Department of Climate Change, Energy, the Environment and Water

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Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2023

Background and changes

January 2024

Acknowledgement of Country

The Department Climate Change, Energy, the Environment and Water acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Glossary and abbreviations

Term	Definition
Aquifer	An underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay) from which groundwater can be usefully extracted. The volume of water stored in an aquifer, the rate at which water can recharge, the volume of water extracted from it, and the rate at which water can move through the aquifer are all controlled by the geologic nature of the aquifer.
AWD	Available water determination
BLR	Basic Landholder Right
CFA	Coastal floodplain alluvial
DCCEEW	The NSW Department of Climate Change, Energy, the Environment and Water, formerly the Department of Planning and Environment.
EMU	Extraction management unit A group of water sources; defined for the purpose of managing long-term average annual extraction.
GDE	Groundwater-dependant ecosystem These are ecosystems that rely on groundwater for their species composition and their natural ecological processes.
LTAAEL	Long-term average annual extraction limit The long-term average annual volume of water in an extraction management unit available to be lawfully extracted or otherwise taken under access licences and basic landholder right requirements.
MER	Monitoring, evaluation and reporting

Term	Definition
NRC	Natural Resources Commission
NRAR	Natural Resource Access Regulator
NSW	New South Wales
Richmond 2010 plan	*Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2010*
Richmond 2023 plan	*Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2023*
Share component	An entitlement to a given number of shares of the available water in a specified water source. The share component on an access licence certificate is expressed as a unit share. The share component of a specific-purpose access licence (for example, local water utility, major water utility and domestic and stock) is expressed in megalitres/year.
Third-order or higher streams	'Stream order' is used to describe the hierarchy of streams from the top to the bottom of a catchment. To determine the stream order of a stream the Strahler system must be applied to streams shown in the hydro line spatial data: https://www.industry.nsw.gov.au/water/licensing-trade/hydroline-spatial-data
WM Act	*Water Management Act 2000*
WSP	Water sharing plan. Generalised term used for any water sharing plan, not specific to a particular plan.

1 Introduction

Water sharing plans were developed for rivers and groundwater systems across New South Wales following the introduction of the *Water Management Act 2000* (WM Act). These plans protect the health of our rivers and groundwater while giving water users perpetual access licences, sustainable resource management, equitable water sharing arrangements, and increased opportunities to trade water.

NSW water sharing plans are valid for 10 years from their start date. The NSW Department of Climate Change, Energy, the Environment and Water (the department) amends water sharing plans throughout their life to ensure they comply with changing legislation and to help carry them out. However, near the end of a plan's 10-year term, the Natural Resources Commission (NRC) formally reviews it to identify any changes that are necessary to deliver better outcomes for all water users, including the environment.

The Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2023 began on 1 July 2023 (the Richmond 2023 plan). The new plan replaces the previous *Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2010* (the Richmond 2010 plan).

This document gives high-level background information on the planning process as well as details of changes to management arrangements in the Richmond 2023 plan.

The Richmond 2023 plan covers 25 water sources, including one new water source, the Richmond River Area Coastal Floodplain Alluvial Groundwater Source.

You can find links to the plan, maps and rule summary sheets on the Far North Coast Region page on the department's website.

The resources in 'Appendix A – References and supporting documents'' give more details of the plan area, its water resources and resource management.

2 Purpose of water sharing plans

Expansion of water extraction across NSW since the 20th century has seen increasing competition between water users (towns, farmers, and industries) for access to water. This has placed pressure on the health and biological diversity of our rivers and aquifers.

In December 2000, the Parliament of NSW passed the WM Act, which has the overall objective to:

> 'provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations'

Water sharing plans play a major role in achieving this objective by providing a legal basis for sharing water between the environment and consumptive water users.

Water sharing plans are the primary means of carrying out the WM Act. They protect the basic rights of landholders to extract water and seek to balance the sustainable use of water for both economic and environmental outcomes.

3 Legislation, policy, and planning framework

3.1 Water Management Act 2000

The *Water Management Act 2000* (WM Act) is the guiding legislation for water management in NSW. The Act allows for the sustainable and integrated management of water sources. It considers ecologically sustainable development, the protection and enhancement of the environment, and social and economic benefits.

The WM Act sets a maximum initial lifespan of 10 years for water sharing plans, at which point they need to be reviewed and replaced or extended. When deciding whether to extend or replace a water sharing plan, the responsible minister must consider:

- the most recent audit of the water sharing plan conducted under section 44 of the WM Act
- a report from the NRC that reviews (within the previous 5 years) if the water sharing provisions have significantly helped to achieve, or have failed to achieve, environmental, social and economic outcomes, and if those provisions should change.

Under the WM Act, a water sharing plan may be extended for up to 2 years past the expiry date to allow the department to prepare a replacement plan.

You can review the NSW *Water Management Act 2000* on the NSW Legislation website.

3.2 Water sharing plans

A water sharing plan sets out locally appropriate rules and management arrangements for specific water sources that align with the principles of the WM Act.

Key elements of water sharing plans include:

- providing water for the environment by protecting a proportion of the water available for fundamental ecosystem health
- protecting the water required to meet basic landholder rights
- setting annual limits on water extractions that ensures security for water users and the environment

- giving water users a clear picture of when and how water will be available for extraction
- giving licence holders flexibility in the way they can manage their water accounts
- specifying rules in groundwater plans to minimise effects on other groundwater users, groundwater-dependent ecosystems (GDEs), culturally significant sites, water quality and the stability of the aquifer
- specifying the rules for water trading/dealings
- setting the mandatory conditions that apply to licence holders.

You can review the *Water Sharing Plan for the Richmond River Area Regulated, Unregulated and Alluvial Water sources 2023* on the water sharing plan pages of the department's website.

3.3 NSW water policy

We are continuously evolving and improving water-related policy and decision-making processes that carry out the legislative framework to ensure effective delivery of our water resource management objectives. We develop plans in line with the principles of the WM Act and the National Water Initiative.

You can find more information on the National Water Initiative on the Australian Department of Climate Change, Energy, the Environment and Water website.

3.4 Changes to policy for harvestable rights in coastal areas

In May 2022 the limit for uptake of harvestable rights water in coastal catchments was raised from 10% to 30%. As of 27 September 2023, the harvestable rights limit for coastal NSW has been returned to the previous limit of 10%, to allow sustainable levels of extraction to be determined prior to any increases in harvestable rights. The department has been in contact with the small number of customers who have registered to increase their harvestable rights storage capacity during this time and is working with the individuals to find suitable solutions.

The 2022 and 2023 plans include an amendment to assess uptake of harvestable rights within 3 or 5 years of the plan commencement to determine if there has been any increase in uptake of water due to the increase to 30%. The amendment also includes the ability to modify access rules in Parts 6 to 8 of the plan in response to any significant increases of uptake to protect critical environmental needs and basic landholder rights.

Due to the small number of instances where landholders have registered their intent to increase harvestable rights uptake the department does not expect any significant changes to

rules in the plan as a result of an increased uptake of harvestable rights. For more information on the specific changes to harvestable rights please visit the department's frequently asked questions webpage or for general information, the harvestable rights webpage.

4 Water sharing plan review and replacement process

Under the WM Act, water sharing plans have a 10-year duration.

During the life of the plan, it will undergo an independent review at least twice, as follows:

- the **implementation of the plan** will be audited in the first 5 years of the plan under section 44 of the WM Act
- the **performance of the plan** will be reviewed in the last 5 years of the plan under section 43A of the WM Act.

The NSW NRC is the independent body that audits and reviews water sharing plans. The section 44 audits aim to identify where improvements are necessary to apply the plan rules. The section 43A review is to determine if the plan is achieving the intended environmental, social and economic outcomes.

The NRC reports the findings of the audits and reviews to the NSW minister responsible for water, who decides whether to extend a plan for another 10 years or to replace it. If the Natural Resources Commission recommends replacing it, the department considers the commission's recommendations when developing the replacement plan.

More information and links to the reviews of the Richmond 2010 plan are in section 4 of this document.

The Minister at the time adopted the NRC's recommendation to replace the Richmond 2010 plan in June 2021.

To allow time to review and replace the plan, the duration of the current plans was extended by 2 years.

You can find more information on the water sharing plan review and replacement process in the Replacement Water Sharing Plan Manual (PDF 1.28 MB).

5 Water Sharing Plan for the Richmond River Area 2023

5.1 Overview

The Richmond 2023 plan contains 25 water sources and manages the same catchment area as the Richmond 2010 plan (approximately 6,900 square kilometres). It includes the coastal catchments of northern NSW from Evans Head to just north of Lennox Head and extends west to the Great Dividing Range bordered by Whiporie in the south and slightly east of Woodenbong in the north, where the Upper Richmond River catchment reaches the NSW border with Queensland (Figure 1). It includes the major population centres of Lismore, Ballina and Casino and the smaller towns and villages of Kyogle, Wiangaree, Coraki, Woodburn, Nimbin, Alstonville and Bangalow.

The Richmond River catchment is made up of three main arms – the Richmond River, the Wilsons River and Bungawalbin Creek. The Richmond River and Wilsons River tidal pools are at the downstream end of these three arms. The eastern part of the catchment is defined by a very large (1,000 square kilometres) coastal floodplain, which extends between Evans Head and Cape Byron. The Richmond River estuary, a large tidal pool that extends across the floodplain, covers approximately one third of the total 19 square kilometres of waterways. A unique feature of this estuary is the upstream extent of tidal influence, which is 90 kilometres from the ocean mouth. The Richmond River enters the Pacific Ocean at Ballina.

The Evans River Catchment is a small coastal catchment (6 square kilometres) which at times receives floodwaters from the Richmond River near Woodburn. Evans River enters the ocean at the township of Evans Head. Most of the catchment area is located within the Bunjalung and Broadwater National Parks and is primarily unmodified with a large proportion of the catchment remaining densely vegetated.

Major in-stream structures within the Richmond River catchment include: Toonumbar Dam - currently used for irrigation purposes; Rocky Creek Dam (14,000 ML), Emigrant Creek Dam (820 ML), two weirs at Casino, one at Kyogle and one at Laverty's Gap, all used for town water supply purposes; and the Mullumbimby Power Station weir on the upper Wilsons River. The Richmond River floodplain has been extensively modified with a network of drains, floodgates, levees and other structures to assist in draining floodwaters and wetlands for agricultural and urban land use.

