



WATER SHARING PLAN IMPLEMENTATION

Active Management Procedures Manual

for the Gwydir Unregulated River Water Sources

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Part A – Purpose and scope

Purpose

This Active Management Procedures Manual (manual) outlines procedures the NSW Government will use to implement active management to protect active environmental water (AEW) in the Gwydir Unregulated River Water Sources (Gwydir Water Sources).

This manual is established under clause 45A of the *Water Sharing Plan for the Gwydir Unregulated River Water Sources 2012* (Gwydir Unregulated WSP).

Approval

This manual was approved by the NSW Department of Planning, Industry and Environment – Water (the Department) – Executive Director Water Policy, Planning and Science in December 2020.

This manual was published on the Department's website in December 2020.

Manual application period

This manual applies until it is replaced.

This manual will be reviewed annually in accordance with Procedure 25 – Annual evaluation and review of active management. Changes may arise as a result of this annual review.

Updates will be published on the Department's website.

Context

Active management protects held environmental water (HEW) from extraction by unregulated access licence holders in the Gingham Watercourse Water Source and the Mallowa Creek Management Zone, allowing this water to remain in the water source for its intended environmental purpose.

HEW is water available under a water access licence (WAL) for the purposes of achieving environmental outcomes. NSW and Commonwealth governments have acquired WALs for environmental purposes in regulated, unregulated and groundwater sources.

In NSW, HEW includes water:

- of an environmental water subcategory
- with a non-statutory environmental purpose agreed between the Department and the WAL holder
- subject to an adaptive environmental water condition imposed under section 8B, 8C, 8D or 62B of the *Water Management Act 2000* (WM Act), or
- of a class prescribed by the regulations for environmental purposes.

The HEW identified as AEW in accordance with the Gwydir Unregulated WSP and this manual will be protected from extraction.

Areas where this procedures manual applies

This manual applies to the following management zones described in the Gwydir Unregulated WSP and shown in Appendix B:

- Upper Gingham Watercourse Management Zone (Gingham Watercourse Water Source)

- Lower Gingham Watercourse Management Zone (Gingham Watercourse Water Source)
- Mallowa Creek Management Zone (Mehi River Water Source)

References to management zones in this manual refer to these management zones unless otherwise stated.

Objectives and principles underpinning implementation of active management

Active management is to be implemented in accordance with this manual and the objectives and principles of active management set out in the Active Management in Unregulated Rivers Policy (active management policy) outlined below.

Primary objective

The primary objective of active management in NSW is to:

Manage access to water in unregulated systems to allow HEW to remain and be used in-stream for environmental purposes.

Secondary objectives

The secondary objectives are to:

- Support compliance with the protection of planned environmental water (PEW), transparency and equity of access
- provide certainty through enduring arrangements, and
- avoid reliance on temporary arrangements to protect HEW from extraction.

Principles

In implementing active management, solutions:

- avoid, mitigate or offset any material change to reliability and access characteristics, including unintended gains
- are evidence-based and outcomes-focused
- are simple, practical and cost-effective
- support cultural and social outcomes, and
- continuously improve through an adaptive management process.

Interpretation

Clauses referred to in this manual are clauses in the Gwydir Unregulated WSP unless otherwise stated.

Terms and abbreviations used in this manual are defined in Appendix A.

Appendices contain supporting information.

Part B – Regulatory Framework

This chapter explains the regulatory framework that enables and guides the implementation of active management in unregulated water sources in NSW.

Water Management Act 2000

The WM Act establishes overarching water management priorities. It also provides regulatory tools to manage flows, such as preparing water sharing plans, in order to protect water for the environment.

While active management will protect HEW from extraction in the Gwydir Unregulated River Water Sources, temporary water restrictions under section 324 of the WM Act will remain a tool for protecting other sources of environmental water, if such restrictions are determined to be in the public interest.

Water sharing plan provisions

This manual must be implemented in accordance with the Gwydir Unregulated WSP.

The Gwydir Unregulated WSP sets out objectives, strategies and rules for sharing water between water users and the environment.

Restricting the taking of water to protect AEW is identified as a strategy to meet the targeted environmental objectives of the WSP (refer to clause 10 (3) (f)).

The following rules in the WSP that enable restrictions on water take to protect AEW:

- Clause 40 allows a licence holder to notify the Minister that they intend to protect water (that could otherwise be permissibly taken) from extraction. The licence holder's account is debited by an amount determined by the Minister in accordance with this manual.
- Clause 42 (8) allows the Minister to determine and announce any adjustments to the Very Low Flow Class and A Class flow class thresholds for unregulated river access licences in the Upper Gingham Watercourse Management Zone by the amount necessary to protect AEW.
- Clause 43 (6A) allows the Minister to determine and announce adjustments to access rules for access licences in the Upper Gingham Watercourse Management Zone by the amount necessary to protect AEW.
- Clause 43A (2) allows the Minister to announce that water must not be taken under a specified access licence and for a specified period from the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones. This can happen if the Minister has determined and announced that the management zone contains AEW only or both AEW and PEW.
- Clause 43A (3) allows the Minister to announce a maximum amount of water that can be taken under a specified access licence and for a specified period from the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones, to protect AEW.
- Clause 45A requires that a manual is prepared and published on the Department's website.
- The definition in the Dictionary of the WM Act, which defines AEW that requires protection from extraction.

All rules under Part 8 of the Gwydir Unregulated WSP for managing access licences must be considered in implementing active management.

Active Management Procedures Manual

This manual is established under clause 45A of the Gwydir Unregulated WSP. Part E addresses procedures specified in the plan for:

- a) identifying and determining AEW on any given day

- b) notifying the minister of an intention to protect water from extraction under clause 40 (guidance for access licence holders)
- c) assessing a notification and determining the amounts to be debited from access licence water allocation accounts under clause 40
- d) determining and announcing any adjustments to flows under clauses 42 (8) and 43 (6A)
- e) determining and announcing the presence of PEW and AEW under clause 43A, and
- f) announcing the water permitted to be taken under an access licence under clause 43A.

In addition, this manual includes information on:

- the regulatory framework that this manual is part of (Part B)
- the responsibilities of agencies in implementing active management in the Gwydir Unregulated River Water Sources (Part C)
- operations in an operational overview (Part D)
- minimum consultation requirements (Part F)
- managing risk (Part G), and
- compliance (Part H).

Water access licence and works approval conditions

Mandatory conditions are imposed as part of WALs and Water Supply Works Approvals (works approvals) under Part 11 Division 2 and Division 3 of the Gwydir Unregulated WSP in accordance with sections 17 (c), 20, 66 (1) (a) and 100 (1) (a) of the WM Act. These conditions:

- give effect to the Gwydir Unregulated WSP rules, including those that enable active management
- provide limits or restrictions on what is authorised by the WAL or works approval, and
- place obligations on the holder which relate to what is authorised by the WAL or works approval.

WAL and works approval holders must comply with mandatory conditions.

Mandatory conditions take legal effect once the licence holder or approval holder has been given written notice of any changes to licence or approval conditions under sections 67 (4) and 102 (4) of the WM Act.

Active Management in Unregulated Rivers Policy

The manual is consistent with the active management policy.

WaterNSW Operating licence

WaterNSW will perform some of the Ministerial responsibilities identified in the Gwydir Unregulated WSP.

The Minister has conferred functions of the Minister under the WM Act to WaterNSW through the WaterNSW Operating Licence. The operating licence enables WaterNSW to exercise its functions under the *Water NSW Act 2014* in addition to the conferred functions of the WM Act.

Functions relevant to active management in accordance with the Gwydir Unregulated WSP include:

- managing water allocation accounts
- imposing daily access rules, and
- managing access to daily flows other than supplementary water.

Each year, the Independent Pricing and Regulatory Tribunal audits and reports on WaterNSW's performance against the WaterNSW Operating Licence provisions.

