020, p. 6; National Irrigators Council, *Submission to the Murray Darling Basin water inquiry interim report*, 13 November 2020, p. 17.

Figure D.6: Number of trades within, into and out of IIO networks for buyers in IIOs from 1 July 2016 to 30 November 2019



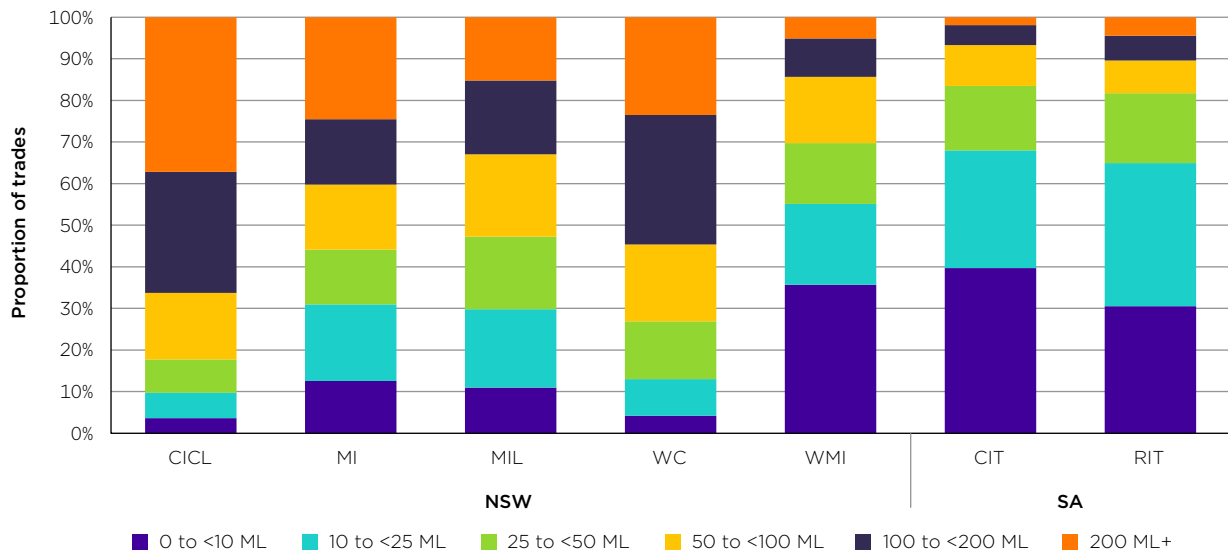
Source: ACCC analysis based on IIOs' responses to voluntary information requests and s. 95ZK responses.

Notes: CICL: Coleambally Irrigation Cooperative Limited; MI: Murrumbidgee Irrigation Limited; MIL: Murray Irrigation Limited; WC: West Corugan; WMI: Western Murray Irrigation Limited; CIT: Central Irrigation Trust; RIT: Renmark Irrigation Trust. Includes zero dollar trades.

The water volumes traded by irrigation right holders also vary across the IIO networks (figure D.7). WMI, Central Irrigation Trust (CIT), and Renmark Irrigation Trust (RIT) are all dominated by small volume trades (those less than 25 ML) while over half of the trades processed by CICL and West Corugan were of at least 100 ML. The volumes traded by customers of Murray Irrigation and Murrumbidgee Irrigation, which are the two largest IIOs and do not charge fees for trades within their networks¹⁴²⁹ (see table C.3 in appendix C), were more evenly distributed where trades up to 25 ML, those between 25 ML and up to 100 ML and those of at least 100 ML each accounted for about a third of trade in each network. While CIT also does not charge for trades within their network, the high proportion of trades less than 25 ML may be better explained by the dominance of horticulture in South Australia where irrigators are likely managing relatively smaller farms.

¹⁴²⁹ Murrumbidgee Irrigation do not charge for the first 5 internal trades each season (see section C.2 in appendix C).

Figure D.7: Relative proportions of all trades within, into and out of IIO networks by volume traded for buyers in IIOs from 1 July 2016 to 30 November 2019

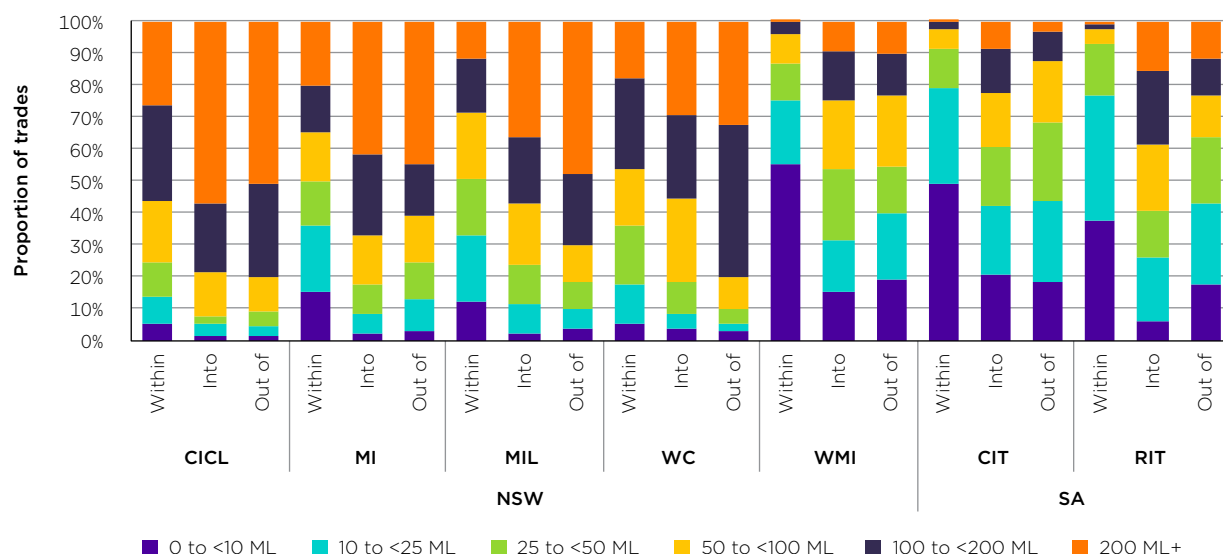


Source: ACCC analysis based on NSW and SA governments' and IIOs' responses to voluntary information requests, and s. 95ZK responses.

Notes: CICL: Coleambally Irrigation Cooperative Limited; MI: Murrumbidgee Irrigation Limited; MIL: Murray Irrigation Limited; WC: West Corugan; WMI: Western Murray Irrigation Limited; CIT: Central Irrigation Trust; RIT: Renmark Irrigation Trust. Includes zero dollar trades. Excludes trades into and out of networks that could not be matched with Basin State registers.

Trades within the IIO networks generally had a higher proportion of smaller volume trades than those traded into and out of the network (figure D.8). This is likely due to the higher transaction costs of trading into and out of IIO networks, where trades must be approved by at least two trade approval authorities (the IIO and the Basin State in which the IIO holds its water access entitlement(s)), incurring trade approval application fees from each authority and requiring more time for these trades to be processed (see section D.3.2). Additionally, most IIOs charge more for trades into and out of the network than for internal trades (see table C.3 in appendix C) and this can further suppress the trade of smaller volumes into and out of IIO networks.

Figure D.8: Relative proportions of trades within, into and out of IIO networks by volume traded for buyers in IIOs from 1 July 2016 to 30 November 2019



Source: ACCC analysis based on NSW and SA governments' and IIOs' responses to voluntary information requests and s. 95ZK responses.

Notes: CACL: Coleambally Irrigation Cooperative Limited; MI: Murrumbidgee Irrigation Limited; MIL: Murray Irrigation Limited; WC: West Corugan; WMI: Western Murray Irrigation Limited; CIT: Central Irrigation Trust; RIT: Renmark Irrigation Trust. Includes zero dollar trades. Excludes trades into and out of networks that could not be matched with Basin State registers.

D.2 Trade processing times

One of the key issues experienced by participants of water markets is a lack of timely information, and many water market participants rely on water registries to provide them with the data they require to make more informed trading decisions (see section 11.3.1).

D.2.1 Basin State TAA's allocation trade processing times

Service standards for allocation trades were first adopted by COAG¹⁴³⁰ in November 2008¹⁴³¹ for commencement on 1 January 2009¹⁴³², with the current service standards in place since 1 July 2009.¹⁴³³ Since 1 July 2009, Basin States are required to meet the following timelines for allocation and entitlement trades:

- at least 90% of intrastate allocation trades processed within 5 business days (10 days for South Australia)
- at least 90% of interstate allocation trades processed within 10 business days (20 days for South Australia)
- at least 90% of entitlement trades processed to the registration stage within 10 business days
- at least 90% of entitlement trades processed to the approval stage within 20 business days.

However, the New South Wales and Victorian trade approval authorities now measure the performance of their interstate allocation trades to South Australia using the 20 business day benchmark rather than 10 business days.¹⁴³⁴

1430 On 29 May 2020, National Cabinet agreed to the formation of the National Federation Reform Council (NFRC) and the cessation of the Council of Australian Governments (COAG).

1431 COAG Communiqué, 29 November 2008.

1432 National Water Commission, *Australian Water Markets Report 2008-2009*, 2009, p. 8.

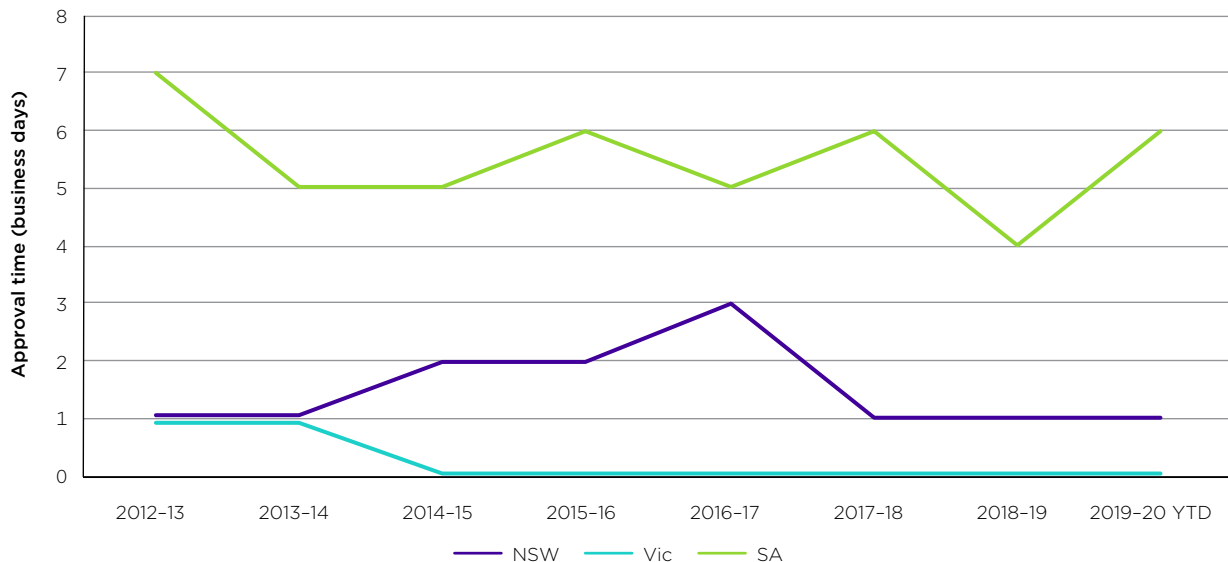
1433 National Water Commission, *Australian Water Markets Report 2009-2010*, 2010, p. 12.

1434 However, the WaterNSW FAQ page refers to the 10 business day benchmark for interstate approvals (see <https://www.watnsw.com.au/customer-service/ordering-trading-and-pricing/trading/faqs-water-trading>, viewed 16 April 2020).

Unlike the other Basin States, Victoria's allocation trade approval applications are assessed by an automated online processing system, which has been able to provide same-day approvals for 90% of intrastate trades since 2016–17 (figure D.9). While New South Wales trade processing is undertaken manually, it has achieved next business day approval times for 90% of its approved intrastate allocation trades in the Southern Connected Basin since 2017–18. South Australia has a paper-based manual process, and has approved 90% of its allocation trades within 4–6 business days since 2013–14.

Sunwater is not required to record trade approval application submission dates but has typically processed its allocation trades within five business days, which meet the COAG service standards.

Figure D.9: Number of business days taken by Basin State trade approval authorities to approve at least 90% of intrastate allocation trades, by state and year



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: This figure shows the 90th percentile for intrastate allocation trade approvals in the Southern Connected Basin, for each state, for each water year. Excludes weekends and public holidays. Same day trade approvals Victoria that occurred on non-business days or the next business day if submitted on a weekend or public holiday have an approval time of zero. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019. Data has been updated since the interim report.

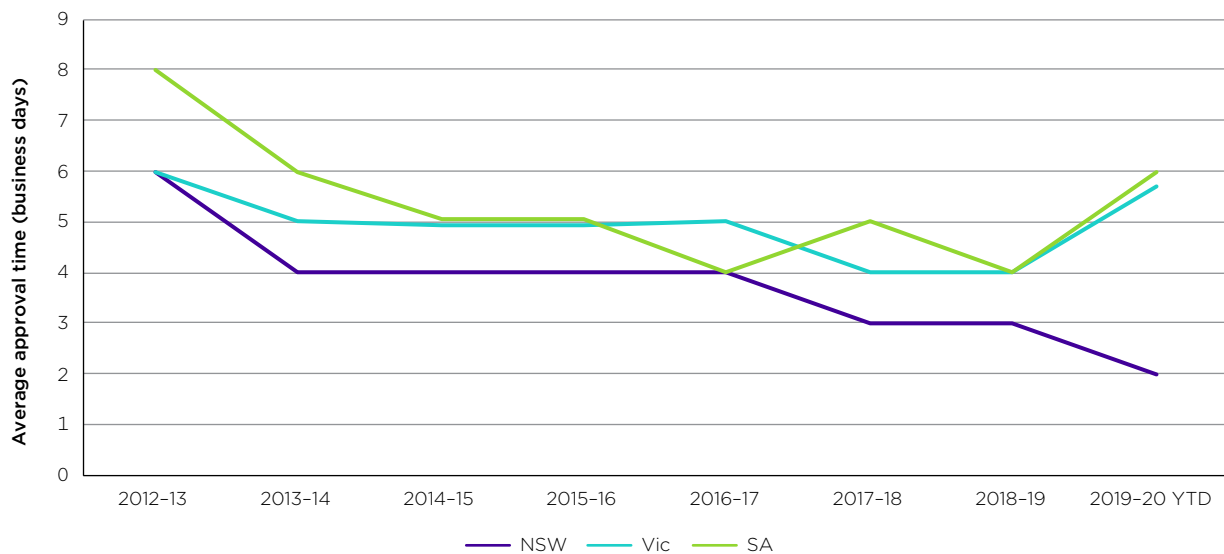
Interstate trading requires coordination between both Basin States' trade approval authorities. The processes are independent but rely on a batched 'interoperability'¹⁴³⁵ system to verify whether a trade can be progressed.¹⁴³⁶ Figure D.10 shows all states have improved their interstate processing times since 2012–13. New South Wales has reduced its approval time, for at least 90% of interstate trades, from 6 business days in 2012–13 to 2 business days for the 2019–20 water year (to 30 November 2019).

While the Victorian automated system can deliver same-day approvals for intrastate trade, if submitted online the system approves the Victorian side of an interstate trade automatically but relies on other Basin States' trading rules to process their side of the trade. Consequently, Victoria's approval times for at least 90% of interstate trades only decreased from 7 business days in 2012–13 to 4 business days in 2018–19. South Australia has also improved its processing time for interstate trades, with approval times decreasing from eight business days in 2012–13 to 4 in 2018–19. While Victoria's and South Australia's approval times for at least 90% of trades at the start of the 2019–20 water year have increased to six business days, this is still well below the 2009 COAG service standard of 10 business days for Victoria and 20 for South Australia.

¹⁴³⁵ This is a term used by the Southern Connected Basin States to describe their file sharing arrangement for supporting interstate trade (see section 10.3.3 in chapter 10).

¹⁴³⁶ Note: New South Wales/Queensland interstate trades still operate on a manual bilateral approval process.

Figure D.10: Number of business days taken by Basin State trade approval authorities to approve at least 90% of interstate allocation trades, by state and year



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: This figure shows the 90th percentile for interstate allocation trade approvals in the Southern Connected Basin, for each state, for each water year. Excludes weekends and public holidays. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019. Data has been updated since the interim report.

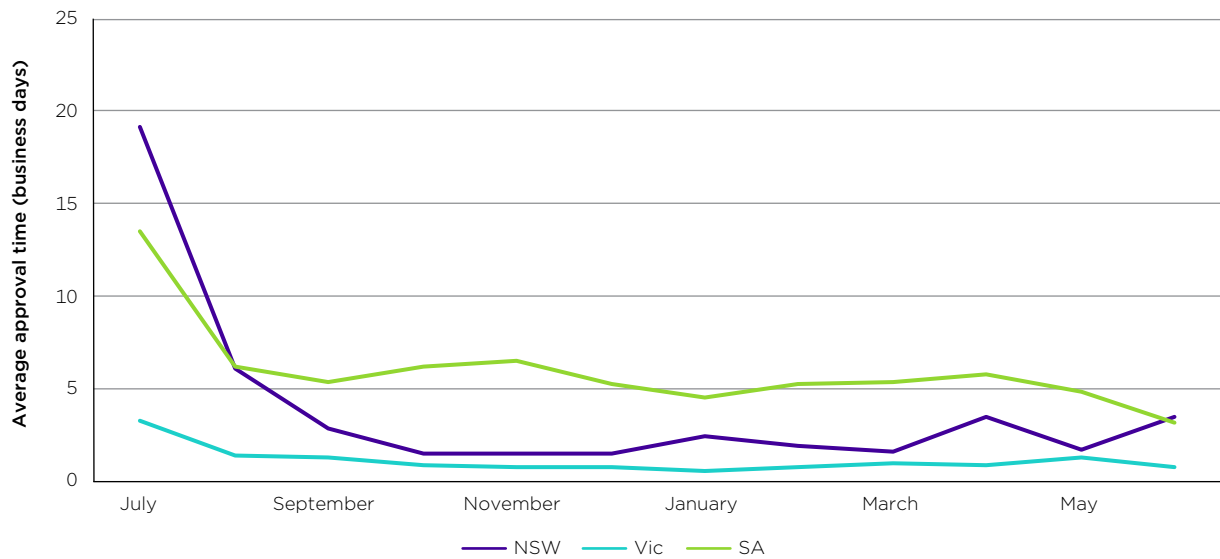
One of the objectives under the National Water Initiative was to develop open and efficient water markets that facilitate trading within and between states to broaden and deepen markets,¹⁴³⁷ with a specific reference to ensuring competitive neutrality in the Southern Murray–Darling Basin.¹⁴³⁸ However, the variable trade processing times shown above could influence trading and investment decisions, and subsequently affect the value of water in certain trading zones. Extended processing times also contribute to delays to information flows, providing a false picture of the 'current' market and increasing transaction costs for traders.

However, on average, the New South Wales and South Australian trade approval authorities struggle to meet the COAG service standards at the start of each water year (figure D.11).

¹⁴³⁷ Council of Australian Governments, *Intergovernmental Agreement on a National Water Initiative*, 2004, paragraphs 23(v) and 58(i).

¹⁴³⁸ *ibid*, paragraph 63(ii).

Figure D.11: Average number of business days taken by Basin State trade approval authorities to approve at least 90% of intrastate and interstate allocation trades by month, 1 July 2012 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: This figure shows the 90th percentile for allocation trade approvals in the Southern Connected Basin, for each state, for each month, averaged over the 2012-13 to 2019-20 (to 30 November 2019) water years. Excludes weekends and public holidays. Includes zero dollar trades. Data has been updated since the interim report.

Further, the extended average approval times are limited to particular trading zones (table D.1). 90% of trades that moved water into trading zone 10 (New South Wales Murray Above Choke) experienced a trade approval time of up to 48.2 days (that is, 10% of trades experience a trade approval time greater than 48.2 days).

Table D.1: Number of business days taken by Basin State trade approval authorities to approve at least 90% of allocation trades, by destination trading zone, from 1 July 2012 to 30 November 2019 by month

Trading Zone	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
NSW												
10 NSW Murray Above Choke	48.2	8	3	2	2	2	2	2	2	2.7	2	2
11 NSW Murray Below Choke	4	2	1	1	1	2	2	2	2	2	2	3
13 Murrumbidgee	2	1	1	1	1	2	2	1	1	1	2	3
14 Lower Darling	2	1.2	1	2	2	2	2	3	2	12.6	6	3
VIC												
1A Greater Goulburn	2	1	2	2	1	1	1	1	1	1	1	1
1B Boort	1	2	3	3	1	2.8	1	1	1.5	1	3	1
2 Broken	10	0	0	15	31.3	0.5	1.6	0	0	0	15	0
3 Lower Goulburn	1.6	12	0	3.4	3.6	1	1	0	2	1	1	1
4A Campaspe – Eppalock to WWC	0.9	1.9	5.2	1	0.4	3.8	1	1	1	1	1	2
4C Lower Campaspe			0	0	1.8	0	0	0	0.8	0	0	0
5A Loddon – CC/Tull to LWP					1		1	0	1.9		1	
6 VIC Murray – Dart to Barmah	3	2	3	3	2	2	1	2	1	1	2	2
6B Lower Broken Creek	0	1	3	2	1	1.1	1	1	1.1	2	2	1
7 VIC Murray – Barmah to SA	4	3	3	3	2	2	2	2	2	1	1	1
SA												
12 SA Murray	12	7	6	6.8	7	6.3	5	7	6	6	5	3
Legend	0 to ≤ 5 business days	[Unshaded]		5 to ≤ 10 business days		10 to ≤ 20 business days			Over 20 business days			

Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: This table shows the 90th percentile for allocation trade approvals in the Southern Connected Basin from 1 July 2012 to 30 November 2019, for each destination trading zone, for each month. Excludes weekends and public holidays. Includes zero dollar trades. Data has been updated since the interim report.

D.2.2 IIOs' temporary trade processing times

IIOs are not required to meet any service standards for temporary trade, but some were able to provide both the date the trade approval application was submitted and the date the trade was approved.¹⁴³⁹ Only 3 IIOs were able to provide records of both dates. A fourth IIO only provided this information regarding water offered for sale on an associated exchange platform (where approval is only required for listing a sell offer).

Figure D.12 shows IIO C completed same-day approvals¹⁴⁴⁰, IIO B approved at least 90% of trades within 2 business days, and that these processes outperformed WaterNSW's allocation trade approval processing for intrastate trades. However IIO A approved most of its trades within 4–7 business days, which was slower than WaterNSW. Not shown are the times recorded by the fourth IIO (IIO D) for at least 90% of its approved trades, which are approved at board meetings. IIO D's times subsequently ranged from 14.5 business days in 2018–19 to 36 days in 2017–18.¹⁴⁴¹

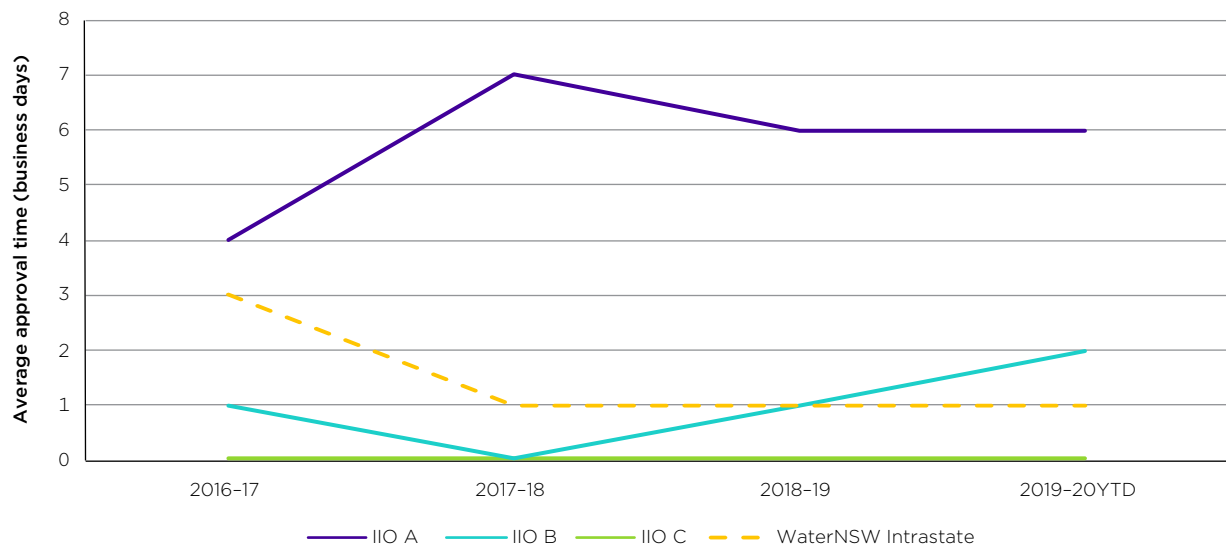
¹⁴³⁹ While table G.4 (in appendix G) shows some IIOs' trading datasets were missing fields, for some IIOs information is also stored in separate systems that could not be integrated with the supplied trading data in time for more complete data to be provided to the inquiry.

¹⁴⁴⁰ This almost occurs instantaneously due to this IIO's interoperable finance, water management and water trading systems (see section 10.3.3).

¹⁴⁴¹ ACCC analysis based on IIO's response to voluntary information request.

This is another example of how water markets participants experience varied transactions costs. Irrigators within IIO networks generally have lower trade approval fees than for water allocation account holders outside of IIOs (except CICL, see table C.3 in appendix C) but the time taken for temporary trades to be approved is highly variable.

Figure D.12: Number of business days taken by IIOs to approve at least 90% of irrigation right trades within IIO networks, by IIO and year



Source: ACCC analysis based on NSW Government's and IIOs' responses to voluntary information requests and s. 95ZK responses.

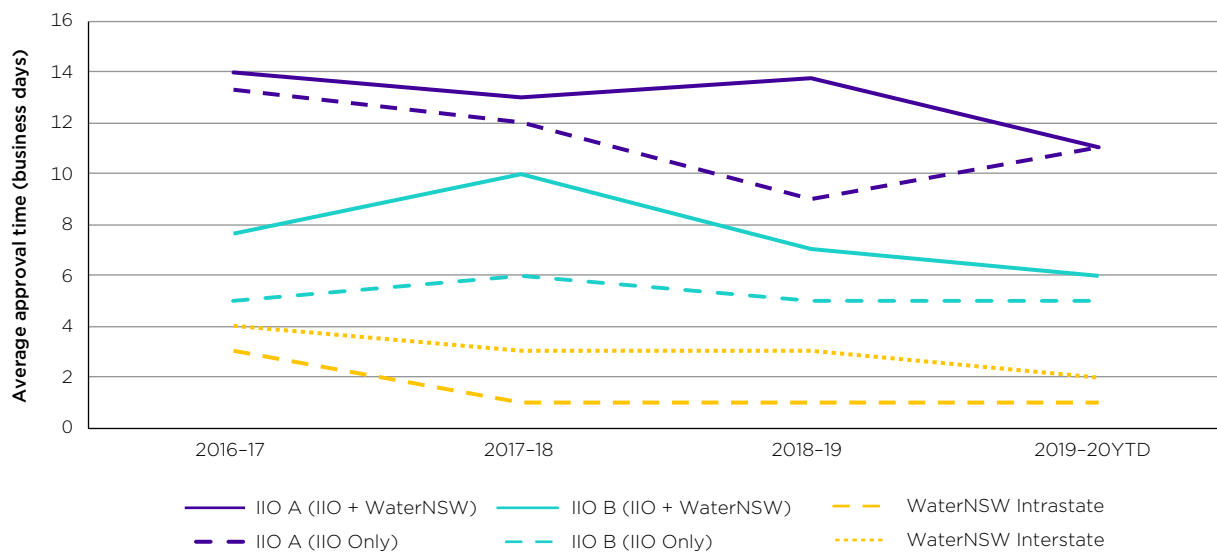
Notes: This figure shows the 90th percentile for irrigation right trade approvals within IIO networks in the Southern Connected Basin, for each IIO, for each water year. Excludes weekends and public holidays. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019. Data has been updated since the interim report.

Trading water into and out of IIOs requires approval from at least two trade approval authorities – the IIO and the Basin State in which the IIO is located. Unlike for interstate trading, the processes cannot be undertaken in parallel and one must precede the other.¹⁴⁴² This means trade into and out of IIOs usually takes longer than for both intrastate and interstate allocation trade, as processed by WaterNSW (figures D.13 and D.14). IIO A and IIO B each took longer to process these trades than trades within their networks. This could be due to the added complexity of trades into and out of networks, where the IIOs must also complete and submit trade forms to WaterNSW.¹⁴⁴³

¹⁴⁴² For example, when trading water into an IIO – the Basin State trade approval authority must first approve the allocation trade onto the IIO's water account, then the IIO must approve the temporary irrigation right trade onto the irrigator's water account. Whereas for interstate trade, a Basin State trade approval authority can 'pre-approve' a trade and then finalise the trade when the outcome of the other Basin State's approval process is known.

¹⁴⁴³ Section D.2.6 also notes exchange platforms take longer to submit trades to the NSW and SA trade approval authorities than electronically to the Victorian one.

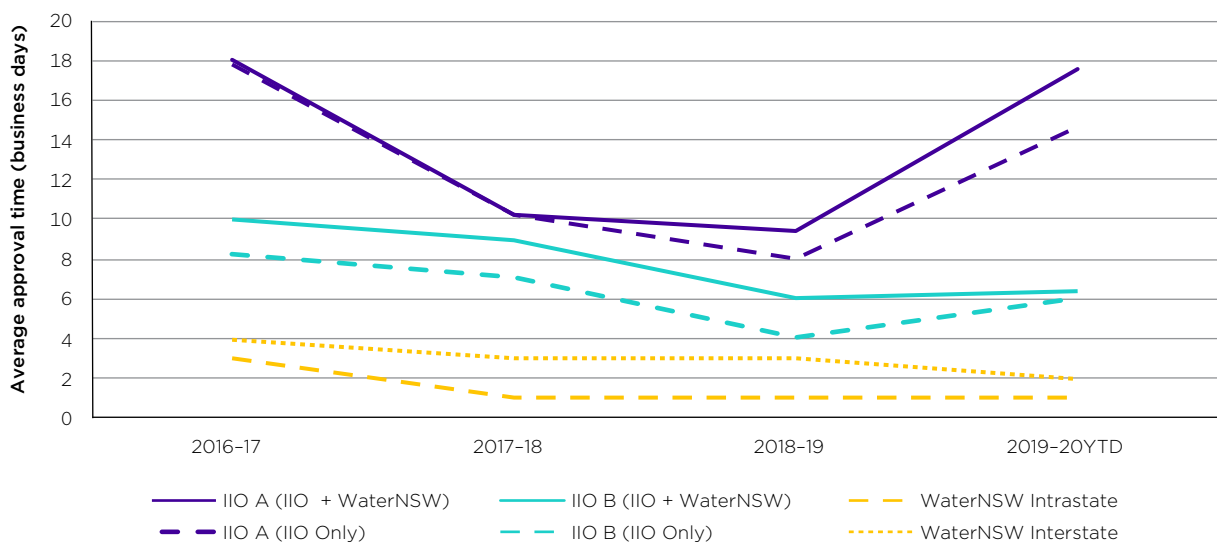
Figure D.13: Number of business days taken by IIOs to approve at least 90% of irrigation right trades into IIO networks, by IIO and year



Source: ACCC analysis based on NSW Government's and IIOs' responses to voluntary information requests and s. 95ZK responses.

Notes: This figure shows the 90th percentile for irrigation right trade approvals into IIO networks in the Southern Connected Basin, for each IIO, for each water year. Excludes weekends and public holidays. Irrigation right trades into IIO networks are processed as allocation trades by the Basin State trade approval authorities. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019. Data has been updated since the interim report.

Figure D.14: Number of business days taken by IIOs to approve at least 90% of irrigation right trades out of IIO networks, by IIO and year



Source: ACCC analysis based on NSW Government's and IIOs' responses to voluntary information requests and s. 95ZK responses.

Notes: This figure shows the 90th percentile for irrigation right trade approvals out of IIO networks in the Southern Connected Basin, for each IIO, for each water year. Excludes weekends and public holidays. Irrigation right trades out of IIO networks are processed as allocation trades by the Basin State trade approval authorities. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019. Data has been updated since the interim report.

D.2.3 Basin State trade approval authorities' entitlement trade processing times

Entitlement trades take longer to process than allocation trades as they are more complex, requiring identity checks and at times involving third party interests such as mortgages and long-term leases.

They also require 2 steps, first to gain approval and then to register the trade, with approval and registration in some Basin States being provided by two separate entities, even for intrastate transfers.

In New South Wales, two entities can be involved in the entitlement trading process – the trade approval authority (WaterNSW) and the registry (New South Wales Land Registry Services). Where entitlement trade only requires a change in ownership of the water access licence (WAL), this can be directly registered with New South Wales Land Registry Services (NSW LRS). However, for entitlement trades where share components are transferred between NSW WALs the trade is first approved by WaterNSW before it is registered with NSW LRS, the entitlement holder (the seller) is responsible for registering the change in ownership with NSW LRS. The impact of this two-step process on IIO transformations in 2018–19 is shown in the next section where transformations from within NSW IIOs take significantly more time to approved than those from SA (see figure D.15).

Water entitlement transfers are also a two-step process in Victoria. The transfer is lodged with the rural water corporation for approval and then a separate form must be submitted to the Water Registrar to complete and register the trade.

In South Australia entitlement trades can be wholly managed by one entity, the Department for Environment and Water. The single entity approach to processing entitlement transfers result in a shorter approval time, as discussed in the next section (D.2.4).

D.2.4 IIOs' transformation application processing times

Transformation allows irrigators with an irrigation right held within an irrigation network in New South Wales and South Australia to permanently transform their irrigation right into a water access entitlement in their own name. Irrigators may wish to do this so they can trade water without any restrictions that may be imposed by their IIO.

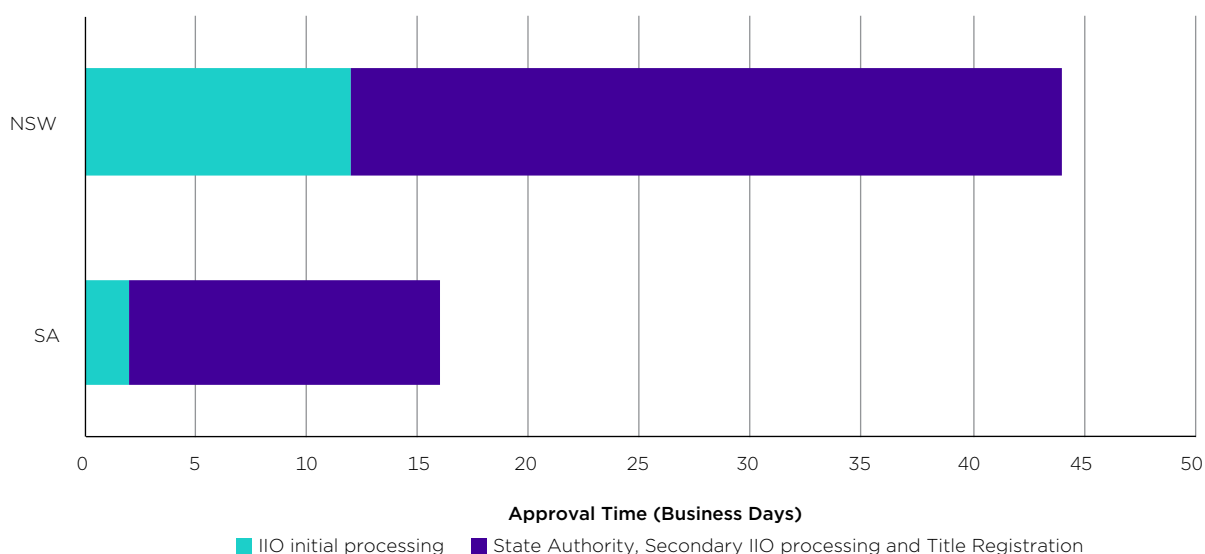
An IIO's revenue is derived from infrastructure charges for the delivery of water to their irrigators, and so has an incentive to restrict water trade out from their network. The *Water Market Rules 2009* prevent IIOs from imposing excessive fees or unreasonably delaying the transformation of irrigation rights. However, the rules give IIOs up to 60 business days to reach agreement with an irrigator on the contractual details of the irrigation right they are considering to transform, and associated water delivery rights. Once agreement has been reached and the irrigator has applied to their IIO for transformation and paid any fees and outstanding charges, the IIO has 20 business days to process the application and an additional 5 business days to notify the irrigator of the outcome.

Following the processing of the transformation application by the IIO, the relevant state authority needs to create the water entitlement. In 2018–19, the median number of days for an IIO in South Australia to complete the initial transformation processing was 2 days, while the median state authority processing time was 14 days. Meanwhile, the median IIO processing time in New South Wales was 12 days, while the second component of processing had a median time of 32 days (figure D.15).

The extended state authority processing time in New South Wales is due to the involvement of two separate government entities and the separate processes for approval and registration. After the initial processing by the IIO, the application is forwarded to WaterNSW. The application is then returned to the IIO who either submits the approved application to the NSW Land Registry Services directly or returns it to the irrigator for lodgement.¹⁴⁴⁴ In South Australia, the Department for Environment and Water is responsible for both trade approval and registration of the transformed water right. Additionally, until recently, entitlement transfers in South Australia were given effect as soon as they were approved by the Minister and there was not a separate step to register the trade (see appendix E).

1444 Hay Private Irrigation District, *Irrigation Transformation and Termination Guideline 2017*, 2017.

Figure D.15: Median days to process transformation applications, by processing stage and state, 2018-19



Source: ACCC analysis based on IIOs' responses to ACCC annual Water Monitoring Report Requests for Information.

Notes: Includes zero dollar trades.

D.2.5 Impact of processing times on transparency

The variable trade processing times experienced by water market participants throughout the water year and in different areas of the Southern Connected Basin suggest there are significant inconsistencies in the water markets. For water users seeking an immediate source of water, this variability can influence trading and investment decisions and decrease the value of difficult to access water sources.