A fifty-kilometre length of river within the Richmond River catchment is regulated through releases from Toonumbar Dam. These releases flow into Iron Pot Creek, which then becomes Eden Creek. The junction of Eden Creek and the Richmond River marks the downstream end of the regulated system. The storage capacity of the relatively small dam is 11,000 ML and, in most years, fills to capacity. The catchment area for the dam is 98 square kilometres. Downstream of the dam wall, regulated reaches receive contributions from the unregulated section of Eden Creek, Doubtful Creek and other small tributaries.

As shown in the plan map (Figure 1), the plan area consists of 4 extraction management units (EMUs) which are made up of 25 water sources (listed in Table 3) and some water sources have management zones. There are 16 management zones in the plan area.

Total licensed entitlement for the plan area is approximately 105,500 ML a year. This entitlement represents average annual potential extraction under licences. Most of these licences are for irrigation, with a significant proportion also used for town water supply.

In addition to licensed extraction, water is also required to meet basic landholder rights (BLR).

Table 1. Estimated requirements for water in the Richmond 2023 plan - Basic Landholder Rights

Extraction type	Potential extraction (ML/year)
Domestic and stock	7,404
Native title	The amount of water that may be taken in the exercise of native title rights in accordance with the *Native Title Act 1993* of the Commonwealth.
Harvestable rights	30,636

Table 2. Estimated requirements for water in the Richmond 2023 plan - licenced extraction

Extraction type	Potential extraction (ML/year)
Domestic and stock	594
Local water utility	25,582
Unregulated river	65,978
Regulated river – General security	9,531
Regulated river – High security	123

Extraction type	Potential extraction (ML/year)
Regulated river – Supplementary	0
Aquifer	3,640

Table 3. Extraction Management Units and Water Sources in the Richmond 2023 plan

Extraction Management Unit (EMU)	Water Source
Water sources in the Richmond River Extraction Management Unit	Alstonville Area Bangalow Area Broadwater Area Coopers Creek Coraki Area Double Duke Area Doubtful Creek Eden Creek Gradys Creek Kyogle Area Lennox Area Leycester Creek Myall Creek Myrtle Creek Richmond Regulated Alluvial Sandy Creek Shannon Brook Terania Creek Toonumbar Area Tuckean Area Upper Richmond River Wyrallah Area

Extraction Management Unit (EMU)	Water Source
Evans River Catchment Extraction Management Unit	Evans River
Richmond Regulated Extraction Management Unit	Richmond Regulated
Richmond River Area Coastal Floodplain Alluvial Groundwater Extraction Management Unit	Richmond River Area Coastal Floodplain Alluvial Groundwater

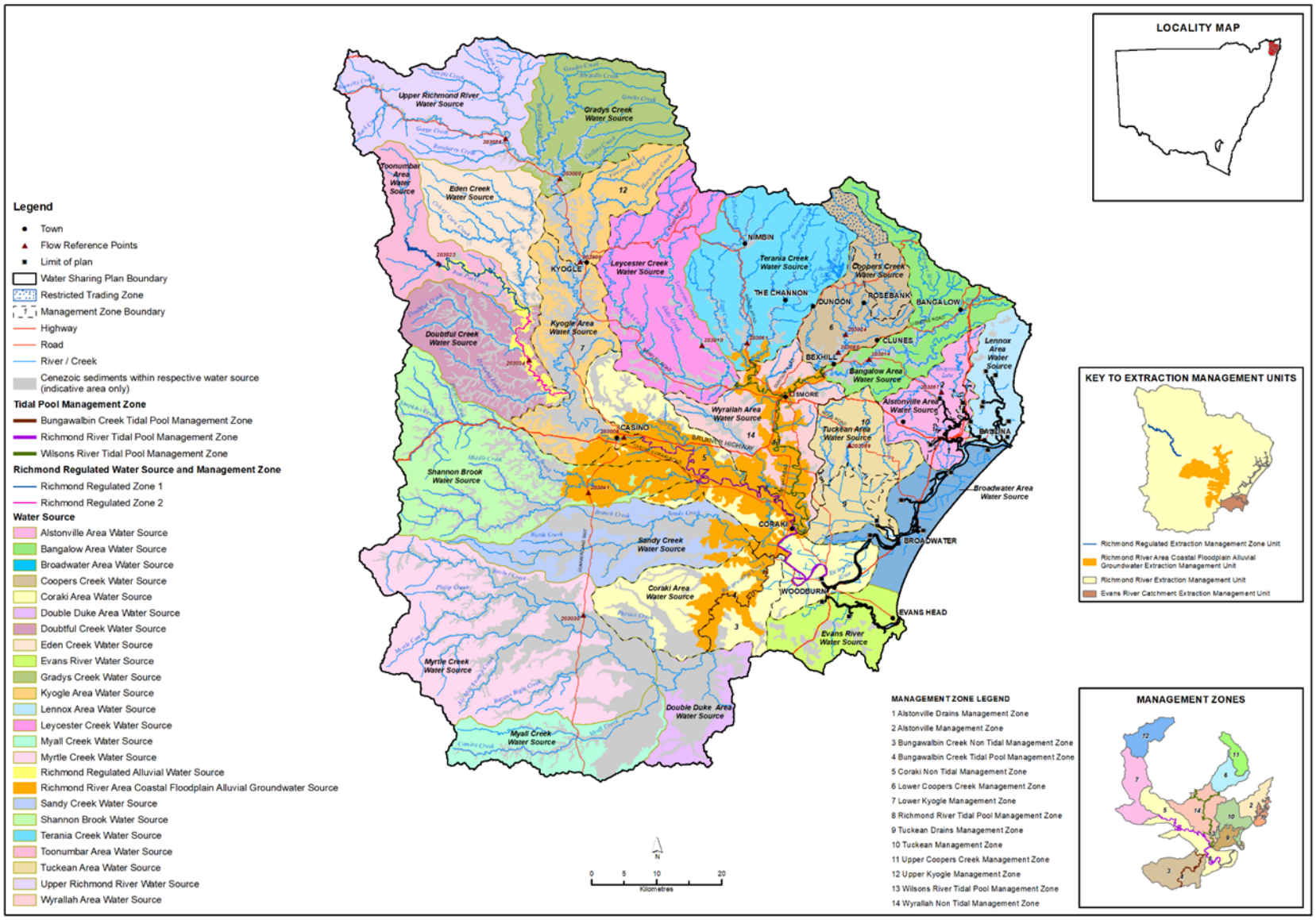

Figure 1. Plan area for the *Water Sharing Plan for the Richmond River Unregulated, Regulated and Alluvial Water Sources 2023*

5.2 Previous plans

Water in the Richmond River Area was previously managed by:

- the *Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2010*

For more information on this plan, refer to:

- the Richmond 2010 plan background document (PDF 979 KB).

The Richmond 2010 plan was developed using the macro-planning approach and included extensive stakeholder and interagency consultation. Details of the macro-planning approach can be found in the following documents:

- Macro water sharing plans – approach for unregulated rivers (PDF 829KB)
- Macro water sharing plans – access and trading rules for pools (PDF 627 KB)
- Macro water sharing plans – the approach for groundwater (PDF 3.11 MB).

As of 1 July 2023, the water sources of the Richmond River Area are now managed under the *Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2023.*

5.3 Developing the 2023 water sharing plan

The processes that the department has used in developing the replacement plan are an update on the previous macro–planning approach.

The development of replacement plans now follows the processes described in the Replacement Water Sharing Plan Manual (PDF 1.32 MB).

We continue to use some methods described in the macro-planning approach. This background document will describe the most recent and specific methods used to prepare the 2023 Richmond plan.

The department is responsible for implementing the WM Act, including developing water sharing plans for NSW water resources. When drafting the replacement water sharing plan, we considered:

- the section 44 Audit of the Water sharing plan for the Richmond River Area Unregulated, Regulated, and Alluvial Water Sources 2010 (PDF 3928 KB)

- recommendations from the Natural Resources Commission's 2021 Review of the water sharing plans for the Richmond and Tweed unregulated and alluvial water sources (PDF 3,549 KB)
- updated data, information and science
- the deliberations across government agencies including the Water group and Environment and Heritage branch within the department, Department of Primary Industries' Agriculture and Fisheries branches, and the Natural Resources Access Regulator
- changes in policy e.g. change in harvestable rights
- consultation with Rous County Council
- consultation with water user groups
- consultation with the wider community.

You can download the *Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2023* from the department's website.

Details of the changes from the 2010 to the 2023 water sharing plan are given in section 6 of this document.

You can find information on the public exhibition phase in the section 5.3.2 of this document.

5.4 First Nations consultation

First Nations engagement during draft plan development was modified due to the covid-19 restrictions. Consultation occurred through:

- the Far North Coast Regional Water Strategy meetings in Kyogle and Lismore in September 2020, water planning staff were available via video link to discuss the proposed plan replacement project
- a mailout in April 2021 to 13 Local Aboriginal Land Councils (LALCs) within the plan area informing of the draft replacement plan development and inviting consultation at any point in time
- a Regional Water Strategy meeting with Githabul people in Muli Muli and another with Lismore LALC in June 2021. Information on the plan development was included in the presentation given and fact sheets were available.

For consultation of the publicly exhibited draft plan, a mailout to the LALC's within the plan area was undertaken and based on feedback, the following meetings were arranged:

- with Githabul Native Title holders at Kyogle on 14 November

- with Casino Local Aboriginal Land Council on 14 November
- with Aboriginal community members at Coraki on 29 November.

Consultation will be ongoing First Nations consultation throughout the life of the plan.

5.5 Public exhibition and finalising the 2023 plan

The department exhibited the draft replacement 2023 water sharing plan between 20 October 2022 and 18 December 2022. During this time a webinar presentation followed by a question-and-answer session was held, along with 4 drop-in style public information sessions to advise the public and get feedback on the draft water sharing plan. These drop-in style sessions were held in Kyogle, Casino, Wollongbar and Ballina during November 2022.

During the public exhibition period, there were 367 unique hits on the plan's public exhibition website. We had phone discussions with 3 members of the public, and one meeting with a local government representative. We received 3 submissions. Issues raised in submissions are summarised in the What we heard document.

In finalising the draft plan, the department considered submissions as well as further deliberations and input from government agencies including the Water Group and Environment & Heritage Branch from department, as well as the Department of Primary Industries' Agriculture and Fisheries divisions.