Part C – Responsibilities

Responsibilities for implementing active management are shared between:

- NSW Department of Planning, Industry and Environment – Water
- WaterNSW
- NSW Department of Planning, Industry and Environment – Environment, Energy and Science, and
- Natural Resource Access Regulator (NRAR).

Table 1 outlines the responsibilities of each organisation, specific to active management.

Table 1: Responsibilities and accountabilities for implementing active management

Organisation	Responsibilities
NSW Department of Planning, Industry and Environment – Water	<ul style="list-style-type: none"> • Prepare, review and amend the active management policy and regulatory framework where required following the annual review process • Evaluate and recommend changes to water sharing rules to support active management • On behalf of the Minister: <ul style="list-style-type: none"> ○ prepare and publish the manual under clause 45A, and ○ amend the manual as necessary following the annual review and publish revisions • Annually review and evaluate the implementation of the manual against the objectives and principles of the active management policy • Consult with WaterNSW, the NSW Department of Planning, Industry and Environment – Environment, Energy and Science, NRAR and the Murray-Darling Basin Authority (MDBA) when conducting each annual review • Consult with licence holders and peak stakeholder groups when conducting each annual review • Consult with licence holders and peak stakeholder groups following any determination to vary components of the operation of active management, including the policy, regulatory framework and manual • Draft and impose mandatory conditions to enact water sharing rules relevant to active management
WaterNSW	<ul style="list-style-type: none"> • Forecast river flows • Maintain flow forecasting tools • Account for AEW through each management zone • Issue flow advice for water users and the public • On behalf of the Minister: <ul style="list-style-type: none"> ○ determine and announce adjustments to the flow class threshold for unregulated river access licences under clause 42 (8) in the Upper Gingham Watercourse Management Zone, by the amount necessary to protect AEW

Organisation	Responsibilities
	<ul style="list-style-type: none"> ○ determine and announce adjustments to access rules for access licences under clause 43 (6A) in the Upper Gingham Watercourse Management Zone, by the amount necessary to protect AEW, and ○ announce that water cannot be taken from the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zone under clause 43A (2) if it is determined that the management zone contains AEW only or both AEW and PEW ● Provide operational reporting on active management, including regular accounting for environmental water use during events ● Provide NRAR with access to data to enable compliance monitoring and enforcement with active management ● Submit an Annual River Operations Report on the management of access to water to protect AEW ● Consult with unregulated river access licence holders or their representative groups prior to submitting the Annual River Operations Report ● Contribute to the annual review of the manual ● Contribute to review of the active management policy
NSW Department of Planning, Industry and Environment – Environment Energy and Science	<ul style="list-style-type: none"> ● Work collaboratively with other environmental water holders (that is, the Commonwealth Environmental Water Office) in planning and coordinating HEW use to improve flows in the Gwydir Unregulated River Water Sources ● Work collaboratively with WaterNSW when planning and using HEW to improve flows in the Gwydir Unregulated River Water Sources ● Submit an annual active management statement to the NSW Department of Planning, Industry and Environment – Water ● Contribute to the annual review of the manual ● Contribute to the review of the active management policy
NRAR	<ul style="list-style-type: none"> ● Monitor compliance with water sharing rules and licence conditions ● Undertake inspections to ensure water is used in accordance with announcements by applying risk-based strategies, policies and procedures ● Conduct compliance investigations and take enforcement actions where appropriate ● Submit an annual active management statement to the NSW Department of Planning, Industry and Environment – Water ● Contribute to the annual review of the manual ● Contribute to review of the active management policy

Part D – Operational Overview

Overview of implementation

Under active management we will identify and determine the presence of AEW, and control access to protect a volume equivalent to that defined as AEW from extraction, ensuring it remains in the water source for environmental purposes.

In the Gwydir Unregulated River Water Sources, only HEW arising from the Gwydir Regulated River Water Sources will be protected.

The Gwydir Unregulated WSP establishes flow class thresholds and specifies the flow classes under which water may be taken for each licence category. WALs express the flow class for each licence as a cease-to-pump (CtP) condition. The Upper Gingham Watercourse Management Zone establishes two flow classes (Very Low Flow Class and A Class). Licence holders in the Mallowa Creek can take water provided there is a visible flow at the pump site.

To protect AEW we will:

- prohibit take in the Upper Gingham Watercourse and Mallowa Creek management zones if only AEW is present in any 24-hour period
- prohibit take in the Lower Gingham Watercourse Management Zone if the CtP conditions have been met with AEW exclusively, and
- increase flow class thresholds in the Upper Gingham Watercourse Management Zone by the volume of AEW present, if both AEW and other sources of water are present.

Normal access conditions (summarised in Appendix C) will apply:

- if no AEW is present, or
- if both AEW and other sources of water are present in the Lower Gingham Watercourse or Mallowa Creek management zones.

The rationale for this simplified approach is summarised in Table 2.

Some elements of active management, such as setting volumetric limits on take or giving unregulated river access licence holders the ability to protect water, are not being implemented in the Gwydir Water Sources for certain reasons. Table 2 provides an overview of the implementation of the provisions required in the Gwydir Unregulated WSP for active management, as well as the rationale for implementing or not implementing these provisions, on 1 December 2020.

Only AEW that is entering the Lower Gingham Watercourse and Mallowa Creek management zones can be monitored. This means that any HEW reaching the end of the system in the Gwydir cannot be tracked and protected in the next water source.

Table 2: The implementation and rationale for active management provisions in the Gwydir Unregulated WSP

Provision of the water sharing plan	Implemented on 1 December 2020	Rationale
Clause 40	No	<p>Clause 40 of the Gwydir Unregulated WSP allows licence holders to protect water that could have otherwise been permissibly taken.</p> <p>This clause will not be implemented in the Gwydir Water Sources from 1 December 2020, as there are currently no plans by existing licence holder to protect environmental water, and no plans by environmental water managers to acquire licences in this area.</p> <p>There are no unregulated HEW licences in the Gwydir Unregulated River Water Sources (as of June 2020). Protecting water is likely to be of low interest to licence holders. In addition, providing a mechanism to protect unregulated water from extraction would complicate the process in the Gwydir. The implementation of this provision will be considered during the annual evaluation and review of active management.</p>

Provision of the water sharing plan	Implemented on 1 December 2020	Rationale
Clause 42 (8) and Clause 43 (6A)	Yes	When flows are above 250 ML/day, and AEW is present in the Upper Gingham Watercourse Management Zone, the flow class thresholds and access rules defined in the WSP will be adjusted by the amount necessary to protect in-stream AEW from extraction.
Clause 43A (2)	Yes (clause 43A (2) (b)), No (clause 43A (2) (a))	<p>If a management zone contains a) only AEW and PEW resulting from rules in the unregulated WSP, or b) only AEW, the Minister can announce that the take of water is prohibited for a specified period, in order to protect AEW in the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones.</p> <p>Prohibiting take under clause 43A (2) (a) is not proposed in the Gwydir for the first stage of active management as:</p> <ul style="list-style-type: none"> • access in mixed events in the Upper Gingham Watercourse Management Zone can be controlled by adjusting the flow class threshold • the AEW and the water available to access licence holders cannot be determined in a mixed event in the Lower Gingham Watercourse Management Zone, due to a lack of appropriate infrastructure to assess flows through these zones, and • licences in the Mallowa Creek Management Zone are subject to visible flow conditions, in order to prohibit access when only AEW is likely to protect the majority of AEW and PEW below visible flow. <p>Therefore, only clause 43A (2) (b) will be implemented from 1 December 2020. The Mallowa Creek Management Zone operates under 'no visible flow' CtP conditions that cannot be adjusted to protect AEW. Prohibiting take when only AEW is present is the simplest option for implementing active management in a system with no gauges and no CtP thresholds linked to a gauge.</p> <p>Licence conditions in the Lower Gingham Watercourse Management Zone already restrict take to support environmental watering of the wetlands. Prohibiting take when licence conditions are exclusively met with HEW is the simplest option for implementing active management with no gauges.</p>
Clause 43A (3)	No	<p>Although clause 43A (3) of the WSP allows for volumetric limits to be announced for specified access licences in the Upper Gingham Watercourse, Lower Gingham Watercourse and Mallowa Creek management zones, the implementation of these limits is not proposed. Because the Upper Gingham Watercourse Management Zone only has one licence holder, CtP threshold adjustment is sufficient to protect AEW. As such, volumetric limits to share the available water are not required.</p> <p>Neither the Lower Gingham Watercourse nor Mallowa Creek management zones have gauges, which makes it difficult to determine the volumes of water moving through the management</p>

Provision of the water sharing plan	Implemented on 1 December 2020	Rationale
		zone in order to set appropriate daily volumetric limits. The requirement for volumetric limits in these management zones will be assessed as part of the annual evaluation and review of the implementation of active management.
Clause 45A	Yes	Procedure manuals will be prepared and published on the Department's website.
Clause 71 (l)	When required	Allows access rules to be amended to implement active management.
Dictionary	Yes	Defines AEW that requires protection from extraction.