More broadly, extended processing times delay the timely publication of any trading data and increase the transaction costs for market participants as they must undertake additional research to better understand the 'current' state of the water market.

One way to consider the impact of delayed processing on market information is to compare the price of water for trades submitted to a trade approval authority with the price of water for trades approved by the trade approval authority on the same day. This will only be a minimum lag given trade application forms are lodged after the deal has been struck, and data on approved trades are published after the trade has been approved by the trade approval authority.

In the case of trade approval authority lags, the *price dispersion ratio* will equal one for days when the price of water is the same for trades that are lodged and trades that have been approved that day. When trades lodged have a lower price than those approved on the same day, the price dispersion ratio is less than one. When the trades lodged have a higher price than those approved on the same day, the price dispersion ratio is greater than one. The price dispersion ratio is calculated for each trading zone, and will be influenced by intrastate and interstate trading processes.

Figure D.16 shows price dispersion ratios are closest to one for trading zones in Victoria, which is likely a result of the consistent short approval times for intrastate trade. It also means water market participants have better information on Victorian trading zones than for other states, reducing the research costs for those trading Victorian water allocation. Trading zones in New South Wales and South Australia have more variable price dispersion ratios, although this does stabilise for zones in New South Wales from mid-2017. This coincides with New South Wales achieving next business day approval times for at least 90% of its approved allocation trades (figure D.9).

Figure D.16: Monthly averages of the daily price dispersion ratios due to trade approval authority trade processing lags for Southern Connected Basin trading zones from 1 July 2015 to November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: Daily zone price series derived using ABARES GAM methodology.¹⁴⁴⁵ Discontinuities in the NSW data series are due to trade approval closures at the end of the 2015-16 and 2016-17 water years.¹⁴⁴⁶ Excludes zero dollar trades. Data has been updated since the interim report.

D.2.6 Impact of intermediaries on processing times

Private transaction costs incurred by water market participants will vary depending on whether they trade directly with others or use an intermediary, who can help some water market participants find trading partners and navigate complex trade rules associated with intervalley trades and delivery limits. The private transactions costs incurred by a water market participant who uses an intermediary includes the monetary fees charged (see appendix C) and any time lags between when an intermediary strikes a trade and lodges the trade approval application form with the relevant trade approval authority. These lags can be due to a combination of factors, including the intermediary's payment system and policies (such as that a trade approval application form is not lodged until the buyer of the tradeable water right has paid the intermediary for the trade) and the ease of the lodgement process.

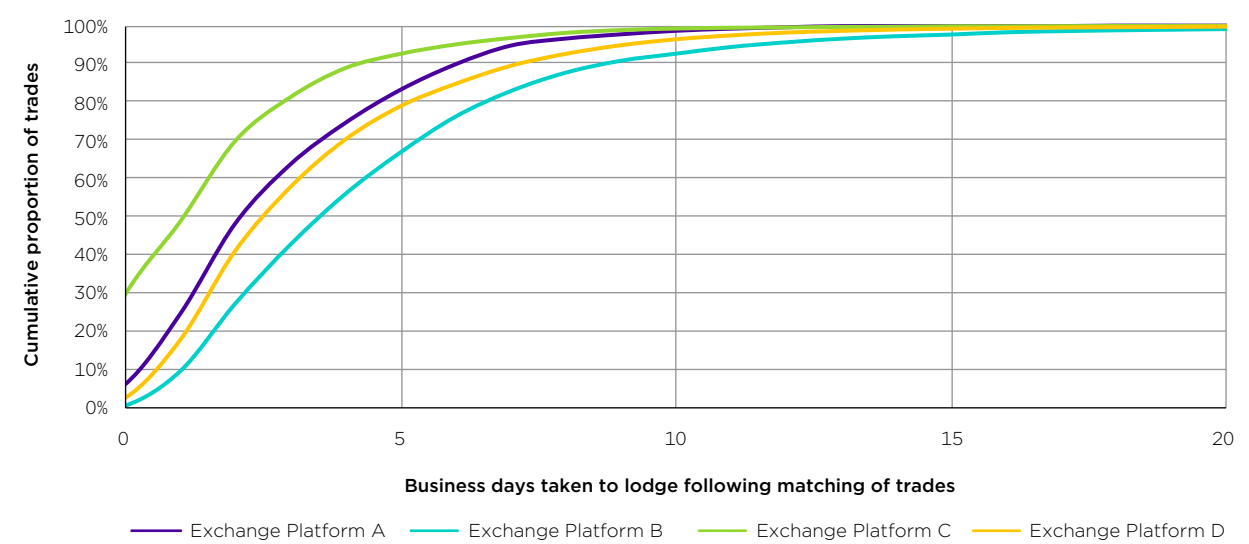
As described in section 6.2, the ACCC used its information gathering powers to obtain data from the exchange platforms operated by WEX Water (trading as Waterexchange), H2OX, Water Partners (trading as Waterpool) and Waterfind. The ACCC also obtained data from the platforms operated by Murray Irrigation Limited (trading as Water Exchange) and WaterMart under voluntary requests and compulsory notices.

1445 ABARES, *Measuring water market prices: statistical methods for interpreting water trade data*, 2019. Available at <https://www.agriculture.gov.au/sites/default/files/abares/documents/research-topics/water/measuring-water-market-prices.pdf>, viewed 26 June 2020.

1446 ABARES recommend the use of a filter when smoothing methods (including GAM) are used, as the methods can produce unreliable results during brief periods of market inactivity in otherwise high frequency markets, such as when trading is temporally suspended by regulators. Source: ABARES, *Measuring water market prices*, 2019. Available at <https://www.agriculture.gov.au/abares/research-topics/water/measuring-water-market-prices#key-findings>, viewed 5 February 2021.

Figure D.17 shows that while most exchange platforms took about 6 to 8 business days (8 to 11 days if weekends and public holidays were included¹⁴⁴⁷) to lodge 90% of their trades since they were matched¹⁴⁴⁸, Exchange Platform C took less than 5 days (5 days including weekends and public holidays¹⁴⁴⁹). Exchange Platform C predominantly matches intrastate trades in Victoria only and is connected to the Victorian Water Register through the Broker Application Programming Interface (API) facility.

Figure D.17: Number of business days taken for exchange platforms to lodge Southern Connected Basin trades with Basin State trade approval authorities from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests and s. 95ZK responses.

Notes: Includes zero dollar trades. Time lags exclude weekends and public holidays (based on the jurisdiction of the Basin State trade approval authority).

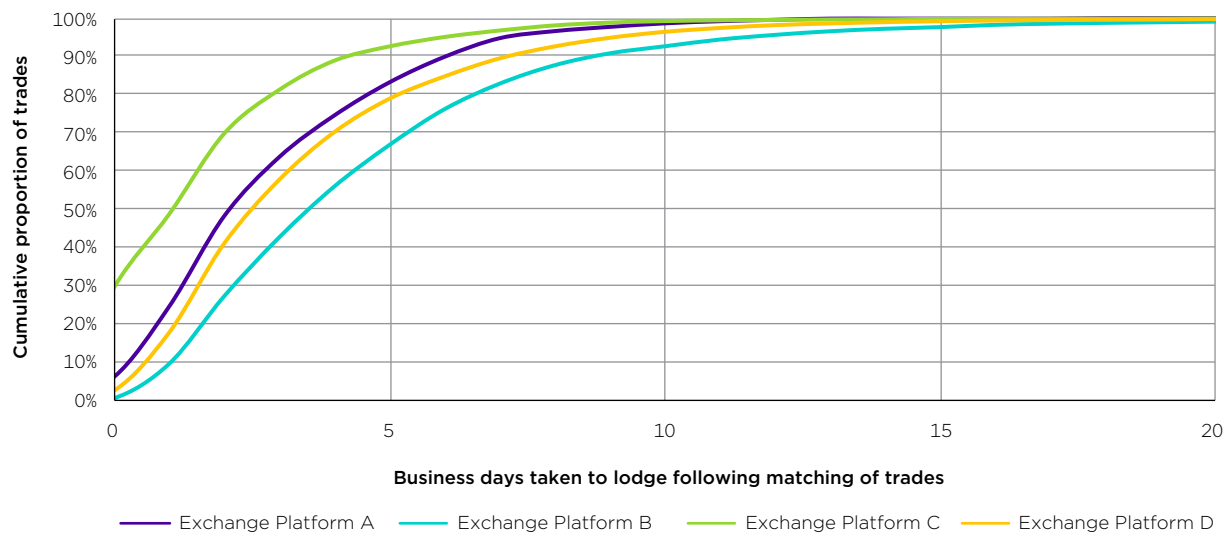
However, Exchange Platform C also outperforms the other exchange platforms when only lodgement times to the Victorian Water Register are considered (figure D.18), although the other exchange platforms only connect to the Victorian Water Register through the Broker Portal lodgement facility rather than the automated Broker API.

1447 ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests and s. 95ZK responses.

1448 The ACCC acknowledges that some trades were for water products such as forwards, carryover or contractual leases. In the case of forwards and contractual leases, the trade applications may not be lodged until closer to the time of delivery as agreed between the buyer and seller, while carryover trades may not be lodged until the end of the water season.

1449 ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests and s. 95ZK responses.

Figure D.18: Number of days taken for exchange platforms to lodge Southern Connected Basin trades with the Victorian Water Register via the Broker API or Broker Portal from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests and s. 95ZK responses.

Notes: Includes zero dollar trades. Time lags exclude weekends and public holidays (based on the jurisdiction of the Basin State trade approval authority).

Figure D.19 shows that exchange platforms took the least time to lodge their trade approval applications through Victoria's electronic lodgement facilities, while the most time was taken lodging applications to the SA trade approval authority.

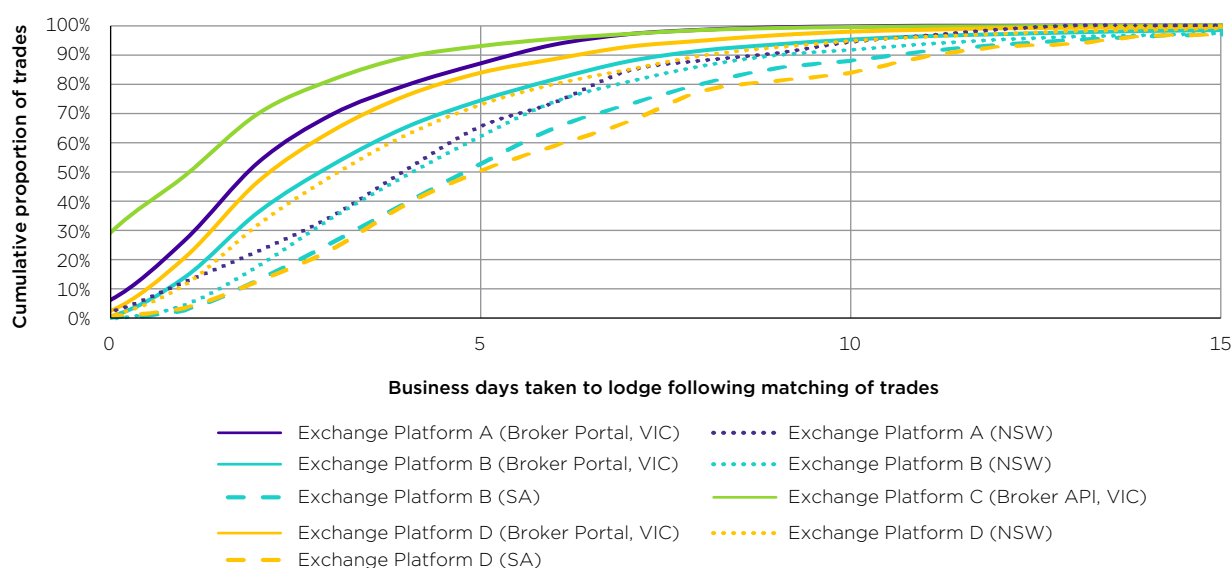
As discussed in section 10.2.4, this could be due to a range of factors, such as:

- ease of using the electronic lodgement facilities
- incentive to use electronic lodgement facilities due to limits on trading opportunities
- absence of IIOs from which approval must also be sought to trade into and out of IIO networks
- requirement to first lodge interstate trades to Victoria when using their electronic lodgement facilities.¹⁴⁵⁰

The ACCC also acknowledges there may be cases where a buyer fails to pay for a trade or provide sufficient information in a timely manner, and that an intermediary will not lodge the trade application form to the relevant trade approval authority until payment or additional information is received, which will increase lag times.

¹⁴⁵⁰ Department of Environment, Land, Water and Planning (Victoria) 2021, <https://waterregister.vic.gov.au/water-trading/my-water/broker-instructions>, viewed 2 February 2021.

Figure D.19: Number of business days taken for exchange platforms to lodge Southern Connected Basin trades with Basin State trade approval authorities from 1 July 2017 to 30 November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests and s. 95ZK responses.

Notes: Includes zero dollar trades. Time lags exclude weekends and public holidays (based on the jurisdiction of the Basin State trade approval authority).

D.2.7 Impact of lodgement lags on transparency

The time taken for intermediaries to lodge trades to approval authorities not only affects the water market participants who are directly involved in the trade, but also contributes to delays associated with the timely publication of trading data.

Figure D.20 compares the price dispersion ratio due the combined effects of lodgement and processing lags¹⁴⁵¹ to ratio the effect of processing lags alone¹⁴⁵², and shows that lodgement lags have a significant impact on price dispersion ratios. Victorian trades have the least variable price dispersion ratios due to shorter lodgement times (figure D.19) and shorter processing times (figures D.9) than the other states, while South Australian trades have the most variable due to the longer lodgement times and longer processing times.

In order to fill this information gap, some intermediaries publish information on trades that have not yet been approved by trade approval authorities.¹⁴⁵³ While this is an imperfect approach to providing more timely data to the market, the majority of trades lodged to trade approval authorities are approved.¹⁴⁵⁴ The price dispersion ratios suggest water markets participants who plan to trade South Australian water rights would have a greater dependence on these information sources to form price expectations.

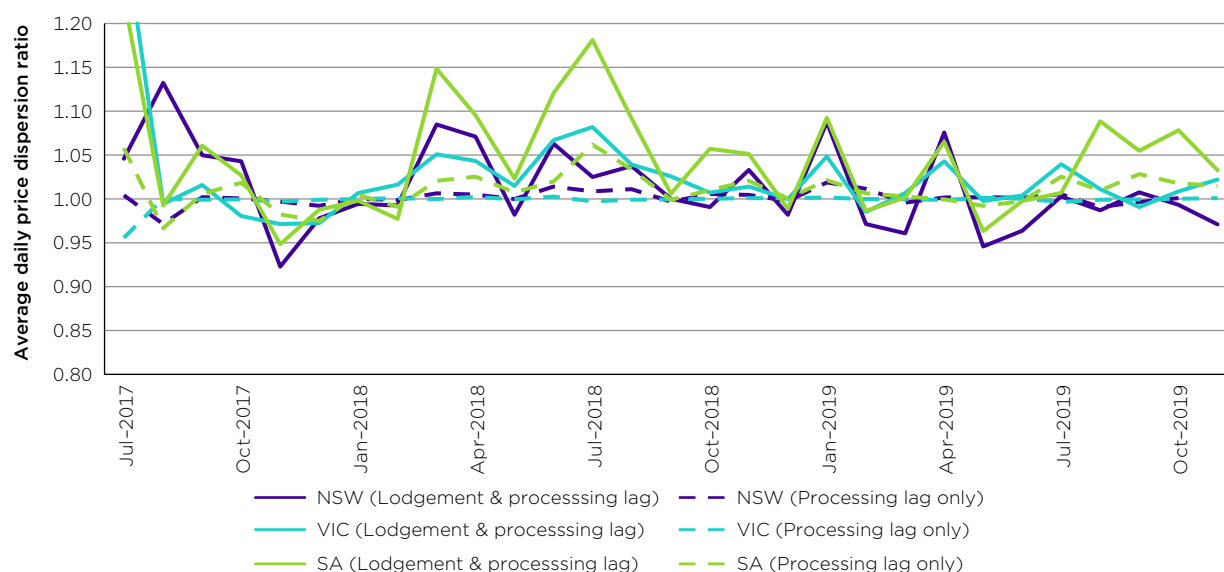
¹⁴⁵¹ In this case, the price dispersion ratio equals one for days when the price of water is the same for trades that are matched and trades that have been *approved* that day. When matched trades have a lower price than those approved on the same day, the price dispersion ratio is less than one. When matched trades have a higher price than those approved on the same day, the price dispersion ratio is greater than one.

¹⁴⁵² Price dispersion ratios due to trade approval authorities' trade processing lags are discussed in section D.2.5.

¹⁴⁵³ For example, Waterexchange publishes trades that have been matched but are not yet approved, clearly labelling them as "pending".

¹⁴⁵⁴ ACCC analysis based on Victorian government response to voluntary information request.

Figure D.20: Monthly averages of daily price dispersion ratios due to lodgement and processing lags for Southern Connected Basin trading zones from 1 July 2017 to November 2019



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests and s. 95ZK responses.

Notes: Price dispersion ratios that consider lodgement and processing lags compare the prices of trades matched each day to the prices of trades approved by Basin State trade approval authorities in the same trading zone on the same day. Price dispersion ratios that only consider processing lags compare the prices of trades lodged each day to the prices of trade approved in the same trading zone and on the same day. Daily zone price series derived using ABARES GAM methodology.¹⁴⁵⁵ Excludes zero dollar trades. Data has been updated since the interim report.

D.3 Basin States' technological differences give some water rights holders a competitive advantage

D.3.1 Barmah Choke trade limit

The Barmah Choke trade limit¹⁴⁵⁶ applies to trade downstream regardless of whether trade occurs through NSW trading zones, Victorian trading zones or an interstate trade. In all cases, the Basin State trade approval authority must seek advice from the MDBA, which is responsible for keeping track of the balance of trade.¹⁴⁵⁷

The NSW trade approval authority seeks this advice through an online portal, where trade details must be manually input. The process of manually providing trade details to the online portal introduces a lag to the NSW trade approval process. While the trade details were already manually input to the NSW trade approvals systems from the trade form, there is no interoperability between the NSW trade approvals system and the MDBA's online portal.

However, the Victorian trade approval authority co-developed an API with the MDBA that was implemented in mid-2018 to automate the MDBA advisory process.¹⁴⁵⁸ Once the trade application has been lodged, the Victorian Water Register's automated trade approvals process can assess the trade, seek and receive the advice from the MDBA, and approve (or refuse) a trade almost instantaneously. This allows water rights holders who use Victoria's electronic lodgement facilities (Broker Portal, Broker

¹⁴⁵⁵ ABARES, *Measuring water market prices: statistical methods for interpreting water trade data*, 2019. Available at <https://www.agriculture.gov.au/sites/default/files/abares/documents/research-topics/water/measuring-water-market-prices.pdf>, viewed 26 June 2020.

¹⁴⁵⁶ See section 3.2 in chapter 3 for an overview of the major trade restrictions in the Southern Connected Basin.

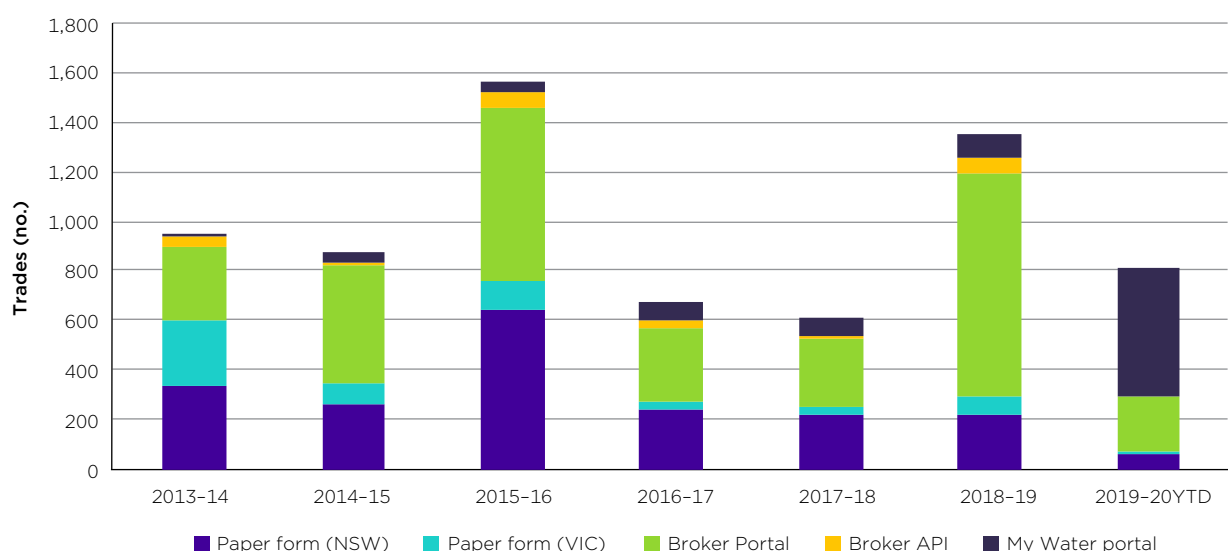
¹⁴⁵⁷ Murray-Darling Basin Agreement (Schedule D — Permissible Transfers between Trading Zones) Protocol 2010 (Cth), ss. 8, 10.

¹⁴⁵⁸ Datacom, 2018, Serverless water trading – Murray Darling Basin Authority Barmah Choke API, <https://www.datacomgroup.net/Case-Studies/Software/Murray-Darling-Basin-Authority-Barmah-Choke-API.aspx>, viewed 8 December 2020.

API and My Water portal) to access trading opportunities through the Barmah Choke without being hampered by manual interactions.¹⁴⁵⁹

While trades lodged through WaterNSW represented about one-third of approvals per water year from 2012–13 to 2017–18, since 2018–19 Victorian water rights holders had a significantly greater number of approved trades through the Barmah Choke than NSW water rights holders (figure D.21). This was predominantly achieved through the Broker Portal in 2018–19 and the My Water portal in 2019–20 (to 30 November 2019).

Figure D.21: Number of approved allocation trades from above to below the Barmah Choke, by lodgement pathway and year



Source: ACCC analysis based on NSW and Victorian governments' responses to voluntary information requests.

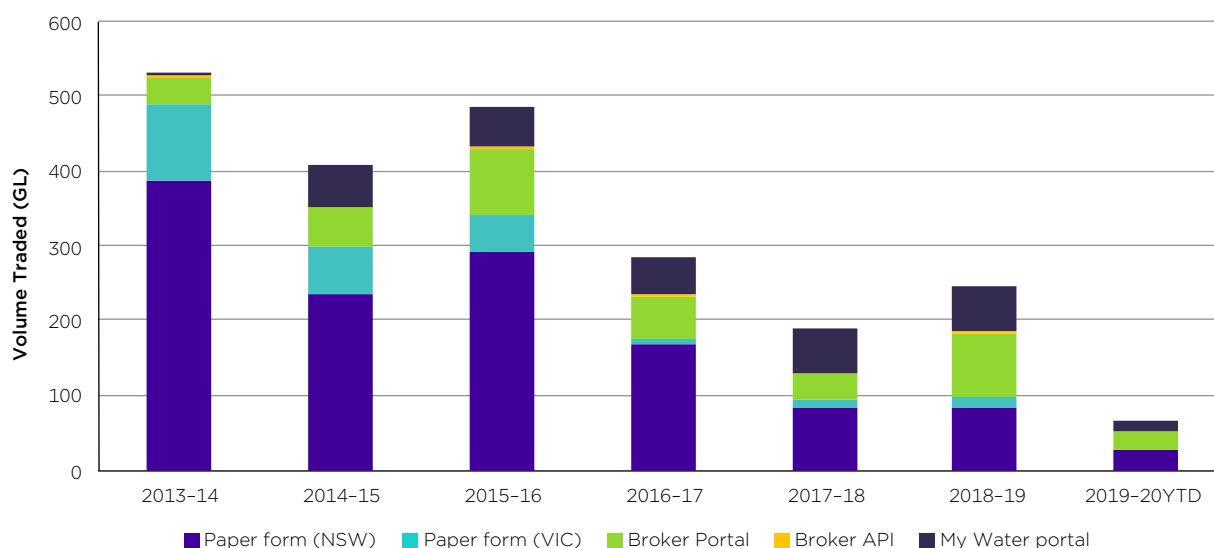
Notes: In NSW, paper forms can be submitted by email, fax, mail or in person. In Victoria, paper forms can be submitted by fax, email, upload or in person. The Broker Portal, Broker API and My Water portal are Victorian lodgement options. The Barmah Choke trade limit has been operating in its current form since 28 October 2014. Prior to this date, there were fewer restrictions on trade across the Barmah Choke. Includes zero dollar trades. Excludes 3 trades completed in 2013–14 through Victoria's preliminary broker portal. 2019–20YTD = 2019–20 year to 30 November 2019.

From 2012–13 to 2017–18 the volume traded downstream through the Barmah Choke was mostly sourced from NSW water rights holders, but this changed in 2018–19 and 2019–20YTD¹⁴⁶⁰, where Victorian water rights holders were the predominant supplier of the water traded by volume (figure D.22). Figures D.21 and D.22 also indicate the implementation of the Victoria-MDBA API has changed the nature of trade through the Barmah Choke from a small number of large-volume trades to a large number of small-volume trades.

¹⁴⁵⁹ Trades lodged through Victorian Water Corporations (GMW, LMW) need to be manually entered into the Victorian Water Register system by GMW and LMW staff.

¹⁴⁶⁰ 2019–20YTD = 2019–20 year to 30 November 2019.

Figure D.22: Allocation volumes of approved trades from above to below the Barmah Choke, by lodgement pathway and year



Source: ACCC analysis based on NSW and Victorian governments' responses to voluntary information requests.

Notes: In NSW, paper forms can be submitted by email, fax, mail or in person. In Victoria, paper forms can be submitted by fax, email, upload or in person. The Broker Portal, Broker API and My Water portal are Victorian lodgement options. Trade through the Barmah Choke was not restricted during 2013-14 and until 28 October 2014. Includes zero dollar trades. Excludes 3 trades completed in 2013-14 through Victoria's preliminary broker portal. 2019-20YTD = 2019-20 year to 30 November 2019.

D.3.2 Interzone and interstate trading for Victorian water rights holders

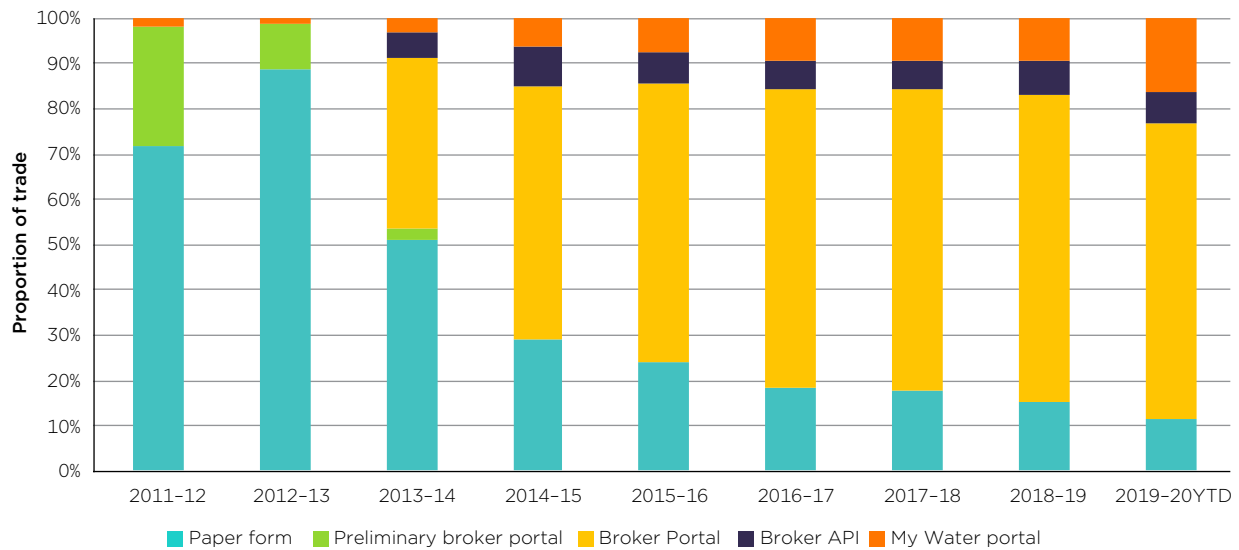
Victorian water rights holders are able to lodge trades through three lodgement pathways:

- through an intermediary that uses the Broker Portal or Broker API to connect to the Victorian Water Register¹⁴⁶¹
- the My Water portal (which can also be used by a water rights holder's nominated broker)
- by completing a trade form and sending this to a Victorian water corporation by fax, email, upload facility or in-person.

Figure D.23 shows that since the Victorian Water Register upgrade in December 2013 and the introduction of lower approval fees for trades submitted online, the use of the paper forms has declined significantly. The majority of trades are now lodged through the Broker Portal, and there has been a slow take up of the My Water portal which only submitted a greater proportion of approved trades than the paper form pathway in the 2019-20 water year (to 30 November 2019).

¹⁴⁶¹ Prior to the upgrade of the Victorian Water Register (VWR) in December 2013, there was a preliminary broker portal. This preliminary portal was replaced with the modern Broker Portal.

Figure D.23: Approved allocation trade in Victoria, by lodgement pathway and year



Source: ACCC analysis based on Victorian Government response to voluntary information request.

Notes: Paper forms can be submitted by fax, email, upload or in person. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019.

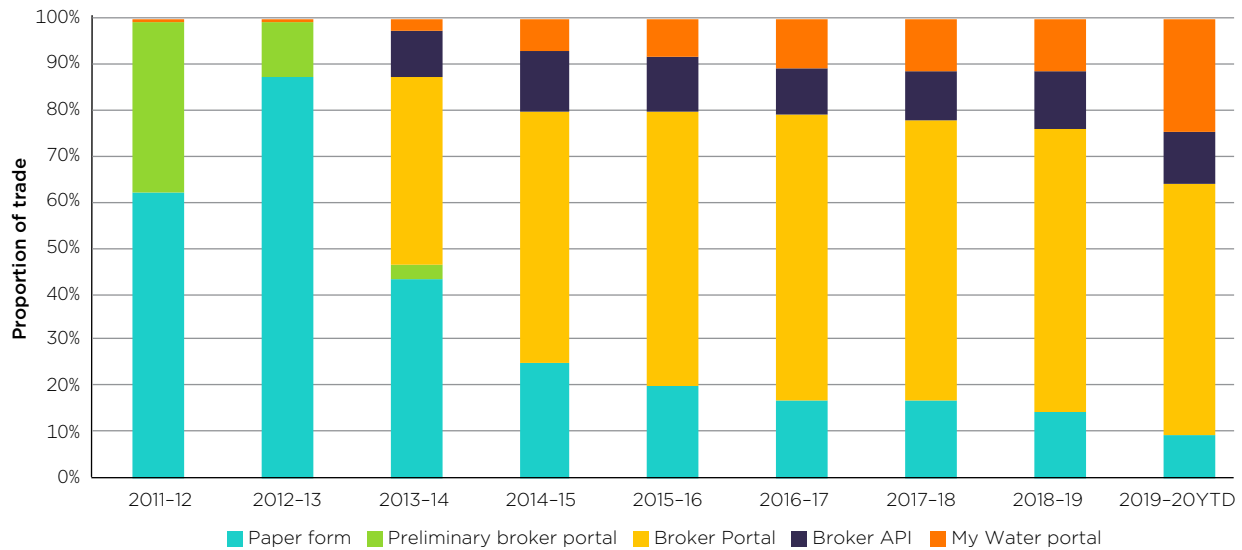
The increase in the use of the My Water portal during 2019-20 (to 30 November 2019) is due to its use in interzone trade within Victoria (figure D.24). The use of the My Water portal for this interzone trade was driven by only a few water market participants: 3 individuals accounted for over 50% of interzone trades lodged through My Water during 2019-20YTD compared to over 30 during 2018-19.¹⁴⁶²

For Victorian water rights holders who do not wish to use a broker, the My Water portal allows for near-real time allocation trade approvals, a feature that is not available when lodging a paper form. When trade approval authorities process trades through IVTs using a 'first come, first served' queuing system¹⁴⁶³, water market participants are incentivised to use electronic lodgement facilities such as the Broker Portal and My Water portal that enable market participants to quickly lodge trades and compete to be 'at the head of the queue' for trade opportunities (see sections D.3.1 and 5.6 in chapter 5).

¹⁴⁶² ACCC analysis based on Victorian Government's response to voluntary information request.

¹⁴⁶³ See section 14.1.6 in chapter 14.

Figure D.24: Approved interzone allocation trade within Victoria, by lodgement pathway and year

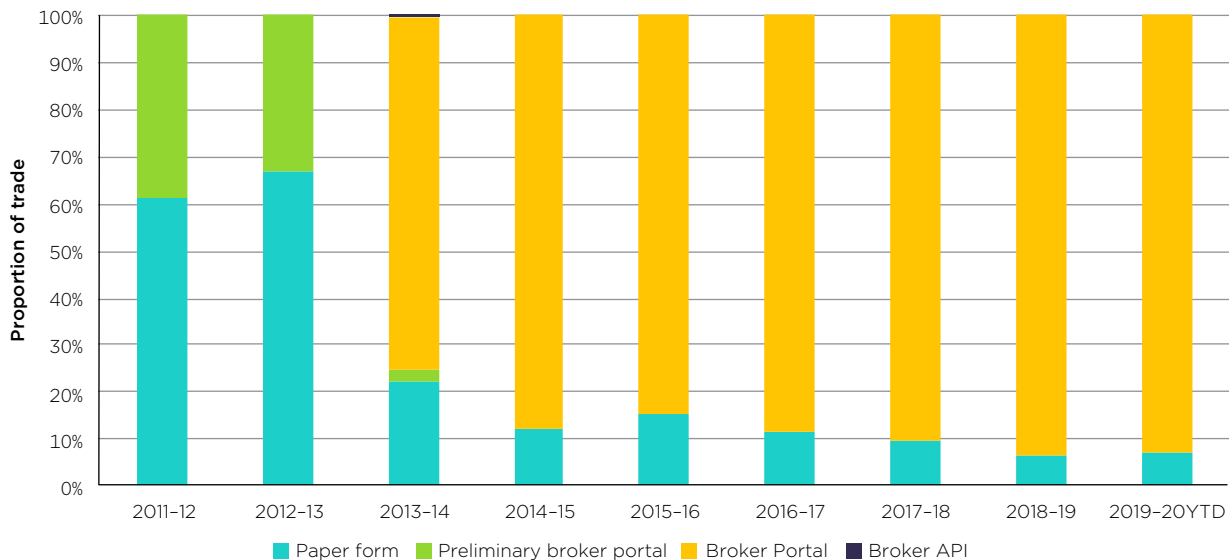


Source: ACCC analysis based on Victorian Government's response to voluntary information request.

Notes: Paper forms can be submitted by fax, email, upload or in person. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019.

In the case of interstate allocation trade however, Victorian water rights holders are limited to lodging the trade in paper form or engaging a broker who can submit interstate trades through the Broker Portal or API.¹⁴⁶⁴ Interstate trade is not possible through the My Water portal. Since 2014-15, over 85% of interstate trade has been lodged through the Broker Portal (figure D.25).

Figure D.25: Approved interstate allocation trade by Victorian water rights holders, by lodgement pathway and year



Source: ACCC analysis based on Victorian Government response to voluntary information request.

Notes: Paper forms can be submitted by fax, email, upload or in person. Includes zero dollar trades. 2019-20YTD = 2019-20 year to 30 November 2019.

¹⁴⁶⁴ Brokers can only use the Broker Portal/API through an agreement with the Victorian Department of Environment, Land, Water and Planning.

The Victorian Water Register lodgement facilities require Victorian water rights holders who wish to engage in interstate allocation trade to either pay a higher fee to lodge the paper form with their local water corporation¹⁴⁶⁵ or pay for a broker to lodge the form electronically. Victorian water rights holders who wish to trade through IVTs that have limited opening windows may find they must engage a broker, and pay additional transaction costs to electronically lodge the trade when there is a trading opportunity.

¹⁴⁶⁵ For the 2020–21 water year, the fee for lodging a ‘paper’ trade application form by fax, email, upload or in person is \$89.50 while the fee is only \$47.50 if it is lodged online.

Appendix E – Basin State entitlement, allocation, trade approval and registration frameworks

Water rights have been partially ‘unbundled’ into the right to hold or take water (separate to land), the right to use water on land, the right to construct or operate water-related infrastructure and the right to have water delivered by an infrastructure operator.¹⁴⁶⁶ These unbundled rights are what is traded in water markets, with the majority of trade being trade in water access entitlements and water allocations.

The details below highlight that there continue to be fundamental differences in the terminology and structure of water rights across the Basin. The consequence of these differences is that slightly different rights are afforded to individuals and the resulting trading processes also differ (see chapter 12 for recommendations to address this).

The differences in the trade processes and state registers discussed in chapter 10 have also given rise to different information being made available to the public from these registers. In order to fulfil the National Water Initiative (NWI) ‘publicly accessible’ register objective, each Basin State’s Act includes a provision on how the register should be made available. Chapter 11 explores how the current legislative provisions in relation to making registers publicly available are not meeting users’ information needs.

E.1 Overarching governance framework

E.1.1 The National Water Initiative envisaged a national water market, and the Water Act was the next stage of reform

The states agreed under the NWI to establish compatible institutional and regulatory arrangements to facilitate intrastate and interstate trade.¹⁴⁶⁷

Under the NWI, the Australian, state and territory governments also agreed to cost recover the administration and water resources management of the Basin, including the water accounting systems that facilitate water trading.