Section 6 of this document details changes made from the Richmond 2010 plan to the Richmond 2023 plan, while Appendix B - Substantive changes made between the draft and final 2023 water sharing plan provides details of changes between the draft on public exhibition and final plan and indicates if a change was in response to submissions received.

6 Changes from the 2010 plan to the 2023 plan

6.1 Overview

Key drivers for the changes in the 2023 plan were:

- the NRC's review recommendations
- contemporary water resource policy – some changes to the plan align it with current policy to help improve efficiency and consistency in achieving water resource management objectives across the state
- updated data and knowledge improvements
- consultation on the draft plan, feedback and submissions.
- limiting change due to impacts of flooding

Changes to the plan reflect improved understanding and updated data. They aim to modernise and simplify the water sharing plan to make it easier to read while ensuring provisions are practical to implement and legally accurate.

Limited changes were made to daily access to water in the Richmond 2023 plan. This is due to the hardships still being faced by much of the community after the disastrous flooding that occurred in 2022. An amendment provision has been included that allows for the plan to be changed within the first 5 years to review and update access rules, at a time more suitable to the community. The department will be back out to consult the community on changes to access rules before year 5 of the plan. Any required amendments will be progressed following this consultation, public exhibition and submission processes.

Changes that were made from the 2010 to the 2023 plan include:

- the general layout of the plan
- include a new floodplain alluvial groundwater source
- enable amalgamation of the Coopers Creek Alluvial and Coopers Creek Unregulated water sources
- identification of planned environmental water
- the vision, objectives, strategies, and performance indicators
- update the definition of the long-term average annual extraction limit

- prohibit in-river dams in some water sources
- the plan map
- simplify access rules for tidal pool users
- update basic land holder right estimates and access licence share components
- update distance rules for groundwater works
- update trade provisions
- add a high-priority, Groundwater Dependent Ecosystems (GDE) map including wetlands, and remove the schedule to reflect updated information
- prohibit water supply works approvals near State Environmental Planning Policy (SEPP) wetlands and potential acid sulfate soils
- uncontrolled flows
- Aboriginal Community Development Access Licences
- adaptive management and amendment provisions.

Appendix B - Substantive changes made between the draft and final 2023 water sharing plan, includes information about substantive changes made between the draft and final water sharing plans, and if a change was in response to submission received.

For a summary of all issues raised in submissions, regardless of whether they led to a change, please refer to the Outcomes of public exhibition section of the department's website and the What we heard document.

Rules Summary Sheets for each water source are available on the department's website. These detail the relevant rules that apply to each water source under the Richmond 2023 plan.

6.2 Layout changes

There are several structural layout changes in the Richmond 2023 plan. Clauses may have been moved or reworded, but their intent is the same. Such changes reflect current template styles and provide a more standard and consistent layout across the state's water sharing plans, as well as making the water sharing plan easier to understand.

For example, we have removed unnecessary notes, as well as moving and consolidating amendment provisions to the amendment part of the plan.

6.3 Inclusion of a coastal floodplain alluvial groundwater source

Not all groundwater in alluvial sediments downstream of the tidal limits was included in the previous water sharing plan. The Richmond 2023 plan establishes a new water source, the Richmond River Area Coastal Floodplain Alluvial Groundwater Source. This new water source covers the alluvial floodplain deposits that are hydrogeologically distinct from the upriver alluvial deposits, which are more connected to surface water. The boundaries of the proposed water source are shown on the map in Figure 1. You can find a high-resolution map of the Richmond 2023 water sharing plan on the department's website.

Existing WM Act groundwater licences within the proposed alluvial water source will be amended to reflect the new water source. The establishment of the new alluvial groundwater source should not result in tangible changes for existing water users taking from the water source or affect water availability for these users.

Water sources managed under a water sharing plan are subject to long-term average annual extraction limits (LTAAELs). A LTAAEL of 13,000 megalitres/year has been set for the new coastal floodplain alluvial (CFA) water source. This volume caters for current and estimated future demand and is equivalent to 25 % of the average annual recharge for the water source.

In determining the limit, the department considered the principles set out in Macro water sharing plans – the approach for groundwater (PDF, 2,414.13 KB).

Unlike other water sources in the Richmond 2023 plan, more licence shares may be granted in the CFA water source through a controlled allocation process. This is because the sum of current entitlement and BLR is well below the LTAAEL.

Aboriginal community development and Aboriginal cultural specific-purpose access licences may also be granted in the CFA water source.

Trading into the CFA water source is prohibited as it is not hydrologically highly connected to any other water sources.

The Minister for Water makes available water determinations (AWDs) each year to allot a volume of water for each water allocation account. The Richmond 2023 plan sets out the rules for how those accounts are to be managed.

We also use AWDs to return extraction in a water source to the LTAAEL if it is exceeded. This is unlikely in the case of this CFA as the proposed extraction limit is much higher than combined current entitlement and BLR use.

6.4 Amalgamation of Coopers Creek Alluvial and Unregulated water sources

The previous Coopers Creek Alluvial Groundwater Source is a legacy artefact of the original Coopers Creek water sharing plan 2003 before it was merged into the Richmond plan.

The Coopers Creek alluvium is highly connected to the flows in Coopers Creek. In all other parts of the Richmond plan where alluvial sediments are highly connected to surface water the water in the alluvial sediments is managed as part of the overlying surface water source. For example, the Myall Creek Water Source includes both the surface water and water in the highly connected underlying alluvium.

In order to simplify and improve consistency, the management of the Coopers Creek alluvium was moved into the Coopers Creek Water Source – as per the other water sources in the plan.

This change does not result in any significant impacts to water users. The plan map has been updated to reflect this modification.

6.5 Changes to the plan map

The plan defines its limits and this is shown on the plan map. The updated plan map is included here as Figure 1.

This map includes the following changes from the Richmond 2010 plan map.

Inclusion of the coastal floodplain alluvial groundwater source

The plan map was updated to include the new Richmond River Area Coastal Floodplain Alluvial Groundwater Source.

Minor change to regulated zone boundary

The plan map was updated to make a slight change to the boundary location between Richmond Regulated Zone 1 and Zone 2 – this change resolved an administrative issue that affected 2 licences and is not a change of intent.

Minor change to water source boundary

Based on community feedback and updated spatial data sets, a small portion of the boundary between the Coraki and Wyrallah water sources has been realigned to correctly follow the geographical high point between the two water sources. Detail of the new boundary is shown in Figure 2. The change is also reflected on the plan map.

The correction affected a single licence that will be amended to reflect the boundary change.

Establishing Bungawalbin Creek tidal and non-tidal management zones

The Richmond 2010 plan included specific trade rules for the Bungawalbin Creek sub-catchment but did not establish management zones. To improve clarity and to support locally relevant trade rules, the Richmond 2023 plan establishes the following management zones:

- the Bungawalbin Creek Non-Tidal Management Zone
- the Bungawalbin Creek Tidal Management Zone.

The extent of the zones is shown in Figure 3 and is also reflected on the new plan map. It should be noted that the Bungawalbin Creek Tidal Management Zone includes the tidal portion of Sandy Creek.

Work approval holders and licences associated with works within the extent of the proposed zones will be amended to reflect the respective zone.

Please also note the trade rules for the new management zones in the changes to trade provisions section of this document.

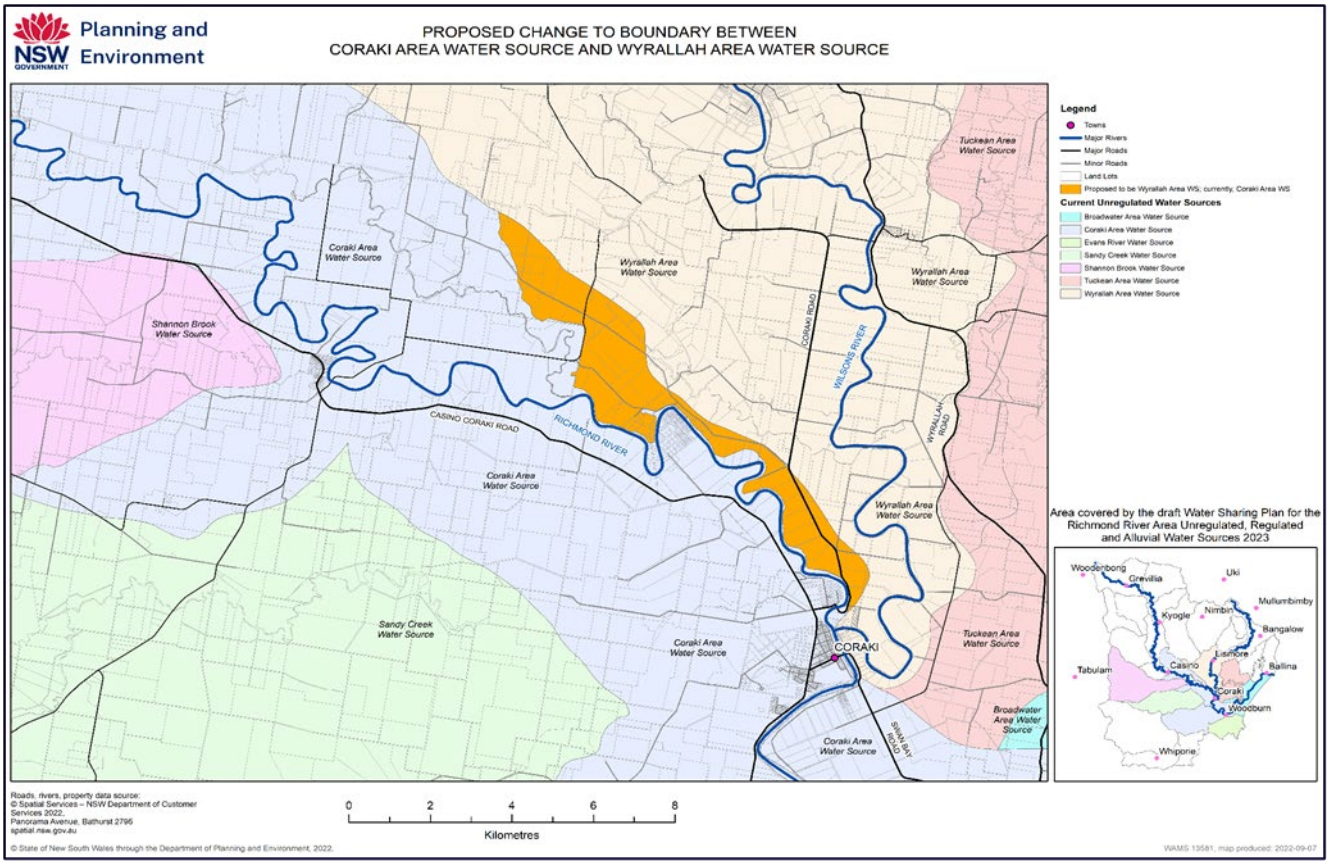

Figure 2. Details of the change to the boundary between Wyrallah Area and Coraki Area water sources