Overview of procedures

Table 3 outlines the procedures for protecting AEW in the Gwydir Unregulated River Water Sources and supporting reporting and adaptive management. Each stage is described further in Part F – Procedures. Some of these procedures are iterative.

Table 3: Daily, weekly and annual procedures for active management in the Gwydir

Stage	Purpose of procedure
Forecast flows in upstream tributaries and along the Gwydir (see Part F – Forecasting flows and river transmission losses)	To determine for each management zone, a) the total flows, and b) AEW entering the zone, leaving the zone and contributing environmental purposes in each management zone (that is, the volume of AEW that seeped into the riverbed and banks, evaporated or was taken up by vegetation)
Issue flow advice (see Part F – Issuing flow advice)	To inform water users and the public about likely flows along the river, the potential for AEW to be in the river, the likelihood that access will be prohibited or adjusted, and the progress of river flows
Determine the rate of AEW entering each management zone (see Part F – Identifying and determining active environmental water)	To determine the amount by which it is necessary to adjust flow class thresholds in the Upper Gingham Watercourse Management Zone, and access rules for licences in the Upper Gingham Watercourse, Lower Gingham Watercourse and Mallowa Creek management zones, in order to protect AEW and water below the base flow class thresholds
Announce flow classes and access conditions (see Part F – Error! Reference source not found.)	To inform licence holders in the Upper Gingham Watercourse Management Zone of the adjusted flow class thresholds To inform licence holders in the Upper Gingham Watercourse, Lower Gingham Watercourse and Mallowa Creek management zones if access is prohibited, in order to protect AEW
Assign losses to the AEW at the end of the management zone (see Part F – Forecasting flows and river transmission losses)	To determine the volume of AEW that enters the management zone and reaches the next management zone or water source

Stage	Purpose of procedure
<p>Assess cumulative mismatch between forecast losses and actual unaccounted differences during a flow event</p> <p>(see Part F – Forecasting flows and river transmission losses)</p>	<p>To determine if an operational response is required to better achieve the desired sharing between AEW and unregulated river access licence holders</p>
<p>Data capture, archiving and accessibility</p> <p>(see Part F – Monitoring, evaluation, reporting and improvement)</p>	<p>To support reporting, adaptive management and compliance monitoring and enforcement</p>
<p>Annual reporting and evaluation</p> <p>(see Part F – Monitoring, evaluation, reporting and improvement)</p>	<p>To inform annual evaluations of the appropriateness, efficiency and effectiveness of active management</p> <p>To inform improvements to active management and amendments to this manual</p>

Part E – Procedures

Forecasting flows and river transmission losses

Intent

Active management relies on forecasting flows entering and travelling along the Gingham Watercourse Water Source and Mallowa Creek Management Zone to:

- inform water users and the public about likely flows entering the Gingham Watercourse Water Source and Mallowa Creek Management Zone, the potential for AEW to be present, the likelihood of access being prohibited or adjusted, and the progress of flows
- determine the AEW in each management zone
- determine the AEW that contributed to environmental purposes in each management zone (that is, the AEW that seeped into the riverbed and banks, evaporated or was taken up by vegetation), and
- determine the adjusted flow class thresholds and announcements required in each management zone to protect the AEW.

Forecasting in the Upper Gingham Watercourse, Lower Gingham Watercourse and Mallowa Creek is only required if AEW is likely to be present in these management zones.

Uncertainty in forecasting flows can arise from uncertainty in estimating water use, tributary inflows, river transmission losses (these arise due to seepage into the bed and banks, and through evapotranspiration, and can vary significantly between events) or flow routing effects. To minimise the effects of overestimating or underestimating the AEW protected, a balance must be struck between managing the uncertainty and staying within the limits of operational feasibility and cost-effectiveness.

While it is impossible to eliminate uncertainty, the mismatch between the forecast and observed flows can be minimised by:

- considering the best information available on daily extraction volumes
- making the forecast, and the access announcements that rely on that forecast, as close as possible to the period of access
- basing initial and ongoing river transmission loss estimates on an assessment of the average losses for comparable past historical events, and
- adaptively adjusting ongoing river transmission loss forecasts based on observed unaccounted difference, so that mismatches do not compound as an event proceeds.

Procedure 1 – Forecasting flows from upstream gauged tributaries

1. WaterNSW must forecast inflows from upstream gauged tributaries when AEW is likely to reach the Gingham Watercourse Water Source or the Mallowa Creek Management Zone. This forecast will establish the:
 - a) total daily inflows into each management zone, and
 - b) daily inflows arising from AEW into each management zone, according to the definition of AEW under categories A and B, as shown in Table 4.
2. WaterNSW must document the procedures used to forecast flow within the tributaries to determine the forecasts of total daily inflows, as well as the proportion of inflows into the Gwydir Water Sources that satisfy the definition of AEW as outlined in Table 4.

Procedure 2 – Forecasting flows from upstream ungauged tributaries

1. WaterNSW must estimate ungauged tributary inflows for management zones when either:

- a) there has been significant local rainfall in that management zone or in an ungauged tributary catchment that flows into that management zone, or
 - b) there is evidence of flows in ungauged tributaries and
 - c) there has been a response in the calculated unaccounted differences that indicates an increase in ungauged inflows.
2. Ungauged tributary inflows are estimated by comparing the observed unaccounted difference in the relevant management zone with the observed trends in the preceding days and weeks, and considering any other relevant information.
 3. If WaterNSW assesses that, due to local rainfall, there are ungauged tributary inflows from smaller streams and the residual catchment along the management zones, or high flows in tributaries bypassing flow gauges, the unaccounted difference must be adjusted for the purposes of estimating river transmission losses.
 4. Where ungauged tributary inflows are not attributable to HEW, they will contribute to the assessment of water available to access licence holders, subject to the access rules set out in the Gwydir Unregulated WSP.

Procedure 3 – Forecasting flows within the Gingham Watercourse Water Source

1. WaterNSW must forecast flows within the Gingham Watercourse Water Source when AEW is present or forecast to be entering the water source.
2. WaterNSW must forecast flows within the Gingham Watercourse Water Source to:
 - a) estimate the volume of AEW as it moves and attenuates through the water source, and
 - b) determine if changes to access conditions for unregulated river access licence holders are required.
3. WaterNSW must document procedures for forecasting flows along the Gingham Watercourse Water Source.

Procedure 4 – Forecasting river transmission losses

1. WaterNSW must estimate river transmission losses between gauges to forecast flows expected at each gauge and to assign losses.
2. WaterNSW must estimate the river transmission losses in each management zone for each 24-hour period. This must be based on a water balance approach that uses the best available estimates of the following information, with appropriate allowance for travel times:
 - a) upstream, downstream and relevant tributary or effluent flow, and
 - b) water use in each management zone.
3. When flows commence, WaterNSW must make forecasts of the 'initial' river transmission losses in each management zone. This must be based on an assessment of the observed average or typical initial losses for past events with comparable antecedent conditions.
4. WaterNSW must document the method for determining 'initial' river transmission losses and make it publicly available.
5. WaterNSW must adjust river transmission loss forecasts based on observed unaccounted differences in the preceding days and weeks.
6. Mismatches in forecast losses and observed unaccounted differences must not be reconciled between events.