Schedule 3 of the *Water Act 2007* (Cth) sets out the Basin water market and trading objectives and principles, which include that ‘[r]egisters be compatible, publicly accessible and reliable’ and that there are ‘good information flows in the market’. The Basin Plan water trading rules are required to contribute towards the achievement of these objectives and principles set out in the Act.¹⁴⁶⁸

The *Water Act 2007* (Cth) specifies the following objectives and principles for water market and trading arrangements for the Murray–Darling Basin, which are drawn from NWI commitments.¹⁴⁶⁹ The objectives are:

- (a) to facilitate the operation of efficient water markets and the opportunities for trading, within and between Basin States, where water resources are physically shared or hydrologic connections and water supply considerations will permit water trading
- (b) to minimise transaction cost on water trades, including through good information flows in the market and compatible entitlement, registry, regulatory and other arrangements across jurisdictions

¹⁴⁶⁶ Some aspects of rights remain bundled, for example, in most catchments, rights to storage and to on-river delivery remain bundled with water access entitlements and/or water allocations.

¹⁴⁶⁷ Productivity Commission, *National Water Reform*, Report no 87, 2017, p. 116.

¹⁴⁶⁸ *Water Act 2007* (Cth), s. 22.

¹⁴⁶⁹ *Water Act 2007* (Cth), Schedule 3, s. 3.

- (c) to enable the appropriate mix of water products to develop based on water access entitlements which can be traded either in whole or in part, and either temporarily or permanently, or through lease arrangements or other trading options that may evolve over time
- (d) to recognise and protect the needs of the environment, and
- (e) to provide appropriate protection of third-party interest.

Relevant principles include:

- (3) All trades should be recorded on a water register. Registers will be compatible, publicly accessible and reliable, recording information on a whole of catchment basis, consistent with the National Water Initiative.
- (15) Institutional, legislative and administrative arrangements will be introduced to improve the efficiency and scope of water trade and to remove barriers that may affect potential trade.

As these excerpts show, compatibility between registers is a fundamental goal of the NWI and the Act, and is linked to the quality of information flows.

The ACCC has observed that significant efforts have been made by governments in cooperation with other stakeholders to pursue these objectives and develop an effective and efficient market system.¹⁴⁷⁰

While there are some clear differences in both the structural set up of trade approval authorities and registers, as well as information collection and publication across jurisdictions, the Basin States have agreed to certain levels of transparency and processing standards in relation to water trading in the course of water reform processes over the last 15 years.¹⁴⁷¹

E.1.2 Schedule D protocols – Murray–Darling Basin Agreement (Schedule D – Permissible Transfers between Trading Zones) Protocol 2010

Interstate entitlement trading and allocation trading in the Southern Connected Basin is also governed by Schedule D of the Murray–Darling Basin Agreement and the Permissible Transfers protocol made under it.

Schedule D of the Murray–Darling Basin Agreement requires the states to notify the Murray–Darling Basin Authority (MDBA) of any intervalley trade. The MDBA is also required to provide Ministerial Council a report each year on the operation of Schedule D.

The Murray–Darling Basin Agreement (Schedule D – Permissible Transfers between Trading Zones) Protocol 2010¹⁴⁷² outlines the restrictions and rules applying to interstate trade in the Southern Connected Basin, including for trade through the Barmah Choke.¹⁴⁷³ The MDBA has the role of monitoring these trades under the protocol, and approval authorities must promptly advise the MDBA if they approve any trades from below to above the Choke.¹⁴⁷⁴ The MDBA also has the role of advising

¹⁴⁷⁰ In performing its roles of providing advice on the development of the Basin Plan water trading rules and preparing annual water monitoring reports, the ACCC has observed significant effort of Basin State and Australian government agencies over time which go part way to deliver on these commitments. For example, states have both amended legislation and upgraded systems to facilitate with water trading. Victoria, New South Wales and South Australia have implemented file sharing arrangements for interstate trades, which allow them to share the status of applications. The Commonwealth government has introduced the Water Regulations 2010 (Cth) which have helped to improve the capture and dissemination of water market information. Other agencies, such as MDBA and environmental water holders have also worked to increase and improve the level of information provided to market participants. The ACCC's water monitoring reports are available at <https://www.accc.gov.au/publications/accc-water-monitoring-report>.

¹⁴⁷¹ For example, the NWI committed the states to developing registers which would produce good information flows in the market.

¹⁴⁷² As required by Schedule D of Basin Agreement under paragraph 6(1)(e).

¹⁴⁷³ Available at: <https://www.legislation.gov.au/Details/F2010L02466/Html/Text>.

¹⁴⁷⁴ Murray–Darling Basin Agreement (Schedule D – Permissible Transfers between Trading Zones) Protocol 2010, Paragraph 10(1) which states 'If an approval authority approves the transfer of a water entitlement, or the transfer of an allocation, from below to above the Choke, the approval authority must promptly advise the Authority.' Note that in this report, the term 'trade' is generally used rather than 'transfer', and 'trade' is defined to include 'transfer'.

an approval authority whether a proposed trade from above to below the Choke may be approved.¹⁴⁷⁵ If the MDBA advises the authority that the trade from above to below the Choke cannot be approved, the authority must then refuse the trade.¹⁴⁷⁶

E.1.3 Schedule D protocols – Murray–Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010

Interstate allocation trades in the Southern Connected Basin are also governed by another Schedule D protocol, the Murray–Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010.¹⁴⁷⁷ This protocol outlines a five step process which the states have agreed the approval authorities will follow in processing interstate allocation trades in the Southern Connected Basin.

At the first step, the protocol requires that forms be submitted to the destination state and to the origin state. The protocol requires that an application not be processed unless:

- a. the transferor provides the original of the transferor’s authority’s application form (that is, the origin state authority’s form) and a copy of the transferee’s authority form (the destination state authority’s form) to the origin state authority, and
- b. the transferee has provided an original of the transferee’s form and a copy of the transferor’s form to the destination state authority.

The protocol then requires consideration of the application by the destination state authority, and requires the authority to assign a transaction identification number to the trade. The authority is also required to consider if any protocol under subclause 6(1) of Schedule D of the Murray–Darling Basin Agreement or any other matters required to be considered would prohibit the trade.

As the third step, the protocol requires consideration by the origin state authority. If the origin state authority decides the application should be approved, they must notify the destination state authority and provide the application identification number, debit the allocation account, set the date upon which the trade will take effect, and advise the transferor that the application has been granted.

At the fourth step, the destination state authority must finalise the application. This occurs when the destination state authority receives the notice of approval from the origin state, and the destination state authority must promptly approve the trade, amend records to reflect the trade, calculate the volume of the allocation to be received, and advise the transferee and any broker or agent engaged in process that the trade has been finalised.

Finally, the MDBA conducts a monthly reconciliation of interstate trades and updates its register of interstate trades.

E.1.4 Basin Plan Water Trading Rules

The Basin Plan Water Trading Rules (BPWTR) provide for the free trade of surface water within or between regulated systems¹⁴⁷⁸, except for restrictions which are permissible, for example where there are hydrological constraints or environmental protection needs.¹⁴⁷⁹

The BPWTR provide the right to trade free of certain restrictions and define the types of trade restrictions that are and are not permissible in the Basin. For example:

¹⁴⁷⁵ *ibid*, paragraph 10(3).

¹⁴⁷⁶ *ibid*, paragraph 10(5).

¹⁴⁷⁷ Murray–Darling Basin Agreement (Schedule D – Processing Interstate Transfers of Water Allocations) Protocol 2010. Available at: <https://www.legislation.gov.au/Details/F2010L02473>.

¹⁴⁷⁸ Basin Plan 2012 (Cth), s. 12.16.

¹⁴⁷⁹ Basin Plan 2012 (Cth), s. 12.18.

- A person may trade a water access right free of any restriction on the trade that relates to the person being a member of a particular 'class of persons' (such as environmental water holders or irrigators) or to the 'purpose' for which the water will be used.¹⁴⁸⁰
- Free trade of surface water is required within and between regulated systems, and within unregulated systems, except where a restriction meets certain criteria (for example, where there is a physical constraint, lack of connectivity, or a need to protect the environment).¹⁴⁸¹

The Basin States are however able to set their own trading rules, and specify these rules in a variety of instruments, for example, in regulations (Queensland), Water Sharing Plans (New South Wales), Water Allocation Plans (South Australia), Protocols (Queensland), or separate rules (Victoria). These rules may place restrictions on trades that are generally allowable in the state legislation, but not allowed in certain water courses.

The BPWTR include rules intended to improve market information and in particular require the price of each trade of a water access right to be reported to the relevant approval authority.¹⁴⁸² This obligation however does not extend to specifying how this information should be collected and recorded by approval authorities, and the obligation does not extend to price reporting for trades of irrigation rights and water delivery rights within irrigation infrastructure operator (IIO) networks.

E.1.5 Water Regulations 2008 (Cth)

The Water Regulations 2008 (Cth) includes a part (Part 7) on water information, which gives effect to the requirement placed on the Bureau of Meteorology (BOM) under Part 7 of the *Water Act 2007* (Cth) to collect, hold, manage, interpret and disseminate Australia's water information. The BOM also has a role in maintaining and developing Part 7 of the Regulations, which sets out the requirements of the water information framework established in the *Water Act 2007* (Cth). Part 7 specifies what information is required to be provided by certain organisations (over 200 organisations are named in the Regulations), and they also specify the time and the format in which the information must be provided to the BOM. This includes information such as allocation trade data from the state registers.

BOM uses this information to publish its Water Information and Water Markets Dashboards.

E.1.6 Water Market Rules 2009, Water Charge (Termination Fees) Rules 2009 and Water Charge Rules 2010

The Water Market Rules 2009 seek to ensure irrigators can permanently transform their irrigation right into or onto a statutory water access entitlement which they can trade or hold in their own name, free of any trade restrictions imposed by the IIO.

The Water Market Rules 2009 are a legislative instrument enabled under the *Water Act 2007*, and are not as broad as they may sound, and the ACCC has a very limited role in enforcing these rules which are specifically in relation to the transformation of irrigation rights held within IIOs in New South Wales and South Australia.

E.1.7 COAG service standards

Service standards for allocation trades were first adopted by COAG¹⁴⁸³ in November 2008¹⁴⁸⁴ for commencement on 1 January 2009¹⁴⁸⁵, with the current service standards in place since 1 July 2009.¹⁴⁸⁶

¹⁴⁸⁰ Basin Plan 2012 (Cth), ss. 12.07–12.08.

¹⁴⁸¹ Basin Plan 2012 (Cth), ss. 12.16–12.18.

¹⁴⁸² Basin Plan 2012 (Cth), s. 12.48.

¹⁴⁸³ On 29 May 2020, National Cabinet agreed to the formation of the National Federation Reform Council (NFRC) and the cessation of the Council of Australian Governments (COAG).

¹⁴⁸⁴ COAG Communiqué, 29 November 2008.

¹⁴⁸⁵ National Water Commission, *Australian Water Markets Report 2008–2009*, 2009, p. 8.

¹⁴⁸⁶ National Water Commission, *Australian Water Markets Report 2009–2010*, 2010, p. 12.

The COAG service standards for allocation trades were agreed upon following a review of trade processing times in the Basin States. Prior to the introduction of these service standards, there was an inconsistent approach where not all public authorities had service standards, and those that did varied by scope.

In its review of the National Water Initiative, the Productivity Commission noted trade approval times had decreased and recommended service standards be tightened.¹⁴⁸⁷ The ACCC also recommended that service standards be reviewed every two years.¹⁴⁸⁸ However, there has been no change to service standards since 1 July 2009. Despite processing improvements, trade approval times continue to fail to meet the expectations of market participants¹⁴⁸⁹ and there are inconsistencies in these times between states.¹⁴⁹⁰ While outdated and in need of tightening, the standards are also only aspirational with no consequences for trade approval authorities that fail to meet them. Further, the New South Wales and Victorian trade approval authorities now measure the performance of their interstate allocation trades to South Australia using the 20 business day benchmark rather than 10 business days.^{1491, 1492}

Victoria, New South Wales and South Australia legislation all refer to the Murray–Darling Basin Agreement¹⁴⁹³ allowing for interstate trade. The states in the Southern Connected Basin have introduced file sharing arrangements to assist interstate trading and meet obligations under the protocol. There are also separate provisions allowing the states to form inter-governmental agreements (IGAs) for interstate trade. In the Border Rivers, a separate intergovernmental agreement¹⁴⁹⁴ was made to enable interstate trade, as this trade is not covered by the Murray–Darling Basin Agreement.

E.2 Queensland

E.2.1 Entitlement and water allocation framework

In Queensland, what is considered a Water Access Entitlement in the Commonwealth Water Act is referred to as a ‘Water Allocation’. Queensland’s *Water Act 2000* enables a Water Allocation to be granted in accordance with the processes set up (if those processes are set up) in a water plan, water management protocol or regulation.¹⁴⁹⁵ Unlike other states, where a water access entitlement may be held independently of location-related rights, if the allocation is to be managed under a Resource Operations Licence¹⁴⁹⁶ (ROL), a water allocation may only be granted to a person if they also hold a water supply contract with the ROL holder.¹⁴⁹⁷

1487 Productivity Commission, *National water reform*, Report no. 87, 2017, p. 128.

1488 ACCC, *Water trading rules – Final advice*, 2010, p. 122.

1489 Australian Water Brokers Association, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 3; Coleambally Irrigation Co-operative Limited, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 12; Gwydir Valley Irrigators Association, *Submission to Murray–Darling Basin inquiry issues paper*, 30 January 2020, p. 5.

1490 Australian Water Brokers Association, *Submission to Murray–Darling Basin water inquiry issues paper*, 30 January 2020, p. 3; Coleambally Irrigation Co-operative Limited, *Submission to Murray–Darling Basin water inquiry issues paper*, 13 February 2020, p. 12.

1491 Department of Environment, Land, Water and Planning (Victoria), 2020, <https://waterregister.vic.gov.au/water-trading/status-of-trading-applications>, viewed 17 April 2020; WaterNSW, 2020, <https://www.watarnsw.com.au/customer-service/ordering-trading-and-pricing/trading/statistics-by-month>, viewed 16 April 2020; WaterNSW, 2020, <https://www.watarnsw.com.au/customer-service/ordering-trading-and-pricing/trading/statistics>, viewed 22 June 2020.

1492 However, the WaterNSW FAQ page refers to the 10 business day benchmark for interstate approvals (see <https://www.watarnsw.com.au/customer-service/ordering-trading-and-pricing/trading/faqs-water-trading>, viewed 16 April 2020).

1493 Murray–Darling Basin Agreement, Schedule 1, *Water Act 2007* (Cth).

1494 New South Wales–Queensland Border Rivers Intergovernmental Agreement 2008. Available at: https://www.dnrm.qld.gov.au/_data/assets/pdf_file/0006/105963/intergovernment-agreement.pdf.

1495 *Water Act 2000* (Qld), s. 27(2)(i), s. 39(d) and s. 147.

1496 *Water Act 2000* (Qld), s. 176. In the Queensland Basin, the Queensland Department of Regional Development, Manufacturing and Water is the ROL Holder for the Border Rivers Water Supply Scheme; and Sunwater holds the ROL for the remaining Queensland Basin water supply schemes. See: <https://www.business.qld.gov.au/industries/mining-energy-water/water/catchments-planning/water-plan-areas/condamine-balconne>; and <https://www.business.qld.gov.au/industries/mining-energy-water/water/catchments-planning/water-plan-areas/border-rivers-moonie>. A ROL is a licence granted to the entity who operates headworks infrastructure such as dams and weirs.

1497 *Water Act 2000* (Qld), s. 147(4).

E.2.2 Entitlement trading

In Queensland, there are two broad categories of water dealings: dealings which require approval and registration¹⁴⁹⁸, and dealings which only require registration.¹⁴⁹⁹ This is set out in the Act as 'permitted' dealings in the water allocation dealing rules, which are dealings which do not require consent, and other dealings that are not prohibited or permitted (and therefore require consent).¹⁵⁰⁰ Dealings which require approval as well as registration include 'changes' (such as location, purpose and priority), subdivisions and amalgamations. Dealings which only require registration (not approval) include leases or transfers of water allocations that do not affect the water allocation's resource-related attributes.¹⁵⁰¹ Regardless of whether approval is required prior to registration, the dealing does not have effect until the dealing is recorded on the register by the Registrar.¹⁵⁰²

Water allocation dealing rules apply to the whole state.¹⁵⁰³ However, these rules do not apply to the extent that a relevant water management protocol provides an alternative for either making an application, or the process for deciding the application.¹⁵⁰⁴ All dealings must be applied for using the approved form and accompanied by the relevant fee.¹⁵⁰⁵ Other dealings (those not outlined in Subdivision 3 of regulations, or in a protocol) are subject to subregulation 73(1), which outlines what must be assessed and established for a dealing to be approved by Department of Regional Development, Manufacturing and Water (DRDMW)¹⁵⁰⁶, including a public interest test.¹⁵⁰⁷

E.2.3 Allocation trading

Allocation trading in Queensland is known as 'seasonal water assignment'.¹⁵⁰⁸ Seasonal water assignments for water allocations are dealt with in the regulations not the Act.¹⁵⁰⁹ Both supplemented (regulated) and unsupplemented (unregulated) water can be seasonally assigned but different processes apply, due to the different entities responsible for managing different types of water supply.

For seasonal water assignments under water allocations not managed under a ROL, the chief executive must approve the application if the application is consistent with the seasonal water assignment rules stated in the water management protocol applying to the relevant water plan area.¹⁵¹⁰ The application must be in the approved form and accompanied by the relevant application fee.¹⁵¹¹ Seasonal water assignments not within a ROL take effect on the day a notice is given to the applicant.¹⁵¹²

1498 These include dealings that require two steps, an application/approval followed by lodgement/registration:

- Dealings which firstly involve an assessment and approval by the resource manager (that is, the relevant water area of the administering department – the Queensland Department of Regional Development, Manufacturing and Water (DRDMW), formerly DNRME) and then lodgement of relevant instruments at the Titles Office for registration on the Water Allocations Register (WAR) – to take effect.
- Dealings that include 'changes' (e.g. location, purpose, priority, etc.), 'subdivisions' and 'amalgamations'.

1499 These are dealings that involve only lodgement at the Titles Office for registration on the WAR, and do not involve resource manager approval. Such dealings include: water 'transfers'; 'leases'; and other/associated 'conveyance' dealings e.g. recording encumbrances and caveats.

1500 Assessed water allocation dealings are dealt with under Subdivision 4 of the Water Regulation 2016 (Qld).

1501 Business Queensland, 2018, <https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/allocation-dealings>, viewed 22 June 2020.

1502 *Water Act 2000* (Qld), s. 161(2).

1503 *Water Act 2000* (Qld), s. 158, and Water Regulation 2016 (Qld), s. 62.

1504 Water Regulation 2016 (Qld), s. 62(2).

1505 Water Regulation 2016 (Qld), s. 63, and Schedule 12.

1506 Formerly the Department of Natural Resources, Mines and Energy (DNRME).

1507 Water Regulation 2016 (Qld), s. 73(1)(b).

1508 'Seasonal water assignment' is defined under Schedule 4 of the *Water Act 2000* (Qld), and refers to the assignment to another person of all or part of the water that may be taken under certain instruments, including 'water allocations' and 'water licences'.

1509 Part 5, Division 2 of the Water Regulation 2016 (Qld) governs seasonal assignments.

1510 Water Regulation 2016 (Qld) s. 59.

1511 Water Regulation 2016 (Qld) s. 58(3), and Schedule 12 sets out the relevant application fees.

1512 Water Regulation 2016 (Qld) s. 59(6).

A holder of a Resource Operations Licence, such as Sunwater, is responsible for approving seasonal water assignments of supplemented water.¹⁵¹³ The application process for seasonal water assignments can occur via paper form or online via Sunwater's website. Sunwater assesses an application for a seasonal assignment of supplemented water in accordance with the Local Conditions (for example, any loss adjustments that may be applicable) for the water supply scheme in place on the day that Sunwater receives an application. Other considerations include whether the buyer has a Supply Contract with Sunwater for delivery of the water prior to the application being made (and ensuring that all accounts are current). If the seller has an arrangement with Sunwater for payment of outstanding charges, Sunwater may approve the assignment subject to these proceeds being paid to reduce the outstanding amount.

E.2.4 Queensland water registers

The water register in Queensland is maintained by the Titles Registry. Section 168 of the *Water Act 2000* (Qld) sets up the Water Allocations Register and sets out what is required to be recorded by the Registrar on the water allocations register. Subsection 168(2) states that regulations may prescribe additional requirements of the register.

The *Water Act 2000* (Qld) specifies more detail about what must be recorded on the register about water allocations compared to other states. Section 152(1) sets out what information must be recorded on the water register, such as name, volume, location of water and other details. Certain dealings relating to water allocations must also be registered.¹⁵¹⁴ There are also other relevant provisions in the *Water Act 2000*, for example, sections 173–174 refer to the collection of water transfer information including under the Duties Act, which is a link to sale price.

Seasonal water assignments do not require registration and are maintained in the water management system of the ROL holder (for supplemented water) and the department (for unsupplemented water).

The *Water Act 2000* (Qld) does not specifically set out requirements for the publication of the permanent register information.

DRDMW publishes a monthly Permanent Water Trade Report (PWTR) which includes a weighted average sale price per ML (for all commercial water trades after filtering out valid, zero dollar trades), for supplemented / unsupplemented water and provided at the level of water supply scheme (supplemented water) and water management area (unsupplemented water) and priority/water allocation group respectively. Section 175 of the Act states that a person may on payment of fee prescribed in regulation, search and obtain a copy of a water allocation or information kept on the register about the allocation.¹⁵¹⁵

Queensland's legislative framework does not require information on allocation trade prices to be captured or published. This is consistent with their legislative framework which does not require allocation trades to be registered.

The *Water Act* was amended in December 2018 to provide for a ROL to include conditions, such as a requirement 'that the licence holder collect and publish the sale price for each seasonal water assignment of a water allocation managed under the licence'.¹⁵¹⁶ No ROLs in Queensland have been amended yet in accordance with this provision, which was introduced in December 2018.

1513 For trades for water allocations managed by Sunwater, subregulation 61 (2)(a) enables Sunwater or DRDMW to consent to the arrangement.

1514 *Water Act 2000* (Qld), s. 161.

1515 There are two avenues available for water market participants to access permanent sale data. For example, the public can access water sale price data either via the department's business centres or online from private value-added resellers. The department's products include: an Abbreviated sale data listing (\$9.00) or a Full sale search (\$18.05), both of which provide volume, price and other details of the dealing.

1516 *Water Act 2000* (Qld), s. 179(e)(vi) for new ROLs, and s. 1288 (2) (b) for existing ROLs to be amended to include this condition.

E.3 New South Wales

E.3.1 Entitlement and water allocation framework

The New South Wales *Water Management Act 2000* allows for the granting of a ‘water access licence’¹⁵¹⁷ (WAL) which permits the holder to access water from a specified water source. The total volume of water available to be extracted from a specified source is shared among WAL holders based on the ‘Share Component’ of each licence¹⁵¹⁸ which sits underneath the WAL.¹⁵¹⁹

Unlike in other states, a person wishing to hold a water allocation must hold a WAL. Thus, in New South Wales the WAL takes the place of a water account (South Australia) or allocation bank account (Victoria). This is important because it acts as an additional step and fee for someone wanting to participate in temporary trade.

E.3.2 Entitlement trading

Section 71Y sets out that dealings (including entitlement trades) in New South Wales are to be dealt with in accordance with the water management principles¹⁵²⁰, orders established under section 71Z of the Act (currently the Access Licence Dealing Principles Order 2004), and access licence dealing rules established by any relevant management plan.¹⁵²¹

Dealing principles are able to be published on the New South Wales legislation website to establish access licence dealing principles that regulate or prohibit the kinds of rules which may be made in management plans, and to regulate or prohibit the kinds of dealings under the Act and to establish conversion factors applicable to the share components of access licences.¹⁵²²

The Act has set up two broad types of dealings: those that require an assessment and consent followed by registration (called General Dealings), and those that just require registration. There are numerous dealing types specified in the Act, including:

- **Transfer** of access licence (some require consent, others do not)
- **Term transfer** of entitlements under access licences – must be for more than six months (requires consent)
- **Conversions** of access licences to new category (can apply to cancel current licence and grant of new one)
- **Subdivision and consolidation** of access licences (can apply to split or consolidate if licences are in same water management area and are of same category)
- **Assignment of rights under access licence** (known as ‘share component trading’) – enables the holders of two or more licences to apply decrease the share component of one licence to have the corresponding increase in the other licence. This can also be used for the extraction component of the licence.¹⁵²³

1517 *Water Management Act 2000* (NSW), s. 61.

1518 *Water Management Act 2000* (NSW), s. 56.

1519 Department of Planning, Industry and Environment (NSW), <https://www.industry.nsw.gov.au/water/licensing-trade/licences/types/water-access>, viewed 22 June 2020.

1520 *Water Management Act 2000* (NSW), s. 5 sets out the water management principles.

1521 For example, the Murrumbidgee Regulated Water Sharing Plan (WSP) for the Murrumbidgee Regulated River Water Source 2016 (available at: www.legislation.nsw.gov.au/#/view/regulation/2016/367) outlines additional access licence dealing rules at Part 10; such as prohibiting certain dealings under the Act (with that dealing in the Act stating it was subject to the WSP). Section 71Z of the Act also requires any access licence dealing rules established by management plans are consistent with the principles in the Order.

1522 *Water Management Act 2000* (NSW), s. 71Z.

1523 *Water Management Act 2000* (NSW), s. 71M and s. 71N. A term transfer under s. 71N does not just entitle the transferee access to allocations made to the licence, but to any entitlement conferred by the licence, payment of fees and charges under the licence, and other conditions (see ss. 71N (5)), 71O, 71P and 71Q).

All entitlement dealings take effect once registered with the New South Wales Land Registry Services, with only dealings on default, certain co-held share dealings (subject to sections 71M and 71N) and security interests not first requiring consent.

Given the way WALs are set up, an entitlement trade in New South Wales can be a trade of the WAL (known as 'transfer trading'), or a trade of the share component which sits underneath it (known as 'share assignment trading').¹⁵²⁴

New South Wales trades vary in what requires consent, consent and registration, and registration only.

Similar to South Australia, while WaterNSW processes trades for private diverters, trades that occur wholly within privately owned irrigation infrastructure operators (IIOs) – the largest being Murray Irrigation Limited – are processed and approved by the IIO and information is not shared with WaterNSW.¹⁵²⁵

E.3.3 Allocation trading

Trade of water allocations in New South Wales is referred to as 'water allocation assignment'. A water allocation can only be transferred between access licence holders and requires the consent of the Minister. An intrastate assignment dealing¹⁵²⁶ or interstate assignment¹⁵²⁷ must be dealt with in accordance with (a) water management principles, (b) the access licence dealing principles established by the Order¹⁵²⁸, and (c) the access licence dealing rules established by any relevant management plan.¹⁵²⁹

Unlike the other states, both the seller and the buyer are considered applicants for a temporary trade in New South Wales.¹⁵³⁰ This means that, in concert with the regulations,¹⁵³¹ consent is required from both parties.

Water allocation assignments take effect as soon as the details are entered into the water allocation account.¹⁵³² Therefore, while dealings with WALs that require consent need to then separately be registered, water allocation assignments only require consent although they are recorded in the Assignment Division of the register.

Water allocation accounts are required to be kept under the Act, and are required to record debits and credits.¹⁵³³

E.3.4 NSW water registers

Division 3A of the *Water Management Act 2000* (New South Wales) sets out the Water Access Licence Register. Subsections 71(3) and (4) allow the Minister to determine the form and manner in which the register is kept, with the only limitation being that it needs to be a computer record.

There are two divisions of water registers in New South Wales – the Water Access Licence Register (General Division), which is maintained by the New South Wales Land Registry Services, and the Water Register (Assignment Division) which details assignment dealings (allocation trade) and is maintained by WaterNSW. This means that allocation trades are recorded in a register in New South Wales.

1524 WaterNSW, <https://waterregister.watarnsw.com.au/water-register-frame>, viewed 22 June 2020.

1525 Some IIOs (irrigation corporations) are listed in the *Water Management Act 2000* (NSW) at Schedule 1. There are also a number of smaller IIOs who, though they have authority to approve, and to restrict, trade into, out of, and within their networks, have no trade approval or trade reporting obligations at all.

1526 *Water Management Act 2000* (NSW), s. 71T.

1527 *Water Management Act 2000* (NSW), s. 71V.

1528 Access Licence Dealing Principles Order 2004 (NSW).

1529 *Water Management Act 2000* (NSW), s. 71Y.

1530 *Water Management Act 2000* (NSW), s. 71T(2).

1531 Water Management (General) Regulation 2018 (NSW), s. 9(b).

1532 *Water Management Act 2000* (NSW), s. 71L(4).

1533 *Water Management Act 2000* (NSW), s. 85.

Both the General and Assignment Division provisions in the Act specify that the registers must record any further information as specified in regulations. The regulations require additional information be recorded on security interests in the General Division¹⁵³⁴, and all assignment dealing applications which have been submitted in approved form and signed must be recorded in the Assignment Division.¹⁵³⁵

In New South Wales, section 71J sets out the ability to access the register, including that the Minister 'is to make the information available to any member of the public at the times and in the manner and on payment of the fee (if any) approved by the Minister'. The New South Wales water register¹⁵³⁶ is the only register that allows for searches by entitlement number to bring up complete allocation trade history. This information is however not available in bulk download and only by one entitlement at a time. Trades conducted within IIOs are not required to be published by the IIOs, however some IIOs have obligations to report to the BOM.¹⁵³⁷

E.4 Australian Capital Territory

E.4.1 Entitlement and water allocation framework

The Australian Capital Territory *Water Resources Act 2007* establishes 'Water Access Entitlements', which entitle the holder to a specified share of surface or ground water within a particular water management area.¹⁵³⁸

E.4.2 Entitlement trading

Australian Capital Territory water access entitlements are tradeable, either permanently or for a limited period.¹⁵³⁹ In approving the transfer, the authority must not approve the transfer unless it is satisfied it is consistent with the conditions of the entitlement, and either consistent with the Territory plan or approved by the authority responsible for water management in the State or Territory in which the water is to be used.¹⁵⁴⁰

E.4.3 Allocation trading

While Australian Capital Territory legislation does make provision for the announcement of annual allocations which are able to be traded separately to water access entitlements, in practice water allocation trades have not yet occurred in the Australian Capital Territory.¹⁵⁴¹

E.4.4 ACT water registers

Under the *Water Resources Act 2007* (section 66), the Australian Capital Territory Environment Protection Authority is required to maintain a register that includes details of (among other things) water access entitlements. The Act does not specify what information on water access entitlements is required to be recorded, just that 'details' need to be recorded.

In the Australian Capital Territory, there is a provision which states that the register should be available for public inspection at reasonable times.¹⁵⁴²

1534 Water Management (General) Regulation 2018 (NSW), subr. 11(1)(a) and (b).

1535 Water Management (General) Regulation 2018 (NSW), subr. 11(2).

1536 Available at <https://waterregister.watrnsw.com.au/water-register-frame>, viewed 22 June 2020.

1537 Under the Water Regulations, BOM is able to determine Category E persons.

1538 *Water Resources Act 2007* (ACT), s. 19.

1539 *Water Resources Act 2007* (ACT) s. 26 (3).

1540 *Water Resources Act 2007* (ACT) s. 26 (2).

1541 Australian Capital Territory Government, 2019, <https://www.environment.act.gov.au/water/water-regulation/water-trading>, viewed 22 June 2020.

1542 *Water Resources Act 2007* (ACT), s. 67(1).

E.5 Victoria

E.5.1 Entitlement and water allocation framework

The Victorian *Water Act 1989* sets up 'Water Shares', which are ongoing entitlements to a share of the water available in a declared water system.¹⁵⁴³

The majority of water users who participate in Victorian Basin water markets hold 'Water Shares', although environmental entitlements and bulk entitlements can be amended and traded under certain circumstances.¹⁵⁴⁴ A 'Water Share' is a water access entitlement in and of itself, and does not sit underneath a licence (as in New South Wales or South Australia).¹⁵⁴⁵ In Victoria, the term 'licence' refers to either a take and use licence or a registration licence.

E.5.2 Entitlement trading

In Victoria, a Water Share can be traded wholly¹⁵⁴⁶, or it may be divided or amalgamated.¹⁵⁴⁷ Therefore a whole transfer is a different dealing to a partial transfer. The Victorian Act gives rise to the following separate dealing types (not all of which are necessarily trades):

- **Transfer of ownership** of water share (water shares can be co-owned and if owned as tenants in common, a person may transfer that person's portion of the share without consent of other tenants – but in other cases requires consent from other owners).¹⁵⁴⁸
- **Limited term transfers of rights to future water allocations under water shares** (leases – transfer involves 'whole of the right to future water allocations'.) The Act specifies it cannot be for more than 20 years, but does not have a minimum, and that the lease gives right to future allocations.¹⁵⁴⁹
- **Standing directions as to future water allocations under water shares.**¹⁵⁵⁰
- **Division of water shares.**¹⁵⁵¹
- **Consolidation of water shares.**¹⁵⁵²

The Minister must not give approval to a transfer of ownership if any fees owed for the water share are outstanding, any other prescribed reason.¹⁵⁵³ The Minister, in approving the transfer, must have regard to any relevant trading rules made under Division 13 of the Act.¹⁵⁵⁴ Once the transfer is approved, the buyer and seller must then submit a form to the Registrar. A water share transfer takes effect once recorded in the Victorian Water Register by the Registrar.¹⁵⁵⁵ This requires individuals to submit a separate notification to the Registrar, other than their trade form and made available by the water corporation on approval of the transfer or limited term transfer.¹⁵⁵⁶

'Trade' of water shares can mean a transfer of ownership, a change of location, or both. A change of location may occur when a water share transfer or an application to vary or associate a water share (without a transfer of ownership) is approved and recorded in the Victorian Water Register. Also, unlike

1543 *Water Act 1989* (Vic), s. 33F.

1544 Bulk entitlements may be traded permanently (transferred under section 46D of the Victorian Water Act) and water held under a bulk entitlement can be temporarily traded (assignment of allocation under section 46 of the Victorian Water Act).

1545 Water shares are described in *Water Act 1989* (Vic), s. 33E.

1546 *Water Act 1989* (Vic), s. 33S.

1547 *Water Act 1989* (Vic), s. 33Y and s. 33Z, respectively.

1548 *Water Act 1989* (Vic), s. 33S.

1549 *Water Act 1989* (Vic), s. 33T.

1550 *Water Act 1989* (Vic), s. 33U.

1551 *Water Act 1989* (Vic), s. 33Y.

1552 *Water Act 1989* (Vic), s. 33Z.

1553 *Water Act 1989* (Vic), s. 33X(3)(a).

1554 *Water Act 1989* (Vic), s. 33X(4).

1555 *Water Act 1989* (Vic), s. 84J(1) and s84JA(1).

1556 Department of Environment, Land, Water and Planning (Victoria), <https://www.land.vic.gov.au/land-registration-for-professionals/lodging-in-the-victorian-water-register>, viewed 7 February 2021.

in New South Wales, only a whole water share can be transferred and there is no equivalent to share component trading where one share is increased and another is decreased.

E.5.3 Allocation trading

Allocation trading in Victoria is referred to as ‘assignment of water allocation’ in the Victorian Act. A person may assign the whole or part of the water allocation available under their water share to any person, which may then be further traded.¹⁵⁵⁷ In Victoria, an allocation trade is described as assigning whole or part of a water allocation to someone else.¹⁵⁵⁸ The allocation trade takes effect from the date specified in the assignment.¹⁵⁵⁹ The Minister must not give approval under section 33X(1)(c) for any prescribed reason, and must have regard to any relevant trading rules made under Division 13 of the Act.¹⁵⁶⁰

E.5.4 Victorian water registers

The Victorian Water Register commenced on 1 July 2007. The water register is established under Part 5A of the Victorian *Water Act 1989* which sets out the obligations in relation to the collection, storage and disclosure of register information. Section 84C states that the Minister is responsible for establishing and maintaining a system for the water register in which the Registrar has responsibility to maintain records and information on water shares, and an Authority has responsibilities to record water allocations, services delivered, water consumption and other details. Unlike other states, the Victorian Act sets out a purpose for the water register:

The purpose of the water register is to facilitate the responsible, transparent and sustainable use of the State’s water resources and includes – (a) facilitating monitoring of, and reporting in relation to, records and information about water-related entitlements and allocation and use of water resources; and (b) facilitating a market for water related entitlements and water resources by providing publicly available records and information and other records and information about ownership and use of water-related entitlements.¹⁵⁶¹

Importantly, section 84C(1) requires the establishment and maintenance of the register by the Minister in which records and information referred to in subsections (2), (2A) and (3) is kept. These subsections include more than just ownership (title) information.¹⁵⁶²

The Minister is responsible for maintaining records and information on water-use licences, water-use registrations, bulk entitlements, environmental entitlements, amounts allocated to water shares under section 33AC and works licences, and take and use licences.¹⁵⁶³ The Registrar is then responsible for records and information on water shares.¹⁵⁶⁴

An Authority¹⁵⁶⁵ is responsible for establishing and maintaining records and information in the water register relating to water allocation assignments (allocation trades), standing directions, consumption of water, and other take and use licence information.¹⁵⁶⁶ The recording of water consumption in the register is unlike the other states, whereby water use is recorded only in water accounts and not in a register.

¹⁵⁵⁷ *Water Act 1989* (Vic), s. 33U and s33V.

¹⁵⁵⁸ *Water Act 1989* (Vic), s. 33U.

¹⁵⁵⁹ *Water Act 1989* (Vic), s. 33U(3) and s. 33V(3).

¹⁵⁶⁰ *Water Act 1989* (Vic), s. 33X(3)(b) and s. 33X(4).

¹⁵⁶¹ *Water Act 1989* (Vic), s. 84B.

¹⁵⁶² Section 84C (2) states that records and information on (a) water-use licences; and (b) water-use registrations, and (c) bulk entitlements; and (d) environmental entitlements; and (e) the recording of amounts of water that are to be allocated to each water share under section 33AC; (f) works licences under section 67(1); and (g) licences to take and use water issued under section 51(1) or registration licences. Section 84C(2A) states that the Registrar is responsible for establishing and maintain records relating to water shares, and (3) states what an authority is responsible for.

¹⁵⁶³ *Water Act 1989* (Vic), s. 84C(2).

¹⁵⁶⁴ *Water Act 1989* (Vic), s. 84C(2A).

¹⁵⁶⁵ Defined in Act as a water corporation or a Catchment Management Authority. The Act includes a list of water corporations in Schedule 1.