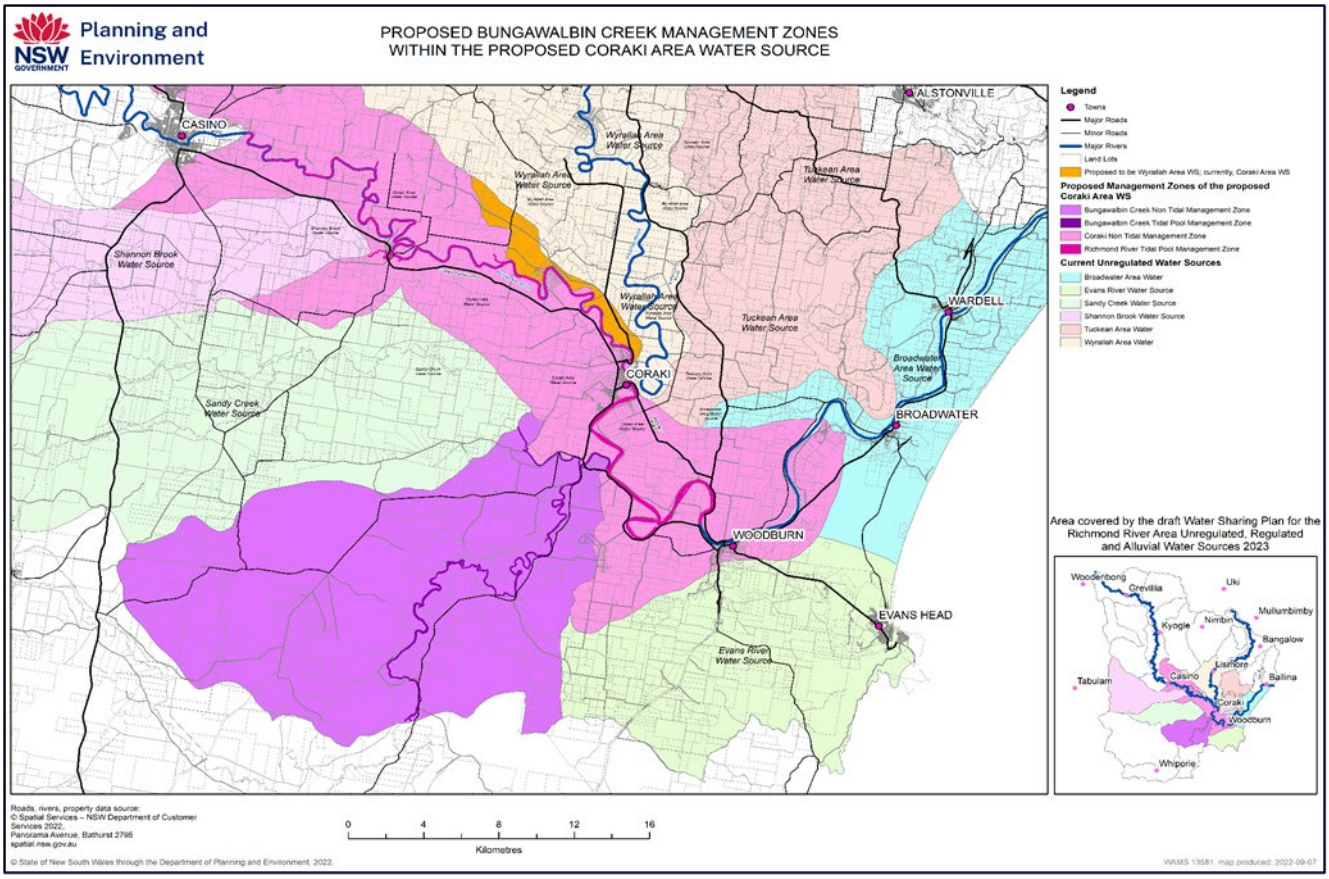

Figure 3. Details of the new Bungawalbin Creek Tidal and Non-Tidal Management Zones within the Coraki Area water source

6.6 Vision, objectives, strategies and performance indicators

Part 2 of the plan describes the vision and objectives. The plan's vision encompasses the overall aim of the plan. The vision of the plan is to provide for the:

- health of the water sources and their dependent ecosystems
- continuing productive extraction of water for economic benefit
- spiritual, social, customary and economic benefits of water for Aboriginal communities
- social and cultural benefits of water for urban and rural communities.

The objectives are arranged into 4 categories: environmental, economic, Aboriginal cultural, and social and cultural. They are to:

- protect, and where possible, enhance and restore the condition of the water sources and their water-dependent ecosystems
- maintain, and where possible, improve access to water to optimise economic benefits for agriculture, water-dependent industries and local economies

- maintain, and where possible, improve the spiritual, social, customary and economic values and uses of water by Aboriginal people
- provide access to water to support water-dependent social and cultural values.
- help prevent structural damage to aquifers resulting from groundwater extraction.

We will include more detailed and SMART (specific measurable, achievable, realistic and timely) objectives in the relevant MER plan. These will clearly link objectives, strategies and performance indicators. This addresses the NRC's recommendation to strengthen the MER of the plan outcomes.

6.7 Updated basic landholder rights estimates and licence share components

We have updated our estimate of extraction of water under basic landholder rights (BLR). We have also updated the water access licence share components (water entitlements for each water source) to reflect total share components for each water source at the commencement of the plan. The new figures are in Part 3 of the Richmond 2023 plan.

Since the development of the first water sharing plans, which began before 2003, numerous methods have been followed to estimate water requirements for domestic and stock BLR. These methods were superseded by a standard NSW approach to support the development of surface and groundwater macro-sharing plans in 2010.

In 2020, we adopted the same method used in the development of macro-water sharing plans for estimating the water requirements of domestic and stock BLR. This method is in Appendix 5 of the Replacement Water Sharing Plan Manual (PDF 1.28 MB).

The 2023 estimates may differ from those in the previous plan because of changes in land use, population density and the availability of more accurate spatial data.

An estimate was made for the annual volume of water used from harvestable rights dams. This involved identifying dams that were not located in third order or larger streams and determining the annual volume of water that could be taken from those dams for each water source. For more detail please see Appendix D.

The water access licence share components (water entitlements for each water source) are listed in Part 3 of the Richmond 2023 plan. They reflect total share components in each water source.

6.8 Identification of planned environmental water provisions

Planned environmental water (PEW) is a key component of water sharing plans. The Richmond 2010 plan had discrete sections on planned environmental water that point to other parts of the plan to identify where water is reserved for the environment. This included access rules.

Instead of having a separate section on PEW, the Richmond 2023 plan includes rules associated with planned environmental water in the relevant sections. Wherever a clause or section of the plan relates to PEW, a note is included, pointing to the relevant section of the WM Act.

6.9 Updated definition of extraction limits

The extraction limits restrict total overall extraction from the extraction management units over the long term or annually.

The NRC recommended that we establish and publish sustainable, fixed, numeric LTAAELs. In response, we have split the LTAAEL into 2 components:

1. The **standard LTAAEL** applies to take from all flows (excluding take from licences that access high flows only) and includes all BLR extraction (including harvestable rights). This is a fixed volume.
2. The annual **higher flow extraction limit** applies to extraction that can only occur from high-flows. This volume can vary as licences are converted to high-flow licences or as we grant specific-purpose licences in high-flows such as high-flow licences, licences for initial fill of dams and Aboriginal community development licences.

Fixing the standard LTAAEL and including maximum harvestable rights (as at the start of the first plan) allows us to manage any growth in water extraction. If the 3-year average extraction increases to more than 5 % above the standard LTAAEL (from licensed take plus BLR take, including harvestable rights), then we may announce a reduced AWD to bring extractions back to the extraction limit. The AWD can only be applied to licensed water users.

The standard LTAAELs for extraction management units (EMUs) covered by the Richmond 2023 plan are:

- Evans River Catchment EMU – 2,264 ML/year
- Richmond River EMU - 190,519 ML/year
- Richmond River Area CFA Groundwater EMU - 13,000 ML/year

- Richmond Regulated EMU - 10,070 ML/year

The annual higher flow extraction limit applies to the Evans River and Richmond River EMUs and defined as; the largest sum of the share components of all higher flow extraction licences within each extraction management unit occurring within a water year.

6.10 Aboriginal community development licences

The Richmond 2023 plan provides for applications for Aboriginal Community Development Licences (ACDLs) in the new Coastal Floodplain Alluvial Groundwater Source. The volume is limited to the combined sum of shares of all licences in the water source, being no more than 9,048 ML/year, as there is unallocated water in the water source.

The Richmond 2023 plan removed the ability to apply for ACDLs in the following water sources:

- Eden Creek
- Leycester Creek
- Myrtle Creek
- Shannon Brook.

No ACDLs had been issued in these water sources. The removal of ACDL provisions for all four water sources is due to high ecological values or because there is no available gauge in the water source (which is required to manage high flow licences).

The issuing of ACDLs is providing for the take of additional water on top of the current level of entitlement (as opposed to trading of existing entitlement). Capping entitlement at current levels will prevent further exacerbation of risks to environmental values.

6.11 Uncontrolled Flows

The Richmond 2010 plan provided for the taking of uncontrolled flows in the Richmond Regulated Water Source. The volume of uncontrolled flows that could be taken was limited to 50 % of the uncontrolled flow volume per day that is in excess of 40 ML/day. The 50 % limit has been removed in the Richmond 2023 plan as individual users would be unable to comply with a rule that is required to be calculated from all users. Due to the nature of the system and demand pattern from water users, this change should not impact on licence holders or the environment.