Notes

- 1 WaterNSW will forecast flows in each management zone using a computer-aided river management system (CARM).
- 2 The information used to forecast flows may include, but is not limited to:

- orders for water made under HEW licences listed on the environmental water register in the upstream water sources
 - expressions of interest for access to supplementary water made under HEW licences listed on the environmental water register in the upstream water sources
 - flow gauge readings from Hydstra (WaterNSW)
 - metering data
 - WAL details, including licence category (flow class), extraction point location, water account balance and authorised pumping capacity
 - weather forecast (from the Bureau of Meteorology), and
 - water required for critical needs, basic landholder rights, native title and licence categories within the water source that the Gwydir Unregulated WSP and the WM Act give a higher priority to.
- 3 Appendix G lists flow gauging stations that may be used in forecasting.
 - 4 Estimates of likely water use will be determined after considering a range of information, including the history of water use (where available) and pump capacity (where available).
 - 5 River transmission losses, one of the significant sources of uncertainty, can be determined retrospectively by calculating the difference between flow recorded by gauges at the top and bottom of a management zone (referred to as the unaccounted difference).
 - 6 Unaccounted differences can be influenced by extraction estimation errors. These include ungauged tributary inflows and flow and extraction measurement errors (for example, a river flow gauge inaccurately measuring flow). They can also include routing effects (for example, changes in channel storage and associated alterations in apparent travel times). This may result in fluctuations in the calculated unaccounted difference (including unaccounted differences that are not always negative) for a management zone.

Identifying and determining active environmental water

Intent

To minimise the effect on access licence holders, only water defined in the Gwydir Unregulated WSP as AEW and determined in line with this manual will be protected from extraction under active management.

AEW will include HEW arising from upstream water sources.

HEW is water available under a WAL for the purposes of achieving environmental outcomes. In NSW, HEW arises from licences listed on the NSW Environmental Water Register.

Planned environmental water from upstream water sources is not protected from extraction under active management in the Gwydir Unregulated River Water Sources

Protecting unregulated water from extraction

This manual does not provide for unregulated access licence holders (including environmental water holders) in the Mallowa Creek, Upper Gingham Watercourse and Lower Gingham Watercourse management zones to protect water from extraction through these zones, even though the Gwydir Unregulated River WSP allows for this. This is because enabling unregulated licence holders to protect water from extraction would significantly complicate the process in the Gwydir. This would lead to increased costs for potentially no benefit, as there are no environmental water holders in the area and protecting water from extraction is likely to be of low interest to licence holders.

Procedure 5 – Identifying active environmental water

1. AEW in the Gwydir Unregulated WSP is water in the Mallowa Creek Management Zone or the Gingham Watercourse Water Source that, on any given day, the Minister identifies or determines day as requiring protection from extraction arising from the following:
 - a) HEW flowing from a water source upstream of either the Gingham Watercourse Water Source or the Mallowa Creek Management Zone, and
 - b) a notification by a licence holder to the Minister, setting out the licence holder's intention to protect the water from extraction under clause 40 of the Gwydir Unregulated WSP.

2. Table 4 describes how AEW defined under the Gwydir Unregulated WSP is identified.
3. Inflows arising from HEW licences not identified in Table 4 must not be recognised as AEW, until the Department agrees to a method for determining the volume of water that arrives at the Gwydir Unregulated River Water Sources. This includes flows arising from HEW licences that originate from other upstream unregulated water sources in NSW and flow into Mallowa Creek Management Zone or Gingham Watercourse Water Source (either directly or through a regulated river water source).
4. WaterNSW must not identify AEW under Category B in Table 4 until a method is established and agreed by the Department for debiting water allocation accounts by the volume of AEW identified and determined to be present.

Table 4: Water to be identified as active environmental water in the Gwydir Unregulated River Water Sources

Water identified as active environmental water	
Water arising from HEW flowing from a water source upstream of the Gingham Watercourse Water Source and Mallowa Creek Management Zone	
Category A	The inflows to the Gingham Watercourse Water Source and the Mallowa Creek Management Zone that arise from delivery of account water under general security and high-security regulated river access licences. These licences are listed on the NSW Environmental Water Register for the Gwydir Regulated River Water Sources.
Category B	The inflows to the Gingham Watercourse Water Source and Mallowa Creek Management Zone arising from regulated river supplementary WALs (listed on the NSW Environmental Water Register), where a volume of water is debited from the account and recognised as AEW during a supplementary access event in the Gwydir Regulated River Water Sources.
Water arising from a licence holder's notification to the Minister of that licence holder's intention to protect the water from extraction under clause 40 of the Gwydir Unregulated WSP.	
Category C	There will be no water identified under this category at the commencement of active management on 1 December 2020, as this manual does not provide for licence holders to notify WaterNSW that they intend to protect the water from extraction.

Notes

- 1 The NSW Environmental Water Register is maintained by WaterNSW and may be accessed at <https://www.industry.nsw.gov.au/water/environmental-water-hub/public-register/environmental>.
- 2 Tributary inflows arising from WALs that do not meet the requirements set out in categories A and B in Table 4 will not be classified as AEW in the Gwydir Unregulated River Water Sources. For example, the water arising from releases of the Gwydir Environmental Contingency Allowance does not meet the definition of AEW in the Gwydir Unregulated River Water Sources and therefore will not be protected under active management.
- 3 AEW as defined by Category C will not be identified in the initial implementation of active management. This is because providing a mechanism for unregulated licence holders to protect water from extraction would significantly complicate the process in the Gwydir. This would increase costs for potentially no benefit, as there are no environmental water holders in the area and protecting water from extraction is likely to be of low interest to licence holders. During the annual evaluation and review of the manual, the Department will consider amending it to provide for unregulated licence holders to notify WaterNSW that they want to protect water from extraction, if licence holders in the Mallowa Creek Management Zone or Gingham Watercourse Water Source express interest.

Procedure 6 – Determining the rate of active environmental water arising from held environmental water flowing from a water source upstream of the Gingham Watercourse Water Source and Mallowa Creek Management Zone

1. WaterNSW must determine the rate of AEW entering the Mallowa Creek Management Zone as:
 - a) water to be debited from the water allocation account (in accordance with an order received under Category A in Table 4) to the Gundare weir pool that is released into Mallowa Creek Management Zone via the Mallowa Creek regulator, plus
 - b) water to be debited from the water allocation account (under Category B in Table 4) entering the Mallowa Creek, based on a method that is documented by WaterNSW, agreed to by the Department and publicly accessible.
2. WaterNSW must determine the rate of AEW entering the Upper Gingham Watercourse Management Zone as:
 - a) water to be debited from a water allocation account (in accordance with an order received under Category A in Table 4) entering the Gingham Watercourse Water Source from the Gwydir weir pool, plus
 - b) water to be debited from a water allocation account (under Category B in Table 4) entering the Gingham Watercourse Water Source, based on a method that is documented by WaterNSW, agreed to by the Department and publicly accessible.

Notes

- 1 AEW enters the Mallowa Creek via the Mallowa Creek Regulator from the Gundare weir pool. WaterNSW controls the releases into the Mallowa Creek through the Mallowa Creek Regulator.
- 2 AEW enters the Gingham Watercourse from the Gwydir weir pool. Water can leave the Gwydir weir pool via the Tyreel regulator or the Gingham Watercourse (or in high flows via other channels and depressions).
- 3 AEW entering the Gingham Watercourse is determined by first apportioning the change in storage volume of the Gwydir weir pool between the Tyreel regulator and the Gingham Watercourse, and then by apportioning the flow into the Gingham Watercourse Water Source based on the proportion of total flow at the upstream Gwydir @ Yarraman gauge (418004) that is AEW.