¹⁵⁶⁶ *Water Act 1989* (Vic), s. 84C(3).

Section 84W(b) states that any water allocation assignment in a water system for which that Authority is responsible must be recorded in the water register by the Authority. Victoria has a single state-wide water register. A number of authorities have responsibilities for recording in the water register. Victoria's water register ensures that ownership of water entitlements is recorded with integrity, with consistency in recording across the State, due process in recording, and providing a state-wide view of entitlements recorded, water availability and use.

Victoria has implemented various improvements to the data they publish, including the way it is published – with the home screen of the Victorian Water Register website providing dashboard type information including some trade price information.¹⁵⁶⁷ In Victoria, section 84EA(2) states '(t)he Minister may make a report created under subsection (1)(c) available to the public, if the report does not include the names and addresses of individuals'.

E.6 South Australia

E.6.1 Entitlement and water allocation framework

The *Landscape South Australia Act 2019* provides that the Minister may grant a 'water licence', which provides the holder access to a share of water available in the consumptive pool(s) to which the right relates.¹⁵⁶⁸ A 'water access entitlement' is a specific share or volume of a particular consumptive pool that the licence holder is entitled to access.¹⁵⁶⁹ Therefore, in South Australia, a licence may hold several different classes of water access entitlement.

This framework is somewhat similar to the New South Wales framework. However, in South Australia, a licence may have several different classes of water access entitlement specified on it (for example, one licence held by a South Australian IIO has Class 1, Class 3 and Class 5 water access entitlements¹⁵⁷⁰), whereas in New South Wales different classes of entitlements are held on different licences (for example, an IIO in New South Wales may hold three separate WALs – one each for Conveyance, High Security and General Security entitlements).

E.6.2 Entitlement trading

Entitlement trades can either be for the licence¹⁵⁷¹ or for the all or part of the WAE that sits underneath.¹⁵⁷² A transfer of a WAE without the licence must be to someone who already holds a licence.¹⁵⁷³ Trade application for an entitlement trade must be submitted in a form specified by the Minister.¹⁵⁷⁴ The South Australian Act enables the following dealing types:

- **Transfer of water licence**¹⁵⁷⁵ – whole licence (may be absolute or for a limited period)
- **Transfer of water access entitlement** – all or a portion of shares (may be absolute or for a limited period)
- Surrender of water licence¹⁵⁷⁶ (not a trade)
- Variation of water licence¹⁵⁷⁷ (not a trade).

¹⁵⁶⁷ Available at [www.https://waterregister.vic.gov.au/](https://waterregister.vic.gov.au/), viewed 22 June 2020.

¹⁵⁶⁸ *Landscape South Australia Act 2019* (SA), s. 121(1).

¹⁵⁶⁹ *Landscape South Australia Act 2019* (SA), s. 121(2).

¹⁵⁷⁰ Department for Environment and Water (SA), <https://www.waterconnect.sa.gov.au/Systems/WLPR/Pages/Default.aspx>, viewed 22 June 2020.

¹⁵⁷¹ *Landscape South Australia Act 2019* (SA), s. 125(1)(a).

¹⁵⁷² *Landscape South Australia Act 2019* (SA), s. 125(1)(b).

¹⁵⁷³ *Landscape South Australia Act 2019* (SA), s. 125(2)(a).

¹⁵⁷⁴ *Landscape South Australia Act 2019* (SA), s. 125(5)(a).

¹⁵⁷⁵ *Landscape South Australia Act 2019* (SA), s. 125(1)(a).

¹⁵⁷⁶ *Landscape South Australia Act 2019* (SA), s. 126.

¹⁵⁷⁷ *Landscape South Australia Act 2019* (SA), s. 124(1).

Entitlement trades take effect upon registration, however, registration can occur either at the time of approval or a separate application for registration can be made.¹⁵⁷⁸ This is a change from the previous Act and Regulations, whereby entitlement trades took effect on approval.¹⁵⁷⁹ Under the new Regulations, the holder of the entitlement can request at the time of applying for the transfer request that the Minister give effect to the transfer either at the time of approval, or by registering the transfer on a separate application made for the purposes of registration.¹⁵⁸⁰

In making a decision to approve or refuse the transfer or variation, the transfer must be consistent with the relevant water allocation plan, be in the public interest (taken to be met if the application satisfies the water allocation plan principles) and, if within the Basin, must take into account the requirements of the Murray–Darling Basin Agreement and any Ministerial Council resolution under that agreement that is relevant.¹⁵⁸¹

In South Australia, the Department for Environment and Water (DEW) serves as the trade approval authority. However, irrigation trusts which operate in South Australia also act as approval authorities for trades within their networks. DEW processes and approves all entitlement and allocation water trades in South Australia (except for those within irrigation trusts).

E.6.3 Allocation trading

Allocation trades in South Australia are called ‘allocation transfers’, and the holder of a water allocation may apply to transfer the water allocation to another person subject to the Minister’s approval.¹⁵⁸² The transfer must also be submitted in a form approved by the Minister and with the relevant fee paid.¹⁵⁸³ Allocation trades must be consistent with the relevant water allocation plan and be in the public interest (taken to be met if the application satisfies the water allocation plan principles).¹⁵⁸⁴ No other state Act requires individual allocation trades to be in the public interest. No separate sections deal with registration of the allocation transfers.

At the time of the MDBA’s Price Audit, South Australia did not require price to be recorded on either allocation or entitlement trades. However, the MDBA reported that since South Australia was advised of the audit outcomes, South Australia has since made price reporting mandatory.¹⁵⁸⁵ There is a provision in the Act which provides the Minister to require the monetary consideration of any transfer to be stated in connection with an application to register a transfer.¹⁵⁸⁶

E.6.4 South Australian water registers

In South Australia, the water register is set up under the *Landscape South Australia Act 2019*.¹⁵⁸⁷ The water register is part of the Landscape Scheme Register established under section 241 the Act. Section 241(2) allows the Minister to divide the Landscape Scheme Register as the Minister sees fit, subject to the establishment of one part specifically for the water register.

While section 241 of the Act sets out the Water Register must be established as part of the Landscape Scheme Register, further detail on what must be recorded is set out in Schedule 4, and includes ownership, temporary and permanent trades all in one register. The Minister can record information under Schedule 4 in the manner and to the extent that the Minister sees fit, and may, in addition to information that is required to be recorded, record such other information in the register as the Minister

1578 *Landscape South Australia (Water Register) Regulations 2020* (SA), subregulation 7(1)(a) and 7(1)(b).

1579 *Natural Resource Management Act 2004* (SA), s. 7(2), and *Natural Resources Management (General) Regulations 2005*, r. 43A. Permanent trades took effect when the Minister gave effect to the transfer in accordance with procedure in regulations; and the regulations stated that the trade was given effect by approval.

1580 *Landscape South Australia (Water Register) Regulations 2020* (SA), subregulation 7(1)(b).

1581 *Landscape South Australia Act 2019* (SA), s. 125(8)(a)–(c).

1582 *Landscape South Australia Act 2019* (SA), s. 132.

1583 *Landscape South Australia Act 2019* (SA), s. 132(3)(a) and (b).

1584 *Landscape South Australia Act 2019* (SA), s. 132 (4) and (5).

1585 MDBA, *Water Trade Price Reporting under Basin Plan, Part 1: Basin State processes and procedures for collecting water trade price information*, 2019, p. 17.

1586 *Landscape South Australia Act 2019* (SA), Schedule 4, s. 16.

1587 *Landscape South Australia Act 2019* (SA), Schedule 4.

thinks fit.¹⁵⁸⁸ The information that is required to be recorded includes details of the entitlement holder, resource to which the entitlement relates and any matter set out in regulations.¹⁵⁸⁹

There are also new regulations, the Landscape South Australia (Water Register) Regulations 2019 which specify further requirements on the information which must be recorded on the water register.¹⁵⁹⁰ The regulations also require price (if any) paid for transfers to be recorded on the register.¹⁵⁹¹

In South Australia, the register is to be made available for public inspection, except for information that the Minister considers should be kept confidential for safety and security reasons.¹⁵⁹² South Australian irrigation trusts also do not publish information on internal trades (although they may choose to report annual aggregate trade volumes in their annual reports).¹⁵⁹³

1588 *Landscape South Australia Act 2019 (SA)*, Schedule 4, Part 1, s. 4.

1589 *Landscape South Australia Act 2019 (SA)*, Schedule 4, Part 2 s. 6.

1590 For example, there subregulation 4(f) specifies the information which must be kept on water allocations.

1591 *Landscape South Australia (Water Register) Regulations 2020 (SA)*, subregulation 4(1)(d)(vi).

1592 *Landscape South Australia Act 2019 (SA)*, s. 241.

1593 Central Irrigation Trust, *Annual Report 2018/19*, 2019, p. 4. Available at: http://cit.org.au/downloads/annual%20reports/CIT_Annual%20Report_2018-19.pdf, viewed 19 June 2020.

Appendix F – Sectoral case studies

In order to better understand what would be involved to implement the longer term recommendations set out in chapter 12, the ACCC conducted five sectoral case studies. The full case study reports are set out below.

For each case study, the ACCC gathered factual information on the key digital infrastructure used, and identified the role of government and industry, as well as the legislation and data standards. The ACCC then considered the results of this analysis and for each case study drew several ‘lessons learned’ for the water sector.

F.1 Standard Business Reporting and Single Touch Payroll – making PAYG easier for businesses

F.1.1 Moving to online business reporting – what SBR and STP entail

Australian businesses are required to keep a range of records and to report information to government agencies, such as the Australian Taxation Office (ATO) for tax purposes.

In the past, there was little standardisation of record-keeping and businesses spent considerable time and resources to collate the information required to be reported to government – particularly when the information was required by multiple agencies and sometimes in differing formats. Over the last decade, government has worked with industry to introduce standardisation and digital tools to streamline and automate record-keeping and reporting where possible, to reduce costs for businesses and improve the accuracy and timeliness of reporting.

According to the Standard Business Reporting (SBR) website, the SBR software ‘uses the business transactions captured in business software to prepare reports that are required by employers to provide to the Australian Taxation Office. This is the concept of ‘capturing once’ and means businesses no longer have to re-enter information (possibly in slightly different ways) for multiple reporting obligations.’¹⁵⁹⁴ Digital Service Providers provide SBR-enabled software.

The SBR program was introduced in 2010 to simplify businesses’ reporting obligations.¹⁵⁹⁵ SBR is built into business and accounting software, and the Australian Business Register (ABR)¹⁵⁹⁶ maintains a register of SBR-enabled software.¹⁵⁹⁷ Single Touch Payroll (STP), which uses SBR and was announced by government in late 2014¹⁵⁹⁸, is a government initiative to streamline employer payroll reporting obligations.

Under this initiative, the use of STP is mandated by the Government and administered by the ATO, and software providers – termed Digital Service Providers – developed compliant software to roll out to employers across Australia.¹⁵⁹⁹ STP includes mandatory reporting obligations, but also includes some voluntary reporting that some software allows employers to also report if they choose.

STP commenced on 1 July 2018 and provides a way for employers to automatically report to the ATO through STP-enabled software. The software sends payroll information such as salaries and wages, PAYG withholding and superannuation to the ATO each time an employee is paid. This reduces administrative burden as the software does this in the background as part of normal payroll functions.

1594 Standard Business Reporting, n.d., <https://www.sbr.gov.au/about-sbr>, viewed 5 January 2021.

1595 Standard Business Reporting, n.d., <https://www.sbr.gov.au/about-sbr>, viewed 5 January 2021.

1596 The Government announced funding to fully implement the Modernising Business Registers program, see: <https://www.abr.gov.au/media-centre/modernising-business-registers-and-director-identification-numbers>, viewed 5 January 2021.

1597 Australian Taxation Office, n.d., https://softwaredevelopers.ato.gov.au/STP_ProductRegistration, viewed 20 November 2020.

1598 <https://ministers.treasury.gov.au/ministers/josh-frydenberg-2014/media-releases/cutting-red-tape-employers-through-single-touch>, viewed 5 January 2021.

1599 Australian Taxation Office, *Regulatory Impact Statement Single Touch Payroll*, October 2015.

Mandatory reporting rollout was staggered and STP was introduced for larger employers (those with more than 20 employees) on 1 July 2018, and then on 1 July 2019 applied to all employers. The rollout also included a 12 month transitional phase for employers to start using STP software. There are also low cost options for micro-employers, and applications for deferral were also available to those who did not think they would be able to meet the deadlines.

The Government announced in the 2019–20 federal Budget that it would expand the data reported through Single Touch Payroll (STP) by the ATO – called ‘STP Phase 2’. SBR was set up in a way to ensure that it could be built on and expanded, and part of phase 2 is expanding STP to allow employers to report child support information, if they choose, to reduce the burden on employers by providing a single avenue for businesses to report to multiple Government agencies.¹⁶⁰⁰

Building on STP’s first phase of streamlining the way employers report payroll and superannuation information to the ATO, STP phase 2 will assist in the administration of social security for Australian citizens in a more efficient, accurate and timely manner.

The cost of compliance with the old PAYG framework was estimated to be \$2.5 billion in 2011, and represented a large regulatory burden for employers.¹⁶⁰¹ In comparison the Regulatory Impact Statement estimated that STP could deliver a potential net compliance cost saving of about \$2 billion over 10 years, with the saving being attributed to STP delivering ‘streamlined TFN declaration and Superannuation standard choice form for new employees, as well as automated reporting of PAYG Withholding’.¹⁶⁰² Sharing STP data with Services Australia (formerly the Department of Human Services) was estimated in later Budget Papers to also deliver \$2.1 billion savings by improving the accuracy of income reporting and reducing overpayments of income support payments.¹⁶⁰³ The expansion of STP was announced in 2019 (phase 2), and the 2019–20 budget committed \$65.278 million to the ATO (including capital expenses) for the rollout over four years.¹⁶⁰⁴

F.1.2 What is the role of government?

Government performs several functions for the SBR program in general, and STP more specifically, including:

- developing underpinning legislation
- providing funding
- administering the product register of SBR-enabled software, and, together with Digital Service Providers, developing the Digital Service Provider operational framework
- receiving data/information
- engaging with industry to develop operational frameworks.

Government agencies participating in the broader SBR program include:

- the Australian Taxation Office (ATO)
- the Australian Prudential Regulation Authority (APRA)
- the Australian Securities and Investments Commission (ASIC)
- State Revenue offices (SROs).

STP data is also shared with Services Australia and the Department of Veterans’ Affairs, and will receive further STP information once phase 2 has been rolled out.¹⁶⁰⁵

1600 Treasury, n.d., <https://treasury.gov.au/consultation/c2020-46061>, viewed 5 January 2021.

1601 Australian Taxation Office, *Regulatory Impact Statement Single Touch Payroll*, October 2015.

1602 Australian Taxation Office, *Regulatory Impact Statement Single Touch Payroll*, October 2015.

1603 Australian Government, 2019. Budget Paper No. 1: Budget Strategy and Outlook 2018-19 – Budget Paper No. 2 2019-20, Canberra: Commonwealth Of Australia.

1604 Australian Government, 2019. Budget Paper No. 1: Budget Strategy and Outlook 2018-19 – Budget Paper No. 2 2019-20, Canberra: Commonwealth Of Australia.

1605 Australian Taxation Office, 2020, <https://softwaredevelopers.ato.gov.au/STP>, viewed 5 January 2021.

The ATO also made STP data available to other agencies as a response to COVID and the need for economic modelling. For example, the ATO shared data with the ABS in order for the ABS to publish 'Weekly Payroll Jobs and Wages in Australia'.¹⁶⁰⁶

STP-enabled software products must meet the Digital Service Provider Operational Framework security requirements, and the Digital Service Provider must be authorised to use the ATO digital whole services and send data directly to the ATO or via a Sending Service Provider (SSP).¹⁶⁰⁷ The framework was developed in 2017 and involved input from a work group and focus groups.¹⁶⁰⁸ The scope of the Framework includes any software product provided by a Digital Service Provider which 'reads, modifies or routes any tax or superannuation related information and the product performs a role in the supply chain'.¹⁶⁰⁹

Digital Service Providers must also demonstrate their software's ability to comply with the framework by completing a security questionnaire to the ATO via the DPO. The ATO states that '[a]ll Digital Service Providers wanting to use our digital services will need to complete the questionnaire and meet the relevant requirements which can include, but is not limited to:

- authentication
- encryption
- supply chain visibility
- certification
- data hosting
- personnel security
- encryption key management
- security monitoring practices'.¹⁶¹⁰

The ATO will assess the evidence provided and, if satisfied, will grant approval (product will be whitelisted).¹⁶¹¹

In circumstances where an approved Digital Service Provider later fails to meet Digital Service Provider framework requirements, the ATO will in the first instance try to work through the issues with the Digital Service Provider. Where that process fails, the Digital Service Provider will face restriction of access to services or de-whitelisting. The ATO is enabled by the SBR Conditions of Use to suspend or terminate any software product, report or information from accessing the SBR channel.¹⁶¹²

The ATO also maintains the product register for SBR and STP products. Products on the STP register are 'products and services are whitelisted for the Payroll Event service and meet the security requirements under the [Digital Service Provider Operational Framework](#)'.¹⁶¹³

1606 Australian Bureau of Statistics, 2020, <https://www.abs.gov.au/websitedbs/d3310114.nsf/home/ABS+Media+Statements+-+ATO-ABS+partnership+delivers+COVID-19+jobs+statistics>, viewed 5 January 2021.

1607 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/product-register>, viewed 5 January 2021.

1608 Australian Taxation Office, n.d., https://softwaredevelopers.ato.gov.au/operational_framework, viewed 5 January 2021.

1609 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/RequirementsforDigitalServiceProviders>, viewed 5 January 2021.

1610 Australian Taxation Office, n.d., https://softwaredevelopers.ato.gov.au/operational_framework, viewed 5 January 2021.

1611 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/sites/default/files/resource-attachments/DigitalServiceProviderOFRtoutiliseATOdigitalservices.docx>, viewed 5 January 2021.

1612 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/sites/default/files/resource-attachments/DigitalServiceProviderOFRtoutiliseATOdigitalservices.docx>, viewed 5 January 2021.

1613 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/stpregisters>, viewed 6 January 2021.

F.1.3 What is the role of legislation?

STP was legislated on 16 September 2016 as part of the *Budget Savings (Omnibus) Act 2016* (Cth).¹⁶¹⁴ This Act included amendments to be made to the *Tax Administration Act 1953* (TAA), and specified that information must be reported under STP in the approved form.¹⁶¹⁵

Single Touch Payroll reporting is established under the TAA 1953.¹⁶¹⁶ The Legislative Instrument Single Touch Payroll – Determination of Amounts to be Notified¹⁶¹⁷ specifies further information which must be provided in addition to that required under the TAA.¹⁶¹⁸

The specifications published in the Standard Business Reporting Australian Taxation Office Payroll Event package (the Package) describe the information which is required to be notified in the approved form.¹⁶¹⁹

Employers must report the information specified in the legislation¹⁶²⁰ and must supply this information in an approved form.¹⁶²¹

In terms of data sharing, no additional changes were required to enable the ATO to on-disclose STP information. This is because the same confidentiality provisions that apply to other information collected by the ATO also apply to STP.

F.1.4 What is the role of standards and guidelines?

For STP reporting, the Digital Service Providers do not have obligations under the TAA to supply information to the ATO because these obligations fall on employers. The standards which Digital Service Providers must use in developing STP software are called ‘the technical service design artefacts’.¹⁶²²

Compliance with the standards is mandated by reference in the TAA¹⁶²³, whereby STP data must be provided in the ‘approved form’. The form approved for mandatory ‘Single Touch Payroll’ reporting is outlined in the Payroll Event (called PAYEVNT) specifications on the SBR website.¹⁶²⁴ A protocol called ‘ATO ebMS3’ is used to exchange the web service messages using the XML format.

The Digital Service Providers make it easy for employers to comply with the approved form and reporting requirements because they are built into the STP-enabled software. Employers are however the ones that have the obligations under the Act; Digital Service Providers do not. Digital Service Providers do however have contractual obligations with businesses to provide a specific service (STP services).

F.1.5 What is the role of industry and how is engagement facilitated?

Digital Service Providers play several crucial roles in delivering the STP and SBR initiatives:

- they develop the digital tools (software) for employers to use, thereby delivering the STP in practice
- they engage with ATO on the Digital Service Provider operational framework, which helps ensure that framework is fit-for-purpose

1614 Australian Taxation Office, n.d., https://www.ato.gov.au/business/single-touch-payroll/in-detail/single-touch-payroll-employer-reporting-guidelines/?anchor=BK_1AboutSingleTouchPayroll#BK_1AboutSingleTouchPayroll, viewed 6 January 2021.

1615 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/RequirementsforDigitalServiceProviders>, viewed 25 February 2021.

1616 *Taxation Administration Act 1953* (Cth), Division 389 of Schedule 1.

1617 Determination under subsection 389-5(3) of Schedule 1 to the *Taxation Administration Act 1953* (Cth).

1618 Information additional to that required under 389-5(1) of the *Taxation Administration Act 1953* (Cth).

1619 Under sections 389-5 and 389-15 of Schedule 1 to the *Taxation Administration Act 1953* (Cth).

1620 That is information under 389-5(1) of *Taxation Administration Act 1953*.

1621 *Taxation Administration Act 1953*, s. 389-5(2).

1622 Australian Taxation Office, n.d., <https://softwaredevelopers.ato.gov.au/STP>, viewed 6 January 2021.

1623 *Taxation Administration Act 1953* (Cth), s. 389-5.

1624 Australian Taxation Office, n.d., <https://www.sbr.gov.au/digital-service-providers/developer-tools/australian-taxation-office-ato/employer-obligations-eo?anchor=PayrollEvent>, viewed 6 January 2021.

- they engage with businesses to develop software that meets business reporting needs as well as STP needs.

The ATO developed a Digital Service Provider Engagement Model to establish a consistent approach to Digital Service Provider engagement, and includes strategic, operational, tactical and informative levels of consultation.¹⁶²⁵ Digital Service Providers Architecture Reference Group (DARG) forms part of the strategic engagement in the ATO's Digital Service Provider engagement model¹⁶²⁶, and there are other groups which consult on the Digital Service Provider Operational Framework in an ongoing manner.¹⁶²⁷

The ATO then conducted specific STP consultation with Digital Service Providers, which enabled the co-design and collaboration to develop and deliver STP. While employers must report through STP, the Digital Service Providers must make compatible and enabled software available to employers to use. Therefore, the ATO conducted extensive consultation with Digital Service Providers to develop the Digital Service Provider Operational Framework (general SBR) and then the STP software requirements. As Digital Service Providers were required to develop, seek authorisation and accreditation, and then rollout STP enabled software, extensive consultation was required to develop the technical service design artefacts. The consultation process included working groups, advisory groups and forums, including (but not limited to):¹⁶²⁸

- Single Touch Payroll document navigation focus group¹⁶²⁹
- Single Touch Payroll advisory group (STPAG)¹⁶³⁰
- Single Touch Payment Industry Engagement Forum.

In the initial consultation round, Digital Service Providers noted that they considered varied product types would be necessary to cater to small through to large businesses.¹⁶³¹

There are also procedures in place to deal with matters that cannot be resolved, for example, when a technical matter cannot be resolved under direction from ATO technical lead, the role of the STPAG is to provide advice and recommendations to the STP project collaboration forums. Where the technical matter is broader than STP, the matter can be referred to DARG for advice.

F.1.6 Lessons learned

STP and SBR more broadly demonstrate the potential to reduce regulatory burden and compliance costs for industry through the use of Regulatory Technology ('RegTech'), and using digital solutions that are built into business software and essentially store information for regulatory purposes in the course of standard business operations (i.e. automated information collection). This means that data collection remains the same, but reporting is standardised. The SBR approach also aligns itself with the relevant international (ISO) standards where possible.

This is particularly relevant in the water space where the ACCC has identified that significant information is generated but the data capture, storage and sharing is not harnessing the full potential of the data. Currently there is also considerable double entry of information, whereby information manually recorded on a form is then also resubmitted on another form.

There are also considerable concerns about who will bear the cost of increased regulation, and there is a need to identify ways in which current information can be better harnessed rather than creating more reporting obligations and increasing compliance costs.

1625 Australian Taxation Office, *Digital Service Provider Engagement Model*, n.d., https://softwaredevelopers.ato.gov.au/sites/default/files/resource-attachments/ATO_Digital_Service_Provider_engagement_model_v1.0.pdf, 2018, viewed 15 December 2020.

1626 Australian Taxation Office, *Digital Service Provider Engagement Model*, n.d., https://softwaredevelopers.ato.gov.au/sites/default/files/resource-attachments/ATO_Digital_Service_Provider_engagement_model_v1.0.pdf, 2018, viewed 15 December 2020.

1627 Australian Taxation Office, 2020, <https://softwaredevelopers.ato.gov.au/opfreviewwg>, viewed 3 February 2021.

1628 Australian Taxation Office, 2020, <https://softwaredevelopers.ato.gov.au/STPConsultation>, viewed 15 December 2020.

1629 Australian Taxation Office, 2018, <https://softwaredevelopers.ato.gov.au/STPTCFGdocnavigation>, viewed 15 December 2020.

1630 Australian Taxation Office, 2021, <https://softwaredevelopers.ato.gov.au/STPAdvisoryGroup>, 6 January 2021.

1631 Australian Taxation Office, *Regulatory Impact Statement Single Touch Payroll*, October 2015.

The use of mandating standards by reference to an 'approved form' in the legislation is also of particular relevance to the ACCC's recommendation regarding the implementation of a Digital Messaging Protocol for water trading (recommendation 10). This could work effectively for water trade also by allowing for the technical requirements to be outside of the legislation, but the mandate to be within.

The STP program undertook significant consultation with industry in order to develop the framework for the Digital Service Providers, and has taken a staged implementation approach. These learnings can be applied in the water space, where any major RegTech change, such as the proposed Digital Messaging Protocol, will require not only the mandate but also industry and Basin State buy-in and consultation.

The multiple opportunities to leverage the data collected and shared through STP also demonstrates the benefits that the proposed Digital Messaging Protocol and near real-time data could provide in water markets.

F.2 E-conveyancing – developing interoperability

F.2.1 Background – what was the challenge?

In Australia, conveyancing is managed by the states and territories. In recent years, there has been a shift to electronic conveyancing (e-conveyancing), although some states have not yet implemented this.¹⁶³² Five states have mandated the use of electronic conveyancing, such as NSW in July 2019, SA in August 2020.¹⁶³³

In order to operate, an Electronic Lodgment Network Operator (ELNO) must apply to the Registrar in the jurisdiction they wish to operate and meet the Australian Registrars' National Electronic Conveyancing Council's (ARNECC) Model Operating Requirements (MOR) – which also requires an ELNO to satisfy requirements for licencing and approvals with other agencies such as ASIC.¹⁶³⁴ To date, the only two ELNOs who have gained approval are PEXA, and more recently, Sympli.

Now that there are two players in the e-conveyancing market, the next issue which has been debated at length is how to design a market in which competition can be encouraged. The issue requires establishing the regulatory framework, risk framework and the actual market model to support competition. This also means making a decision on the technical nature of the connections between ELNOs, Electronic Lodgment Networks (ELNs) and the state registries (and other relevant entities) – and whether this should be done in a nationally standardised way, or on a state-by-state basis. This decision has not yet been made.

The mandating of electronic conveyancing has conferred significant scale and network advantages on PEXA as a first mover, and has significant implications for the ability of new entrants to compete. As the dominant incumbent, PEXA has benefited from network effects and economics of scale of its first mover advantage.¹⁶³⁵

As alternative ELNOs emerge (such as Sympli), without introducing some form of interoperability property transactions require both the buyer and seller (and their respective banks) to use the same ELNO, with the exception of some single sided transactions which do not require interoperability to be completed. Given e-Conveyancing was mandated before competition emerged, conveyancers, lawyers and banks have already signed up to PEXA, and as such it would be difficult for someone to only sign up for a competitor ELNO. Without interoperability, all parties to a transaction need to subscribe to the same ELNO so parties subscribing to a competitor ELNO would mostly likely also need to sign up to PEXA to complete transactions. Interoperability could also develop as different models in each state.¹⁶³⁶

¹⁶³² Tasmania and Northern Territory have not yet rolled out e-conveyancing.

¹⁶³³ See: <https://www.nswlrs.com.au/eConveyancing>, while the ACT has enacted e-conveyancing, it will not mandate the use of it and still allows for paper forms.

¹⁶³⁴ ARNECC, n.d., https://www.arnecc.gov.au/publications/model_operating_requirements, viewed 20 January 2021.

¹⁶³⁵ ACCC, *ACCC report on e-conveyancing*, 2019, p. 4.

¹⁶³⁶ *ibid.*

Interoperability in respect to e-Conveyancing means a user (conveyancer, lawyer, or financial institution) is able to be a subscriber to one ELNO and transact with a user of another ELNO, without having to subscribe to both (for example, buyer's conveyancer using PEXA, seller's conveyancer using Sympli).

In December 2019, the ACCC Chair Rod Sims wrote to the Chair of the Australian Registrars' National Electronic Conveyancing Council (ARNECC) and the heads of the state based policy agency outlining the ACCC's concerns regarding the structure of the developing e-Conveyance markets.

The work of ARNECC is now to consider the complete reform process, which includes the technical approach to interoperability.

F.2.2 What is the role of government and industry?

E-conveyancing generally

The e-Conveyancing market has been brought about by:

- the Intergovernmental Agreement (IGA) for an Electronic Conveyancing National Law (ECNL)
- technological advancements, and
- the technical roll out by state Land Registries and adoption in state legislation (either mandating or allowing for electronic conveyancing).

The IGA established ARNECC to facilitate the implementation and facilitate a national approach to the regulatory framework for e-Conveyancing.¹⁶³⁷ The IGA covers, for example, that ARNECC was required to develop one nationally agreed set of Operating Requirements for ELNOs.

Interoperability

Interoperability is an industry led, government supported reform process. On 7 September 2020, a Ministerial Direction was released, supporting the principle of requiring interoperability between ELNOs in the ECNL¹⁶³⁸.

Leading up to this, the key roles and outcomes in developing a solution for market structure have been:

- The ACCC played a role in advocating for a market in which robust competition can be encouraged. The ACCC did not specify the model of interoperability to achieve this, but stated this was a matter for the technical experts. While the ACCC advocated for a national approach it recognised that, given the urgency, if this cannot be achieved then individual states and territory government should progress their preferred approach so that some markets will benefit from competition.¹⁶³⁹
- In January 2020, ARNECC agreed to undertake a project to compare the costs and benefits of various different interoperability models (this project is currently on hold).¹⁶⁴⁰
- ARNECC organised a review by Dench McClean Carlson to review e-conveyancing.
- In June 2020, the NSW ORG commissioned the Centre for International Economic's report which looked at the costs and benefits of interoperability.¹⁶⁴¹
- South Australia conducted a tender process for blockchain based solutions to interoperability.
- The NSW and SA Registrars chair an Interoperability Industry Panel which reports to ARNECC.

After the Ministerial Direction, the Industry Interoperability Panel's Technical Working Group prepared a report which recommended a 'phased Enterprise Service Bus (ESB) approach' which would involve Direct Connection through a set of open Application Programming Interfaces (API) to support

1637 ARNECC, n.d., https://www.arnecc.gov.au/about_us, viewed 20 January 2021.

1638 ARNECC, n.d., https://www.arnecc.gov.au/_data/assets/pdf_file/0005/1508765/ministerial-direction-econveyancing-market-structure.pdf, viewed 20 January 2021.

1639 ACCC, *ACCC report on e-conveyancing*, 2019, p. 1.

1640 ARNECC, https://www.arnecc.gov.au/_data/assets/pdf_file/0008/1510379/position-statement-econveyancing-market-structures-sept-2020.pdf, viewed 4 February 2021.

1641 NSW Registrar General, n.d., https://www.registrargeneral.nsw.gov.au/_data/assets/pdf_file/0003/927426/Cost-Benefit-Report-Centre-for-International-Economics-Sep-20.pdf, viewed 4 February 2021.

connection between PEXA and Sympli. The approach would then move towards an Enterprise Service Bus (ESB) model which would allow connections between multiple ELNOs and the key market participants (such as land registries and revenue offices).¹⁶⁴²

The Ministerial Direction states that the interoperability platform will be based on APIs, and will be consistent with the National API Design Standards. It also noted that the ECNL will be amended to require interoperability.¹⁶⁴³

Ministers agreed in principle to working towards the following dates:

- **September to November 2020:** consult on draft regulatory approach and draft Bill for updating eConveyancing National Law to require interoperability between ELNOs.
- **November 2020:** Governments to consider updated draft Bills and provide final agreement.
- **February 2021:** introduce the Bill to NSW and once passed, amended legislation is automatically adopted in ACT, Qld and Vic.
- **From February 2021:** remaining jurisdictions submit corresponding legislation to their parliaments.
- **Mid-2021:** legislation in place.
- **Ongoing:** developing of technology and testing for interoperability with an aim of being live as soon as practicable and by no later than the end of 2021.

F.2.3 What is the role of legislation?

The ECNL specifies that ELNOs must comply with the Model Operating Requirements (MOR) made by the Registrar in each state and territory. MORs generally mirror the national template, although some states have some minor differences.

The ECNL will now also be updated with requirements for interoperability. This forms part of the first phase agreed in September, with consultation planned on the draft regulatory approach the draft Bill for updating the ECNL.

New South Wales, Queensland, South Australia and Western Australia agreed to develop the technical and regulatory regime for legislation to be in place by mid-2021, with the aim to have the solution live as soon as practicable, and by no later than the end of 2021.

A decision will be required to determine what is included in the MORs, ECNL and the interoperability agreement. This is being considered through the Industry Interoperability Panel and its working group (the Interoperability Technical Working Group, convened in early 2020), with a decision to be made by ARNECC.

F.2.4 Lessons Learned

While a Ministerial Direction has been issued, there is yet to be a decision on the model provided under this mandate by ARNECC.¹⁶⁴⁴ Some stakeholders, including the ACCC, have stressed it will be important to view the direct connection model as an interim measure. To avoid entrenching a duopoly it will be important to provide clear guidance on when and how industry will move to the ESB model. At the same time, most stakeholders (including the ACCC) recognise it is important to facilitate meaningful competition as soon as possible, especially given the lengthy delays involved with the reform process to date.

The key learning from e-conveyancing, particularly the ACCC's involvement in advocating for competition, is the importance of setting up ex-ante regulatory arrangements to enable the development of competition. Mandating services in advance of such arrangements may entrench an

1642 NSW Registrar General, n.d., <https://www.registrargeneral.nsw.gov.au/regulator/interoperability/reports-and-reviews>, viewed 4 February 2021.

1643 ARNECC, n.d., https://www.arnecc.gov.au/_data/assets/pdf_file/0005/1508765/ministerial-direction-econveyancing-market-structure.pdf, viewed 4 February 2021.

1644 ARNECC, n.d., https://www.arnecc.gov.au/_data/assets/pdf_file/0005/1527044/ministerial-direction-dec-2020.pdf, viewed 4 February 2021.

inadequately regulated monopoly and not facilitate new entrants. This lesson can be applied to the calls for a 'single exchange' or a 'single clearinghouse' for water trade, in which a monopoly would be created. If a monopoly exchange is created and digital links between the exchange and Trade Approval Authorities and Registries are established, it could then be difficult to later bring online other exchanges or establish links between competitors (such as requiring the single exchange to facilitate connections with brokers).

While the ACCC considers that the development of standards used by the Digital Messaging Protocol (at recommendation 10) should involve processes of co-design, collaboration and industry consultation, the process also needs to be mindful of differing levels of resourcing available to stakeholders and their ability to engage in such processes.

Additionally, e-conveyancing demonstrates some learnings from a multi-jurisdictional approach to develop a national standard, and the magnitude of the task in coordinating. The regulator involved in this coordination and development of a national approach must be appropriately resourced, and the ACCC has acknowledged the good work that ARNECC has achieved but that they remain somewhat hampered by funding constraints.¹⁶⁴⁵

Duplication of costs has also been an issue for parties involved in e-conveyancing, with each new entrant establishing links to registries, banks and revenue offices, while the ESB approach (similar to the Backbone Platform proposed at recommendation 11) is designed to avoid this.

F.3 Data standards and digital information systems in the Australian wool industry

F.3.1 Digital tools in the Australian wool industry

Australia's wool industry consists of a number of participants, from growers, shearers, classers, through to brokers and private treaty wool merchants, wool handlers (such as AWH), testing services, wool dumps, exporters, processors and retailers. These participants all contribute to the successful movement of wool along the path from the producer to the end consumer, and add value and provide services as wool travels through the wool 'pipeline'.¹⁶⁴⁶

The wool industry relies on a range of digital tools to ensure wool markets and related services operate efficiently and effectively, both within Australia and internationally. The key components of this digital infrastructure are described below.

Electronic Data Interchange (EDI): industry-specific data standards and digital protocol

Electronic Data Interchange (EDI) is the electronic communication of business documents in a standard digital format. In simple terms, EDI is a standard electronic format that replaces paper-based documents and forms. EDI standards define the location and order of information in a document format.¹⁶⁴⁷

The wool industry was an early adopter of EDI standards and services. Standards development began in the 1980s, with periodic updates and development over the last four decades.¹⁶⁴⁸ The standards were managed collectively by the Wool Industry EDP User Group (WIEDPUG). The Australian Wool Exchange (AWEX) assumed responsibility for EDI Network Services in 1995¹⁶⁴⁹, but has since ceased

1645 ACCC, *ACCC report on e-conveyancing*, 2019, p. 20.

1646 AWEX, *The Australian Wool Market: An introduction (for prospective participants)*, 2014, <https://www.awex.com.au/media/1425/wool-buying-in-australia-2014.pdf>, viewed 17 November 2020.

1647 IBM, *What is electronic data interchange?* n.d., <https://www.ibm.com/au-en/supply-chain/edi-electronic-data-interchange>, viewed 17 November 2020.

1648 McDonald, M., *Electronic marketing of Australian wool – introducing E-commerce to a traditional agricultural industry*, 2000, https://uop.edu.au/download/research/members/mmcdonald_paper.pdf, viewed 17 November 2020.