6.12 Simplification of access rules for tidal pool licence holders

As discussed in section 6.1, in consideration of the impact of the 2022 floods, we made a commitment to licence holders and the community that we would not change daily access to water in the initial Richmond 2023 plan and that these would be reviewed before year 5 of the plan.

Feedback received during public exhibition highlighted the complexity of the salinity based access rules that were in the Richmond 2010 plan, making them hard to understand and comply with.

In finalising the 2023 plan, we worked with representatives of the Richmond and Wilsons Combined Water Users Association and the Richmond and Wilsons Tidal and Fresh Water Users Association to develop a simplified set of rules, that would provide for the same access to water as the complex rules in the 2010 plan.

The Richmond 2023 plan vastly simplifies the previous rules by referring to the previous days average electrical conductivity (EC) as measured at the Coraki salinity gauge. The new access rules are as follows:

If the previous days average daily EC was:

- less than 2000 µS/cm – there are no pumping restrictions
- between 2000 µS/cm, and 4000 µS/cm – then pumping is restricted to 10 hours a day
- equal to or greater than 4000 µS/cm – then pumping is prohibited.

The above rules apply to licences in the:

- Bungawalbin Creek Tidal Pool Management Zone and the Richmond River Tidal Pool Management Zone in the Coraki Area Water Source
- Wilsons River Tidal Pool Management Zone in the Wyrallah Area Water Source.

When assessed against the historical record of EC data at the Coraki gauge, the simplified rules resulted in slightly less cease to pump days than experienced under the complex rules in the Richmond 2010 plan. We do not consider this simplification of access rules as having a negative impact on daily access to water.

It should be noted that the access rules for these tidal pool licences will be reviewed, along with access rules across the whole plan area, within the first 5 years of the plan. Future access rule amendments will be subject to consultation, public exhibition and submission processes.

6.13 Prohibition of in-river dams

Construction of licensed dams on third order stream or higher has been identified as a key threatening process for catchment and marine management.

In-river dams on streams of third-order or higher are generally banned in water sources where:

- we have identified it in our risk assessment as having high ecological value, or
- where such a prohibition was already in place in the previous water sharing plan.

In addition to the 10 water sources where they were prohibited in the Richmond 2010 plan, the Richmond 2023 plan further prohibits in-river dams on streams of third-order or higher in the following 6 additional water sources:

- Eden Creek
- Gradys Creek
- Kyogle Area
- Leycester Creek
- Myrtle Creek
- Shannon Brook.

The Richmond 2023 plan also includes a prohibition exemption that allows proposals of in-river dams to be considered for the purposes of town water supply by local water utilities.

These rules can be found in Part 7 Division 2 of the Richmond 2023 plan.

6.14 Inclusion of map of high-priority, groundwater-dependent ecosystems

The Richmond 2023 plan includes a map of groundwater-dependent ecosystems (GDEs). High-priority GDEs used to be in a schedule in the plan. We have removed this and replaced it with a map.

GDEs are those ecosystems that need access to groundwater to maintain their plant and animal communities and ecological processes. The Richmond 2010 plan provided protection of scheduled (listed) GDEs by specifying minimum setback distance rules for new groundwater works (bores). The GDE setback distances for bores in the Richmond 2023 plan remain unchanged.

The mapped GDEs are the result of a departmental program to identify and prioritise GDEs in NSW. The identification method incorporates existing vegetation community mapping and

remote sensing to identify vegetation communities. Monitoring-bore data was analysed to identify potential groundwater dependence of the vegetation communities. We have identified these vegetation communities as terrestrial GDEs overlying alluvial resources.

The mapping was supported by field-based verification in sample areas representing different land cover types. Sites were selected from almost all major catchments distributed across NSW to ensure that each area had a representative geographic sample that reflected the diverse environmental conditions and management practices.

The high-priority GDEs we identify in the GDE map are vegetation ecosystems that have a high probability of being groundwater-dependent and are of very high or high ecological value. As it is not certain (only highly probable) that the vegetation community is groundwater-dependent, the water sharing plan now includes a provision that ensures distance rules do not apply unless the department has confirmed the high probability of groundwater dependence of the ecosystem.

For more information on methods we employed to identify GDEs, see the paper Methods for the identification of high probability groundwater dependent vegetation ecosystems (PDF 8.6 MB).

The GDE map included in the Richmond 2023 plan is shown here below as Figure 4. You can view a high-resolution version of the high-priority GDE map on the department's web page.

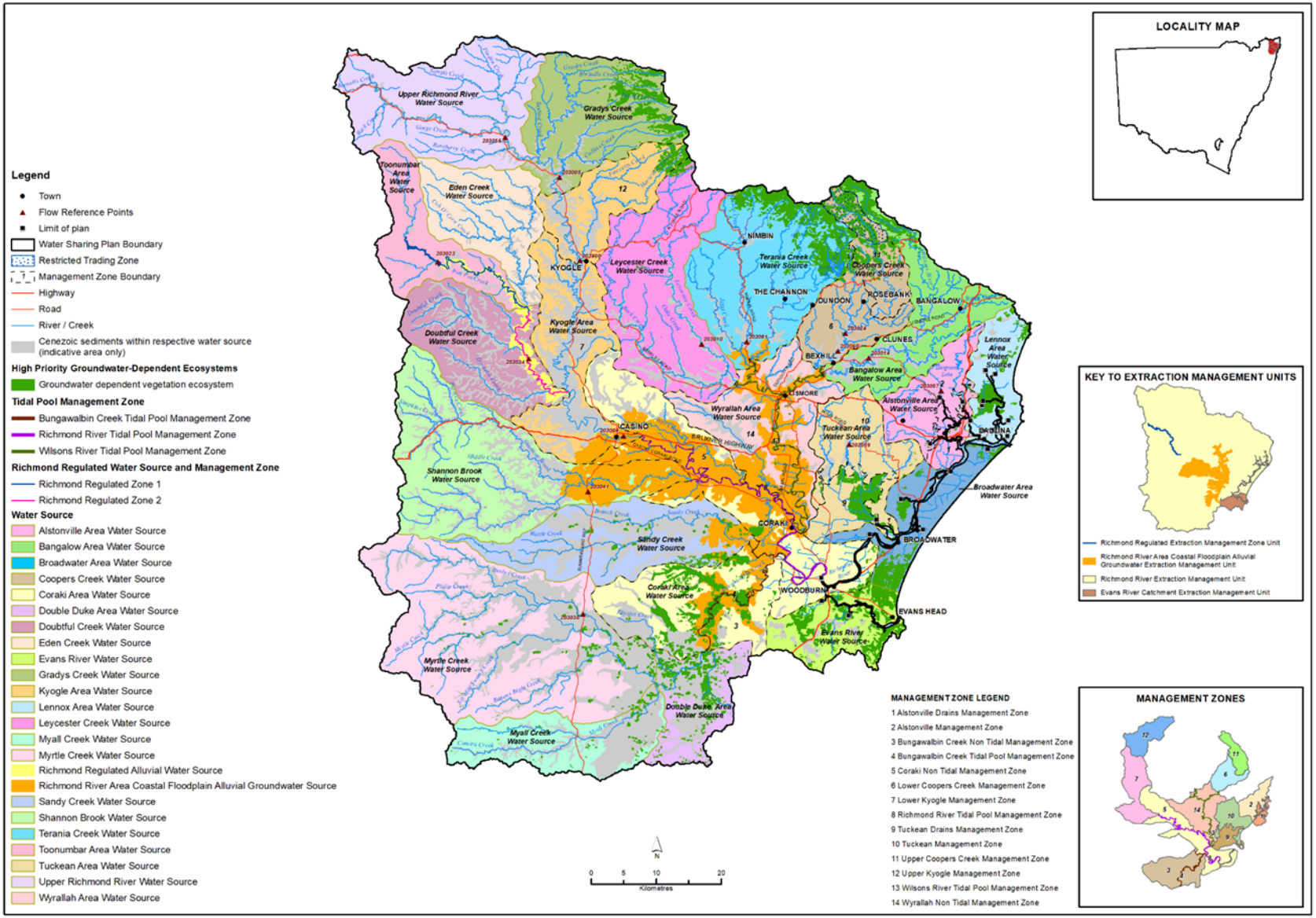

Figure 4 High priority groundwater dependent ecosystem map for the Richmond River Area Water Sharing Plan

6.15 Changed distance rules for groundwater works

The Richmond 2023 plan includes standard distance rules for groundwater works. A detailed description of all current rules is available in the Rules Summary Sheet for Groundwater Works Approvals on the department's website and the changes from the previous plan are listed below.

These include rules for:

- minimising interference between water supply works
- water supply works located near contamination sources
- water supply works located near high-priority, GDEs
- water supply works located near potential acid sulfate soils
- water supply works located near groundwater-dependent, culturally significant areas
- water supply works used solely for BLR
- replacement groundwater works.

New or amended water supply works near **contaminated sources** will not be granted:

- within 500 metres of a contamination site identified by the plan
- 250m of the edge of a plume associated with a contamination source,
- between 250m and 500m from the edge of a plume associated with a contamination source unless no change in groundwater level will occur within 250m of the plume
- 250 metres of an onsite sewage disposal system unless the water supply work is:
  - constructed with cement grout in the borehole annulus to a minimum depth of 20 m from the ground surface
  - located at a sufficient distance from the on-site sewage disposal system to prevent migration of septic contamination in the aquifer.
- Unless in the Minister's opinion, adequate arrangements are in place to protect the water source, the environment, and public health and safety, or the water supply work is for the purpose of monitoring and environmental remediation activities.

Distances for where new groundwater works can be located in respect to **GDEs** has not changed, however additional GDEs are now identified on a GDE map. Additionally, a water supply work approval must not be granted or amended in any water source unless the minister's opinion is that there will be no more than minimal harm to any wetland mapped under the *State Environment Planning Policy (Resilience and Hazards) 2021*.

The Richmond 2023 rules now prohibit construction of new bores in an area classed as having a high probability of the occurrence of **acid sulfate soils** if there is significant risk of acidification of the water sources. There is a map available on the department's SEED information portal to determine where there is a high probability of acid sulfate soils in coastal areas of NSW.

For bores located near **groundwater-dependent, culturally significant areas**, the exemption in the Richmond 2010 plan for bores that are part of a network for a major or local water utility for town water supply has been removed and a setback distance of 200 metres applies. The exemption in the Richmond 2010 plan for bores that are sealed off above the slotted intervals with an impermeable seal between the casing and bore hole, was removed as these conditions can be imposed on a case-by-case basis if required an it is the Minister's opinion, the location of the water supply work at a lesser distance would result in no more than minimal harm to a groundwater dependent culturally significant area.