Procedure 7 – Determining the rate of active environmental water along the Gingham Watercourse Water Source

1. WaterNSW must determine the rate of AEW at the following locations in the Gingham Watercourse Water Source, in line with the methods outlined below and allowing for travel time. The rate of AEW at:
 - a) Gingham Channel @ Teralba gauge (418074) equals the proportion of AEW entering the Gingham Watercourse multiplied by total flows entering Gingham Watercourse from the Gwydir weir pool
 - b) Gingham Channel @ Tillaloo Bridge gauge (418076) equals the proportion of AEW at Teralba gauge multiplied by the total flow at Tillaloo Bridge gauge, and
 - c) Gingham Channel @ Gingham Bridge (418079) equals the proportion of AEW at Tillaloo Bridge gauge multiplied by total flow at Gingham Bridge gauge.

Procedure 8 – Determining active environmental water arising from a licence holder's notifying the Minister of that licence holder's intention to protect the water from extraction under clause 40 of the Gwydir Unregulated WSP

1. WaterNSW must determine that 0 ML/day arises from a licence holder's notification to protect water from extraction under clause 40 of the Gwydir Unregulated WSP.

Notes

- 1 Clause 40 of the Gwydir Unregulated WSP allows unregulated river access licence holders to protect water from extraction.
- 2 This manual does not provide for the protection of unregulated water that could otherwise be permissibly taken, as there are no environmental water holders in the area and protecting a volume is likely to be of low interest to licence holders. In addition, providing a mechanism to protect unregulated water from extraction would significantly complicate the process in the Gwydir, increasing costs for potentially no benefit.
- 3 During the annual evaluation and review of the manual, the Department will consider if it needs to be amended to enable licence holders to notify WaterNSW that they want to protect water from extraction. This will depend if licence holders in the Mallowa Creek Management Zone or Gingham Watercourse Water Source express interest.

Procedure 9 – Determining the active environmental water flowing out of the Mallowa Creek and Lower Gingham Watercourse management zones

1. WaterNSW will not determine the rate of AEW leaving the Mallowa Creek and Lower Gingham Watercourse management zones.

Notes

- 1 AEW exiting the Mallowa Creek and Lower Gingham Watercourse management zones cannot be determined as there is a lack of appropriate gauging stations at the downstream ends of these zones. This makes it difficult to estimate losses and determine the AEW used in these management zones for environmental purposes.
- 2 Water identified and determined as AEW entering the Mallowa Creek and Lower Gingham Watercourse management zones will not be protected from extraction if it flows out of these zones.

Procedure 10 – Determining the rate of active environmental water used in-stream for environmental purposes (assigning losses to active environmental water)

1. WaterNSW must determine the AEW used in-stream between each gauge as the total losses between gauges multiplied by (AEW at the upstream gauge divided by the total flow at the upstream gauge).

Notes

- 1 As AEW flows through each management zone, it will be reduced by its share of the (forecasted) river losses, which shall be based on the ratio of AEW to the total flow that is forecast at the start of the management zone. For example:
 - If 100 ML has entered a management zone and 70 ML of that gets recorded at the downstream gauge, and there was no extraction occurring, then the total river transmission losses (known as unaccounted difference) was 30 ML.
 - If 20 ML of the 100 ML entering the river reach was environmental water, then 6 ML is attributed to the AEW, as calculated by $(20/100) * 30$. Therefore, 6 ML of water was 'used' for environmental purposes.
 - This means that at the end of the zone, there are 14 ML of AEW remaining and 56 ML of system flows.

Monitoring and managing the intended sharing of river flows

Intent

We intend to manage water take so that an equivalent volume to that defined as AEW is protected from extraction during each event.

At the conclusion of each 24-hour period, we will compare the observed flows and observed losses (termed 'unaccounted differences') with the forecasts. This will enable us to assess the effectiveness of the forecasts in determining the AEW and helping to set access rules.

The difference between the forecast and post-calculated AEW flowing out of the management zone can be used to adjust the forecasts of AEW flowing into the next management zone. This will increase the likelihood of an equivalent volume to that defined as AEW being protected during an event, and help ensure that there are no unintended consequences for licence holders.

Procedure 11 – Monitoring mismatches between forecast and observed flows and intended sharing of flow

1. For each management zone where AEW is forecast, WaterNSW must:
 - a) calculate the observed river losses from the previous 24-hour period using observed flows and water use data
 - b) determine the post-calculated AEW that passed out of the management zone in the previous 24 hours using the observed river flows and losses
 - c) maintain a cumulative total of the daily difference between the forecast and post-calculated AEW leaving each management zone, and
 - d) maintain a cumulative total of the daily difference between the forecast and observed water use.

Procedure 12 – Managing mismatches between the forecast and intended sharing of flow

1. WaterNSW may (at its discretion) adjust the forecast AEW based on the cumulative total of the daily difference between the forecast and post-calculated AEW during the current flow event.
2. Any adjustment to the forecast AEW in subsequent days, or adjustments to management zones and access, that occurs in response to a cumulative mismatch in sharing during the event to date, should be distributed across that remaining period of access, where possible. Before this occurs, consideration should be given to the potential for further mismatches between forecast and observed flows.
3. Mismatches in the forecast and post-calculated AEW must not be reconciled between events.

Notes

- 1 There are no criteria for defining when action must be taken to manage a cumulative mismatch in an event. Instead, WaterNSW will report on cumulative differences between the forecast and post-calculated AEW, and when adjustments were made, by 30 September each year.
- 2 During the annual review of this manual, the Department will consider whether criteria are required to define when a response to a mismatch between forecast and post-calculated AEW should be taken.

Issuing flow advice

Intent

When AEW is likely to be in-stream, WaterNSW will issue flow advice before and during an event. This will alert licence holders and the public to likely announcements and restrictions, and provide them with information on the flows that may occur, the AEW likely to be protected, and when and where licence holders are likely to be restricted from taking water.

Procedure 13 – Issuing flow advice

1. WaterNSW must issue flow advice on the WaterNSW website for the Gingham Watercourse Water Source and the Mallowa Creek Management Zone when a flow event is occurring in the Gwydir Regulated River Water Sources that is likely to result in an inflow to the Gingham Watercourse Water Source or Mallowa Creek Management Zone.
2. Flow advice may include, but will not be limited to:
 - a) inflow to the Gingham Watercourse Water Source or Mallowa Creek Management Zone
 - b) the management zones where AEW is forecast to be present
 - c) the management zones and dates where pumping is likely to be restricted
 - d) the timing and magnitude of flows under a probable flow forecast
 - e) the observed and forecast total flow at key locations for that event
 - f) the observed and forecast AEW at key locations for the flow event, and
 - g) reasons for any change to forecasts.

Notes

- 1 The broad seasonal outlook may be based on:
 - the Bureau of Meteorology outlook
 - the circumstances in upstream storages, and
 - any HEW releases that are likely to be actively managed in the Gwydir Unregulated River Water Sources.
- 2 Flow advice will be based on:
 - conservative estimates of inflows and river transmission losses that are at the upper end of what could be expected, consistent with similar past events, and
 - the maximum potential volume of licensed water extraction.

Determining access

Intent

We intend to only restrict take of AEW present, and any flow that contributes to PEW below the access thresholds defined in the Gwydir Unregulated WSP.

A determination of access therefore must take WSP rules and licence conditions into account.