1649 AWEX, *AWEX Annual Report 2008*, 2008, <https://docplayer.net/157042492-Annual-report-15-years-of-service-to-the-wool-industry.html>, viewed 17 November 2020.

service provision although retaining a role in the EDI standards development.¹⁶⁵⁰ In July 2020 AWEX issued version 35.0E of the Wool Industry Data Communications Handbook. The EDI network and custom-built software. For a period of time, it was operated by a private entity, Talman, the 'largest supplier of in-house wool IT systems in the world'.¹⁶⁵¹ Following a security incident in 2020 (described in box F.1 below), the EDI network is now mostly run by the Australian Wool Testing Authority (AWTA), although Talman still provides API systems which most buyers and some brokers use.

The wool industry EDI covers a wide variety of wool industry data, including invoices and payment advices, delivery orders and shipping summaries, wool auction and private catalogues, price and buyer information, and technical specifications of wool bales.¹⁶⁵² The wool industry EDI chiefly comprises three delivery vehicles:

1. **Wool Industry EDI networks:** EDI networks are used to exchange public sale catalogues, auction sales results, post-sale invoices, wool delivery orders and test results between many different market participants. Data transmission encompasses private data flows (e.g. invoices and delivery orders) and private transmissions, whilst auction catalogues are available to all users. Nearly all wool industry participants are subscribers to this network infrastructure.
2. **Australian Wool Testing Authority test data:** receives and transmits information relating to pre- and post-sale testing requirements of wool selling brokers and buyers.
3. **Proprietary point to point transmissions using internal or Internet mediums.** This is dependent on the type of information transferred.

All three systems require users to apply or subscribe before use and are largely mailbox type systems. The EDI network is charged on a user-pays system in terms of volume of data moved. It is not mandatory to belong to the EDI network, as manual documents are supported for non-EDI users (although very few use this option).

AWEX maintains an EDI code list on behalf of the wool industry in Australia to ensure that a single unique set of codes are utilised in all wool industry EDI transmissions.¹⁶⁵³ For example, the EDI includes a *Wool Industry Organisation Code*: this provides a unique identifier assigned to each EDI user, enabling clear identification of each participant and their activity. The master file of Organisation Codes is maintained by AWEX as a publicly available database. To register for a wool industry code an organisation must have a registered ABN and the organisation name registered is required to be either the registered entity name or a trading name for the ABN.

Changes to the EDI standard are administered via the WIEDPUG. WIEDPUG began as a technical forum for the development and implementation of data and document standards for electronic communication of wool industry data through the Industry EDI Networks, and has since expanded to have a policy role. It progresses its recommendations by consensus, relying upon the merit of proposals and the perceptible benefits flowing from essential standardisation. Changes to data exchange standards are considered on referral from recognised industry organisations.¹⁶⁵⁴

1650 AWEX, *AWEX Annual Report 2013*, 2013, https://www.awex.com.au/media/1226/awx-106-ar-2013_art_digital.pdf, viewed 17 November 2020.

1651 Talman, *Who we are?*, n.d., <https://www.talman.com.au/>, viewed 17 November 2020.

1652 AWEX, 2020, <https://www.awex.com.au/media/1977/widch-version-350e.pdf>, viewed 17 November 2020. At present formats exist for the following kinds of data: a) Invoices, Weight-Notes & Test Certificates for Auction and Private Treaty sales; b) Delivery Orders and Shipping Instructions, and Delivery Summaries; c) Auction Catalogues, Auction Catalogue Updates and Private Catalogues; d) Requests for the post-sale printing of pre-sale test certificates; e) Account statements; f) Requests for the production of test certificates; g) Names, addresses, telephone numbers, etc. of wool industry organisations; h) The selling price and buyer of each lot offered at auction; i) Test Certificates; j) Verification of requests for pre-sale tests; k) Wool tax register details and WIN number replies; l) Payment Advices; m) General text document; n) Dark & Medullated Fibre Risk Verification; o) Test Status

1653 AWEX, *EDI Request form*, n.d., <https://gateway.awex.com.au/Webpages/GeneralEDIRequest.aspx>, viewed 17 November 2021.

1654 AXEW, *Wool Industry EDP User Group*, n.d., <https://www.awex.com.au/standards/wool-industry-edp-user-group/>, viewed 17 November 2021.

Box F.1: The Talman cybersecurity incident

The final report of Australian Wool Innovation's Wool Selling Systems Review in 2016 had noted the potential issues with the concentration of wool industry IT systems, concluding that 'reliance on a single provider for such an important piece of infrastructure leaves the industry vulnerable and it should take steps to manage this risk. One of the objectives which should be made explicit in the development of the WEP [Wool Exchange Portal]...should be to ensure effective interfacing with existing systems such as Talman and other IT platforms.'¹⁶⁵⁵

In February 2020, this concern became a reality, when a malicious cyberattack caused all Talman systems, including the EDI network, to be offline for around 1 week, resulting in wool auctions also being suspended.¹⁶⁵⁶

Industry commentators described the incident as a 'wake-up call', and called for an 'autopsy' of the incident to find out what happened and to make plans for a network which was much less susceptible to hacking.¹⁶⁵⁷

A significant outcome of this incident is that AWTA now largely administer the EDI network, since it had an EDI system which it was able to get up and running relatively quickly as a replacement for the Talman software.

WoolQ digital information portal

In October 2014, the wool industry peak body Australian Wool Innovation (AWI) commissioned an independent review of the wool selling system (WSSR). The purpose of the review was 'to determine whether greater efficiencies, increased competitive tension and improved transparency could be delivered in the journey of wool from the shearing shed to the ship's rail for export...The major recommendation of the Review was the concept of a Wool Exchange Portal (WEP), an online tool that could address the major issues identified in the WSSR as well as respond to the original key objectives of the review.'¹⁶⁵⁸ WoolQ is the online platform that delivers this recommendation. According to AWI, 'WoolQ is an online platform that aims to allow woolgrowers and industry participants to easily harness digital efficiencies across the wool-growing and selling cycle. Its goal is to facilitate digital communication and exchange to leverage new opportunities.'¹⁶⁵⁹ Table F.1 provides an overview of the WoolQ Market platform components.

In 2019–20, AWI spent \$0.7 million on developing and operating WoolQ, just under 1% of its annual budget.¹⁶⁶⁰

Brokers and buyers registering to use the WoolQ market must provide a valid EDI code (i.e. unique identifier). WoolQ data is transmitted between participants using the EDI network and standard messaging formats.¹⁶⁶¹

¹⁶⁵⁵ Australian Wool Innovation Limited, *Wool Selling Systems Review*, 2016, p. 8.

¹⁶⁵⁶ Sim, T., 'Cyber attack threatens Australian wool sales and shipments', *Sheep Central*, 25 February 2020, <https://www.sheepcentral.com/cyber-attack-threatens-australian-wool-sales-and-shipments/>, viewed 8 December 2020.

¹⁶⁵⁷ Graham, V., 'Wool sale shutdown a disaster waiting to happen', *FarmOnline*, 4 March 2020, <https://www.farmonline.com.au/story/6661066/wool-sale-shutdown-a-gigantic-wake-up-call/>, viewed 17 November 2020.

¹⁶⁵⁸ AWI, *About WoolQ*, n.d., <https://www.woolq.com/about/>, viewed 17 November 2020.

¹⁶⁵⁹ AWI, *WoolQ Market Operating Procedures*, n.d., https://www.woolq.com/globalassets/woolq-market/gd3427-woolq-market-operations-procedures_v5.pdf, viewed 17 November 2020.

¹⁶⁶⁰ AWI, *Annual Report, 2019-20*, 2020, <https://www.wool.com/globalassets/wool/about-awi/how-we-consult/annual-reports/2019-20-annual-report.pdf>, viewed 7 December 2020.

¹⁶⁶¹ AWI, *WoolQ Market Operating Procedures*, n.d., https://www.woolq.com/globalassets/woolq-market/gd3427-woolq-market-operations-procedures_v5.pdf, viewed 17 November 2020.

Table F.1: WoolQ Market platform components

Component	Description	Accessibility
Market Dashboard	Displays upcoming Auction Catalogues and an interactive graph of WoolQ Market wool sale prices (for 19 and 21 microns) across a time horizon	Registered WoolQ Market Users
Market Auction	Platform where users go to view or transact within the WoolQ Market live auction; also provides historical auction results (including bales sold and passed in)	Registered WoolQ Users
Market Bulletin Board	An offer board of buying and selling interest which is accessible 24/7 (not yet fully operational)	Registered WoolQ Users
Market Order Book	Enables buyers to review the status of all lots sold on WoolQ Market, and provides buyers with useful averages across wool parameters	Registered WoolQ Market Users
Market Admin	A console is where the WoolQ Market administrator manages disputes; schedules and manages upcoming WoolQ Market Auctions; manages WoolQ Market registrations; and performs necessary reporting functions	WoolQ Market Administrator(s)

Source: WoolQ

E-speci

The wool industry relies on wool data being captured accurately when wool is shorn, and transmitted alongside the wool bales all the way through the wool distribution 'pipeline'. Historically, key wool data has been captured on paper forms called the wool classer specifications (known in the industry as 'specis') together with the National Wool Declaration (NWD). The classer's speci and the NWD are on the same form.

As with any paper-based system, paper-based specis and NWDs introduce opportunities for error and also need to be physically transferred (or a copy transmitted electronically). E-specis are a recent innovation to replace paper-based forms with digital forms that are automatically saved and transmitted or made accessible to the different parties who need the data. According to developers, e-specis assist the wool industry by providing 'intuitive workflow[s] designed to reduce workload and errors', and allowing for more seamless digital transmission of information. Several different e-species have been developed, although overall take-up has been low to date as a proportion of the total wool clip:

- WoolClip™ is a free, online internet and smartphone app leveraging Microsoft Azure technology¹⁶⁶², released in 2017–18. It allows the user to create wool Specifications and National Wool Declarations. WoolClip™ has been developed by AWEX, and according to AWEX's CEO, more than 67,000 bales have been created on WoolClip™ in the 2019–20 season, and had increased further in the first part of the 2020–21 season.¹⁶⁶³ Modules within WoolClip™ include Farm Accounts, Job Details, Sheep Mob information, National Wool Declarations, Wool Book bales, Wool Specifications and Consignments. Data entered and developed by the user is subsequently released to user nominated marketing organisation and warehouse.¹⁶⁶⁴ The cost to date to develop the WoolClip app is estimated at around \$0.6–0.8 million, of which, the bulk was spent in 2018.¹⁶⁶⁵
- WoolQ™ eSpeci is another online app which provides similar functionality. Launched in 2015, it has been developed by AWI as part of the WoolQ information platform. According to AWI, the WoolQ™ eSpeci also digitises the 'Wool Book' and allows for 'virtual' collaboration between growers, classers, farm managers and brokers.¹⁶⁶⁶

¹⁶⁶² Microsoft, *Australian Wool Exchange transforms shearing sheds*, 2019, <https://news.microsoft.com/en-au/features/australian-wool-exchange-transforms-shearing-sheds/>, viewed 7 December 2020.

¹⁶⁶³ AWEX, *AGM 2020 – Outcomes*, 27 November 2020.

¹⁶⁶⁴ AWEX, *AWEX WoolClip Training*, 2019, https://play.google.com/store/apps/details?id=com.training.woolclip&hl=es_US, viewed 7 December 2020.

¹⁶⁶⁵ AWEX, *Annual Reports*, 2018, 2019, 2020, viewed 7 December 2020.

¹⁶⁶⁶ AWI, *WoolQ™ FAQs*, n.d., <https://www.woolq.com/about/faqs/>, viewed 7 December 2020.

F.3.2 What is the role of government?

Digital tools developed for the wool industry are predominantly industry-led and managed, with relatively smaller and indirect roles for government:

- Oversight role: AWI is responsible to the Australian Government; for example, the Senate Estimates process has been used to probe expenditure and progress on the WoolQ platform's development.
- Funding role: AWI grower levies are matched by finance from the Australian Government.¹⁶⁶⁷

F.3.3 What is the role of industry?

Wool industry participants – particularly key industry bodies such as AWEX, AWI, AWTA, Australian Wool Handlers (AWH), the National Council of Wool Selling Brokers of Australia (NCWSBA) and the Australian Council of Wool Exporters and Processors (ACWEP) – play the central role in developing digital tools and fostering adoption by individual wool industry participants.

F.3.4 What is the role of standards and guidelines?

The EDI standards form a central digital backbone which underpins both wool trading directly, wool testing certificates issued by AWTA, and other digital tools. It also facilitates traceability of wool in the event of an EAD outbreak, such as Foot & Mouth Disease

Digital tools, particularly the e-Specis, also make use of other standards and guidelines developed by and for the industry, such as:

- National Wool Declarations: a standardised declaration method for recording details about animal welfare practices (i.e. Mulesing Status), the Dark and Medullated Fibre Risk (DMFR) and chemical residues information¹⁶⁶⁸
- Code of Practice for the Classing of Wool (AWEX)
- 1PP certificates: certificates issued to a select group of superfine wools annually that exhibit superlative quality, style and soundness and are prepared in the best possible manner.
- AWEX-ID: a standardised system for the appraisal and description of non-measured characteristics of greasy wool.¹⁶⁶⁹

Together, these standards provide a consistent framework for recording and transmitting wool industry data and identifying industry participants. This increases transparency for market participants, reduces transactions costs and underpins confidence in wool trading and related services.

Standards development, review and versioning is an iterative process led by industry peak bodies, with expert guidance from advisory committees such as the Industry Services Advisory Committee, which provides advice to AWEX on a range of technical matters, and the WIEDPUG technical forum (see above).

F.3.5 Lessons learned

Data standards can work in a voluntary context given the right conditions

Use of the EDI data standards and software is ubiquitous within the wool industry, even without their use being mandated via legislation or regulation. This has been developed for and driven by commercial imperatives. This shows that industry participants see value in the standardisation and ease-of-transacting that the EDI system brings.

¹⁶⁶⁷ Department of Agriculture, Water and the Environment, n.d., <https://www.agriculture.gov.au/ag-farm-food/meat-wool-dairy/wool>, viewed 7 December 2020.

¹⁶⁶⁸ AWEX, *National Wool Declaration (NWD)*, n.d., <https://www.awex.com.au/publication/national-wool-declaration-nwd/>, viewed 7 December 2020.

¹⁶⁶⁹ AWEX, *1PP Certification*, n.d., <https://www.awex.com.au/standards/1pp-certification/>, viewed 7 December 2020.

One aspect driving industry to participate is that almost all Australian wool is sold from Australian wool growers to international mills, generally via an intermediary such as wool brokers (who act as an agent for growers) and Australian-based wool buyers and exporters. This means that the wool supply chain is geographically diverse, but also more linear than in water markets, where irrigators (as well as other market participants) could enter on the supply side, demand side, or both. In the wool industry, there is a higher cost in using non-digital approaches (i.e. paper documentation) to facilitate transactions, both in terms of transmitting and verifying information, than would be the case for a market that is less geographically dispersed.

There is also little incentive for certain participants to not participate out of an intent to maintain a small, localised market. In contrast, in water markets, some market participants who are opposed to the geographical movement of water (e.g. out of an irrigation district or trading zone) may have incentive to opt out of reforms which encourage standardisation and lowering of transactions costs of trade. This means that, while there may be significant support for introducing data standards for water markets, a mandatory approach may be warranted to ensure that reforms have the appropriate coverage. However, not every aspect necessarily needs to be mandated – for example, there could be a high level mandatory requirement of participation, but the exact requirements for data provision (e.g. format, periodicity) could be specified in industry standards and/or guidelines.

Digital tools can build on each other, underpinned by high quality, industry-accepted standards

This case study shows that it is not necessary to have a single digital technology to deliver all aspects of the digitalisation of trade services. It is possible to have an integrated ecosystem of technologies; however, in this approach, underlying data standards are crucial to ensure seamless interoperability between different technologies in the ecosystem.

The key learnings for the water context are that these underlying data standards should be developed first, and that interoperability and seamless interfacing between different digital tools should be a key design criterion for those tools. Ad hoc initiatives currently being developed in the water sector are being developed in isolation from each other, and are unlikely to deliver this integrated outcome.

Reliance on single industry-wide digital tools can create additional risks that need to be well-managed

Core digital technologies in the wool industry were subject to a serious cyberattack in 2020. The incident showed that the technology provider was unprepared and had insufficiently robust security protections and risk management strategies, and as a consequence was slower than expected to respond to the incident.

The lesson learned for the water sector is that if water trade is going to move towards adopting industry-wide custom-built software (in line with ACCC recommendations), there will need to be a focus on building in security protections and risk management strategies from the outset. Examples of strategies that could be taken to help ensure secure and resilient technologies is to use distributed approaches or cloud-based services to make systems more robust; and to plan in advance for potential security incidents or other robustness threats.

F.4 National Livestock Identification Scheme

F.4.1 Australia's National Livestock Identification System

The National Livestock Identification System (NLIS) is Australia's system for the identification and traceability of cattle, sheep and goats. Formed out of early systems for recording livestock movements as far back as the 1960s, the NLIS now combines a range of digital and non-digital tools to deliver a national system for 'whole of life' tracking and tracing Australian livestock. The key components of this system are:

- Livestock identifiers: All livestock are identified by a visual or electronic eartag/device.

- Location identifiers: All physical locations are identified by means of a Property Identification Code (PIC).
- Transaction records: All livestock location data and movements are recorded in a central database.¹⁶⁷⁰
- Enforcement to ensure compliance.¹⁶⁷¹

The NLIS was introduced in 1999 to enhance Australia's ability to trace cattle during disease and food safety incidents, and was expanded to also include sheep and goats in 2009.¹⁶⁷² The key motivation of the NLIS is food safety and biosecurity. According to a 2019 impact assessment for the period of 2015 to 2020, livestock traceability and food safety systems generated an economic benefit of \$316.7 million, by avoiding disease costs and attracting export market premiums.¹⁶⁷³ A significant ancillary benefit of the system is that the data generated can be combined with data from other sources to provide a range of analysis for industry participants, and to support marketing initiatives. The industry is currently engaged in several initiatives to make better use of this data (see below).

F.4.2 What is the role of government?

The key roles of government in the NLIS system are:

- to set the policy agenda and strategic direction for red meat integrity systems
- to participate in standards development
- to ensure standards are mandatory by embedding them in legislation
- to provide funding (in addition to industry levies and fee revenues).

Policymaking for the NLIS occurs through Safemeat – an industry-government partnership responsible for meat safety. The Safemeat Secretariat is located within the Department of Agriculture, Water and the Environment. State and territory legislation forms the regulatory framework for the system. The NLIS also has standards and advisory committees.¹⁶⁷⁴

F.4.3 What is the role of industry?

The NLIS is endorsed by major producer, feedlot, agent, saleyard and processor bodies.

The NLIS is currently operated by the Integrity Systems Company (ISC) a wholly-owned subsidiary of Meat & Livestock Australia (MLA). ISC delivers a suite of integrity programs for Australia's red meat sector (including NLIS), and also provides promotional and educational services. The ISC is also responsible for developing and delivering the Digital Value Chain Strategy and Livestock Data Link, two ongoing initiatives to make better use of existing and new data, including data from the NLIS central database, and to conduct research and development to ensure the best digital tools and database management systems are used to strengthen red meat integrity systems over time.¹⁶⁷⁵

1670 NLIS, *How does the NLIS work?*, n.d., <https://www.integritysystems.com.au/identification--traceability/national-livestock-identification-system/>, viewed 19 November 2020.

1671 Commonwealth of Australia, 2019, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

1672 Integrity Systems, *NLIS standards*, n.d., <https://www.integritysystems.com.au/identification--traceability/nlis-standards/>, viewed 19 November 2020.

1673 Commonwealth of Australia, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, 2019, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

1674 Commonwealth of Australia, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, 2019, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

1675 Integrity Systems, *About the Integrity Systems Company*, n.d., https://www.mla.com.au/globalassets/mla-corporate/meat-safety-and-traceability/documents/isc-factsheet_18_lr.pdf, viewed 19 November 2020.

ISC was created following a review of Australian red meat supply chains, in 2016. ISC has significant industry involvement, for example receiving advice and input on operational aspects from the Integrity Systems Taskforce, which has representation from all peak industry councils across the red meat supply chain.

ISC and MLA have invested approximately \$65 million into the NLIS over the 12-year period between 2006 and 2017. Over that period, the annual operating cost of the NLIS was \$5.4 million.¹⁶⁷⁶ ISC's activities are funded predominantly through red meat industry levies, with matching government research and development levy investment.¹⁶⁷⁷ Income is also received from the sale of National Vendor Declaration books and Livestock Production Assurance accreditation fees.¹⁶⁷⁸

F.4.4 What is the role of standards and guidelines?

The NLIS is underpinned by state/territory legislation, which forms the regulatory framework for the system. This state/territory legislation mandates the adherence to relevant standards:

- *Cattle traceability standards* provide a set of minimum standards for identifying livestock and recording livestock movements that, if adhered to, will ensure the traceability of cattle for disease control and food safety purposes.
- The legal obligation to record the arrival of cattle, sheep and goats, rests with the person receiving the livestock (e.g. saleyard or buyer/receiver of stock). The receiver may engage someone else to notify the database on their behalf.¹⁶⁷⁹
- *RFID standards and tag accreditation* provide a set of criteria against which new livestock tagging devices can be accredited, and designates NLIS Ltd. as the accreditor.

The NLIS system also conforms to international standards for quality management systems, being ISO9001 certified.¹⁶⁸⁰

F.4.5 Lessons learned

Centralisation of record-keeping has been a critical step for the NLIS, and was feasible in part because of limited state-level roles

The NLIS provides an example of a multi-party system where many actors report transactions (livestock movements) to a central record (the NLIS database), in order to provide a comprehensive, 'single point of truth' for livestock traceability. The central database is administered by a purpose-built, independent entity, the ISC.

When NLIS was being introduced, there was considerable discussion among industry participants about the merits of a central database versus more decentralised approaches. Prior to centralisation of record-keeping into the central database, states and territories maintained their own databases. Centralisation was feasible in part because – unlike for water trade – states and territories do not have a role in improving transactions (in this case, livestock movements), and there is no centralisation of livestock management at the state/territory level. This meant that there was no strong driver to keep record-keeping at the state level; in fact, there were considerable benefits from adopting the more

1676 Commonwealth of Australia, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, 2019, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

1677 Commonwealth of Australia, *Feasibility of a national horse traceability register for all horses: Chapter 2 – Animal Traceability in Australia*, 2019, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/NationalHorseRegister46/Report/section?id=committees%2Freportsen%2F024292%2F27428#footnote62target, viewed 12 October 2020.

1678 Integrity Systems, *About the Integrity Systems Company*, n.d., https://www.mla.com.au/globalassets/mla-corporate/meat-safety-and-traceability/documents/isc-factsheet_18_lr.pdf, viewed 19 November 2020.

1679 Agriculture Victoria, *NLIS (Sheep and Goats) and property-to-property transfers*, n.d., <https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/spring-2018/nlis-sheep-and-goats-and-property-to-property-transfers>, viewed 19 November 2020; ISC, *National Livestock Identification System: about NLIS*, n.d., <https://www.integritysystems.com.au/help/faqs/>, viewed 19 November 2020.

1680 National Livestock Identification System, *NLIS Information*, n.d., <https://www.nlis.com.au/NLIS-Information>, viewed 19 November 2020.

centralised approach, particularly given that livestock regularly crosses state borders, and the need to ensure a nationally-consistent approach to biosecurity risk management.

In contrast, water resources need to be managed at the trading zone, water source and Basin levels, and all trades need to be approved by the relevant approval authorities. This entails a much more active role for Basin State governments, and also for irrigation infrastructure operators. Also, given interstate trade currently forms only a very small proportion of water allocation trade, and a minute proportion of water access entitlement trade, the expected benefits from centralising records management and trade administration in the water context are likely to be lower than for the NLIS context. This suggests that while there may be benefits from centralising water market information and data, there is less of a strong driver to centralise the actual records management functions in the water context.

Staged implementation and differing requirements have caused complexities and confusion

The NLIS has differing requirements for different animal types, and across jurisdictions. Further, introduction of NLIS requirements has used a staged approach, across animal types, jurisdictions, and participants. As detailed in box F.2 below, this makes it harder for participants to understand their reporting obligations and to achieve compliance. The lesson learned from this experience is that a consistent approach should be pursued as the 'first-best' approach, with deviations from this being carefully considered. Applying this lesson to water markets suggests that requirements for collecting, storing, and transmitting water market information should be as consistent as possible across jurisdictions, types of trades, and water market participants.

Mandating requirements in legislation is a necessary but not sufficient component of the NLIS

The Integrity Systems Company, which operates the NLIS, identified that mandating requirements via legislation is 'not enough of a reason for participants to comply'; participants 'need a compelling reason to comply', and 'value propositions need to be established across all participant segments to encourage end-to-end compliance' (see box F.2).

This experience highlights the need to ensure obligations provide clear benefits to data providers (in the water context, trade service providers), as well as the sector more generally.

Box F.2: Administering the NLIS: challenges and learnings

In a recent submission to a Senate Inquiry considering the feasibility of a National Horse Traceability Register for all horses, ISC provided an overview of its experience in the development and implementation of national livestock traceability systems. Several of the points raised are highly relevant to consideration of introducing data standards and digital tools for water trade:

- *Staged implementation* of NLIS requirement led to ‘complexity in communicating requirements, to both participants and customers’. ISC recommended that ‘where possible, agree on a national timetable for implementation [and] minimise the lag for implementation across [different areas]’.
- *Different requirements* (in the case of NLIS, across animal species), created confusion and inconsistent rules. ISC recommended a ‘consistent national approach’ to requirements to avoid such outcomes.
- *Defining the role of industry vs government in compliance and enforcement*: ISC identified this as a challenge, noting also that there has been a ‘reduction in resources to support compliance and enforcement over time’, and that ‘penalties for breaches [are] seen as not significant enough to discourage non-compliance’. ISC recommended that ‘compliance and enforcement activities need to be well resourced to be impactful’, and that ‘both industry and government should play a role in supporting compliance.’
- *Technology adoption*: ISC noted that ‘while the NLIS is based on technology, it also caters for those unwilling/unable to engage with or adopt technology, creating complexity in system design and implementation’. Further difficulties in ‘smoothly integrat[ing] technology with other software or hardware systems negatively impacts adoption’. ISC recommended ‘agree[ing] on the minimum technology requirements and deliver that technology in the most simple and cost-effective way’, and that ‘technology needs to present a value proposition beyond compliance in order to drive broad-based adoption’.
- *Resources allocated for communication and education* were primarily for initial implementation, and were eroded over time as the system shifted from implementation to ‘business as usual’. ISC recommended that ‘on-going and sustained investment in communication/education must be factored into the system design’, and that ‘compliance cannot be achieved without on-going communication and education’. ISC flagged the need to ‘ensure there are regular “touch-points” with participants to remind them of the “what” and the “why”.’
- *Value proposition*: ISC highlighted that mandating requirements via legislation is ‘not enough of a reason for participants to comply’; participants ‘need a compelling reason to comply’, and ‘value propositions need to be established across all participant segments to encourage end-to-end compliance’.
- *Funding*: ISC noted that ‘funding has eroded over time as industry and government priorities have shifted’, and that there has been an ‘inability to establish a secure, longer-term funding stream for the system. ISC recommended that funding commitments be established upfront, and ‘sustained at a level that supports compliance objectives and continuous improvement’.

Source: ISC, *Submission to Senate Inquiry into the feasibility of a National Horse Traceability Register for all Horses*, 2019, <https://www.aph.gov.au/DocumentStore.ashx?id=e111eb50-fcb9-4baa-83cf-139a7ffde86f&subId=669772>, viewed 19 November 2020.

F.5 Data sharing protocols to manage Australia’s biosecurity

F.5.1 Background

Biosecurity is ‘the management of risks to the economy, the environment and the community, of pests and diseases entering, emerging, establishing or spreading’¹⁶⁸¹ and the ‘goal of the national biosecurity

1681 Council of Australian Governments, *Intergovernmental Agreement on Biosecurity*, 2019.

system is to minimise adverse impacts of pests and diseases on Australia's economy, environment and the community while facilitating trade and the movement of plants, animals, people and products'.¹⁶⁸²

While there exists both federal (namely the *Biosecurity Act 2015* (Cth)) and state legislation to manage biosecurity in Australia, a key mechanism to ensure a consistent and holistic approach to managing biosecurity is the Intergovernmental Agreement on Biosecurity (IGAB)).¹⁶⁸³ This case study examines how the IGAB has facilitated the creation and use of data sharing protocols and digital platforms to underpin a shared approach to managing biosecurity risks facing Australia.

Point 6 of IGAB preliminaries sets out the nature of shared responsibility:

Parties recognise that biosecurity is a responsibility shared by all Australians and that cooperation, investment and action with industry and the community are essential for a strong national biosecurity system. Governments' agreements and arrangements with industry and the community are separate but related to this Agreement.¹⁶⁸⁴

The IGAB (now on its second iteration called IGAB2, see box F.3) is an important part of Australia's biosecurity architecture and has a crucial role in strengthening the biosecurity by enhancing national collaboration among Australian governments, and supporting the biosecurity system to meet current and future challenges.¹⁶⁸⁵

The IGAB2 sets out the components of the national biosecurity system, which includes 'a national information and intelligence system'.¹⁶⁸⁶ The National Biosecurity Committee (NBC) was formally established under the Intergovernmental Agreement on Biosecurity (IGAB). In 2017, NBC endorsed National Minimum Dataset Specifications for surveillance and emergency activity across each sector.

IGAB2 commits each party to 'sharing biosecurity information, data, intelligence and other knowledge necessary for the efficient functioning of the national biosecurity system with other Parties and, where appropriate, with industry and the community'.¹⁶⁸⁷

The revised IGAB (IGAB2) came into effect in January 2019, and the Commonwealth and all states and territories are signatories. The IGAB2 was developed in response to the recommendations of the 2017 review of the initial IGAB (see box F.3). In response to the review's findings, a 'stronger commitment to data and knowledge sharing has therefore been included in the revised IGAB'.¹⁶⁸⁸ Implementation of the review's recommendations have either been the responsibility of the Commonwealth Department of Agriculture, Water and the Environment (DAWE), or state governments. The recommendations are being implemented through mechanisms such as the NBC, or are the responsibility of state and territory governments (see below for details on implementation of data-related recommendations).¹⁶⁸⁹

The NBC is now focusing on priority areas that will guide implementation of the new agreement. These priority areas were agreed to by agriculture ministers on 25 October 2018, in response to the final report of the initial IGAB review.

¹⁶⁸² Council of Australian Governments, *Intergovernmental Agreement on Biosecurity*, 2019.

¹⁶⁸³ Department of Agriculture, Water and the Environment, n.d., <https://www.agriculture.gov.au/biosecurity/partnerships/nbc>, viewed 7 February 2021.

¹⁶⁸⁴ Council of Australian Governments, *Intergovernmental Agreement on Biosecurity*, 2019.

¹⁶⁸⁵ Department of Agriculture, Water and the Environment, n.d., <https://www.agriculture.gov.au/biosecurity/partnerships/nbc/intergovernmental-agreement-on-biosecurity>, viewed 7 February 2021.

¹⁶⁸⁶ Council of Australian Governments, *Intergovernmental Agreement on Biosecurity*, 2019, paragraph 23 j.

¹⁶⁸⁷ Council of Australian Governments, *Intergovernmental Agreement on Biosecurity*, 2019, paragraph 33.

¹⁶⁸⁸ Agriculture Ministers' Forum, *Priorities for Australia's biosecurity system: Response from Australian agriculture ministers to the report by the Intergovernmental Agreement on Biosecurity review*, 2018.

¹⁶⁸⁹ Parlwork, n.d., <https://parlwork.aph.gov.au/senate/questions/1869>, viewed 7 February 2021.

Box F.3: Review of initial IGAB identified the need to strengthen data arrangements

The first IGAB was signed in 2012 by all states except Tasmania. In 2015, the IGAB was reviewed by Wendy Craik, culminating in a final report *Priorities for Australia's biosecurity system* (the report) published in 2017.¹⁶⁹⁰ Agriculture ministers commissioned this review to fulfil the commitment within the initial IGAB for a review of the implementation and effectiveness of the IGAB and its schedules. The review also considered and provided recommendations on the capacity of key components of the national system to manage increasing biosecurity risk.

The review made several recommendations to be incorporated into a new IGAB, some of which include strengthening data arrangements.

The review found that data arrangements under the original IGA were not as coordinated or aligned as they could be, leading to some gaps in comprehensive data, and the report found that 'there also appears to be a tendency for the NBC to be overly risk averse in sharing biosecurity information, data and intelligence.'¹⁶⁹¹

The original IGAB was criticised by some stakeholders for not involving industry and the community in its development. The original IGAB also contained detailed schedules which proposed extensive bodies of work which could not be completed by the jurisdictions.¹⁶⁹² Under the original IGAB, the National Biosecurity Committee (NBC) played a role in reviewing and reprioritising these schedules, and the 2017 review indicated that the NBC should continue to have flexibility in this respect.¹⁶⁹³

F.5.2 Governance

The IGAB and its successor IGAB2 provide an over-arching governance mechanism to help co-ordinate federal, state and territory biosecurity efforts. These IGAs are in turn supported by several institutions with governance roles:

- The **Agriculture Senior Officials Committee** (AGSOC), provides for cross-jurisdictional coordination to matters of national interest, and has a number of sub-committees which include specific ones for biosecurity. The AGSOC comprises all department heads and CEOs of agencies responsible for primary industries policy issues, and is chaired by the Secretary of DAWE.
- The **National Biosecurity Committee** (NBC), established by the IGAB itself, provides advice to the Agriculture Senior Officials Committee on national biosecurity, and on progress in implementing the Intergovernmental Agreement on Biosecurity. It is also responsible for managing a national, strategic approach to biosecurity threats relating to plant and animal pests and diseases, marine pests and aquatics, and the impact of these on agricultural production, the environment, community well-being and social amenity. The NBC is supported by four sectoral committees¹⁶⁹⁴ and a communications and engagement network. These provide policy, technical and scientific advice on matters affecting their sector, covering all pests and disease risks to the terrestrial and aquatic (inland water and marine) animals and plants, and the environment.¹⁶⁹⁵
- The **National Biosecurity Information Governance Expert Group** (NBIGEG) was established by the NBC to guide improved cooperation between the Commonwealth, state and territory governments,

1690 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017.

1691 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017, p. 94.

1692 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017.

1693 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017, p. 149.

1694 These are: the Animal Health Committee; the Plant Health Committee; the Marine Pest Sectoral Committee; and the Environment and Invasives Committee.

1695 Department of Agriculture, Water and the Environment, *National Biosecurity Committee*, n.d., <https://www.agriculture.gov.au/biosecurity/partnerships/nbc>, viewed 12 January 2021.

with industry, in the collection, collation, analysis, storage and sharing of biosecurity information, in order to improve decision making and enhance operational efficiency.

- The **Inspector-General for Biosecurity**, who is independent from DAWE and makes recommendations for overall system improvements.¹⁶⁹⁶

F.5.3 Data sharing protocols, platforms and standards to support management of biosecurity risks: recent progress

All governments, through the NBC, endorsed the National Minimum Dataset Specifications for surveillance and emergency activities and these are now being implemented. The National Minimum Dataset Specifications provide specific instructions about how each field is to be filled in for different scenarios and surveillance types, which will ensure consistency for surveillance protocols.¹⁶⁹⁷ To facilitate the use of these standards the Department of Agriculture and Water Resources is developing a metadata registry that will support access..

The 2017 review recommended that data sharing be a core commitment of jurisdictions under the new IGA, and that this commitment include agreed minimum standards and specifications for datasets. The Agriculture Senior Officials Committee (AGSOC) signed the data sharing protocol arrangement in 2018.

The 2017 review made four data-related recommendations (recommendations 39 to 42, see box F.4), which were agreed to be implemented by the state and national ministers in their joint response to the review.¹⁶⁹⁸

Box F.4: Data sharing recommendations in the Intergovernmental Agreement on Biosecurity Review

The review of the IGAB set out 42 recommendations for strengthening Australia's national biosecurity system. Of these, four recommendations related specifically to strengthening data sharing arrangements:

- Recommendation 39: Data and knowledge sharing should be a core commitment of jurisdictions under IGAB2. Minimum standards and specifications should be agreed for datasets.
- Recommendation 40: Within the period covered by IGAB2, the Australian Government agriculture department should lead the development of a common information architecture for the national biosecurity system (including data-sharing protocols, standards and authority protocols) for all jurisdictions to share and access biosecurity data and information in the national interest.
- Recommendation 41: The Australian Government should establish, within the agriculture department, a dedicated National Biosecurity Analytics and Intelligence Centre, to centralise, coordinate and provide advice to the NBC, AGSOC and AGMIN on biosecurity intelligence covering emerging risks and pathways and international and domestic pest and disease detections.
- Recommendation 42: Jurisdictions should adopt the proposed new priority reform areas and associated work program for IGAB2 and amend the IGAB in line with proposed revisions.

Source: Craik, Palmer and Sheldrake, 2017.¹⁶⁹⁹

1696 Inspector-General of Biosecurity, n.d., <https://www.igb.gov.au/>, viewed 7 February 2021.

1697 For example: Surveillance Protocols Working Group, *Development and Approval of National Surveillance Protocols for Plant Pests*, 2019.

1698 Agriculture Ministers' Forum, *Priorities for Australia's biosecurity system: Response from Australian agriculture ministers to the report by the Intergovernmental Agreement on Biosecurity review*, 2018.

1699 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017.

In the joint response to the review, ministers noted that the NBC had already endorsed National minimum Dataset Specifications for surveillance and emergency activities.¹⁷⁰⁰

The NBC also earlier (in 2016) noted the progress made with the National Minimum Dataset Specifications, a biosecurity data and information governance framework and progress of international standards for biosecurity data.¹⁷⁰¹

Significant progress has been achieved on implementing the review's recommendations, although certain actions are not yet complete.