For bores used **solely for BLR,** the existing setback distances were unchanged, and some additional provisions were included in the Richmond 2023 plan.

Water supply works (bores) used solely for BLR must not be granted or amended if the bore is located within:

- waterfront land
- 100m of a government monitoring or observation bore
- 100m of a high priority groundwater-dependent ecosystem unless, in the Minister's opinion, there is not a high probability of groundwater dependence for the relevant ecosystem, or the location of the water supply work is likely to cause no more than minimal harm to the high priority groundwater-dependent ecosystem,
- 100m of a groundwater-dependent culturally significant area unless, in the Minister's opinion, the water supply work is likely to cause no more than minimal harm to the groundwater-dependent culturally significant area,
- 100m of a wetland, unless in the Minister's opinion, the location of the water supply work is likely to cause no more than minimal harm to the wetland concerned.
- 500 metres of a contamination source unless, in the Minister's opinion, the location of the water supply work is adequate to protect the water source, the environment, and public health and safety.
- 250 metres of an onsite sewage disposal system unless the water supply work is:
  - constructed with cement grout in the borehole annulus to a minimum depth of 20 metres from the ground surface unless in the Minister's opinion adequate

arrangements are in place to protect the water source, the environment, and public health and safety.

- located at a sufficient distance from the on-site sewage disposal system to prevent migration of septic contamination in the aquifer.

The Richmond 2023 plan rules for **replacement groundwater works** include the following changes:

- the internal diameter or excavation footprint is to be no larger than the existing bore, unless that diameter is no longer manufactured, in which case this will now be permitted to be no greater than 120 % of the current internal diameter
- the replacement bore must not have a greater internal diameter or excavation footprint than the existing bore, unless the existing bore's internal diameter is less than 100 mm, in which case the internal diameter must be no more than 100 mm
- a replacement bore may be permitted to a different depth within the water source, or greater than 20 metres from the existing bore, if it can be determined that it will not adversely impact:
  - a water source
  - a high priority groundwater dependent ecosystem
  - public health and safety
  - a groundwater-dependent culturally significant area
  - take of water by another user with an existing water supply work.

Before a groundwater water supply work is approved, the application goes through an assessment process to make sure the work would not have impacts to connected surface water, the aquifer, neighbouring bores or GDEs. More information on groundwater assessments is found on the department's website.

6.16 Prohibition of work approvals near SEPP wetlands and potential acid sulfate soils

The Richmond 2023 plan prohibits the construction of water supply work approvals that take water from sources where it will cause more than a minimal impact on Ramsar wetlands and wetlands listed under the *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP).

The *Coastal Management Act 2016* and Resilience and Hazards SEPP specifies how developments within the coastal zone should be assessed. The Resilience and Hazards SEPP

identifies wetlands to protect their ecological values. Coastal water sharing plans recognise these same wetlands to ensure protection to align regulatory objectives.

Part 7 of the Richmond 2023 plan prohibits the granting of approvals for surface water or groundwater works if it would result in more than minimal harm to a wetland mapped under the Resilience and Hazards SEPP.

You can find more information about the Resilience and Hazards SEPP on the Coastal management page of the department's website.

The Richmond 2023 plan also includes rules to prevent water sources from becoming acidic through drainage of potential acid sulfate soils. The rule prohibits the construction of a water supply work that takes groundwater, such as a bore, from within an area classed as having a high probability of containing acid sulfate soils.

6.17 Trade provisions

Trade rules form Part 8 of the Richmond 2023 plan.

Trade of entitlement is generally prohibited:

- between water sources that are not hydrologically connected (that is, the water sources do not drain into each other), or
- into water sources that have high ecological value, and
- where there are no references points/gauges.

The Richmond 2023 plan updated trade or dealings provisions for several water sources to align with the above limitations. Trades are no longer permitted into the following water sources due to their high ecological values:

- Shannon Brook Water Source
- Eden Creek Water Source.

Trading into the new Richmond River Area Coastal Floodplain Alluvial Groundwater Source is prohibited due to low hydrological connectivity.

Trade into Alstonville Water Source is now permitted as long as there is no increase in entitlement above the volume that existed at the commencement of the 2023 plan.

For the Coopers Creek Water Source, trade from Coopers Creek tributaries into the main trunk of Coopers Creek is now permitted.

The intent of the Richmond 2010 plan was to allow for trade of upstream water (to a combined maximum of 2000 ML) into the Richmond and Wyrallah tidal pool management zones.

However, the specific wording of the plan and a delay in establishing licences prevented the original trade intent from being implemented.

The Richmond 2023 plan prohibits trade of water from upstream water sources into the Coraki and Wyrallah Area Water Sources, It does, however, now permit trade up to 2,500 ML of entitlement into the Richmond River Tidal Pool Management Zone from the Wyrallah Area Water Source and up to 2500 ML into the Wilson River Tidal Pool Management Zone from Coraki Area Water Source.

This is a long standing request of stakeholders, for which the department sourced modelling that shows no impact on the movement of the salt wedge upstream as a result of trade.

New management zones have been created for Bungawalbin Creek. A tidal management zone and a non-tidal management zone. Temporary trade provisions have been included for 2 licences allowing them to trade from Bungawalbin Creek tidal to Bungawalbin Creek non-tidal management zone if it is to the same property. With that exception, trade is not permitted into either the Bungawalbin Creek Non-Tidal or Tidal management zones.

For information on all trade provisions including those that were unchanged from the Richmond 2010 plan, please refer to the rule summary sheet for the relevant water source on the department's website.

Changes to high flow conversion provisions are detailed below in Table 3.

Table 4. Changes to conversion from unregulated river access licence to High Flow access licence

Previous 2010 plan rule	Current 2023 plan rule	Decision driver
Conversion to a High Flow access licence is permitted for the following water sources: • Myrtle Creek • Eden Creek.	Conversion to a High Flow access licence is no longer permitted in the following water sources: • Myrtle Creek • Eden Creek.	One or more of the following reasons apply: • No gauge in water source • Hydrologic stress for fresh or high flows is assessed as medium or high Values at the 30th and/or 50th percentile of flow data are less than 20 ML/day.

Previous 2010 plan rule	Current 2023 plan rule	Decision driver
Conversion to a High Flow access licence is permitted for the following water sources at a ratio of 1:5 to a maximum of the following high flow unit shares: • Gradys Creek – 4,190 • Kyogle Area – 7,845 • Shannon Brook - 650 • Upper Richmond River – 1,705 • Bangalow Area, Leycester Creek and Terania Creek - total for all – 10,655.	Conversion to a High Flow access licence is permitted for the following water sources at a ratio of 1:5 to a maximum of the following high flow unit shares: • Gradys Creek - 4,190 • Kyogle Area – 9,890 • Shannon Brook - 725 • Upper Richmond River - 590 • Bangalow Area, Leycester Creek, Terania Creek and Coopers Creek – total for all – 13,535.	Changes to volumes are a result of updated flow data over the last ten years, giving new volumes for the 30th percentile flows. The addition of Coopers Creek Water Source to the Bangalow Area, Leycester Creek and Terania Creek Water Sources has resulted in a new calculated maximum volume for all four water sources. These sources are combined for flexibility as they all drain to the upper Wilsons River tidal pool.

6.18 Adaptive management and amendment provisions

Adaptive management means changing things in response to new information. During the life of a water sharing plan, this information may come from data collection and monitoring or from some other improvement in understanding. Such information could include difficulty in implementing rules, socio-economic studies, hydrological modelling, ecological studies and information about Aboriginal cultural sites.

Adaptive management is a requirement of both the WM Act and the National Water Initiative. The WM Act allows for changes to a water sharing plan during its life if it is in the public interest. The plan also includes provisions that allow for amendments during the life of the plan. The public would be consulted before making any changes that could affect water users or the environment's access to water. Part 10 of the plan includes updated amendment provisions.

Examples of adaptive environmental water provisions in the Richmond 2023 plan include the ability to amend:

- access and trade rules in the water sharing plan if we find that increased capture of rainfall run-off in harvestable rights dams is above the current 10 % harvestable rights limit –any such review would consider the effect the increased harvestable rights

capture has on river flows, given the change in policy around harvestable rights in the coastal areas this is unlikely to be triggered

- LTAAELs to base them on a proportion of flow if more information becomes available
- the plan if we find climate change is affecting water quantity or quality.

7 Monitoring, evaluation and reporting

Monitoring, evaluation and reporting (MER) are key components to adaptive management. They ensure that water sharing plans are effective in meeting their objectives.

Comprehensive MER programs are resource-intensive and long term. We must prioritise areas where there is a high risk of water extraction affecting environmental assets or where the demand for water is greater than the volume of water available.

The department is working on a project that will prioritise water sources for MER activities, based on risk in areas that have high levels of extraction, ecological value, or stakeholder needs.

The MER plan will be a framework specifically designed for the water sharing plan. It will follow established guidelines and include both freshwater and estuarine ecosystems.

8 Areas for further work

8.1 Metering and record keeping

The NSW Non-urban water metering program is being rolled out across the state. In coastal NSW, the new metering requirements, which require metering for works of a certain size and log-bookkeeping for water extracted for smaller works, will begin in December 2024. For more information, see the NSW non-urban water metering framework pages on the department's website.

8.2 Determine flow requirements for key assets and functions

Several government agencies such as Department of Primary Industries – Fisheries and the department's Environment and Heritage division are working on flow requirements for key assets and ecosystem functions. As these become available and there is sufficient flow data, we can use this information in making water-sharing decisions.

8.3 Cultural flows and improving the involvement of first nations people in water management

The department will work toward priorities in the State Water Strategy. Priority 2 of the State Water Strategy is to Recognise First Nations/Aboriginal People's rights and values and increase access to and ownership of water for cultural and economic purposes.

The NSW Government recognises First Nations/Aboriginal People's rights to water and our aim is to secure a future where water for First Nations/Aboriginal People is embedded within the water planning and management regime in NSW, delivering cultural, spiritual, social, environmental and economic benefit to communities.