Procedure 14 – Determining adjusted flow class thresholds in the Upper Gingham Watercourse Management Zone (and the resulting flow class) under clause 42 (8) and cease to take conditions under clause 43 (6A)

1. For each 24-hour period when AEW is forecast to be present in the Upper Gingham Watercourse Management Zone, WaterNSW must:

- a) calculate the AEW at the Tillaloo gauge (418076) by applying the proportion of AEW determined at the Teralba gauge (418074) to the forecast flow at the Tillaloo gauge, allowing for travel time and river transmission losses, and
 - b) assess whether the flows in the Gingham channel at the Tillaloo gauge are forecast to exceed 250 ML/day.
2. WaterNSW must adjust the flow class thresholds for the Upper Gingham Watercourse Management Zone at the Tillaloo gauge if flows at the Tillaloo gauge are forecast to:
 - a) exceed 250 ML/day, and
 - b) include AEW.
 3. The amount necessary to protect AEW equals the forecast rate of AEW at the Tillalo gauge.
 4. Flow class thresholds for the Upper Gingham Watercourse Management Zone must not be adjusted if:
 - a) there is no AEW forecast at the Tillaloo gauge, or
 - b) flow at the Tillaloo gauge is not forecast to exceed 250 ML/day.

Procedure 15 – Determining if only active environmental water is present under clause 43A (2) (b)

1. WaterNSW must determine that only AEW is present in the:
 - a) Upper Gingham Watercourse Management Zone if the flow in Gingham Channel @ Tillaloo gauge for the 24-hour period is assessed as 100% AEW
 - b) Lower Gingham Watercourse Management Zone if the flow in Gingham Channel @ Gingham Bridge (418079) for each day over the past 12 months is assessed as 100 % AEW, and
 - c) Mallowa Creek Management Zone if the flow entering the Mallowa Creek Management Zone from the Mallowa Creek regulator for the 24-hour period is assessed as 100 % AEW.

Procedure 16 – Determining if only planned environmental water and active environmental water are present under clause 43A (2) (a)

1. WaterNSW must not determine or announce that water must not be taken, under a specified access licence and for a specified period, from the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones, if PEW (resulting from the access rules specified in clauses 42 and 43 of the Gwydir Unregulated WSP) and AEW are present.

Notes

- 1 Clause 43A (2) (a) of the Gwydir Unregulated WSP allows for take to be prohibited for a specified period, when both PEW and AEW are present in either the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones, to protect AEW.
- 2 Prohibiting take under clause 43A (2) (a) is not proposed in the Gwydir for the first stage of active management, on the basis that:
 - access in mixed events in the Upper Gingham Watercourse Management Zone can be controlled by adjusting the flow class threshold
 - the AEW and therefore the water available to access licence holders cannot be determined in a mixed event in the Lower Gingham Watercourse Management Zone, due to a lack of appropriate infrastructure to assess flows through these zones, and
 - licences in the Mallowa Creek Management Zone are subject to visible flow conditions, so prohibiting access when only AEW is present is likely to protect all AEW and PEW below visible flow.

- 3 During the annual evaluation and review of the manual, the Department will consider if this procedure needs to be amended, depending on whether risks to AEW or PEW are demonstrated.

Procedure 17 – Determining and announcing the maximum amount of water permitted to be taken under clause 43A (3)

1. WaterNSW must not determine or announce a maximum amount of water that any licence permits the taking of in the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones.

Notes

- 1 Clause 43A (3) of the Gwydir Unregulated WSP allows for the maximum amount of water to be determined and announced for a specified access licence for a specified period from the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zone, in order to protect AEW.
- 2 Daily volumetric limits control extraction when there is AEW and other sources of flow present. Access thresholds cannot be adjusted or the water available may be less than the pump capacity of all licence holders.
- 3 Volumetric limits under clause 43A (3) are not proposed in the Gwydir for the first stage of active management, on the basis that:
 - access in mixed events in the Upper Gingham Watercourse Management Zone can be controlled by adjusting the flow class threshold, and
 - the AEW and therefore the water available to access licence holders cannot be determined in a mixed event in the Lower Gingham Watercourse or Mallowa Creek management zones, due to a lack of appropriate infrastructure to assess flows through these zones.
- 4 During the annual evaluation and review of the manual, the Department will consider if this procedure needs to be amended to provide for the setting of volumetric limits, depending on whether risks to AEW are demonstrated.

Access announcements

Intent

Access announcements will occur if access is to be restricted or prohibited to protect AEW.

The Lower Gingham and Mallowa Creek management zones may have access allowed or prohibited under active management.

The Upper Gingham management zone may have access allowed, restricted or prohibited under active management.

Procedure 18 – Announcing that water must not be taken under clause 43A (2)

1. WaterNSW must:
 - a) announce that water must not be taken by 7 am on the day the announcement applies to
 - b) publish announcements on the WaterNSW website, and
 - c) communicate announcements to licence holders via email and SMS.
2. Announcements of prohibited take must apply for 24 hours, starting at 9 am each day.
3. The announcement must state that water must not be taken, and specify:
 - a) time and date the announcement is made
 - b) management zone the announcement applies to
 - c) period that the announcement applies
 - d) the rule under which the announcement is made

4. An announcement prohibiting access cannot be amended or retracted.

Notes

- 1 An announcement prohibiting access may apply for one or multiple 24-hour period/s depending on the certainty of forecasts.
- 2 If WaterNSW detects local rainfall within the 24-hour period in which the announcement applies, adjustments can be made on the following day, following the process used to manage mismatches between forecast and observed flows.
- 3 Standard access conditions apply for licences in the Mallowa Creek and Lower Gingham management zones if an announcement prohibiting access is not made under clause 43A (2).
- 4 Standard access conditions apply for licences in the Upper Gingham Watercourse Management Zone if neither an announcement prohibiting access under clause 43A (2), or an announcement adjusting flow class thresholds under clause 42 (8), is made.
- 5 Access will not be prohibited for domestic and stock access licence holders and local water utility access licence holders.

Procedure 19 – Announcing adjusted flow class thresholds in the Upper Gingham Water Course Management Zone under clause 42 (8)

1. WaterNSW must:
 - a) make adjusted flow class announcements by 7am on the day the announcement applies to
 - b) publish adjusted flow class announcements on the WaterNSW website, and
 - c) communicate adjusted flow class announcements to licence holders via email and SMS.
2. Adjusted flow class announcements must apply for 24 hours, starting at 9am each day.
3. The adjusted flow class announcement must specify the:
 - a) time and date the announcement is made
 - b) management zone the announcement applies to
 - c) adjustment to the flow class threshold
 - d) adjusted flow class threshold
 - e) flow class the announcement applies to
 - f) period that the announcement applies (this may be one or several 24-hour period/s), and
 - g) the rule under which the announcement is made.
4. Flow class announcements can be made for more than one 24-hour period at a time if there is confidence in the flow forecast for the period the announcement applies to.
5. A flow class announcement cannot be amended or retracted.

Notes

- 1 A flow class announcement may apply for one or multiple 24-hour period/s depending on the certainty of forecasts.
- 2 If WaterNSW detects local rainfall within the 24-hour period in which the announcement applies, adjustments can be made on the following day, following the process used to manage mismatches between forecast and observed flows.
- 3 Access will not be adjusted for domestic and stock access licence holders and local water utility access licence holders.

Procedure 20 – Announcing adjustments to flows under clause 43 (6A) for the Upper and Lower Gingham Watercourse management zones

6. Procedures are not required to adjust flows under clause 43 (6A). This is because the Department has determined that there are no access licences in these management zones

where cease to take conditions are higher than the upper limit of the Very Low Flow Class, or access rules specified in clauses 42 (2)–(5).

Debiting water allocations accounts

Intent

Water extracted or protected must be debited from water allocation accounts. This ensures that account balances reduce based on the water extracted or protected.

Water extracted can be metered and debited from water allocation accounts. However, when water is protected from extraction, it cannot be measured by meters. As such, an alternative approach is required.

This manual does not allow for water allocation accounts to be debited when water is protected from extraction, as it does not provide for the protection of water otherwise permitted to be extracted.

Procedure 21 – Determining the amounts to be debited from access licence water allocation accounts under clause 40 (when unregulated water has been identified as active environmental water)

1. No water is to be determined and debited from accounts under clause 40.

Procedure 22 – Debiting unregulated water allocation accounts when water is extracted

1. Announcements must not be considered in debiting water allocation accounts when water is extracted.
2. WaterNSW must debit water allocation accounts for extractive use based on take and in accordance with existing, documented procedures.
3. WaterNSW must provide a method for licence holders to specify their preference for the order in which accounts are debited, in instances where multiple access licences are linked to one works approval and take is permitted from multiple access licences.
4. WaterNSW must document water allocation account debiting procedures.