The data sharing protocols, recommendation 40, have been implemented.¹⁷⁰² This recommendation was the responsibility of DAWE, and in earlier documentation and again in August 2020, DAWE reported that in AGSOC signed a national data sharing protocol in 2018 to facilitate data sharing between the Australian Government and state and territory biosecurity agencies.¹⁷⁰³

Implementation of the National Biosecurity Analytics and Intelligence Centre (recommendation 41) is still in progress. Through the Agricultural Competitiveness White Paper, the Australian Government invested in developing an advanced analytics capability in biosecurity. In the joint response to the IGAB review, the ministers stated that:

We will build a secure national platform for sharing biosecurity data between government agencies and significantly advance our ability to identify passengers, imports and pathways most likely to expose Australia to exotic pests or disease.¹⁷⁰⁴

The Australian Government committed \$15.9 million to develop an advanced analytics capability for biosecurity in 2016, and then later announced funding of \$36.5 million over five years to support the development of a secure national biosecurity data platform ('Biosecurity Portal' (BSP)). The platform is being built within the DAWE, and will work to support existing data sharing with states and territories.¹⁷⁰⁵

The result of this recommendation is the online portal called the BSP, which is jointly funded by DAWE and Plant Health Australia (PHA). The BSP 'aims to strengthen Australia's biosecurity research, surveillance, diagnostic and response capability, by enabling researchers, industry and governments, to collaborate, use expertise, share data, information, and generate intelligence using leading edge tools and technologies made available through the BSP's online workspaces.'¹⁷⁰⁶ When complete, the BSP will comprise:

- a centralised repository and gateway to online biosecurity information, which includes the ability to provide differential access (e.g. restricted access sub-sites for each member industry)
- a 'self-supporting operational system', comprising hardware, software and maintenance, which can be used by researchers, industry and government.¹⁷⁰⁷

In providing a 'gateway', the BSP provides links to other relevant online resources and databases, such as the Australian Plant Pest Database.¹⁷⁰⁸ As such, the BSP does not itself aim to house all relevant information or duplicate information already provided elsewhere, but rather will provide a single access point for relevant parties, including industry, researchers and governments.

1700 Agriculture Ministers' Forum, *Priorities for Australia's biosecurity system: Response from Australian agriculture ministers to the report by the Intergovernmental Agreement on Biosecurity review*, 2018.

1701 Department of Agriculture, Water and the Environment, n.d., <https://www.agriculture.gov.au/biosecurity/partnerships/nbc/nbc-meeting21-workshop7>, viewed 7 February 2021.

1702 Parlwork, n.d., <https://parlwork.aph.gov.au/senate/questions/1869>, viewed 7 February 2021.

1703 Parlwork, n.d., <https://parlwork.aph.gov.au/senate/questions/1869>, viewed 7 February 2021.

1704 Agriculture Ministers' Forum, *Priorities for Australia's biosecurity system: Response from Australian agriculture ministers to the report by the Intergovernmental Agreement on Biosecurity review*, 2018, p. 4.

1705 *ibid.*, p. 24.

1706 Plant Health Australia, *Biosecurity portal*, n.d., <https://portal.biosecurityportal.org.au>, viewed 12 January 2021.

1707 Plant Health Australia, *Biosecurity portal*, n.d., <https://portal.biosecurityportal.org.au>, and 'Biosecurity preparedness portal', <https://portal.biosecurityportal.org.au/pages/preparednessportallanding.aspx>, viewed 12 January 2021.

1708 Plant Health Australia, *Biosecurity portal*, n.d., <https://portal.biosecurityportal.org.au>, viewed 12 January 2021.

In August 2020, DAWE reported that recommendation 41 was being implemented progressively and that a 'skilled team is progressively sourcing data, improving its quality and integrating it to support biosecurity decision making. These improvements will enhance the existing data shared with state and territory agencies.'¹⁷⁰⁹

The review also proposed three priority reform areas and associated programs of work to be delivered. Recommendation 42 outlines how these should be actioned.

One of these priority reform areas was 'knowledge management and system performance', and included relevant deliverables of:

- national collaboration on data and intelligence sharing
- agreement to common information architecture for the national system, including data sharing protocols, and data standards
- an independent comparative Report of Government Biosecurity Services (ROGBS)
- an independent IGAB Evaluation Program of jurisdictional commitments
- nationally consistent system for property identification codes (PICs).¹⁷¹⁰

The reform priority areas were agreed by Agriculture Ministers (AGSOC) in 2018, and have evolved from the reform areas proposed in the review's final report (for instance, there are now four reform priority areas).

There is still a reform deliverable of a 'national information sharing, intelligence and analytics system, to support scenario planning, risk identification and resource allocation.'¹⁷¹¹

F.5.4 Information platform and enhanced traceability

The *Biosecurity Act 2015* (Cth) contains information gathering powers, and such powers also come with restrictions to balance with privacy and security concerns.

The National Surveillance and Diagnostics Framework (the framework) has been developed by the IGAB Schedule 4 working group to provide an integrated approach to the funding and management of the activities that fall under this framework.

One other outcome in the key reform priorities was to develop 'a single national traceability framework for animal and plant products', which requires as a key deliverable, a 'nationally consistent property identification code system with agreed business rules, supported by appropriate legislation and administrative arrangements'.¹⁷¹²

Recommendation 6 of the IGAB review is also relevant to traceability:

Jurisdictions should develop a nationally consistent system for the allocation and use of property identification codes (PICs) across the animal and major plant production sector.¹⁷¹³

1709 Parlwork, n.d., <https://parlwork.aph.gov.au/senate/questions/1869>, viewed 7 February 2021.

1710 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017, p. 150.

1711 Department of Agriculture, Water and the Environment, n.d., <https://www.agriculture.gov.au/biosecurity/partnerships/nbc/intergovernmental-agreement-on-biosecurity#a-unified-strategic-framework-for-the-national-biosecurity-system>, viewed 7 February 2021.

1712 Department of Agriculture, Water and the Environment, n.d., <https://www.agriculture.gov.au/biosecurity/partnerships/nbc/intergovernmental-agreement-on-biosecurity#a-unified-strategic-framework-for-the-national-biosecurity-system>, viewed 7 February 2021.

1713 Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017, recommendation 6.

With regard to traceability, the IGAB review found the use of PICs would support identification and traceability, and that a system would have substantial value if a 'unified, national system tied to GPS data was adopted across the animal and major plant production sectors.'¹⁷¹⁴

F.5.5 Lessons for water

The IGAB review process highlighted the need for an improved and nationally consistent approach to biosecurity, and that key to this was developing data and intelligence sharing supported by common information architecture, data sharing protocols and data standards. Some key learnings to be drawn from this process which are relevant to water markets are:

- The use of an IGA as a tool for this kind of reform has been quite valuable. The IGA has facilitated coordination between different government agencies, and has provided a framework upon which other tools such as standards and protocols can be built. The review process also highlights the importance of building in mechanisms to review the IGA and its priority areas. The value in centralising information and publishing committee outcomes has also been demonstrated in this case.
- There are benefits in bringing various agencies together to commit to data sharing, and formalising these commitments in agreements and protocols.
- In the biosecurity sphere, there is value in creating compatible hardware and software for use by government and industry. This case study provides a useful example for the water sector in considering what kind of hardware and software would be required to implement a holistic Digital Messaging Protocol and Backbone Platform for water trading and water market data.
- This case study shows that the role of the Inspector General in the biosecurity data and information management system is to provide independent recommendations for overall system improvements. This is relevant for water because the Commonwealth Government has already signalled its intention to have an Inspector General for water compliance (IGWC), but the precise functions of the Inspector General are under development. The example of biosecurity suggests that it will be useful to consider data-related functions of the IGWC.
- In the biosecurity context, there is value in supporting 'traceability', and there is a need for this to be nationally consistent. In water markets, and water management more generally, there is currently only very limited traceability for specific parcels of water allocation. This case study shows that keys to establishing traceability are the use of individual identifiers, and having a holistic approach covering all relevant areas, rather than a piecemeal or jurisdiction-based approach.

¹⁷¹⁴ Craik, W, Palmer, D & Sheldrake, R, *Priorities for Australia's biosecurity system, An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement*, 2017, p. 43.

Appendix G – Basin Water Market Data Quality Assessment

Key Points

- High quality data is fundamental to evidence based decision making.
- The ACCC has assessed key Basin water market data sources using an eight-dimension Data Quality Framework.
- The ACCC has identified various data quality issues across data types (trade, accounting, management and other data) and data suppliers (Basin States, private businesses such as irrigation infrastructure operators (IIOs) and exchange platforms, and other government bodies). The most serious issues identified are:
 - an inability to consistently identify individual market participants, which affects all datasets analysed (lack of referential integrity)
 - an inability to produce complete historical transaction records of certain types of trades ('share component trade') in New South Wales (incompleteness, lack of referential integrity)
 - a near-complete absence of price information for some IIOs (incompleteness)
 - a complete lack of the use of transaction identifiers for some IIOs (incompleteness, leading to a lack of referential integrity)
 - usage data not being available at sufficient granularity in relation to time or location (due to incompleteness and timeliness)
 - problems in matching trade data between different approval authorities (lack of completeness and referential integrity, leading to issues with accuracy)
 - inconsistencies between what data is held by IIOs and made available via public sources.
- These data quality issues make it difficult to fully analyse water markets, and can impede implementation of policy tools which rely on having complete, accurate, and granular data about water trade and/or usage.
- Water markets data is primarily an administrative by-product which is collected for non-statistical purposes, and therefore not managed or maintained as an information asset for analytical purposes.
- In addition data is often poorly described, managed and maintained. This leads to transparency issues for market participants and a poor basis for conducting analysis which requires time series data for market analysts and policy evaluation.
- Improvements to data quality would lead to improved transparency and confidence in water markets and better informed decision making.

G.1 Assessing data quality

Data quality is a measure of the condition or state of data in relation to its use. Poor quality data means that data may not be fit for purpose, and contributes to misconceptions and misinformation about the conduct of market participants and harms market confidence. In contrast, high quality data enables effective and evidence based decision making and increases transparency and confidence. The purpose of this appendix is to assess the quality of public and private water market data and related data in the Basin, using a standardised framework to evaluate different datasets. It is important to note that while a number of data quality issues are identified in this appendix, in most cases this does not render the affected data useless, rather these issues limit the robustness of the conclusions that can be drawn from the data. That is they make the data more unreliable and less trustworthy. Further, the assessment is limited in scope to the data provided to the ACCC through voluntary information processes, and through s. 95ZK responses, and that this may not represent the full extent of data holdings by providers.

The ACCC/AER uses a Data Quality Framework (DQF) in order to achieve an agreed Data Quality standard across the ACCC/AER. The Inquiry has adopted this framework in order to assess the quality of certain key data sets relevant to water markets. The datasets assessed broadly fall into four categories:

1. **Water trading information:** data relating to the trading of entitlements and allocation.
2. **Water accounting information:** non-trade data relating to inflows and outflows to individual water accounts (e.g. usage, forfeits, carryover).
3. **Water management information:** data relating to the management and movement of water through the system (e.g. IVT balance information, storage levels).
4. **Other information:** data relating to water markets which do not fit into any of the above categories.

This appendix largely focusses on trading and accounting information, however does comment on data quality issues in the other categories where relevant. One of the complexities of water market information is that there are a number of suppliers and holders of information (for example the Bureau of Meteorology (BOM), Basin State governments, irrigation infrastructure operators (IIOs), water market intermediaries and other private corporations). Where relevant, the data quality of each of these data sources will be considered separately.

One key aspect of the DQF for the purposes of the Inquiry is the eight dimensions for assessing data quality. These dimensions are based on the Data Management Body of Knowledge (DMBOK) framework, and provide a framework to assess the quality of a particular set of data.

Table G.1 provides a summary of the eight dimensions of data quality in the DMBOK Data Quality framework.

Table G.1: Data Quality Dimensions

Dimension of Quality	Description
Accuracy	Accuracy refers to the degree that data collected for a given attribute accurately reflects the real world object that is being recorded i.e. is the data correct.
Completeness	<p>Completeness refers to whether all required data is present. Completeness can be measured at the data set, record or column level.</p> <p>For example, completeness asks: are all trades recorded? Do all trades have data for all relevant fields (e.g. price, volume, buyer and seller details)?</p>
Consistency	<p>Consistency refers to ensuring that data values are consistent and reflect the same information across data sets.</p> <p>Consistency also refers to data values being consistent within a record in a dataset, across time and between systems.</p> <p>Consistency can also be used to refer to consistency of format of data.</p> <p>For example, consistency considers questions such as: are different types of trade dealings (leases, forward contracts, 'spot' allocation trades, entitlement transfers, etc.) referred to consistently within and across datasets? Are trades always recorded in the same units (e.g. ML), or are difference units clearly identifiable? Are trading zones defined consistently over time and across datasets?</p>
Integrity	<p>Data Integrity (or 'Coherence') includes ideas associated with completeness, accuracy and consistency. In data, integrity usually refers to either referential integrity (consistency between data objects via a reference key contained in both objects) or internal consistency within a data set such that there are no 'holes' or missing parts.</p> <p>Data sets without integrity are seen as corrupted, or have data loss. Data sets without referential integrity have 'orphans' (invalid reference keys), or 'duplicates' (identical rows) which may negatively affect aggregation functions.</p>
Reasonability	<p>Reasonability asks whether a data pattern meets expectations. For example, in the water markets context, reasonability could assess whether the distribution of allocation trading activity across a geographic area makes sense based on what is known about demand factors and market participant behaviour (e.g. irrigation activity) in that catchment or region, and supply factors such as water allocation and storage levels, etc.</p> <p>Measurement of reasonability can take different forms. For example, reasonability may be based on comparison to benchmark data, or past instances of a similar data set (e.g. trade volumes and values from the previous quarter).</p> <p>Reasonability is sensitive to the specific context of the dataset.</p>
Timeliness	Timeliness is a measure of the delay between the real world event occurring and the data capture of that event. For example, time lags between when a trade is agreed between parties and when it appears in public registry data or time lags between when water usage occurs at the individual level and when aggregate water usage data for a trading zone or catchment becomes publicly available.
Uniqueness/ Deduplication	Uniqueness requires that no entity exists more than once within the data set. Asserting uniqueness of the entities within a data set implies that a key value relates to each unique entity, and only that specific entity, within the dataset. Uniqueness is measured by testing against key structure. For example, is each and every trader identifiable in the dataset using a unique identifier? Is each and every transaction (trade) identifiable using a unique identifier?
Validity	<p>Validity refers to whether data values are consistent with a defined domain of values. A domain of values may be a defined set of valid values (such as in a reference table), a range of values, or value that can be determined via rules.</p> <p>The data type, format, and precision of expected values must be accounted for in defining the domain.</p> <p>For example, if a trade is reported to have a 'zero price', is there a valid reason for this? Is the reason captured in the dataset?</p>

Source: Adapted from DAMA, *DAMA-DMBOK: Data Management Body of Knowledge (2nd Edition)*.

G.2 Accuracy

Accuracy refers to the degree that data correctly represents ‘real-life’ entities. Accuracy can be affected by, amongst other things, measurement errors, instrument precision, misreporting and misclassification.

Accuracy is also relative to what variable the data is trying to measure. For example, a smart watch may record a person’s heart rate and use this to accurately measure whether the person is ‘active’ or ‘at rest’. However the same heart rate readings may be inaccurate when compared to another, more precise source. In this case the heart rate measured by the smart watch accurately measures activity levels but not the numbers of beats per minute of the heart.

Box G.1: Accuracy of matched data

Interstate trade matching

In order to produce a holistic view of allocation trade in the Southern Connected Basin, it was necessary to combine data from the Basin State trade approval authorities. In doing so the ACCC also had to match data across approval authorities for trades that occurred interstate. This matching process was necessary to avoid double counting and get a complete picture of the buyers and sellers (as for an interstate trade each state only holds information on either the buyer or the seller).

For trades between New South Wales and Victoria, it was possible to attempt to perform direct matching of trades as New South Wales records the trade identifier for the incoming or outgoing trade with Victoria (that is, the trade identified acted as a unique common key). For all other trade directions (e.g. between New South Wales and South Australia and South Australia and Victoria) only the account number buyer or seller was recorded (and an account may be associated with multiple trades) so other matching variables were required (date, price and volume).

At the aggregate level, there was very little difference between the volume of water that states reported as either outflows or inflows into their state due to interstate allocation trade. The maximum (over 6 years) difference was 1.4% (representing approximately 14.5 GL of water) between what New South Wales reported as volume going into South Australia versus what South Australia reported as having received from New South Wales in allocation trade.

Table G.2: Aggregate difference in reported volume of interstate trade, 2012–13 to 2019–20 YTD

	NSW to SA	NSW to VIC	SA to NSW	SA to VIC	VIC to NSW	VIC to SA
% difference in volume (Average)	1.4%	0.1%	0.2%	0.0%	0.1%	0.1%

Source: ACCC analysis based on NSW, Victorian and SA governments’ responses to voluntary information requests.

Notes: YTD = year to date (2019–20 year to 30 November 2019)

For each matched trade, an assessment of the accuracy of the matching process undertaken relied primarily on creating ‘quality flags’, which took on a value from zero to three based on the number of variables (date, price and volume) matched across the two records, where a higher number indicates higher match quality. For example, if the trade of a water allocation from New South Wales to South Australia was recorded in both states as sharing the same date, price and quantity, the matched trade would have a quality flag of three.

Analysis of the quality flag variable showed that only 26% of matched trades (by volume) perfectly matched on all three indicators. For the remaining matches, 73% of the volume trades share two indicators while 2% exactly matched only one or no indicator at all (in which case the match is the closest trade).

Figure G.1: Number of matching indicators by allocation trade direction, 2012-13 to 2019-20YTD



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: YTD = year to date (2019-20 year to 30 November 2019)

While the number of matched indicators differs by trade direction, the distribution is broadly similar across all directions. The most common mismatched indicator was date. The next most common mismatch was price, with volume between each trade approval authority agreeing the most. The ACCC's assessment is that date mismatches most likely occur because of how the dates of the application lodgement and approval differ, rather than because of data errors within each states dataset. Mismatches arise because interstate trades essentially entail two separate approval processes – one in the origin state, and another in the destination state – which are joined via interstate interoperability protocols. Price mismatches could occur for the same reason, especially if the buyer and seller do not consistently report price inclusive or exclusive of transactions costs such as brokerage fees. While the quality of matches obtained through the ACCC's matching process is reasonable given existing processes for approving interstate trade, ideally there should be 100% matching across all directions and all indicators.

External IIO trade matching

Similar to interstate trades, external IIO trades (that is, trades which move water from inside to outside the IIO's network or vice versa) involve two or more trade approval authorities (that is, at a minimum, the IIO itself and the relevant Basin State). As such, information on the trade, particularly the identities of the buyer and seller, may be fragmented across these data sources. The ACCC accordingly attempted to match IIO data to the Basin State registry data to create a holistic view of IIO trades.

Unlike interstate trades, at the aggregate level there were significant differences between what the Basin States reported as the volume of water going into or out of the IIO compared to what the IIOs themselves reported to the ACCC in their trade data. In most cases, the number of trades were within $\pm 10\%$ of the number of trades reported by the Basin States. Volume differences are larger, but these differences in volumes are largely influenced by unmatched outlier trades.

Figure G.2: Difference in trade numbers reported by IIOs compared to Basin States, 2016-17 to 2019-20YTD



Source: ACCC analysis based on NSW, Victorian and SA governments' and IIOs' responses to voluntary information requests and s. 95ZK responses.

Notes: CICL: Coleambally Irrigation Cooperative Limited; CIT: Central Irrigation Trust; MIL: Murray Irrigation Limited; MI: Murrumbidgee Irrigation Limited; WC: West Corugan; WMI: Western Murray Irrigation Limited; RIT: Renmark Irrigation Trust. YTD = year to date (2019-20 year to 30 November 2019).

In terms of matching individual trades, some IIOs provided the relevant Basin State trade ID which assisted with matching. However given many IIOs do not record price, in the absence of a trade ID to match on, matching often resorted to matching only on volumes and dates of trade. This was made more difficult by the practice of some IIOs combining multiple parcels of water from within the IIO but submit only a single trade with the Basin State trade approval authority, or to split a trade of water into the IIO into multiple different parcels. This practice is likely the cause of the difference in the number of trades reported by CIT compared to the Basin States as seen in figure G.2 above.

The result of this is that the quality of matches between the IIOs and the Basin States can be poor at the unit record level. Given the lack of price reporting from many IIOs (see table G.4) in most cases it was not possible to produce quality flags in the same manner as for interstate trades. In the case of IIO external trades, dates are also not a reliable indicator of data quality given the different basis for reporting of date (for example, date of approval could be approval by the IIO or the Basin State).

Exchange platform trades matching

As exchange platforms contain information on the trade which may be useful for analytical purposes (such as struck date), being able to match records from the exchange platforms to the Basin State trade records should in theory provide a more complete picture of individual trades and therefore enhance data quality.

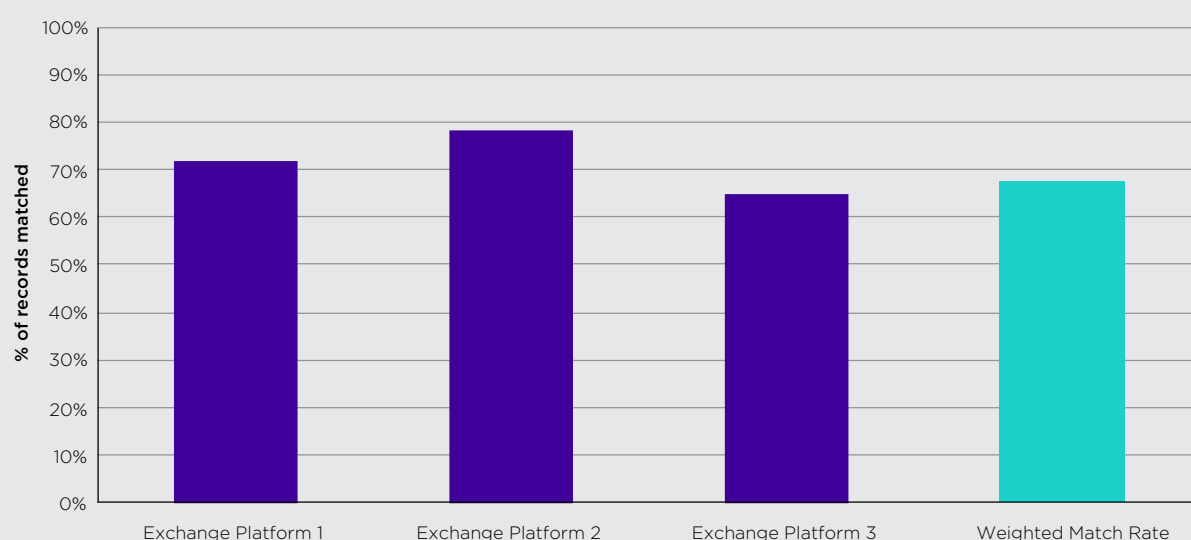
As part of the analysis of lodgement lags in appendix D, a matched dataset between some of the exchange platforms and the Basin State allocation trade dataset was created.

Trades were initially matched based on the exchange platforms' records of the application ID for each Basin State trade approval authority. In the case of one exchange platform where the application IDs were not consistent with Basin State trade approval records for a specific period, trades were matched based on:

- volume
- origin trading zone
- destination trading zone
- date of trade approval
- value of trade.

Based on this dataset, somewhere between 65% and 78% of exchange platform trades could be successfully matched to a Basin State trade.

Figure G.3: Matching rates between selected exchange platform and Basin State trade records



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests and s. 95ZK responses.

Some exchange platform trades could not be matched as they may have been within-IIO trades conducted on-platform which may explain the lower matching rate. In addition, some exchange platforms do not consistently record trade identifiers from the Basin State (meaning there is not a universal and unique matching key). For example, identifiers may not be recorded, or may be recorded inconsistently, particularly where the trade involves multiple parcels of water or multiple trade approval authorities.

G.2.1 Accuracy of water trading information

One data quality issue noted by a number of stakeholders is the issue of zero dollar trades. This issue refers to the fact that considerable proportions of trades recorded in Basin State registry data have a reported price of zero dollars. As noted in section 8.8, some stakeholders allege that some trades may be deliberately misreported as zero dollars in order to influence the average price of water products (e.g. allocations). Other stakeholders are concerned that, even where zero dollars is the real price associated with a trade, it is difficult to determine the purpose or meaning of zero dollar trades (for example, are they simply movements of water allocation between trading zones, or users' own accounts). The MDBA has also acknowledged problems with zero dollar trades, and has acknowledged the difficulty of determining whether the reported price of zero dollars (or null) is not only an issue of completeness, but also an issue of accuracy. If consideration was paid for the trade and zero dollars or nothing is reported then the data does not correctly reflect 'real-life' (that is, the recorded data is

inaccurate). However, in some cases the zero dollars may be accurate (for example if no consideration was paid because the trade was to execute a transfer of water from the same entity's accounts in different zones). In other cases the zero dollars may reflect the fact that the consideration paid represented a non-standard trade (for example carryover parking), in which case a zero dollar reported, whilst inaccurate, may be more accurate than reporting an actual price. Given accuracy is relative to the purpose, if the purpose of the price field is to capture the price of a 'commercial trade' of water, then only prices for market trades should be captured. Omitting data may increase the accuracy of the price for the purposes of determining the market price of water, though it may decrease the accuracy of the total value of all water traded. This is further considered in box G.2.

Analysis in this appendix shows that a significant proportion of trades at zero dollars are either for environmental purposes or trades between the same or related parties. As noted in chapter 4, movements in water allocation between trading zones (whether or not an ownership change has occurred) are sometimes referred to as 'transfers' (as opposed to 'commercial trades') by some water market participants.¹⁷¹⁵ This distinction may have overall implications for the accuracy of trade data, depending on the purposes for which it is to be used. If the intention is to measure what is occurring in the system as a whole, there are likely to be less implications for quality than if the intention is to measure water traded in between legitimate buyers and sellers at market prices.

In addition to accuracy of price, accuracy of volume traded is also a potential data quality issue in some circumstances. While trades which occur entirely within the same zone are assumed to be accurate (as there is no other information source on which to calculate accuracy), in the case of interstate trades different approval authorities may record different volumes in some cases (see box G.1), which raises the question of which record is correct.

Accuracy can also be affected by failures in other data quality dimensions. As discussed in box G.4, a lack of referential integrity or common identifiers can have implications for whether activities are recorded against the correct entity. In some cases during the Inquiry records capturing the movement of water have been found to be recorded against multiple unassociated names and this may not accurately reflect the real transfer of water within named accounts. Name inaccuracy can also be a particular concern for corporations, with multiple variations on the legal name of the entity. In one case, one large business was recorded against at least 9 different variations of the name.

For allocation trade, the Basin State trade approval authorities record at least the submitted date (the date an application was lodged) and the approval date (the date the application was approved). However none captured the struck date (or the date that the agreement for the sale was reached). While the submitted and approval dates are accurate for their own purposes, calculation of an average price may be inaccurate when based on approval or submitted date. Take for example, a case where two parties agreed to a trade of water of \$X per ML on some date t, however the trade is not submitted until t+1 and not approved until t+2, in the time between period t and t+2 there has been significant rainfall causing the price of water to fall to \$Y per ML. Any average calculated on the approval date (t+2) will include a price \$X which is higher than \$Y. While in some cases this can be somewhat overcome by incorporating data from brokers and exchange platforms (who do record the struck date), water trades that are conducted outside of an exchange platform cannot be assessed against the prevailing market price. It is difficult to assess the accuracy of transacted prices when the prevailing market conditions and context are not recorded.

G.2.2 Accuracy of water accounting information

As discussed in the section on consistency below, the ACCC encountered issues in attempting to apply accounting identities to track credits and debits within individual users' allocation accounts. One possible explanation for this inconsistency is due to inaccurate data. Accurately assessing account movements may be impeded when water credits and debits do not accurately balance.

¹⁷¹⁵ Note, however, that both may need to be considered as different types of trade, for example, for the purpose of assessing the aggregate volume of trade (including 'transfers' and 'commercial trades') between two trading zones against relevant trading rules such as Inter-Valley Trade restrictions.

One key input into water accounting data is usage information. In addition to concerns around whether meters correctly measure the amount of water take, the issue of timeliness (covered later in this appendix) can also impact accuracy. Even if meters were perfect, in the absence of more frequent recordings of meter readings, the information from meters will only be useful for measuring aggregate usage or take and will not be suitable to measuring patterns or trends of usage over time.

G.2.3 Accuracy of water management and other information

Conveyance losses is also an area where the ACCC has concerns about the accuracy of data. The current data and collection methodology are unable to accurately specify the magnitude of conveyance losses from the movement of individual parcels of water or as a result of changing patterns of water trade. However it is noted that given the nature of water deliveries being managed at a 'bulk' level, it is unlikely to be able to accurately measure losses for individual movements.

G.3 Completeness

Completeness refers to whether all required data is present. Completeness can be measured at the data set, record or column level. For example, for trade data, data set level completeness would be affected by whether there were any missing trades, record level completeness would be affected by any missing information about a particular trade, and column level completeness would be affected by any missing variables for all trades.

Completeness can also impact on other dimensions of data quality. Incomplete information will affect accuracy (for example in the case of price for trades), and if certain variables used as identifiers are missing (for example ABNs/ACNs of traders) this could impact on integrity of the data.

Box G.2: Completeness of water market information held by the states and IIOs

Basin State registry analysis

The capturing of Australian Business Numbers (ABN) and Australian Company Numbers (ACN) for tradeable water right holders is an area in which Basin State registries can improve the completeness of their data. This information is typically captured as an optional field by the Basin State authorities and as a result is often left blank. However, there are sometimes requirements to provide an ACN or an ASIC company extract when a company is involved in trading. No equivalent requirement applies for unincorporated businesses to provide ABNs. Table G.3 below highlights the level of completeness for the ABN/ACN fields for the various state registries in the basin.

Table G.3: Use of ABN or ACN in water markets data

Basin State	Percentage of water entitlements with either ABN or ACN listed for owner	Percentage of water allocation (by volume) trades with either ABN or ACN listed for either party (Southern Connected Basin only)
NSW ¹⁷¹⁶	n/a	1%
VIC	4%	9%
SA	18%	16%
QLD ¹⁷¹⁷	22%	n/a
ACT	67%	n/a ¹⁷¹⁸

Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

While it is not a requirement to have an ABN or ACN in order to own a tradeable water right (and therefore without such a requirement it will never be possible to reach 100% reporting of ABN or ACN), the ACCC considers it is highly likely that this information has been materially under-reported in a number of state registries. Additionally, the NSW Land Registry Service was not able to provide the ACCC with information relating to their customers ABN or ACN as they do not collect this information. Improving the completeness of the ABN and ACN reporting would enable Basin State registries to more accurately identify trading parties across state boundaries.

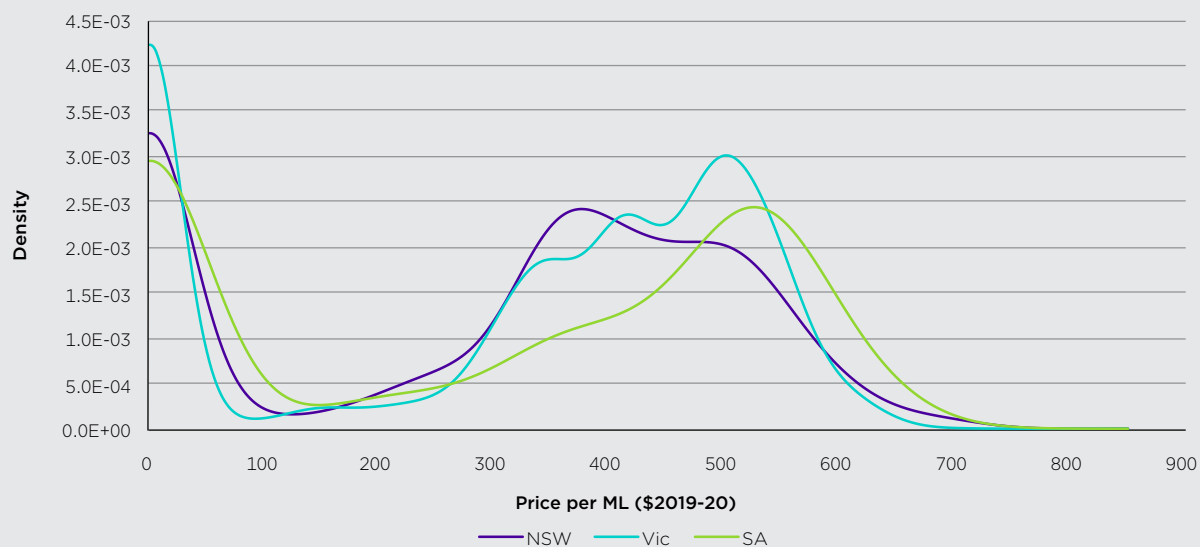
Trade pricing information has also been identified as an area where completeness in data reporting can be improved. Over 30% of all trades (by number of trades) in the Southern Connected Basin were reported as zero dollar trades between water years 2012-13 and 2018-19. Similar trade price reporting practices have been observed by all the Basin State registries in the Southern Connected Basin, as shown in figure G.4 below. Legitimate reasons for zero dollar trades exist, such as environmental trades and owners transferring water between their own accounts, and when these are accounted for it reduces the percentage of trades for which a reason for the zero dollar trade cannot be ascertained. It is likely that at least some of these trades reported at zero dollars are commercial trades which have been incorrectly reported, though less than the headline figure suggests, as the analysis in this box shows.

¹⁷¹⁶ Includes NSW LRS for entitlement information and WaterNSW for allocation information.

¹⁷¹⁷ Includes the Qld DNRME only.

¹⁷¹⁸ This figure is n/a due to absence of allocation trade in ACT.

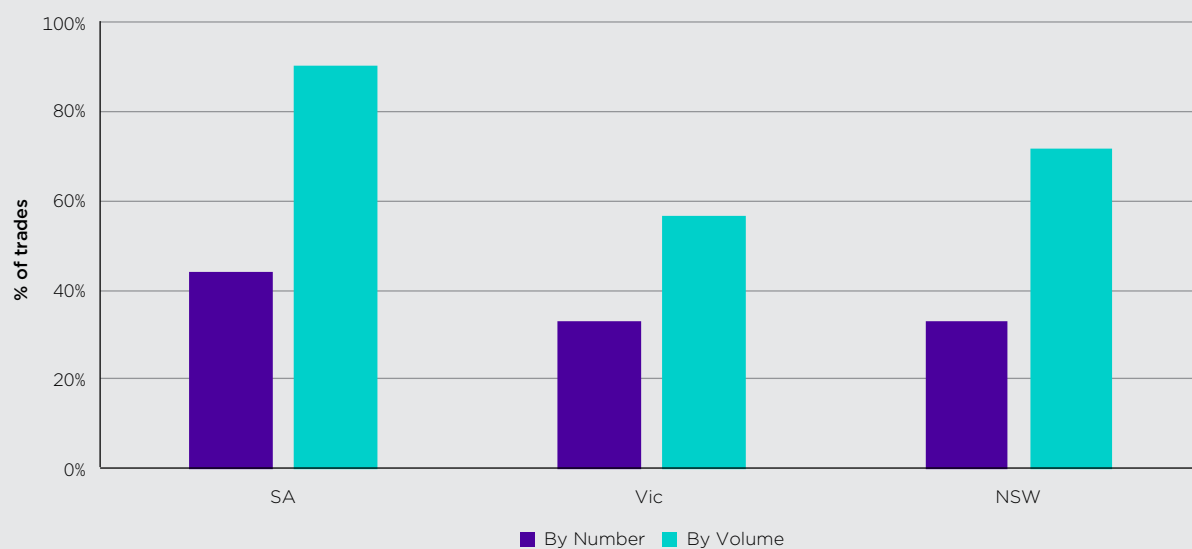
Figure G.4: Distribution of allocation trade prices reported across the Southern Connected Basin state registries during water year 2018-19



Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: A density plot shows the distribution of trade prices. Higher densities mean more trades at that price. Upper bound outliers have been removed using the Inter Quartile Range method.

Figure G.5: Proportion of trades with missing or zero price by state, 2012-13 to 2019-20 YTD

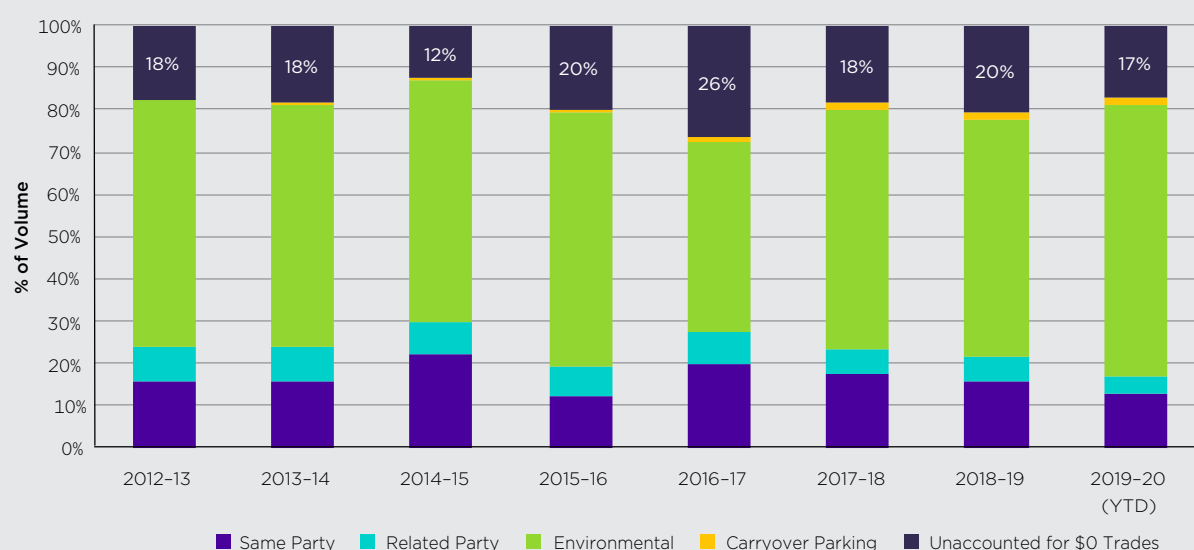


Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: YTD = year to date (2019-20 year to 30 November 2019).

Analysis was conducted on zero dollar allocation trades to determine whether it was possible to account for the reason that zero dollars was reported. Figure G.6 shows that once same and related party trades, trades for the environment and carryover parking are accounted for, the proportion of unaccounted for zero dollar trades by volume is at most a quarter, and in most years only a fifth of all zero dollar trades.