Actions under the State Water Strategy include:

- strengthening the role of First Nations/Aboriginal People in water planning and management
- developing a state-wide Aboriginal water strategy

- providing for Aboriginal ownership of and access to water for cultural and economic purposes
- working with First Nations/Aboriginal People to improve shared water knowledge
- working with First Nations/Aboriginal People to maintain and preserve water-related cultural sites and landscapes.

The department is committed to providing greater opportunities for Aboriginal water management and participation in water sharing. A new Aboriginal water directorate has been established within the department and work is progressing on an Aboriginal Water Strategy which will identify the ways in which we can achieve the priorities under the State Water Strategy. The department is also in the process of establishing Regional Aboriginal Water Advisory Committees in each of the NSW water regions and piloting some cultural watering plans in various parts of NSW.

8.4 Stormwater harvesting

The department is developing a stormwater harvesting policy to determine the best way to manage stormwater extraction to maximise the benefits of re-using stormwater and reducing erosion of water ways while ensuring adequate water is available for the environment and water users who rely on it.

8.5 Sustainable long-term average annual extraction limits

The NRC has recommended that LTAAELs on the coast should be set at a sustainable level. The department is considering ways of doing this.

This plan sets a numerical and fixed LTAAELs to cover all flows and a separate, specific limit for just high flows. This will limit take from low flows to that which was generally provided for at the start of the first water sharing plan.

8.6 Climate change

Australia has a highly variable climate, and rainfall is especially variable. This makes it vital that we understand as much as we can about our climate so we can work out how we manage our water supplies. The frequency and duration of wet and dry events determines how much water we have available.

NSW is already experiencing trends of higher average temperatures and reduced cool season rainfall. There are indications from climate models that drought conditions may become more frequent and severe, and last longer.

Higher demand from a growing population, alongside reductions in supply, will increase water scarcity, putting more pressure on all users, including the environment (Productivity Commission, National Water Reform Issues Paper, May 2020, p.2). We must collectively improve our understanding of these risks to better manage water supply and ensure that our operational, planning and future development decisions take future water reliability and security into account.

The department is developing river models that incorporate random variable, long-term data to help guide regional water strategies. We can use these models to inform water sharing decisions as they are developed across the state. For example, to further understand what sustainable extractions are and consider future impacts of climate change. Rising sea level models will also be incorporated into future water sharing decisions where they are available.

Priority 4 of the State Water Strategy is to increase resilience to changes in water availability (variability and climate change). The 2021/22 action plan looks to improve and apply our understanding of climate variability and change. This includes work to determine a methodology and progressively incorporate climate risk data into water sharing plans and environmental water management decision making.

Appendix A – References and supporting documents

- Far North Coast Region Water Sharing Plans page with links to the 2023 plan, plan maps, rules summary sheets per water source, background document and other related information including the previous 2010 plan
- NSW Legislation website contains NSW legislation, including the WM Act
- National Water Initiative
- The previous water sharing plan, the *Water Sharing Plan for the Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2010*
- The previous background document for the 2010 water sharing plan (PDF 572 KB)
- Details of the macro planning approach:
- Macro water sharing plans - approach for unregulated rivers (PDF 829KB)
- Macro water sharing plans – access and trading rules for pools (PDF 627 KB)
- Macro water sharing plans - the approach for groundwater (PDF 3.11 MB)
- The Natural Resources Commission's Review of the Richmond and Tweed Areas water sharing plans (PDF, 3.55 MB)
- 2019 Audit of the Water Sharing Plan for the Richmond River Area Regulated, Unregulated and Alluvial Water Sources 2010 (PDF 3.7 MB)

Appendix B - Substantive changes made between the draft and final 2023 water sharing plan

Table 5. Changes made between the draft and final water sharing plan for the Richmond River Area

Provisions in the publicly exhibited draft replacement plan	Final 2023 plan provision	Reason for change
Access rules for licences in tidal pool management zones unchanged from the 2010 plan.	If the previous days average daily EC at Coraki gauge was: • less than 2000 µS/cm – there are no pumping restrictions • between 2000 µS/cm, and 4000 µS/cm – then pumping is restricted to 10 hours a day • equal to or greater than 4000 µS/cm – then pumping is prohibited.	Based on public exhibition feedback. This is a simplification of what were complex access rules that were hard to understand or comply with. Based on an assessment the new rules provide very similar access to the previous rules but are far easier to implement and understand. The changes apply to licences in the: • Bungawalbin Creek Tidal Pool Management Zone and the Richmond River Tidal Pool Management Zone in the Coraki Area Water Source • Wilsons River Tidal Pool Management Zone in the Wyrallah Area Water Source.
No trade from the Bungawalbin Tidal Management Zone to the Bungawalbin Non-Tidal Management Zone.	For 2 licences that had a work in both zones, temporary trade is permitted to the non-tidal zone provided the water is used on the same property.	Recognition of work approval associated with the licences that nominated a work in the non-tidal zone.

Appendix C - Vision, objectives, strategies and performance indicators

Vision statement

The vision for the Richmond River Area Regulated, Unregulated and Alluvial Water Sharing Plan 2023 is to provide for the following:

(a) the health and enhancement of the water sources and their dependent ecosystems

(b) the continuing productive extraction of water for economic benefit

(c) the spiritual, social, customary and economic benefits of water to Aboriginal communities

(d) the social and cultural benefits to urban and rural communities that result from water.

10 Environmental objectives

(1) The broad environmental objective of this plan is to protect, and where possible enhance and restore, the condition of the water sources and their water-dependent ecosystems.
Note: The water-dependent ecosystems of the water sources include in-stream, riparian and floodplain ecosystems, and groundwater-dependent ecosystems

(2) The targeted environmental objectives of this plan are:

(a) to protect, and where possible, enhance and restore, the following over the term of this plan:

(i) the recorded distribution or extent of target ecological populations including native fish and native vegetation

(ii) the population structure of target ecological populations including native fish, native vegetation, low-flow macroinvertebrate communities and high-priority groundwater-dependent ecosystems

(iii) the connectivity between and within water sources, including to support surface and groundwater exchange and downstream processes including priority fish passages

(iv) connectivity between tidal pools, connected estuaries and connected upstream water sources

(v) water quality within target ranges to support water-dependent ecosystems and ecosystem functions

(vi) flows that support ecosystem values and processes within connected estuaries

(b) to contribute to the prevention of structural damage to aquifers of the water sources resulting from groundwater extraction.

(3) The strategies for reaching the targeted environmental objectives of this plan are as follows:

(a) reserve all water volume in excess of each long-term average annual extraction limit for the environment

(b) reserve a portion of natural flows to partially mitigate alterations to natural flow regimes in the water sources

(c) restrict the take of water from an in-river pool or off-river pool when the volume of water in the pool is less than the volume of water that can be held by the pool when at full capacity

(d) restrict or prevent water supply work approvals on third-order or higher streams within specified water sources

(e) reserve a portion of natural flows to maintain hydrological connectivity between the water sources and other connected water sources, including connectivity between tidal pools and estuaries

(f) manage the construction and use of water supply works to minimise impacts on in-stream ecosystems, high-priority groundwater-dependent ecosystems and groundwater quality.

(4) The performance indicator used to measure the success of the strategies for reaching the broad environmental objective in subclause (1) is an evaluation of the extent to which the combined outcomes of the targeted objectives in subclause (2) have contributed to achieving the broad objective.

(5) The performance indicators used to measure the success of the strategies for reaching the targeted environmental objectives in subclause (2) are the changes or trends in the ecological condition of the water sources during the term of this plan as assessed using one or more of the following:

(a) the recorded range or extent of target populations including native fish, native turtles, native vegetation communities and high-priority groundwater-dependent ecosystems

(b) the recorded condition of target populations of native fish, native vegetation, low-flow macroinvertebrate communities and high-priority groundwater-dependent ecosystems

(c) measurements of fish movements through priority fish passage areas

(d) measurements of flows through tidal pools and into connected estuaries

(e) the recorded values of water quality measurements including salinity, turbidity, total nitrogen, total phosphorous, pH, water temperature and dissolved oxygen

(f) the recorded values of groundwater levels

(g) the extent to which the strategies have provided flow conditions of sufficient magnitude, frequency, duration, timing and water quality to achieve the targeted environmental objectives

(h) the extent to which the strategies have provided flow conditions of sufficient magnitude, frequency and timing to tidal pool management zones with designated estuary flow requirements.

(6) In evaluating the effectiveness of the strategies in meeting the objectives in this clause, the following will be relevant:

(a) the extent to which the strategies in subclause (3) and provisions in this plan have been implemented and complied with

(b) the extent to which changes in the performance indicators can be attributed to the strategies in subclause (3) and provisions in this plan

(c) the extent to which the strategies in subclause (3) support achievement of the environmental objectives

(d) the extent to which external influences on the water sources and their dependent ecosystems during the term of this plan have affected progress toward achieving the environmental objectives

11 Economic objectives

(1) The broad economic objective of this plan is to maintain, and where possible improve, access to water to optimise economic benefits for agriculture, water-dependent industries and local economies

(2) The targeted economic objectives of this plan are as follows:

(a) to maintain, and where possible improve, water trading opportunities for water-dependent businesses

(b) to maintain, and where possible improve, access to water up to the long-term average annual extraction limits for agriculture, water-dependent businesses and landholders

(c) to protect, and where possible, improve connectivity to provide flows that support economic activities in connected estuaries

(d) to contribute to maintaining water quality within target ranges for agriculture, water-dependent businesses and landholders.

(3) The strategies for reaching the targeted economic objectives of this plan are as follows:

(a) provide for trade of water allocations and share components subject to environmental constraints and local impacts

(b) provide a stable and predictable framework for sharing water among water users

(c) provide for flexibility of access to water

(d) manage extractions to the long-term average annual extraction limits

(e) reserve a portion of natural flows to maintain connectivity between tidal pools and connected estuaries.

(4) The performance indicator used to measure the success of the strategies for reaching the broad economic objective in subclause (1) is an evaluation of the extent to which the

combined outcomes of the targeted economic objectives in subclause (2) have contributed to achieving the broad objective.