Notes

- 1 Procedures to determine the amounts to be debited from access licence water allocation accounts under clause 40 (when unregulated water has been identified and determined to be protected from extraction) are not required, as this manual does not provide for licence holders to notify WaterNSW that they want to protect water from extraction.

Monitoring, evaluation, reporting and improvement

Intent

Active management in the Gwydir Unregulated River Water Sources is a significant change in how unregulated rivers are managed.

The Department will review the implementation of active management annually to support learning and allow for improvements to rules and procedures.

The review will rely on data and reports provided by agencies.

To support reporting, compliance monitoring and enforcement and continuous improvement, data used in active management is to be recorded, archived and made accessible to NSW government agencies.

The annual review cycle starts with reports that contribute information for the annual evaluation of active management. These reports also ensure that active management is conducted transparently.

Reporting from WaterNSW will document forecasting and accounting of river flows, river losses, AEW and licensed water use, and management responses and recommendations for improving the implementation of active management.

Reports from the Department of Planning, Industry and Environment – Environment, Energy and Science and NRAR will document any issues that arose in protecting AEW and monitoring and enforcing compliance. They will also provide recommendations for improvements to ensure the objectives and principles of active management are met.

Appendix F summarises the annual review cycle.

Procedure 23 – Data capture, archiving and record-keeping requirements

1. WaterNSW must capture and archive the information in Table 5 for each management zone, for each day.
2. WaterNSW must make the data outlined in Table 5 accessible to the Department for reporting, evaluation and compliance monitoring and enforcement purposes.

Table 5: Data to be captured, archived and made accessible

Purpose	Recording and archiving requirements
Issuing flow advice	<ul style="list-style-type: none"> • Flow advice issued
Forecasting flows	<ul style="list-style-type: none"> • Installed irrigation infrastructure (number of pumps and their capacities, and on-farm storage capacities) • All observed or reported input data (observed flows, water use, on-farm storage volumes, weir pool levels/volumes, rainfall and evaporation) • Daily outputs of flow forecasting • Actual unaccounted differences • Adjustments in response to mismatches between forecast and actual unaccounted differences, and reasons for adjustments • Adjustments to loss estimates and reasons for adjustments
Identifying and determining AEW	<ul style="list-style-type: none"> • Volume of AEW entering from each tributary or upstream water source, and its licence source • Volume of AEW entering the management zone from an upstream management zone of the same water source

Purpose	Recording and archiving requirements
	<ul style="list-style-type: none"> • Period when access is prohibited to protect AEW
Accounting for losses of AEW	<ul style="list-style-type: none"> • Losses assigned to AEW in each management zone
Determining the adjusted flow class thresholds and access rules for licences in the Upper Gingham Watercourse Water Source	<ul style="list-style-type: none"> • Adjusted flow class thresholds • Adjusted access rule
Monitoring the intended sharing of access to river flows	<ul style="list-style-type: none"> • Daily post-calculated AEW for each management zone • Daily mismatches between announced and post-calculated volumes of AEW

Procedure 24 – Annual reporting requirements

1. By 30 September each year, WaterNSW must provide the following information to the NSW Department of Planning, Industry and Environment – Water:
 - a) a description of the active management undertaken during the relevant water year
 - b) the performance in meeting:
 - the relevant requirements of the Gwydir Unregulated WSP
 - the requirements set out in this manual, and
 - a general description of the flow events and water use that occurred
 - c) a summary account on a monthly or event basis of the:
 - inflows of AEW
 - volume of AEW passing key points
 - volume of AEW protected from extraction
 - volume of AEW used in-stream (that is, losses assigned to AEW), and
 - whether announcements to prohibit access needed be made in order to protect AEW
 - d) a comparison on a monthly or event basis of the:
 - forecast and observed river losses, and
 - forecast AEW with the post-calculated volume of AEW
 - e) documentation of:
 - feedback received from consultation with stakeholders on the implementation of active management
 - issues that arose in the implementation of active management and details of how any issues were managed, and
 - deviations from the procedures outlined in this manual, as well as details of why the deviations were necessary
 - f) recommendations to:
 - address issues that arose in implementing active management
 - improve the efficiency or effectiveness of active management, and
 - avoid future deviations where possible
 - g) any other matter relevant to active management that the Department may request following consultation with WaterNSW.

2. WaterNSW may consult with unregulated river access licence holders in the Mallowa Creek Management Zone and Gingham Watercourse Water Source to seek feedback on the implementation of active management for that water year, and include a summary of any such feedback in the Annual Rivers Operation Report.
3. By 30 September each year, the Department of Planning, Industry and Environment – Environment, Energy and Science must submit the following information to the Department of Planning, Industry and Environment – Water:
 - a) a brief description of environmental events that led to active management being used to protect environmental water during the previous water year
 - b) the degree to which active management enabled the environmental water holder to achieve their environmental objectives
 - c) documentation of:
 - any issues that arose in the accounting of AEW, and
 - feedback from consultation with stakeholders on active management
 - d) recommendations to:
 - address issues, and
 - improve the implementation of active management.
4. The Department of Planning, Industry and Environment – Environment, Energy and Science may consult with environmental water holders and stakeholders in preparing their annual statement.
5. By 30 September each year, NRAR must submit to the Department of Planning, Industry and Environment – Water documentation of:
 - a) relevant compliance outcomes
 - b) any issues that arose in monitoring or enforcing compliance with active management provisions, and
 - c) recommendations to address those issues or improve the operation of active management.

Procedure 25 – Annual evaluation and review of active management

1. The NSW Department of Planning, Industry and Environment – Water must conduct an annual evaluation and review of the implementation of active management after considering reports provided by WaterNSW, NRAR and the NSW Department of Planning, Industry and Environment – Environment, Energy and Science.
2. In undertaking the review, the NSW Department of Planning, Industry and Environment – Water must consider the objectives and principles set out in the active management policy.
3. By 31 March each year, the NSW Department of Planning, Industry and Environment – Water must prepare an active management evaluation and review report. This report will include:
 - a) reporting on the implementation of improvements from previous reviews
 - b) issues relating to active management raised through consultation with stakeholders
 - c) a summary of results and recommendations contained in reports provided by WaterNSW, NRAR and the NSW Department of Planning, Industry and Environment – Environment, Energy and Science
 - d) proposals for variations or new procedures brought forward by agencies or stakeholders
 - e) an assessment of whether:
 - procedures for active management were followed
 - any deviations from the procedures occurred, including any potential modifications to the procedures that may be required to avoid future deviations, where possible

- the current active management procedures and associated operations provide for AEW to remain in the water source for environmental purposes
 - the risk management measures in place are effective at protecting AEW and ensuring that water users' access to water above the access thresholds arising from other sources has not been impacted, and
 - the active management procedures should be expanded, modified or remain unchanged, and
- f) recommendations to change this manual, the active management policy or the Gwydir Unregulated WSP rules relating to active management.
4. Proposals to support changes or improvements to the operation of active management may be brought forward for consideration in the review by a number of parties. These parties include WaterNSW, NRAR, the NSW Department of Planning, Industry and Environment – Environment, Energy and Science, and stakeholders such as licence holders, the Commonwealth Environmental Water Holder, the MDBA or any other party. Proposals must be supported by appropriate evidence and analysis.
5. By 31 March each year, the Department must publish a summary of the annual review, including any findings of the review and recommendations.

Procedure 26 – Amendments to the manual

1. In consultation with key stakeholders, the Department of Planning, Industry and Environment – Water is responsible for amending the regulatory framework in order to give effect to any recommendations arising from the review. The Department will endeavour to complete amendments by 30 June each year, depending on their complexity.
2. The Department may make non-material amendments to this manual without consulting stakeholders.