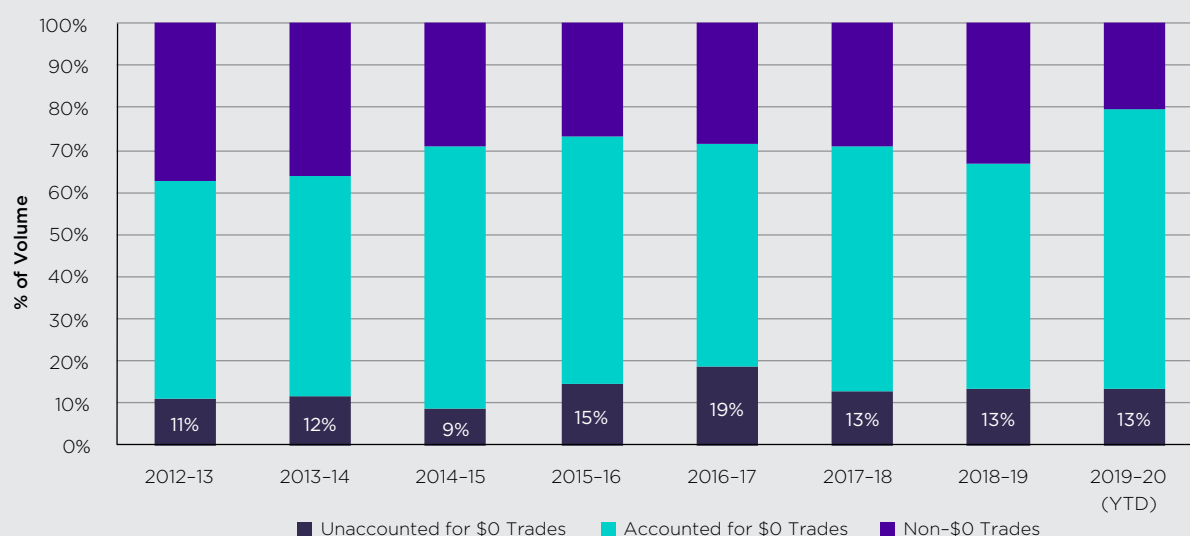
Figure G.6: Breakdown of zero dollar allocation Trades, by Year, Southern Connected Basin



Source: ACCC analysis on NSW, Victorian and SA governments' responses to voluntary information requests.

When placed in the context of all allocation trades, the proportion of potentially missing or inaccurate trades falls to less than 20% by volume and less than 30% by number. The proportion of inaccurately reported or missing prices is likely to be even lower once other reasons (such as trades mediated through a third party, which it was not possible to identify with the data available), have been accounted for.

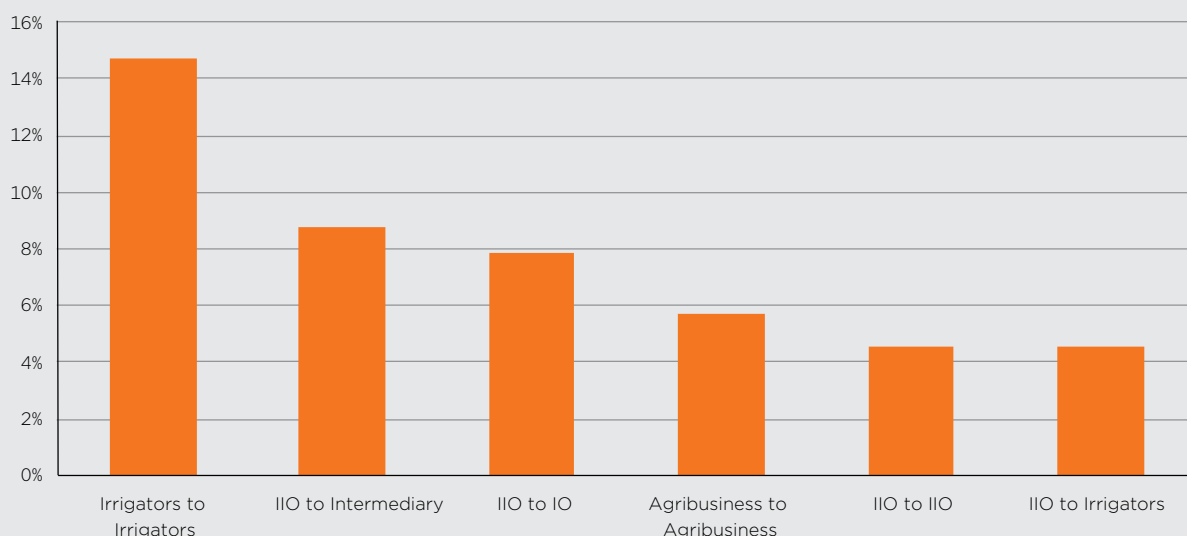
Figure G.7: Breakdown of all trades, by year, Southern Connected Basin



Source: ACCC analysis on NSW, Victorian and SA governments' responses to voluntary information requests.

Of the remaining unaccounted for zero dollar trades, almost half involve trades between irrigators or IIOs and other market participants (see figure G.8) as opposed to larger agribusinesses or institutional investors. Where zero dollar trades involve trade to or from IIO licences, the issue of inaccurate price reporting in Basin State registry data becomes linked to the question of trade data recorded by IIOs. For example, if an IIO routinely does not require internal customers to report price, the IIO itself may be unable to report the correct price when making its application to the Basin State on behalf of the internal customer.

Figure G.8: Percentage by volume of unaccounted for zero dollar trade by Top 6 Participant Types (Seller and Buyer), Southern Connected Basin



Source: ACCC analysis on NSW, Victorian and SA governments' responses to voluntary information requests.

IIO analysis

The ACCC acquired data from several IIOs across the Basin on their temporary (water allocation) trades. Although recording practices varied significantly across IIOs, some similarities emerged in the ACCC's analysis of this data.

Much of the analysis conducted in this Inquiry used an aggregated dataset which joined various smaller datasets source from Basin States' and IIOs' registers. This process of aggregating datasets uncovered inconsistencies within the data. These inconsistencies were most obvious for allocation trades into, or out of, an IIO network. In some cases inconsistencies also occurred internally within an IIO's own records, for example duplicate records or inconsistent formats for transaction identifiers.

Table G.4 illustrates the differences between the data collected from IIOs on allocation trading from 2016-17 to 2018-19. Most IIOs specified the volume of each trade occurring within their network. Over 90% of transactions specified some sort of internal identifier for buyers or sellers, although this information was often not recorded for external parties for trades in to or out of the IIO's network. Half of the IIOs included in the analysis recorded the date on which a transaction was submitted. In contrast all but one recorded the date on which it was approved by the IIO or Basin State trade approval authority.

A price was recorded for less than 30% of IIO trades overall. It is likely that this number is skewed by some IIOs not recording a price when they intend to record a zero dollar trade, since four of the IIOs did not collect price data at all.

Table G.4: Completeness of IIO field specification from temporary allocation trade data during water years 2016–17 to 2019–20 YTD

Data Source	Price	Volume	Party ID	Account ID	Date Submitted ¹⁷¹⁹	Date Approved ¹⁷²⁰
CICL	53%	100%	0%	57%	0%	100%
CIT	0%	100%	0%	68%	0%	100%
MI	22%	98%	80%	80%	100%	100%
MIL	46%	100%	100%	77%	0%	100%
Narromine	78%	100%	0%	100%	98%	75%
RIT	0%	77%	6%	6%	0%	100%
WC	93%	97%	0%	0%	100%	0%
WMI	0%	100%	0%	99%	100%	100%

Source: ACCC analysis based on IIOs' responses to voluntary information requests and s. 95ZK responses.

While not formally defined as incomplete information, there are also values which are not being collected by trade approval authorities but which could or should be in order to improve data quality, particularly data integrity and consistency. These include trade and party identifiers (see box G.2), intermediary identifiers and identifiers from exchange platforms. Further, as noted above in section G.1, failure to include sufficient information on the timing of trades can distort the accuracy of derived statistics such as average prices or prevailing prices in a given time period (for example, minimum and maximum daily prices).

In addition to the above examples, and the issues regarding timeliness and accuracy of water metering data, is the difficulty in allocating aggregate usage at the account level to a specific location. Whilst locational information is often attached to the specific meter used to record usage, it is not a straightforward process to link this low level data to the aggregate account usage. The lack of defined spatial boundaries for trading zones also mean that latitude and longitude data (which is often associated with meters) can not be readily mapped to trading zones. Improving the geospatial element of accounting and usage data, where possible, would further enhance the analytical potential of water accounting data.

G.4 Consistency

Consistency refers to ensuring that data values are consistent:

- across different records in different datasets (cross-record consistency)
- within the same record in a single dataset (record-level consistency)
- within the same record across time (temporal consistency)
- across data values or data elements in different systems.

If data is consistent then the same event will be recorded in the same way not only within a single dataset but also across different datasets where that event is recorded multiple times.

For example, for water trade data, if an interstate trade was rejected, the data would be consistent if both approving authorities recorded the trade as being rejected. Data would not be consistent within a dataset if, for example, the status was 'rejected' but there was also a valid 'date of trade approval'.

Consistency between sources is particularly important where there are multiple providers of information, as is the case with water markets. Inconsistent results or irreconcilable differences, can

¹⁷¹⁹ Date Submitted refers to the date the trade was submitted to the IIO.

¹⁷²⁰ Date Approved refers to the date the trade was approved by the IIO or the Basin State Trade Approval Authority (for external trades).

raise data quality concerns about all providers, even where the data quality issues only stem from one of the sources. Box G.3 looks at differences between data sources in relation to trade data.

Box G.3: Consistency of information sources for trade data

Comparing BOM and IIO information

The BOM publishes information relating to water trading within the basin. This information is provided by Basin State trade approval authorities and IIOs, and published on BOM's Water Markets Dashboard¹⁷²¹, and aims to provide greater transparency of trade information within the Basin. Basin States are required to report trade of leases of entitlement and trades of allocation to BOM; IIOs are required to report trade or leases of irrigation right to BOM, although the regulations do not currently clearly distinguish between temporary and permanent trade of irrigation right.¹⁷²²

The ACCC has compared the public information published by the BOM with the information provided by the IIOs through the process of the Inquiry to determine the cross-record consistency of the two datasets. The Water Regulations (2008) specify both the type of water information and the type of organisations that need to provide information to the BOM. This includes rural water utilities such as Coleambally Irrigation Co-operative Limited (CICL), Murrumbidgee Irrigation Limited (MI), Murray Irrigation Limited (MIL), Central Irrigation Trust (CIT), and SunWater. Other IIOs outlined in this report including Narromine, Renmark Irrigation Trust (RIT), West Corungan Private Irrigation (WC), and Western Murray Irrigation (WMI) are not required to provide information to the BOM.

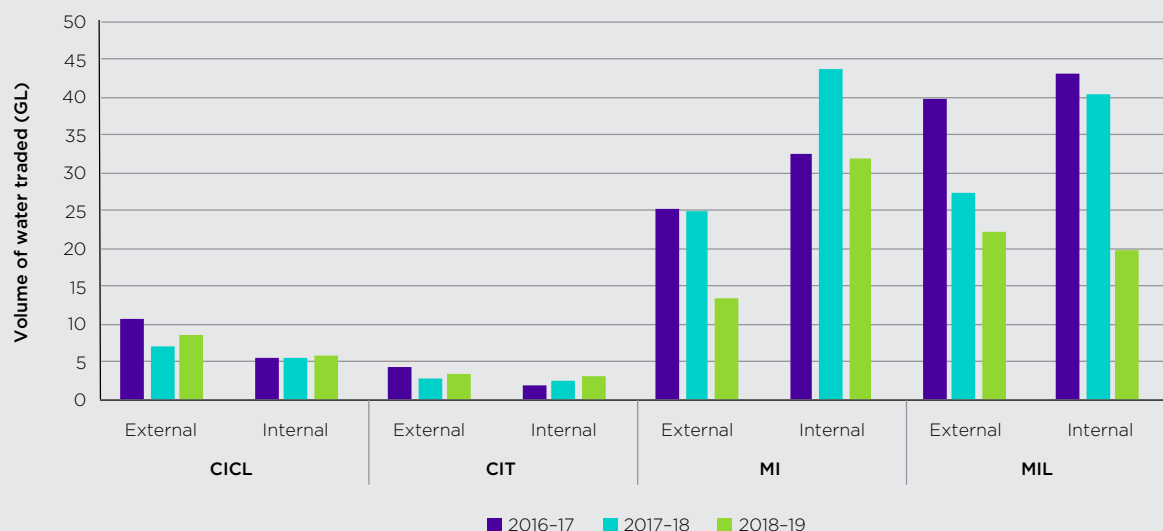
The BOM consolidates trade data from these sources and publishes it on its Water Markets Dashboard, using a consistent set of trading zones to identify the relevant locations of traded rights. In relation to trades involving IIOs, BOM currently only identifies an IIO-specific zone for trades wholly internal to the IIO. For example, MIL is one IIO required to report trade data to BOM. In the BOM trade data, a trade wholly within MIL's network is identified as a trade where both the origin and destination trading zone is 'Murray Irrigation'. However, the trading zone for trades to and from MIL's is designated as 'New South Wales Murray Regulated River Water Source / that part of the water source upstream of the River Murray at Picnic Point' (zone 10)¹⁷²³; it is currently not possible to distinguish trades into, or out of MIL's network from trades within zone 10 that occur wholly outside MIL's network. As such, it is difficult to compare the external trade volumes in the BOM data with the volumes provided by the IIOs themselves. External trades make up a large proportion of the total trade volumes involving IIO networks. Figure G.9 below highlights the relative volumes of the two trade types for CICL, CIT, MI, and MIL.

1721 <http://www.bom.gov.au/water/dashboards/#/water-markets/mdb/at>, viewed 25 January 2021.

1722 Rural water utilities (including certain IIOs) are designated as 'Category E persons', and are thereby required to provide the following data on a weekly basis: 6b: Trades or leases of Australian water access entitlements and irrigation rights; and 6c: Trades of water allocations. See Water Regulations 2008 (Cth), <https://www.legislation.gov.au/Details/F2020C01054>, and BOM (November 2019), *Persons and Classes of Persons*, http://www.bom.gov.au/water/regulations/schedules/document/Persons_and_Classes_of_Persons.pdf, viewed 25 January 2021.

1723 This designation is equivalent to 'Zone 10' in the MDBA's inter-state trading zone schema, although BOM does not use this terminology.

Figure G.9: Volume of water traded by trade type within IIOs



Source: ACCC analysis based on IIOs' responses to voluntary information requests and BOM data.

Note: External trades are those which are traded into or out of the IIO network.

Another issue with the cross-record consistency between BOM and the IIOs' data is the total reported volume of water traded. Internal trade volumes are not always consistent between BOM data and IIO data provided to the ACCC, as shown in table G.5 below.

Table G.5: Volumes (ML) of water traded internally in IIOs, as reported by IIOs to ACCC, and BOM Water Markets Dashboard

	2016-17		2017-18		2018-19	
	IIO	BOM	IIO	BOM	IIO	BOM
CICL	53,840	54,378	55,135	56,954	58,550	59,054
CIT	17,927	2,599	25,253	4,337	29,057	7,897
MIL¹⁷²⁴	430,286	662,048	404,280	484,101	196,249	221,585
MI	325,321	326,596	435,645	430,626	318,321	314,442

Source: ACCC analysis based on IIOs' responses to voluntary information requests and BOM data.

Some of these differences may be due to definitional issues, for example, the definition of trade versus transfer. In terms of the discrepancy with CIT, the ACCC's view is that reporting of trades from CIT may be complicated by several factors, particularly that CIT actually operates multiple irrigation districts on behalf of member trusts (meaning that definitions of 'external' trade may differ in this case). Note that these discrepancies should not be taken to imply that IIOs are failing to provide information to BOM as required under the regulations; rather, discrepancies emphasise the difficulties of consolidating datasets provided across multiple entities in the absence of clear and shared definitions of different types of trades, and trading zones.

The ACCC also found inconsistencies between water accounting data provided to the Inquiry and publically available sources. This was most prevalent in New South Wales where data on account inflow and outflows could not be reconciled with New South Wales General Purpose Water Accounting Reports (GPWAR) data in some zones.

¹⁷²⁴ MIL provided revised data in February 2021 (2016-17: 504,766; 2017-18: 420,529; 2018-19: 197,902). This revised data was unable to be incorporated fully into the report in time for publication. MIL has stated that it believes that the differences between its figures and those reported by the BOM may be principally due to definitional issues.

The accounting data in New South Wales also had some apparent internal inconsistencies, with basic account identities (for example closing balance = opening balance + inflows – outflows) not balancing for all account holders. This issue was most pronounced with carryover data, with figures reported for carryover into the new water year in many cases not matching what carryover was assumed to be based on the closing balance of the previous year. Accounting rules can change from year to year, even within a year, which can be the cause of these apparent inconsistencies. The ACCC is not suggesting that balances or data are incorrect (and WaterNSW has advised that balances are routinely checked by internal and external parties) but rather that data quality can be affected by apparent inconsistencies (even when the data, in fact, is not inconsistent). Surface level inconsistencies in the data, with no apparent reason to a reasonably well-informed user, can result in lack of confidence around the underlying data.

In terms of water management information, there are issues of consistency of IVT data. Details of the current status of IVT can differ between the relevant Basin State agency and the MDBA. These differences are often related to timing (for example whether the balance is being stored in a continuous series or only for specific points in time), but can make it difficult to reconcile the data between the two sources. This is further complicated by differences in how the IVT balance is stored (for example as the actual balance or the amount available for forward or back trade).

Inconsistent data can have a number of causes, however a common cause is changes to definitions, or definitional differences between data producers. For example, Queensland processes for interstate ‘tagged trade’ operate differently than in other states, which affects reporting of tagged trade volumes and means these volumes are not directly comparable with data on tagged trades in other jurisdictions.

In addition, correctly structuring data, including the provision of relevant identifiers, can make it easier to reconcile two or more different datasets. Often an apparent inconsistency may simply be due to different inclusions or exclusions in the data. However, if it is not possible to join data together then not only is there no opportunity to resolve inconsistencies, but they may also not even be identified in the first place.

G.5 Integrity

Data Integrity includes ideas associated with completeness, accuracy and consistency. Generally there are two types of integrity: referential integrity, which refers to integrity and consistency of data between sources: and structural integrity (or internal consistency), which relates to the consistency or integrity of data within a data source.

Referential integrity has been a key data quality issue faced by the Inquiry in relation to all information sources.

Box G.4: Referential integrity and related data in water markets

At its most basic interpretation referential integrity refers to the ability for a database to keep related data from becoming corrupted. In the water markets context, much of the data is related. For example, that an entitlement belongs to an account and that an account is owned by an entity are examples of related data. Referential integrity is therefore essential to being able to relate piece of data to each other.

In order to have referential integrity, not only is there an ongoing data management requirement to ensure references remain up to date, but there is also a foundational requirement to set up Primary and Foreign Keys on the relevant tables, and this is commonly done through the use of some kind of identifier. These keys must also be unique and mutually exclusive (this is known as entity integrity).

In the context of water markets data, all states maintained identifiers for entitlements/licences and, where they existed, their allocation accounts. All the states also had identifiers for their trades, and one state also had identifiers for all their incoming and outgoing transactions into the water account.

Victoria and New South Wales also maintained identifiers for market participants (for example owners or holders of allocation accounts), however there were issues with these (see below). South Australia, Queensland and the ACT all use account identifiers but do not have separate identifiers for individual entities. This can present a potential data quality issue if the accounts are able to change ownership (see the example at the end of this case study).

For IIOs, the use of identifiers is even more variable. Of the IIOs included in this analysis, one does not use account identifiers, and only two use party identifiers, again presenting potential data quality issues.

Quality of participant identifiers

In Victoria, market participants (or entities) are issued 'Party Codes', which are intended to uniquely identify the same participant across all data. Whilst intended to be unique, the same entity may have multiple Party Codes, however DELWP and the Water Corporations have invested in data cleansing to minimise effect of this. Analysis of Victorian data shows that some commercial and government entities have in excess of half a dozen different Party Codes, and at least 5 entities have 20 or more unique Party Codes. For all unique entity names in Victoria, almost 13% had more than one Party Code. However, analysis also shows that in many cases Party Codes remain with entities even when their names change (for instance, due to marriage) this indicates there are processes in place for Party Codes to track an entity through time, and provided that appropriate governance is in place to retain historical names (which the inquiry was unable to assess with the information available), this will lead to improved data quality.

In New South Wales, WaterNSW uses 'Customer Numbers' to identify different entities. At least one entity had 13 different Customer Numbers, and of all unique entity names in New South Wales almost 4% had more than one Customer Number.

As noted in section G.1, it is also the case that the same entity might be recorded under several different names. For example, company names may, in one data source, be recorded with Pty Ltd and in another data source, without; or first names may be included in full in some cases but be initialised in other. Machinery of Government changes result in departments having frequent name changes, which particularly impacts on water held by various environmental water holders, where the owner is often listed as the responsible Minister or Department. These issues not only affect comparisons of entities across data sources (such as in different states), but also even amongst the same data source (for example, different names being used for the entitlement versus the allocation).

Lack of trade and other transaction identifiers

Some IIOs lack any trade identifiers. While this alone is not a data quality issue, it becomes problematic when combined with unusual data structures. For example, some IIOs report internal transfers across two rows in a dataset, one row for the buyer side and one for the seller side. In the absence of a trade identifier, joining the buyer and seller side data (for example, to identify who the trade was from or to) relies on making assumptions about the data which may not hold true. This is further exacerbated when the volume of water debited from one account may not match the water credited to another (for example to account for conveyance losses, or where there are multiple buyers and/or sellers participating in a single transaction). This issue was not unique to the IIOs, issue was also present with one Basin State trade approval authority.

For identifiers to be useful, they must also have entity integrity, that is the identifiers must be unique and mutually exclusive. This requires additional considerations when transactions involve multiple parcels of water. In this case, while it is essential for each trade (that is, each unique parcel going from Party A to Party B) to have an identifier (a trade identifier), as noted above, each part of the transaction as a whole needs to have its own identifier (a transaction identifier) as a transaction may consist of multiple trades. In some cases, such as for external trades into or out of the network, IIOs had a transaction identifier but not a trade identifier. When multiple parcels of water were aggregate or disaggregated the lack of a consistent trade identifier made it difficult to match trades from the Basin State register to the equivalent trade in the IIO data.

While the majority of water trading occurs within the same state or IIO and therefore requires only the involvement of a single trade approval authority, a not insignificant amount (approximately 16%) involve more than one approval authority, for example interstate trades and trades out of or into an IIO. Some trades can even involve 3 or more approval authorities. As noted above, while most approval authorities maintain their own trade identifiers, in general there is no collaboration across approval authorities to use the same, (globally-consistent) set of trade identifiers, and the recording of trade identifiers used by another approval authority is less consistent. For example, South Australia, Victoria and New South Wales each use their own sets of trade identifiers. NSW data provided to the ACCC recorded both the NSW and interstate trade identifiers in the case of interstate trade involving NSW; but data provided by other Basin States did not. Only some of the IIOs record the relevant Basin State trade identifier for internal and external trades. As noted in box G.2 this can have implications for the accuracy of matched data.

In addition to trade data, other transactions (such as forfeits, allocations and other debits and credits to water accounts) should also be associated with identifiers (both an individual transaction identifier and the identifier of the account to which the transaction to which the transaction relates). This would enable information from multiple sources to be seamlessly combined for more detailed analysis.

Implications for lack of identifiers

Apart from the risks of orphans and duplicate data if identifiers are not correctly managed, the lack of robust identifiers can result in lack of integrity (particularly when combining multiple data sources).

For example water entitlements (which can and do legally change hands, potentially multiple times). While all states have identifiers for the entitlements themselves, if these are not associated with party identifiers, as well as a historical record of the relationship between the entitlement and the party, it may not be possible to recreate historical information about what has occurred in the past. This issue was realised not only with entitlement ownership data but also entitlement and allocation trade data in New South Wales. Neither NSW Land Registry Services (LRS) (as holders and managers of the data) or WaterNSW (as key users of the data) were able to provide a dataset listing the owner of a water access licence (WAL) at a historical point in time. This led to numerous issues with NSW entitlement trade and ownership data:

- WaterNSW provided water allocation trade data, with the 'buyer' and 'seller' fields listing the current owner of the relevant WAL. This means that this dataset may inaccurately represent allocation trading activity for a particular market participant where a WAL has changed hands over time.
- LRS provided a list of WAL 'dealings', which includes ownership changes of WALs, subdivisions, amalgamations and cancellations, but not trade of share component. Where an ownership change occurs, LRS provided two fields: 'Holders on title', listing the names of WAL holders prior to the dealing, and 'Incoming holders', listing the names of WAL holders post-dealing. This means that ownership changes can be deduced by comparing these two fields, but this requires manual comparison, and errors could be introduced, if, for example, there was a misspelling of the name of a holder who was a continuing holder (that is, their name was listed in the 'Holders on title' and 'Incoming holders' fields).
- LRS also separately provided a dataset of 'share component trades': this is a trade in which the volume or share component is reduced for one WAL, and commensurately increased for another WAL, without the WALs themselves changing ownership. LRS advised that they were unable to extract or provide information required by the inquiry, namely, the historical ownership of the WAL at the time of the trades (although they could provide information to enable the ACCC to create historical ownership information). This means that there is no readily accessible record of who was involved in share component trades. For a standard WAL transfer the share component being traded is not required to be collected as part of operating the WAL Register and was therefore unable to be supplied, NSW LRS was only able to report on the volume share of the WAL as it currently stood, not at the time that the trade was made. It is possible that if the data had referential integrity back to a centralised point in time historical dataset that this information could be produced.
- This inability to provide reliable records of ownership and WAL volumes before and after trade is a serious shortcoming and indicates that LRS systems, whilst being reliable for the purposes of water management and the legislated functions of NSW LRS, are currently not fit-for-purpose for providing readily accessible and complete information for analytical purposes.

These issues had significant implications for the ACCC's analysis of historical market activity, and also have broader implications for the quality of any analysis requiring an accurate and complete time series or historical trade records.

For the purposes of the Inquiry, the ACCC has 'backward engineered' WAL ownership for this dataset by meshing together this dataset with the WAL dealings dataset described above. While this 'backward engineering' was technically possible, it was difficult to assess the quality of the resulting outputs as any corruption of the underlying data will result in errors in this process. Further, such processes also require a level of sophistication which may not be available in all agencies (as was the case with NSW LRS).

Lack of appropriate integrity also has implications for trade analysis. Take another example: if Account 1 was owned by Party A, Jane Doe and was subsequently sold to Party B, John Smith, if the only identifier in a dataset is that some action was performed by the owner of Account 1, we may not know if this action was undertaken by Jane Doe or John Smith unless these information is also recorded in the dataset. However even when the name of the entity is recorded, further issues can potential arise. If after selling Account 1, Jane Doe married and changed her name to Jane Nguyen and then established Account 2, with only the names available we cannot analyse the actions that Party A (Jane Nguyen nee Doe) performed across both accounts.

Lack of referential analysis can also make aggregate analysis difficult. For example, it may be desirable (or even essential), to analyse the total activity of an individual market participant (as opposed to their activity against only a single account or entitlement). If it is not possible to relate each account back to an entity this makes this type of analysis much more difficult. While using the same names can be one potential solution, as noted in section G.1 Accuracy, a single entity may not have its name accurately or consistently recorded.

Issues relating to structural integrity have largely already been considered above in relation to the Consistency dimension of data quality.

Another aspect of integrity is domain integrity, which relates to ensuring that data in a field contains valid values. This is considered in more detail in section G.9. Validity.

G.6 Reasonability

Reasonability asks whether a data pattern meets expectations (in its given context). Data may be seen to be unreasonable where it does not meet expectations and there is no credible explanation as to why. For example, if average water prices (the data) were to fall significantly during a period of drought and less water allocation (the context) this would not fit into expectations around the effect of supply and demand on prices. In the absence of an alternative explanation as to why the data does not meet expectations, then it is possible that the data has quality issues.

Where multiple data sources measure the same entity or event, it may be possible to assess reasonableness by assessing whether data sources are broadly in agreement, for example by showing the same trends or yielding the same conclusions.

Reasonability tends to be more relevant for sample or survey data, where sampling and non-sampling errors can cause measurement errors which can result in data failing to meet expectations. Where data is administrative in nature, or a census, as is the case with most water market information, data is unlikely to be unreasonable in the absence of any other data quality issues, because it represents a complete picture of the state of affairs.

Notwithstanding the above, derived data (for example the calculations of averages or other summary statistics), can have issues with reasonableness if the summary statistics do not well represent the distribution of the data as a whole. Here the summary data does not meet the expectations in the context of the source data. The case study below examines this notion in more detail in relation to the calculation of average water prices.

Box G.5: Methodologies to calculate average or ‘prevailing’ water prices

Market participants often want to understand what the ‘current’ or ‘prevailing’ price of water products is, and how this changes over time. This gives rise to the question of how best to aggregate price information from individual trades into some kind of average or aggregate indicator. Many different methodologies are currently in use, including simple measures such as medians or simple averages, and more complex methods such as Volume-Weighted Average Price (VWAP) or methods which rely on computer modelling of price movements. Further, due to the known issues in Basin water markets data, many methodologies also apply some kind of ‘cleaning’ to raw trade data prior to calculating the average or aggregate indicator, such as removing outliers.

In 2019, ABARES reviewed a number of different methodologies and recommended the use of General Additive Models (GAM) for the calculation of average price series for allocations and entitlements. The rationale was that GAM methods produce lower error and best overall performance.¹⁷²⁵ Despite this recommendation, most public reports either use a simple median or a VWAP with some removal of outliers. While simple median methods were included in the ABARES analysis, VWAP methods were not. Generally, VWAP methods are easier to implement, understand and interpret than the smoothing methods recommended by ABARES and thus results may seem more reasonable. The ACCC has not sought to replicate the analysis undertaken by ABARES, but has tested the following propositions:

- that GAM results can produce unexpected results
- that VWAP methods are broadly reasonable enough to be considered a substitute for the more complex GAM method, even if GAM produces the most accurate results in theory.

VWAPs can be ‘rolling’, where calculations include data for a certain number of days (e.g. 14 days) from the reference date (the date the price is being calculated for) being included, either after the reference date (‘left aligned’), before the reference date (‘right aligned’) or on either side of the reference date (‘centre aligned’). They can also be ‘tumbling’, where each reference period (for example a week) is mutually exclusive and only prices from that period are used to calculate a VWAP for the whole period. VWAPs can also be calculated using means or medians (where means are more common because they are easier to weight).

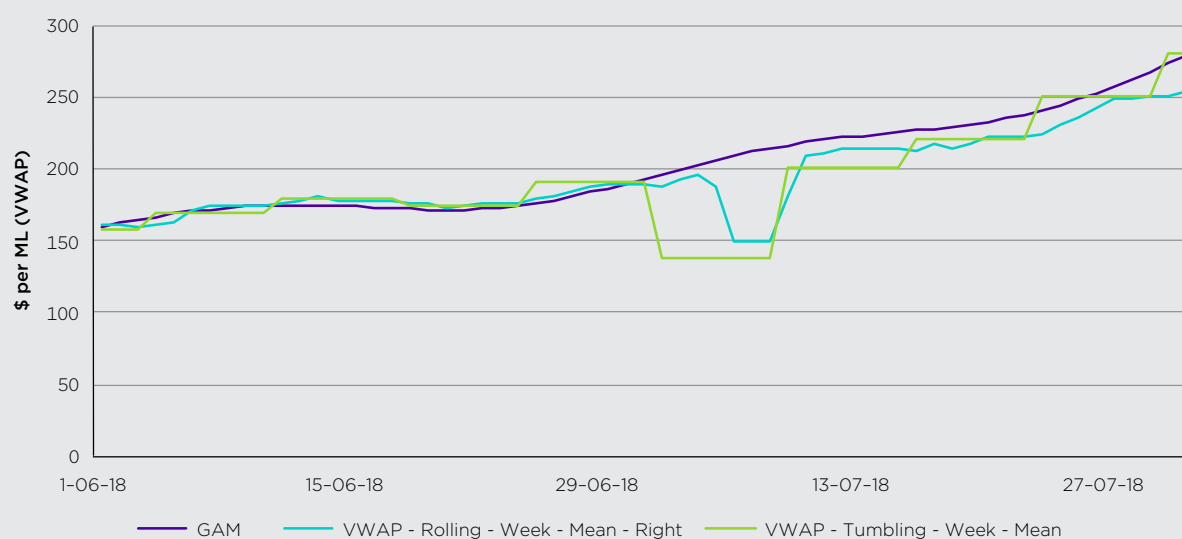
Where the GAM method seems to excel is in two areas:

- being able to provide a ‘smooth’ daily estimate of price
- remaining stable even with few (but not zero) prices.

This is particularly evident when looking at the period leading up to and after the new water year (where there are fewer transactions, as well as some days of zero transactions due to seasonal closures of trade processing). As shown in figure G.10, the two VWAP methods both show temporary price drops before returning to roughly the same level, whereas the GAM smooths over the drop. It is an open question as to which method is more reasonable; on the one hand the GAM prices remain consistent and smooth and potentially better estimate what the price of water would have been during that period had there been more transactions, given prices returned to that level. In effect GAM smooths out any short term changes in price and attempts to capture the overall trend. On the other hand, the end and beginning of the water year have less transactions because there is less demand for water and therefore water potentially does trade at a temporarily reduced price. So whether such short term changes are reasonable likely depend on the purpose of the data: providing an up-to-the-minute estimate of prices or showing the longer term trends in water prices.

¹⁷²⁵ <https://www.agriculture.gov.au/abares/research-topics/water/measuring-water-market-prices>, viewed 9 December 2020.

Figure G.10: Comparison of pricing methods at the beginning of 2018-19 water year

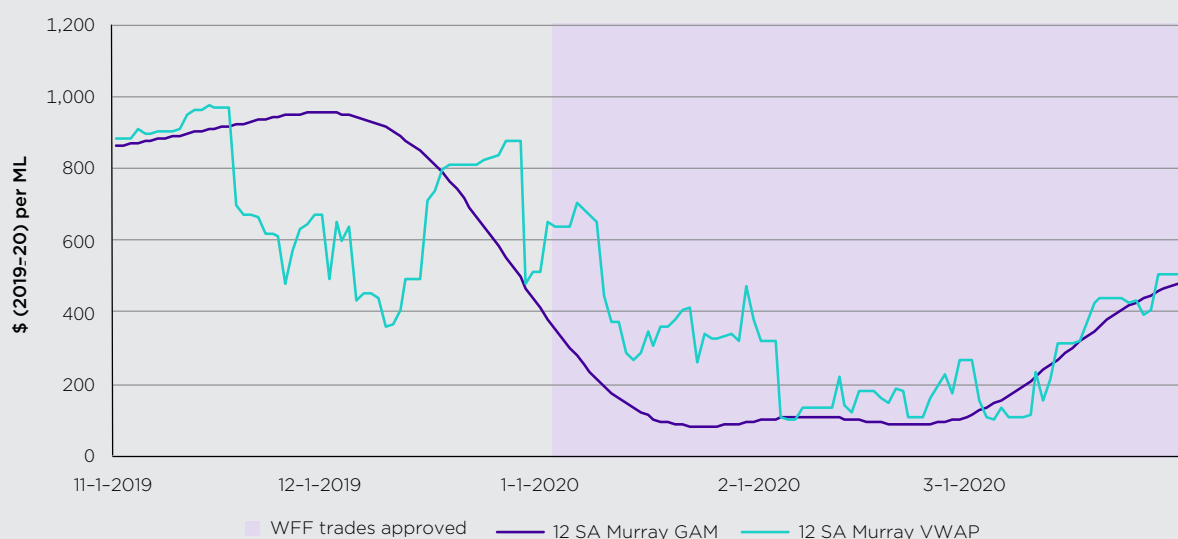


Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

The tendency of GAM to find the trend in the data, while useful for longer term analysis, can have some interesting side effects. Consider the Water for Fodder (WFF) program where participants could purchase 50 ML of water from South Australia for \$100 per ML, well below the prevailing market price at the time. The program was announced in November 2019, however trades were not approved until at the earliest 2 January 2020. As would be expected, these trades had a downward effect on prices.

As figure G.11 shows based on the VWAP there was some downward pressure on prices in December 2019 (due to some outlier trades at very low values), the average returned to close to \$800 per ML toward the end of 2019, and then dropped and remained low in the first quarter of 2020 due in large part to the WFF trades. However this nuance is potentially lost in the GAM series which peaks on 30 November 2019 and slowly declines and remains low in the first quarter of 2020; this trajectory occurs because the GAM method employs local smoothing, incorporating information from forwards and backwards and so the WFF trades in January 2020 are influencing the price series in December. Again in terms of reasonableness, which series is more reasonable depends on the purpose of the analysis. The GAM series robustly ignores the outliers in late 2019 but also displays a downward trend over a longer period of time, the VWAP series is more influenced by short term movements but correctly identifies the timing of the WFF program's influence on prices.

Figure G.11: Effect of Water for Fodder Program on GAM and VWAP Prices



Source: ACCC analysis of Waterflow data.

In summary, it may not be possible to determine one single method that is optimal for expressing average or aggregate water price trends in all situations. The GAM method recommended by ABARES, as their analysis shows, demonstrates good overall performance, lower error and as the above analysis shows a strong indication of the trend in water prices. For longer term analysis this may be the most reasonable, but it may not satisfy the requirements for short term pricing of water, especially given its complexity to implement and the potential for later events to affect price derivations in earlier periods. In particular, where it is important to capture significant short-term price movements or series breaks, the GAM method may be less appropriate than other methodologies which do not ‘smooth out’ such fluctuations.

G.7 Timeliness

Timeliness can refer to the difference between when an event happens and when data about the event becomes available. It can also refer to the difference between when data is expected or advertised to become available and the date in which it is actually available. Length delays between the actual event and data becoming available are likely to have implications for how up to date or reliable the data is.