(5) The performance indicators used to measure the success of the strategies for reaching the targeted economic objectives in subclause (2) are the changes or trends in economic benefits during the term of this plan, as assessed using one or more of the following:

(a) the economic benefits of water extraction and use

(b) the economic benefits of water trading as demonstrated by:

(i) the annual number or volume of share components of access licences transferred or assigned

(ii) the weighted average unit price of share components of access licences transferred or assigned

(iii) the annual volume of water allocations assigned

(iv) the weighted average unit price of water allocations assigned

(c) the recorded values of water quality measurements including salinity, sodium adsorption ratio, harmful algal blooms, total nitrogen, total phosphorus, pH and dissolved oxygen

(d) the recorded values of groundwater levels.

(6) In evaluating the effectiveness of the strategies in meeting the objectives in this clause, the following will be relevant:

(a) the extent to which the strategies in subclause (3) and provisions in this plan have been implemented and complied with

(b) the extent to which the changes in the economic benefits of water extraction and use can be attributed to the strategies in subclause (3) and provisions in this plan

(c) the extent to which the strategies in subclause (3) support achievement of the economic objectives

(d) the extent to which external influences on water-dependent businesses have affected progress towards achieving the economic objectives.

12 Aboriginal cultural objectives

(1) The broad Aboriginal cultural objective of this plan is to maintain, and where possible improve, the spiritual, social, customary and economic values and uses of water by Aboriginal people.

(2) The targeted Aboriginal cultural objectives of this plan are as follows:

(a) to provide access to water in the exercise of native title rights

(b) to provide access to water for Aboriginal cultural use and community development, including fishing

(c) to protect, and where possible improve, identified water-dependent culturally significant areas, including important riparian vegetation communities

(d) to protect, and where possible improve, connectivity to provide flows that support Aboriginal cultural activities within connected estuaries

(e) to contribute to the maintenance of water quality within target ranges to ensure suitability of water for Aboriginal cultural use and community development.

(3) The strategies for reaching the targeted Aboriginal cultural objectives of this plan are as follows:

(a) manage access to water consistently with the exercise of native title rights

(b) provide for water associated with Aboriginal cultural values and uses, and community development

(c) manage extractions under access licences and basic landholder rights within the long-term average annual extraction limits

(d) reserve a portion of natural flows to mitigate alterations to natural flow regimes in the water sources

(e) restrict the take of water from an in-river pool or off-river pool when the volume of water in the pool is less than the volume of water that can be held by the pool when at full capacity

(f) reserve a portion of natural flows to maintain hydrological connectivity between the water sources and other connected water sources, including between tidal pools and estuaries

(g) manage the construction and use of water supply works to minimise impacts on groundwater quality and groundwater-dependent culturally significant areas.

(4) The performance indicator used to measure the success of the strategies for reaching the broad Aboriginal cultural objective in subclause (1) is an evaluation of the extent to which the combined outcomes of the targeted Aboriginal cultural objectives in subclause (2) have contributed to achieving the broad objective.

(5) The performance indicators used to measure the success of the strategies for reaching the targeted Aboriginal cultural objectives in subclause (2) are the changes or trends in Aboriginal cultural benefits during the term of this plan as assessed using one or more of the following:

(a) the use of water by Aboriginal people, by measuring factors including:

(i) the extent to which native title rights can be exercised, consistently with any determination of native title or Indigenous land-use agreement

(ii) the extent to which access to water has contributed to achieving Aboriginal cultural and community development outcomes

(b) the recorded range or extent of target ecological populations including native fish, native vegetation communities and high-priority groundwater-dependent ecosystems

(c) the recorded condition of target ecological populations of native fish, native vegetation, low-flow macroinvertebrate communities and high-priority groundwater-dependent ecosystems

(d) the recorded values of water quality measurements including salinity, harmful algal blooms, total nitrogen, total phosphorus, pH, and dissolved oxygen

(e) the extent to which the strategies have provided flow conditions of sufficient magnitude, frequency and timing to tidal pool management zones with designated estuary flow requirements

(f) the recorded values of groundwater levels.

(6) In evaluating the effectiveness of the strategies in meeting the Aboriginal cultural objectives in this clause, the following will be relevant:

(a) the extent to which the strategies in subclause (3) and provisions in this plan have been implemented and complied with

(b) the extent to which changes in the performance indicators can be attributed to the strategies in subclause (3) and provisions in this plan

(c) the extent to which the strategies in subclause (3) support achievement of the Aboriginal cultural objectives

(d) the water made available for Aboriginal cultural values and uses during the term of this plan through available water determinations and the granting of new access licences

(e) the extent to which external influences on the water-dependent Aboriginal cultural activities have affected progress toward achieving the Aboriginal cultural objectives.

13 Social and cultural objectives

(1) The broad social and cultural objective of this plan is to provide access to water to support water-dependent social and cultural values.

(2) The targeted social and cultural objectives of this plan are to maintain, and where possible, improve the following:

(a) access to water for basic landholder rights, town water supply and licensed domestic and stock purposes

(b) access to water for water-dependent cultural, heritage and recreational uses, including recreational fishing

(c) flows that support cultural, heritage and recreational activities within connected estuaries

(d) water quality within target ranges for basic landholder rights, town water supply, domestic and stock purposes and surface water-dependent cultural, heritage and recreational uses, including recreational fishing.

(3) The strategies for reaching the targeted social and cultural objectives of this plan are as follows:

(a) provide water access for basic landholder rights, town water supply and licensed domestic and stock purposes

(b) reserve all water in excess of each long-term average annual extraction limit for the environment

(c) reserve a portion of natural flows to partially mitigate alterations to natural flow regimes in the water sources

(d) restrict the take of water from an in-river pool or off-river pool when the volume of water in the pool is less than the volume of water that can be held by the pool when at full capacity

(e) reserve a portion of natural flows to maintain hydrological connectivity between the water sources and other connected water sources, including between tidal pool management zones and connected estuaries

(f) manage the construction and use of water supply works to minimise impacts on groundwater quality, basic landholder rights, and town water supply.

(4) The performance indicator used to measure the success of the strategies for reaching the broad social and cultural objective in subclause (1) is an evaluation of the extent to which the combined outcomes of the targeted social and cultural objectives in subclause (2) have contributed to achieving the broad objective.

(5) The performance indicators used to measure the success of the strategies for reaching the targeted social and cultural objectives in subclause (2) are the changes or trends in social and cultural benefits during the term of this plan as assessed using one or more of the following:

(a) the social and cultural uses of water during the term of this plan, by measuring factors including:

(i) the extent to which basic landholder rights and licensed domestic and stock requirements have been met

(ii) the extent to which local water utility access licence requirements have been met

(b) the recorded range or extent of target populations of native fish that are important for recreational fishing

(c) the recorded takes of native fish that are important for recreational fishing within legal age and size classes

(d) the recorded values of water quality measurements including salinity, harmful algal blooms, total nitrogen, total phosphorus, pH, and dissolved oxygen

(e) the extent to which the strategies have provided flow conditions of sufficient magnitude, frequency and timing to tidal pool management zones with designated estuary flow requirements

(f) the recorded values of groundwater levels.

(6) In evaluating the effectiveness of the strategies in meeting the social and cultural objectives in this clause, the following will be relevant:

(a) the extent to which the strategies in subclause (3) and provisions in this plan have been implemented and complied with

(b) the extent to which changes in the performance indicators can be attributed to the strategies in subclause (3) and provisions in this plan

(c) the extent to which the strategies in subclause (3) support achievement of the social and cultural objectives

the extent to which external influences on social and cultural activities dependent on the water sources during the term of this plan have affected progress toward achieving the social and cultural objectives.

Appendix D – Estimate of annual extraction from harvestable rights dams

Part 3 of the Richmond 2023 plan includes the requirements for water to satisfy harvestable rights. This figure has been estimated using the process below.

1. Remote sensing was used to identify dams in each water source on relevant land and water courses smaller than third order streams. Land types such as National Parks, state forests, named waterbodies and heavily developed areas were excluded as there is a low likelihood of harvestable rights dams being present on these types of land.
2. The estimated volume of each dam was determined based on its surface area.
3. Each dam was then assessed for aspect ratio (length of long side/length of short side). With this calculation a number close to 1 indicates a square (or round) body which indicates a higher likelihood of a man-made structure. A very large number such as 50 would indicate a very long thin body (such as a river) and is more likely to be a natural waterbody. Based on previous similar work, it was determined that an aspect ratio of <9.0 was the most suitable threshold for harvestable rights dams. If a dam had an aspect ratio <9.0 it was automatically assumed to be a harvestable rights dam.
4. Harvestable rights dams with a capacity greater than 100 ML on the coast are unusual and the dam is likely to exist for a different purpose such as town water supply or the result of an old quarry. Dams less than 100 ML were automatically included as harvestable rights dams.
5. All dams above the volumetric or aspect ratio limits were investigated individually and either included or excluded as harvestable rights dams. Examples of excluded dams were quarries and licenced dams.
6. The total dam capacity of all dams considered to be harvestable rights dams was then calculated per water source.

The dam capacity is not an annual volume. A dam with the same capacity would produce a smaller annual harvestable rights volume in an area with less rainfall runoff than the same dam in an area with more rainfall runoff.

The department holds a series of contours that reflect the annual runoff across NSW. These contours are called the "Harvestable Rights Multiplier". Generally, the dryer the area the lower the Harvestable Rights Multiplier and the larger a dam must be to capture the same volume of water. This relationship is expressed numerically as a 'Dam Reliability Factor' (DRF) found in Table 5 below.

Table 6. Relationship between the Harvestable Rights multiplier and the Dam Reliability Factor

Harvestable rights multiplier	Corresponding Dam Reliability Factor
0.050	2.5
0.051	2.32
0.052	2.17
0.056	2.04
0.054	1.93
0.055	1.83
0.056	1.75
0.057	1.68
0.058	1.61
0.059	1.55
0.060	1.5
0.062	1.41
0.064	1.33
0.066	1.27
0.068	1.21
0.070	1.17
0.075	1.07
0.080	1
0.090	0.9
0.100	0.83
0.110	0.79
0.120	0.75
0.130	0.72
0.140	0.7
0.150	0.68
0.160	0.67
0.170	0.65

Harvestable rights multiplier	Corresponding Dam Reliability Factor
0.180	0.64
0.190	0.63

A geographic information system was used to determine the average harvestable rights multiplier per water source based on the rainfall runoff contours. Table 6 was then used to determine the corresponding Dam Reliability Factor per water source.

7. To determine the estimated annual volume of harvestable rights the total volume held in harvestable rights dams for each water source (as calculated in step 6) was then divided by the Dam Reliability Factor for that water source.