G.7.1 Timeliness of water trading information

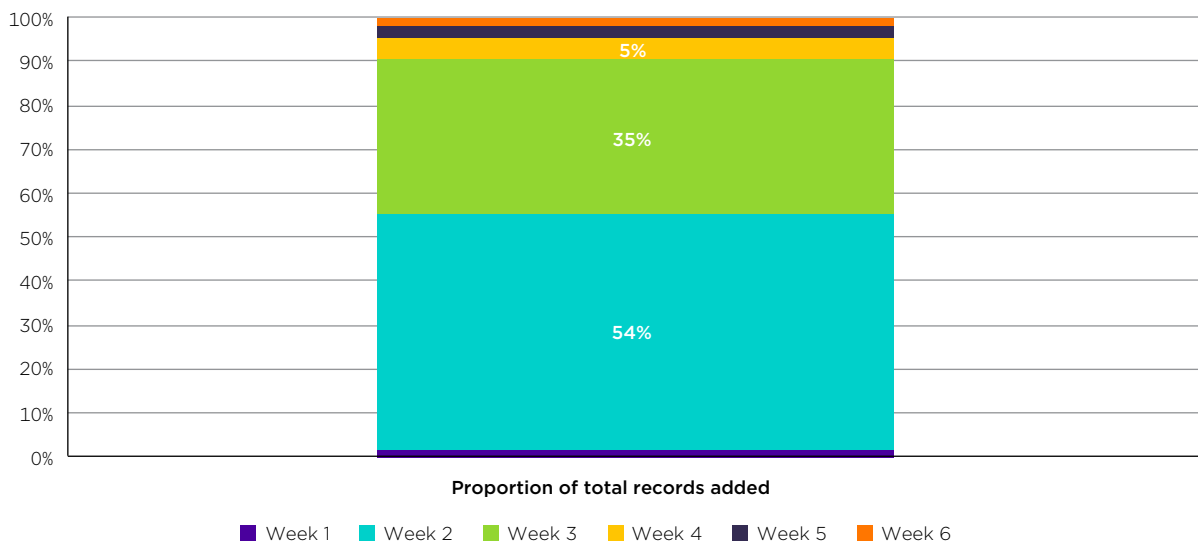
In general, for all water trade information, timeliness for at least one source of data is generally good (relative to the date of approval). For example, in NSW and Victoria information about trades is generally available on the water registry website a short period after trade approval.¹⁷²⁶ However, for aggregated or consolidated data (such as that from BoM), information is less timely. Where close-to-real time information on water prices is required, these timeliness issues can be significant for market participants.

In order to assess the timeliness of publicly available finalised trade data, historical data on finalised¹⁷²⁷ allocation trades in the Southern Basin was periodically collected from the Waterflow website over a number of weeks to assess the length of time it took for most trades for a given period to be reported. On average, over half (56%) of finalised trades were published on Waterflow within 2 weeks of the trade being finalised. Almost all (91%) of finalised trades were available within 3 weeks of the trade being finalised. However, only 2% of trades were available within the first week.

¹⁷²⁶ Data on approved trades is updated daily on the Victorian Water Register website. Data in allocation trade opportunities on the website is managed in real-time.

¹⁷²⁷ That is, not including broker trade data also available from Waterflow, based on BOM data only

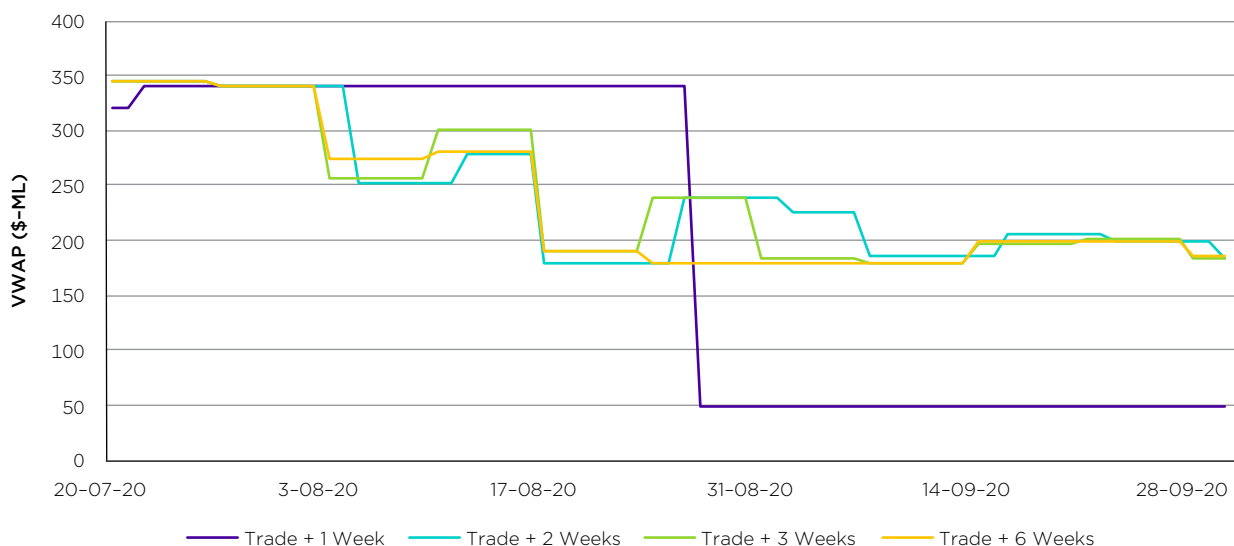
Figure G.12: Average proportion of total records added during period by time elapsed since trade approval date, measured in weeks



Source: ACCC analysis of Waterflow data.

The result of the lag between the trade being finalised and being published is that any derived data based on finalised trade data, particularly averages, are likely to be subject to significant revisions as more data is published. Figure G.13 below shows the VWAP which would have been calculated in the first, second, third and sixth weeks after the trade was finalised. It shows that the average calculated in the first week bears little resemblance to the final average price, at best correctly showing that prices went down at some point over the period. While the average stabilised in weeks 2 and 3, there is still some further revision.

Figure G.13: Average prices by number of weeks after finalisation



Source: ACCC analysis of Waterflow data.

Given the issues that historical finalised trade data has with timeliness, more timely data (for example data on trades available prior to finalisation) would be required to calculate robust average prices in a timely manner

Waterflow also includes some data from brokers on current bids and offers, as well as historical trade data from broker or exchange platform websites (rather than from Basin State registry data). This goes some way to addressing timeliness issues with registry data, as it supplements finalised data; however,

it is limited to that set of trades which are facilitated on participating broker or exchange platforms. Currently this broker data does not feed into average price calculations. There is some indication that market participants evaluate the current price of water with reference to comparable trades, rather than an average or spot price, in which case calculation of a timely average price is less important than having access to information about recent trades consolidated in a single location.

Prices for trades are generally calculated based on the approval date of the trade, however this may be some days after the price of the water was agreed (the struck date), particularly if the price was agreed through the use of an exchange platform or other third party. The more time that passes between the agreed price being set and the trade being approved (that is, the less timeliness there is in the data), the more this difference could distort average prices and other statistics, particularly if the price of water is rapidly rising or falling.

G.7.2 Timeliness of water accounting information

In terms of water market accounting data, granular information about inflows and outflows to individual account holders is not made publically available and therefore there are no timeliness issues to consider from the perspective of public data. For internal users of the water accounting data (for example, the Basin State trade approval authorities themselves, and individual account holders), there are no indications that timeliness is an issue given that the states themselves operate the systems from which data is extracted. With the data available to the Inquiry it was not possible to investigate the timeliness of individuals being able to access their own information from relevant authorities. However, aggregated water market accounting data does exhibit significant delays. For example, as at 25 November 2020, 2018–19 is the most recent year for which New South Wales General Purpose Water Accounting Reports¹⁷²⁸ and (finalised) National Water Accounts¹⁷²⁹ are available.

G.7.3 Timeliness of water management and other information

For water management and other information, IVT account balance data can have issues with timeliness. In theory, the balance of an IVT account should be continuously recorded as each separate transaction affects the balance individually. While information on the Goulburn IVT account is recorded near continuously, the Murrumbidgee IVT account balance is only stored as an end-of-day balance. While this is sufficient for many purposes, when trying to conduct intra-day analysis or analysis of very specific openings then the difference between the event occurring (a credit or debit to the balance), and the balance being recorded at the end of the day, can be insufficient despite it being less than 24 hours.

Water usage information in the Basin is generally collected by water meters or estimated via computer models. Information from water meters is (usually) periodically read by or sent to the relevant Basin State authority who then debits the water from the holder's account. While meters continuously read consumption at the point of usage, in some cases this is only reported periodically so there can, at times, be a large gap between when the usage occurred and when the information about that usage is reported (in aggregate). For example, if an irrigator had their meter read quarterly, and in the first quarter of a year used 10 ML a day for the first month, 200 ML a day in the second month, and 0 ML a day in the third their usage would only be recorded once on the 31 March as 5910 ML. This single data point does not give any information as to the pattern of usage beyond it being used in the first quarter of the year. Even calculating an average per day usage would be inaccurate for any given day in the period. The timeliness of usage information can be approximately inferred from the frequency of debits from water accounts. This analysis shows that there is a clear difference between the frequency of account debits (and therefore meter reads) recorded for South Australia accounts, compared to New South Wales and Victoria. The median difference in New South Wales and Victoria is one day, which suggests that at least 50% of usage debits in the Southern Connected Basin are occurring at daily intervals in New South Wales and Victoria.

1728 <https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/gpwar>, viewed 25 November 2020

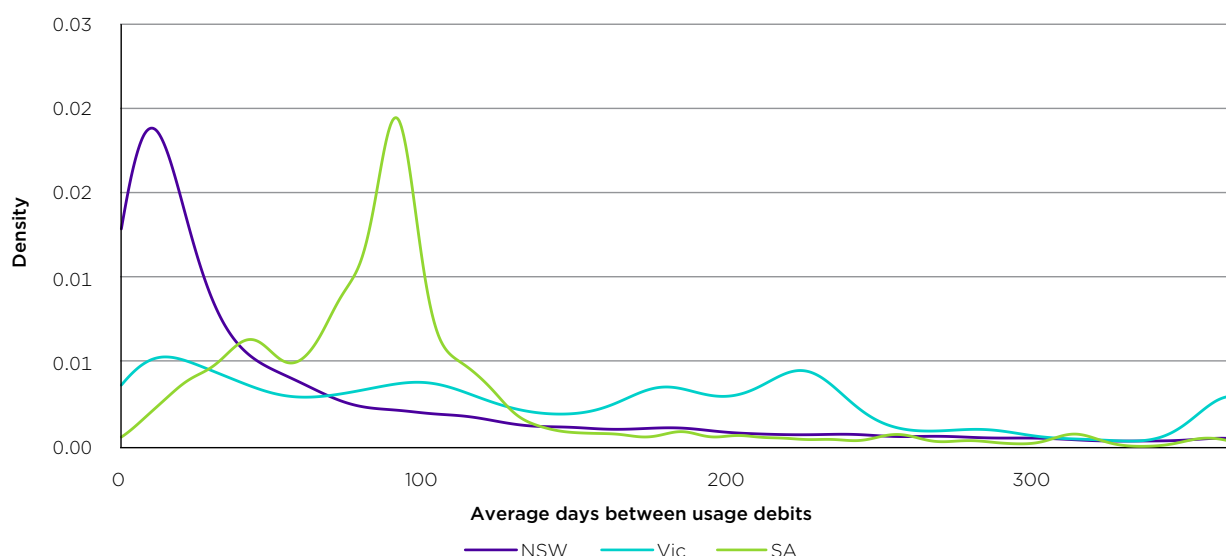
1729 <http://www.bom.gov.au/water/nwa/2020/>, viewed 25 November 2020.

Table G.6: Mean and median time (in days) between account debits by state, Southern Connected Basin

Data Source	Mean	Median
NSW	13	1
Victoria	30	1
SA	67	74

Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Further analysis of the average number of days between usage debits for each account in South Australia, New South Wales and Victoria shows that in New South Wales the density peaks at 14 days (and then falls off), whereas for South Australia it peaks at 90 days (with some variation) and Victoria shows an even distribution across days. This suggests for South Australia the typical lag between actual usage and recorded usage is 90 days, whereas for New South Wales it is 14 days. The data for Victoria is harder to interpret, but based on the average and median the typical lag is somewhere between New South Wales and South Australia (but closer to New South Wales).

Figure G.14: Density of Average days between usage debits by state, Southern Connected Basin

Source: ACCC analysis based on NSW, Victorian and SA governments' responses to voluntary information requests.

Notes: This density plot shows the distribution of water allocation accounts. Higher densities mean more accounts had an average days at that point.

G.8 Uniqueness and deduplication

Uniqueness requires that no entity exists more than once within the data set.

Few issues with unexplained duplicate data were encountered during the course of the inquiry, suggesting there are processes in place to ensure duplication does not generally occur.

One issue of note however was that for a number of data providers, information relating to trades was recorded across multiple rows of a dataset, with one row containing information about the seller and another containing information about the buyer. One state also provided multiple rows of data for each every time the trade record was updated during the approval process (for example, one row representing the transaction at the time the application was submitted, another at the time it was approved; and sometimes with additional rows showing intervening steps). While technically this results in duplicate data, neither of these on their own present data quality issues (provided there are no referential integrity issues, see the case study in box G.4). However this type of duplication can increase the complexity of the data which can create data quality issues when the data is transformed into a '1 row per trade' format (which is optimal for analysis). This is further discussed in section G.10 Other data quality issues.

G.9 Validity

Validity refers to whether data values are consistent with a defined domain of values. Value domains may specify a specific format, data type or range or the value domain may be enumerated (that is, restricted to a specific list of codes or values).

As with duplicate data, few issues with validity have been encountered by the Inquiry team across all types and sources of data. However one significant issue relates not to validity within data sources, but rather validity *across* sources, and that is reporting of trading zones. The BOM reports water trade data against either a Trading Zone or Water Resource Plan Area. While concordances exist to translate data into a Trading Zone, failure to have universal and publically available concordance tables could result in data quality issues across a number of dimensions, including validity, completeness and coherence. Similarly, definitions of the Southern Connected Basin also exist. Where possible, these concordances and definitions should be standardised and data should be published using the standardised classification, even if this means publishing multiple versions of the data.

Another quality issue relating to validity which was observed primarily in IIO trade data was the use of free text fields for the reporting of data items which should instead be reported against an enumerated and defined domain of values (such as a code list or classification). In some cases IIOs use free text fields as quasi trade IDs, but these IDs were inconsistently reported and defined. Additional information which had potential analytical value was also stored in 'notes' fields, which made consistent extracting relevant information problematic.

G.10 Other Data Quality Issues

While high quality data is important, if the data itself is not appropriately managed, understood and maintained, this can result in:

- data not being shared, because data owners are unable to extract it from their systems or compile data into an appropriate form for sharing
- data not being understood, either by the data owners or recipients of shared data
- data errors, through incorrect compilation or interpretation of the data.

G.10.1 Data Governance and Management

Most water market data is sourced from water registers or water management systems, and as such may be classed as an administrative by-product, as opposed to survey data or primary or secondary data. According to the Australian Bureau of Statistics (ABS), 'Administrative by-product data are produced by an agency in the course of providing services and/or undertaking their core business.'¹⁷³⁰ Administrative by-product data is often a rich data source and increasingly being used in the compilation of official statistics. However, one side-effect of administrative data is that more often than not it is not collected for statistical or analytical purposes. This has particularly been the case for water markets data, which is primarily collected for the purposes of service delivery and physical water management. Many of the data quality issues identified in this appendix are due to decisions agencies made about data that allow them to best operate the system (for example to manage the movement of water between accounts), rather than to produce analytical outputs or to facilitate market monitoring. For example, the practice of recording trades in two parts (against the buyer and seller separately) makes sense when the purpose is to correctly debit and credit water accounts, but this comes at the expense of a single row per trade dataset, suitable for aggregate reporting and statistical analysis.

There were also a number of instances over the course of the Inquiry where data providers (Basin State agencies and IIOs included) were unable to supply the data requested of them either because it was simply not available, or the provider lacked the technical expertise to be able to extract it from the relevant IT systems. One key example was water accounting data in NSW which, due to system design, had to be compiled from the various inputs to the accounts as WaterNSW does not store historical

¹⁷³⁰ <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4533.0-2018-Main%20Features-Types%20of%20Data%20Sources-5>, viewed 9 December 2020

outputs to their accounts data, and transactional lists are limited to a single water year at a time. WaterNSW creates transactional account statements dynamically from the water accounting system when required, (for example, creating statements at the end of the water year). Further, some IIOs could not provide ownership details for accounts which no longer existed. There were also the issues identified in box G.4 in relation to NSW LRS.

While the primary function of many of these agencies and IIOs will be service delivery, greater focus on other uses of the data, beyond service delivery, would likely go some way to identifying and improving data quality issues at the source. In particular, reviewing data sources through the lens of their suitability for market monitoring and analysis would be a valuable exercise.

Improvements to systems and processes to support the dual purposes of service delivery and end to end management of market information will likely require some level of technical expertise to implement, which may be beyond the current capabilities of some IIOs given the issues identified in section 10.3.3 of the main report. Introduction of data governance and data management policies and practices will also be required in order to reduce quality issues at the source of the data, and this may require new skills and capabilities to be introduced to the agencies and IIOs. Again, this may be more feasible for government departments than it is for IIOs.

G.10.2 Accessibility, Interpretability and Transparency

Data governance and data management are important internal foundations on which evidence-based outcomes rest; if the evidence lacks quality, the conclusions that can be derived from that evidence will be limited. However, in addition to having high data quality, accessibility and interpretability are important externally facing foundations, and are needed to ensure that data users can make the best use of data resources, whatever their quality.

According to the ABS:

Accessibility refers to the ease of access to data by users, including the ease with which the existence of information can be ascertained, as well as the suitability of the form or medium through which information can be accessed. The cost of the information may also represent an aspect of accessibility for some users. Accessibility is a key component of quality as it relates directly to the capacity of users to identify the availability of relevant information, and then to access it in a convenient and suitable manner.¹⁷³¹

Poor data quality can lead to a reluctance to make data more accessible, or may lead to a lack of confidence in using the data. In addition there may be privacy implications for the level of data shared.

Interpretability is about ensuring that sufficient information is available in order to help provide insights into the data. This can include things like information on the structure of the datasets and other associated metadata, such as concepts and classifications. This is important as it enables information and data to be used appropriately and with due care. As part of information requests to Basin States and other data holders, the ACCC requested information that would help to interpret the data provided. While almost all data holders were able to provide some information, much of it was informally documented. Only one data holder (Victorian Department of Environment, Land, Water and Planning) provided formal documentation on the data models used in their underlying data warehouse.

In the vast majority of cases, officials from the relevant data holders had extensive understanding as to the meaning and interpretation of variables within the data, or as to why certain data was the way that it was. However, an over-reliance on people, rather than documentation, as a storage mechanism for this contextual information introduces a potentially unacceptable level of 'key-person risk' (that is, the risk that data sources are compromised or core information is lost if, for example, a key person with core institutional knowledge moves on from the organisation).

1731 <https://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/1520.0Main%20Features9May%202009?opendocument&tabname=Summary&prodno=1520.0&issue=May%202009&num=&view=>, viewed 9 December 2020

As noted in chapter 11, good quality and timely water information is key to providing confidence and enabling informed trading decisions across the Basin water markets. Pro-active disclosure and increased accessibility of both metadata and data will not only enhance data quality, particularly for derivative data, but increase transparency and therefore confidence in the market. Furthermore it will enhance evidence-based decision making by ensuring data that is used to inform decisions is fit for purpose.

Appendix H – Smart markets as a potential long-term solution for water trading in the Murray-Darling Basin

H.1 Overview

The ACCC has identified various problems relating to interzone trade and the impacts on third parties, including the environment. One potential solution to these may be a smart market or water market operator. The following is one type of model that could be used, and there may be other models that are more appropriate. It still remains to be proven that there are large enough problems with the market operation to justify a reform of this kind.

A smart market is a centralised computer-assisted market which takes information from buyers and sellers (in the form of bids and offer curves) and which computes the trading outcomes that maximise the gains from trade subject to the physical limits of the underlying infrastructure. In the case of the Southern Connected Murray-Darling Basin the physical limits of the underlying infrastructure take two forms: (a) the delays in water transportation as water flows through the system of weirs and sluice gates; and (b) the maximum and minimum flows in the system consistent with preventing damage to infrastructure or the environment.

Smart markets are used extensively in energy markets, and the ACCC acknowledges that there are key differences between these markets and the water market. However there are enough similarities that the ACCC believes that this option is worth exploring.

H.2 Problems with the status quo

As discussed in chapters 13 to 16, many of the issues in the market stem from a mismatch between the implicit property rights¹⁷³² and the underlying hydrological reality. These problems have become more material over time as water use patterns have changed, water has become more valuable, and climate change is increasing the scarcity and variability of inflows.

There are two main categories of problems with the property rights. The first category relates to rights to water allocation and storage; the second category relates to rights to deliver water (the use of the river network infrastructure). This proposal only addresses questions relating to the use of the river infrastructure. The property rights relating to storage and carryover can be addressed separately and are not covered in this model.

This appendix focuses on resolving the issues related to managing delivery capacity. At present constraints on the river infrastructure are largely or imperfectly defined ignored in the definition of property rights to water. As a consequence, there is a risk that the changing patterns of water use (brought about as a result of water trade) will lead to flows which exceed the capability of the network to handle, leading to either curtailment of flows or extractions (with consequential economic harm to water users), or damage to the network itself.

The effect of this imperfection in existing property rights is that:

- water users do not have an incentive to put water to its highest-value use
- there are third-party effects associated with water use, delivery, and storage decisions

¹⁷³² Note that the ACCC refers to property rights throughout this report with reference to their definition in economic theory, which is that a property right implies 'the powers to consume, obtain income from, and alienate ... assets'. Economic theory commonly notes characteristics of property rights as excludable, enforceable and transferrable and can include 'incomplete' property rights. The extent to which statutory water rights have proprietary characteristics appears to vary between different types of statutory right – see *ICM Agriculture Pty Ltd v The Commonwealth*. Barzel Y, 1997, *Economic analysis of property rights* (2nd edition), Cambridge University Press, p. 64.

- water trade occurs even when it is not socially beneficial and some water trades that are socially beneficial do not occur
- there is an overlay of administrative restraints on trade (e.g., IVT limits) which are a source of friction and which give rise to windfall gains for those who manage to overcome the limits.

Viewed through the lens of property rights, the problems with the current market arrangements derive from the lack of effective mechanisms for signalling (and efficiently rationing) the scarcity of network capacity. One solution may be to define tradeable delivery-capacity rights for the choke or pinch-points on the network, and to require that all users of those choke points at times of congestion hold delivery rights.

The accurate definition of delivery-capacity right shares may be impractical. Although in principle it might be possible to define delivery-capacity rights for all segments of the river, defining, pricing, and enforcing these rights as flow changes over the system is almost certainly infeasible in practice.

H.3 Operation

This market requires two types of market participants (who may be the same person): water users or **extractors** who desire to extract water from the system at a specific location, and water owners or water **injectors**, who have the ability to inject water into the system (typically through providing instructions for a release from storage).

A key difference between a smart market for water and a smart market for electricity is in the time period covered by the market. Water takes time to move through a water network. In a largely gravity-fed water network, such as the Murray–Darling Basin, it takes several weeks for water to move from the major upstream storages to the mouth of the Murray. These delays are a key characteristic of the physical infrastructure that must be taken into account. For this reason, a smart market for water must determine not only water injection and extraction in the short term (over the next 24 hours, say), but must also determine forward promises to inject or extract over several days (perhaps 30–60 days) into the future.

Each day, the water market would operate as follows: market participants who desire to inject or extract water would submit a supply or demand curve (respectively) to the water market operator, both for the immediate future (next 24 hours) and potentially for each day out over the time horizon of the market (say 30 days). The water market operator would assess the current state of the network, including the physical characteristics and limits of the network, and would carry out a mathematical optimization process to determine the combination of injections and withdrawals which maximise the gains from trade subject to the physical limits of the infrastructure. A by-product of this process is the set of corresponding prices (spot and forward prices) for water – both water delivered immediately, and water to be delivered in the future. The water market operator would then issue instructions to the water market participants who would be required to inject or extract the corresponding amount over the next 24 hours, and would be paid the corresponding prices. The water market operator would also communicate any future obligations or promises to inject or extract in the future (such obligations do not need to be fulfilled until real-time, and can be offset by making offsetting trades up until real-time).

There are several key benefits of a smart market approach to water trading:

- Provided certain conditions are satisfied (specifically, provided there is effective competition, and provided the water market operator is able to accurately model the hydrological constraints in the water network) the outcome of the smart market maximises overall economic welfare. In other words, the total gains from trade are exhausted, subject to the physical constraints of the river infrastructure.
- The resulting prices provide efficient signals to all market participants – including efficient signals for the injection and extraction of water and efficient incentives for investment in water-related production and consumption assets, such as investment in crops (including permanent plantings) and on-farm water storage. The prices also provide efficient signals for investment in the infrastructure itself, such as widening or deepening of river channels or construction of new canals.

- In principle, the smart market can also provide the water market operator with guidance on how to use its control over the water network (e.g., heights of weirs, diversion into storage ponds) in ways which maximises overall welfare.
- In principle, environmental objectives can be incorporated and addressed in two ways: either (a) through an environmental market participant submitting supply and demand curves; or (b) in the specification of the physical limits of the infrastructure.
- The approach is potentially robust to long-term developments in the sector, including further changes in inflows and water use patterns. There should be no need for any further overhaul of the water trading arrangements provided the conditions set out above continue to hold.¹⁷³³
- The approach eliminates the need for administrative discretion in the operating of trading arrangements.

The establishment of a smart market for water trading arrangements in the Murray–Darling Basin offers the potential for long-term sensible and sustainable reform which promotes the long-term interests of water users and investors in the Murray–Darling Basin.

At the same time, there remain several issues that would need to be resolved:

- It would be necessary to establish a sufficiently accurate hydrological model of the river network. Factors that will need to be taken into account are conveyance losses, interaction with groundwater, and return flows. The MDBA and Basin States already have models of water flows in the Murray–Darling Basin. These would have to be developed further.
- The precise specification of the water market operator’s mathematical optimisation would need to be determined. For example, there are questions as to whether the optimisation can be formulated as a “linear program” which can be solved quickly and easily, or whether more complex algorithms would be required.
- There are important questions about how any transition to the new market design would occur. A key question is whether it is possible to roll out such a market in a progressive manner, or whether a once-off “big bang” approach is required.

There would likely be a material one-off start-up or establishment cost associated with a move to a smart market. Amongst other things, there are the establishment costs of the water market operator itself, and the costs of training water users to make effective use of the market for their own ends.

H.4 The design of the proposed smart market for surface water

In order to establish the proposed smart market, certain preliminary actions would need to be taken, as explained below:

1. First, an appropriate *time interval* for the market should be determined, and an appropriate *time horizon*. At this stage the proposed market could operate at an interval of one day¹⁷³⁴, and a time horizon of 30–60 days (according to the length of time it takes water to flow through the system).
2. Second, market participants – at all locations up and down the river – must register as either water injectors, or water extractors (or both). All water injections and extractions must be accurately measured at the location of injection or extraction (in other words, effective, high-quality metering is essential). Water injectors would be holders of rights to inflows (that is, those who hold a tradeable water right and receive a “water allocation” under the existing arrangements). These would typically be held in a storage, in which case the point of injection is at the point of outflow from the dam. In principle, holders of rights to inflows in unregulated tributaries could also be allowed to participate as injectors. In principle, owners of on-farm storage may also be able to register as injectors provided the injected water can be accurately measured and provided the injected water meets quality requirements (particularly salinity).

¹⁷³³ That is, provided there is effective competition in the market, and provided it is possible to model water flows in the system.

¹⁷³⁴ Raffensperger et al (2009), in their proposal for a groundwater market, propose a time interval of one week, and a time horizon of one year.

3. Third, it would be necessary to develop a hydrological model of water flows in the Murray–Darling Basin. Specifically, the operator would need to know: how does water flow between the segments of the network? How does the water flow rate over each weir, flume, or sluice gate depend on factors such as the height of the water? How much water is lost due to evapotranspiration and conveyance losses, and how does this relate to factors such as weather conditions and the height of the water in each segment? What are the interactions with groundwater?¹⁷³⁵

The proposed water market would operate as follows:¹⁷³⁶

- Each water day, water users (that is, extractors) who desire to extract water from the network, either immediately or in the near future up to the time horizon, would submit a demand/offer curve for water to the water market operator (WMO) for extraction at a specific location. To illustrate, here are some example demand curves:
 - “I would like to extract 20 ML from location X, over the next 24 hours, as long as the price of water at X does not exceed \$500/ML.”
 - “I would like to extract 10 ML per day from location Y, starting in 7 days and extending to 14 days in the future.”
 - “I would like to extract 100 ML per day from location Z, on any day when the price is below \$100/ML, reducing to 50 ML on any day when the price is below \$200/ML, otherwise nothing.”
- Similarly, water owners (that is, injectors) who have (or expect to have) water in their account for a specific location would submit a supply curve for injecting water at that location (typically the location of the dam/storage). Here are some example supply curves:
 - “I am prepared to inject up to 20 MW at location Z, over the next 24 hours, provided the price does not drop below \$200/ML.”
 - “I am willing to inject 200 ML per day on any day when the price is above \$500/ML.”
- The water market operator takes all of the supply and demand curves and finds the combination of injections and extractions which maximises the gains from trade subject to the physical constraints of the water network. This process results (as a by-product) in the price for water at each location on the network on each day out to the time horizon. Each water market participant receives back from the water market operator:
 - the spot price for water at each location on the network, for the next 24 hours, and instructions on how much the participant must inject or extract at his/her location over the next 24 hours
 - the future price for water at each location on the network, for each day in the future out to the end of the time horizon, together with instructions on the obligation to inject/extract water that the participant has incurred.
- The water market operator would then monitor compliance with the instructions or obligations provided by the market, and would ensure that market participants settle at the corresponding prices.

Provided there is effective competition at each location for injection and withdrawal, each market participant has an incentive to submit a bid/offer curve which reflects their true demand/supply curve. Provided the water market operator correctly models the hydrology of the network (injections, withdrawals, flows, levels, losses), the resulting prices and injections/withdrawals maximise the total gains from trade in the system, guaranteeing that the market is extracting the maximum benefit from the network subject to the physical and environmental constraints.

A few points are worth emphasising:

- There is only a single price for water at each location at each point in time – in other words, the price that must be paid to extract water is the same as the price paid to a user for injecting water at the same location at a given point in time.

¹⁷³⁵ For this proposal to work effectively the constraints under which the water market operator operates would have to be made explicit and transparent (and ideally non-discretionary).

¹⁷³⁶ There is a strong analogy here to the operation of the wholesale electricity market, although there are also clear differences: primarily that the electricity market operates on a single time period at a time.

- At any given point in time, the water difference in the price for water across two locations is the “cost of delivery”, reflecting physical flow constraints, conveyance losses, and the time delay in water flowing through the system.
- At any given point in time, the market operator receives a flow of funds corresponding to the difference in revenue from payments from water extractors and payments to water injectors. This flow of funds or surplus corresponds to the “merchandising surplus” received by the system operator in the context of the electricity sector. This payment stream may be positive, but this would have to be proven. It could be negative in some circumstances (for example, when there is an unexpected drop in demand at a location, and water has already been injected upstream).

One remaining issue to be addressed is the implications of the proposal for risks to which water market participants are exposed. Under the status quo, water users (extractors) who hold water in their water account are insulated from variations in the spot price of water (in the dam) and are partly insulated from variations in the cost of delivery (only partly because under the status quo there is a risk of undeliverability). Following the establishment of the smart market, water market participants would need to have the same ability to insulate themselves from risk. Therefore, the final element of this proposal is a discussion of the associated risk management instruments. It is proposed that:

- Up until the time horizon, water market participants can enter into arrangements to inject or withdraw a given volume of water at a fixed price and therefore are insulated from risk.
- In addition, on a time scale longer than the time horizon, the ACCC expects that forward contracts would develop for the price of water at specific locations. For example, there could be a forward price for water in Hume dam, and so on. It is expected that these instruments could be provided by financial markets and no further specific action by the market designers would need to be taken. In other words, they would arise spontaneously.
- It may also be necessary for the water market operator to make available financial contracts which insulate market participants from the risk of price differences across locations. The precise form of these hedging instruments would be the subject for further research and development.

H.5 A simple worked example

To give some idea of how this might work, let's consider a simple example. In this example the river network comprises three segments, separated by weirs, labelled A, B and C. The last segment drains to the sea. This is illustrated in figure 1 below. The rate at which water flows from segment A to segment B, segment B to segment C, and out of segment C, depends on the height of the water above the weir in each case. With the parameters chosen, half of the water in segment A can drain out in 2.3 days, and in segment B in 6.9 days, and segment C in 13.9 days.

To get some indication of how water flows through this hypothetical network, let's assume that there is 10 metres of water in segment A and then, at time zero, this water is released (there are no other injections or withdrawals). The resulting water flow is illustrated in figure 2. As can be seen, the water level in segment A drops off over ten days, while the water level in B increases rapidly before peaking and dropping off. The water level in segment C peaks around day 15 and then drops off.

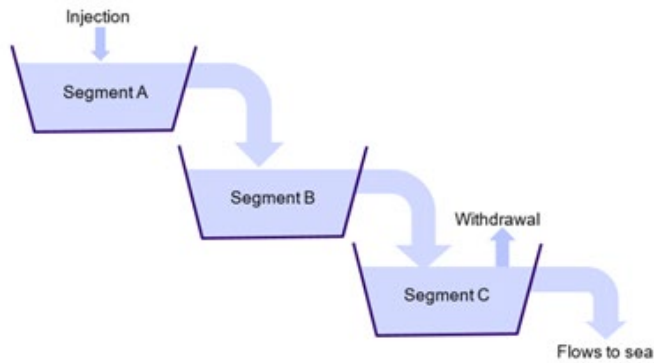
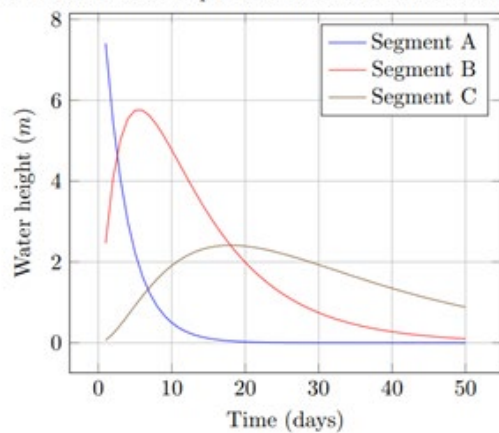


Figure 1: A simple three-segment water network

Figure 2: Evolution of simple water network with no extraction/injection

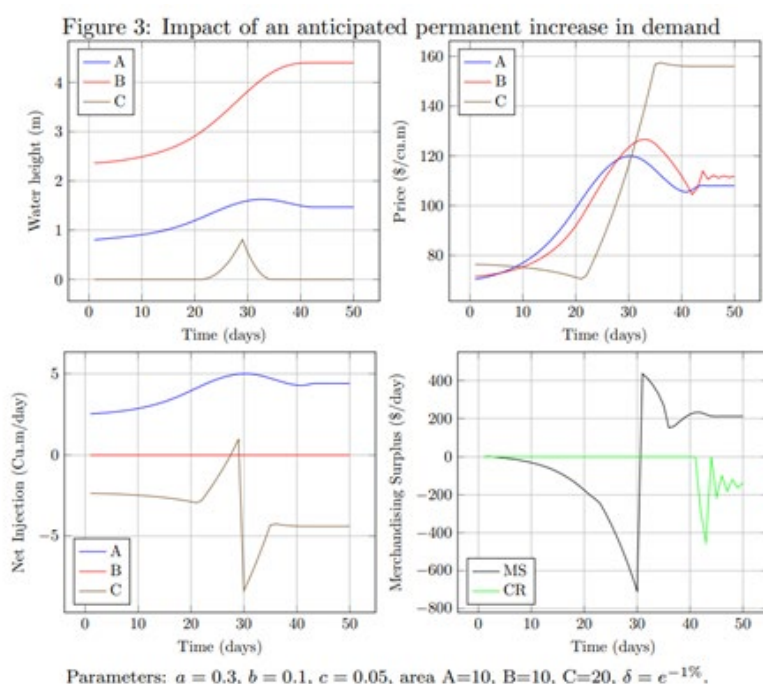


Parameters: $a = 0.3$, $b = 0.1$, $c = 0.05$, area A=10, B=10, C=20, $\delta = e^{-1\%}$.

Finally, imagine that there is a water injector in segment A and a water extractor in segment C. Let's start in a steady-state in which the water injector and the water extractor are injecting/extracting at a constant rate. Then imagine that the water extractor forecasts an increase in demand in 30 days time (this could be due to a need for crop irrigation, or a forecast decline in rainfall). What happens to prices and flows in this case?

The answer can be seen in figure 3. As can be seen, in the efficient (welfare maximising) water dispatch pattern, the injector in segment A starts increasing the injection of water well before the increase in demand. This builds up water in segment B and segment C in advance of the increase in demand, at first depressing the price at C. But the price at C increases rapidly before the increase in demand, before peaking and then declining to the new, higher, steady state.

Observe that this pattern of flows is surprisingly complex for a relatively simple network. Further analysis is needed to make sure this is not an artefact of the modelling. At this stage, this is considered to be representing a real effect of efficient pricing in a water network with flow constraints, such as set out here.



H.6 Conclusion

This proposal offers clear price signals, to which market participants can respond. The proposal also allows for market participants to focus attention on their own activity, such as water use (i.e. farming), without needing to pay attention to the specifics of how water flows through the network. The proposal would require market participants to do a bit more than at present (specifically to submit bids and offers to a centralised market operator), but some degree of change is inevitable in any effective reform of the water trading arrangements.

Many specific issues remain to be addressed and several design issues must still be worked out. For example, there are questions about how the environmental requirements (including periodic flooding) would be taken into account. There are also questions about precisely how the optimisation would be formulated, and about the design of the hedging instruments. At this stage, there is no indication that these issues are insurmountable.

Questions also still need to be answered as to whether the problems present in the market and their impacts on the river system are of sufficient importance to justify this large scale reform.