Notes

- 1 WaterNSW may issue a report on the progressive outcomes of sharing at any time during an event.

Deviating from procedures outlined in this procedures manual

Intent

The Gwydir Unregulated WSP defines the water to be identified as AEW and protected from extraction. This manual outlines how the presence of AEW is determined and how access is adjusted based on this determination. To meet the objectives and principles of active management, it is critical that the AEW is appropriately quantified.

Since active management is a new process, a flexible application of its procedures may be required. This flexibility can help ensure that the objectives of active management are met and its principles are applied if unanticipated circumstances arise.

Preparing an outline of how deviations from the manual are managed will support transparency and improve the implementation of active management over time.

Any deviations from the manual are to be documented by WaterNSW and reported annually to the Department. This report will be considered by the Department during the annual evaluation and review of the implementation of active management.

The only circumstances that allow for deviations from the procedures are those in which current procedures are not feasible, or where they compromise the primary objective or principles of active management.

Under no circumstances is WaterNSW to deviate from the rules outlined in the Gwydir Unregulated WSP.

Procedure 27 – Documenting deviations from procedures

1. Under all circumstances, WaterNSW and the Department must implement active management in line with water sharing rules outlined in the Gwydir Unregulated WSP.
2. The application of the procedures outlined in this manual should be guided by the objectives and principles of the manual, as well as the intent of each procedure. Where uncertainty exists, WaterNSW and the Department will adopt a precautionary approach to minimise potentially detrimental impacts or any unintended benefits for licence holders.
3. WaterNSW must notify the Department in writing of any deviation within five working days of its occurrence.
4. WaterNSW must:
 - a) seek clarification from the Department when the manual is not explicit on procedures
 - b) document the deviation in the Annual River Operations Report that is submitted to the Department, including the reason for deviating from the procedures and outlining possible modifications to the manual that may be required, and
 - c) ensure that any deviations from procedures are guided by the objectives and principles outlined in this manual and the intent of the procedures.
5. In the Active Management Annual Evaluation and Review report, the Department must document and consider:
 - a) any deviation from the procedures outlined in this manual
 - b) any circumstances identified during the implementation of active management where the manual is not explicit on the procedures to be used, and if and how deviations from the manual can be addressed.

Part F – Consultation

Consultation is important to ensure active management evolves and improves in response to new information, insights and stakeholder feedback.

Table 6 outlines the minimum consultation requirements for the annual review of this manual.

Table 6: Minimum consultation requirements in implementing and evaluating active management

Who will be consulted	When will they be consulted	What will they be consulted on	How will they be consulted	Who is responsible for consulting
WaterNSW, NRAR, the NSW Department of Planning, Industry and Environment – Environment, Energy and Science, and the MDBA	When conducting each annual review	The appropriateness, effectiveness and efficiency of the manual in meeting the objectives and principles of the active management policy, and any proposed substantive changes to the manual arising from the annual review	The NSW Department of Planning, Industry and Environment – Water may establish an inter-agency working group or use an existing inter-agency forum for this purpose.	The Department of Planning, Industry and Environment – Water
Licensed water users, including environmental water holders and stakeholder representatives	When conducting each annual review	The appropriateness, effectiveness and efficiency of the manual in meeting the objectives and principles of the active management policy, and any proposed substantive changes to the manual arising from the annual review	The NSW Department of Planning, Industry and Environment – Water may establish a stakeholder consultative group, use an existing forum or use an alternative engagement approach for this purpose.	The NSW Department of Planning, Industry and Environment – Water
Licensed water users or their representative groups	Prior to submitting their report on active management operations	Implementation issues	WaterNSW will determine the most appropriate means of consulting, and may use existing forums for this purpose.	WaterNSW

Part G – Managing risk

The manner in which active management is implemented is important in managing the risk of:

- not protecting the AEW in a water source or management zone, and
- affecting access by licence holders to water above access thresholds arising from sources other than AEW.

Some of the risks are managed by limiting the water that can be protected from extraction.

Causes of residual risk

The principal residual risk arises from uncertainty in forecasting flows due to the inherent variability in natural river systems as well as limitations in measuring factors.

Uncertainty in forecasting flows can arise from uncertainty in estimating water use, river transmission losses and tributary inflows, errors in flow or use measurements, or flow routing effects.

The forecast of flows relies primarily on the forecasting of river transmission losses arising from seepage, evaporation and evapotranspiration. The losses associated with these processes cannot be measured.

Consequence of risk

If observed flow in a management zone is found to be higher than the forecast, because forecast losses are overestimated, less water than intended is made available for access.

Similarly, the reverse risk also exists, where observed flows are lower than the forecast, because forecast losses are underestimated. As a result, more water than intended is made available and the full volume of AEW is not protected.

Managing risk

A balance must be struck between managing the uncertainty and staying within the limits of operational feasibility and cost effectiveness. This balance will minimise the overestimation or underestimation of the AEW to be protected, as well as the potential effects on water available to unregulated river access licence holders.

While it is impossible to eliminate the mismatch between forecast and actual flows, we will minimise it through the following steps:

- taking into account the best information available on daily extraction volumes at each pump site, including metering
- making the forecast, and the adjusted access announcements that rely on that forecast, as close as possible to the period of access – this means announcements may only be made for single 24-hour periods; however, announcements may be made for longer periods where the forecast is more certain
- sharing river transmission losses proportionally, by assigning them to the AEW at the end of each management zone, based on the ratio of AEW at the start of the management zone compared to the total flows
- basing initial and ongoing loss estimates on assessments of the average losses for comparable historical events
- adjusting ongoing loss forecasts based on observed unaccounted differences, so that mismatches arising from uncertainty in loss forecasts don't compound as an event proceeds.
- adjusting access during a flow event to address cumulative mismatches between forecast and observed unaccounted differences on previous days
- increasing the frequency of announcements to allow for operational responses to be made, and
- ensuring active management continuously improves and is responsive to improved information, insights, infrastructure, tools or systems.

Part H – Compliance

The Natural Resources Access Regulator (NRAR) is the independent regulator and is, responsible for monitoring and enforcing compliance with the WM Act, and associated WSP rules.

The WSP rules and associated mandatory conditions set the active management operational framework. NRAR will apply its risk-based approach to active management compliance. Ensuring compliance from water users is key to the ongoing success of the environmental reforms.

Licence holders need to comply with their licence conditions. This includes complying with adjusted flow class announcements in the Upper Gingham Watercourse Management Zone, or announcements that prohibit take in the Upper Gingham Watercourse Management Zone, Lower Gingham Management Zone or the Mallowa Creek Management Zone when AEW is present.

NRAR runs a range of compliance, monitoring and auditing campaigns in the WSP area. Campaigns may be focused regionally, on particular industries or other targeted programs. The regulator relies on a wide range of data sources, such as metering records, logbooks, satellite and aerial imagery and conducting site inspections.

To determine if a licence holder was permitted to take water, and the maximum volume permitted to be taken under that licence in a specified period (if applicable), NRAR refers to data sets, including, but not limited to:

- adjusted flow class announcements in the Upper Gingham Watercourse Management Zone
- announcements prohibiting access was made in the Upper Gingham Watercourse Management Zone, Lower Gingham Management Zone or the Mallowa Creek Management Zone in order to protect AEW
- flow recorded at flow reference points.

Beyond compliance, monitoring and audits, NRAR responds to suspected breach reports with a range of enforcement actions and/or by investigating. A risk-based approach is applied to ensure proportionate enforcement action is taken in accordance with the [NRAR Regulatory Policy](#) and [NRAR Regulatory Framework](#).

Enforcement actions are published in the [NRAR Public Register](#). Reports on NRAR's compliance activities and outputs to date are also published on NRAR's website.

This approach ensures that NRAR delivers on its principal legislative objectives to:

- ensure effective, efficient, transparent and accountable compliance and enforcement measures for natural resources management legislation, and
- maintain public confidence in the enforcement of natural resources management legislation.

Appendix A – Terms and abbreviations

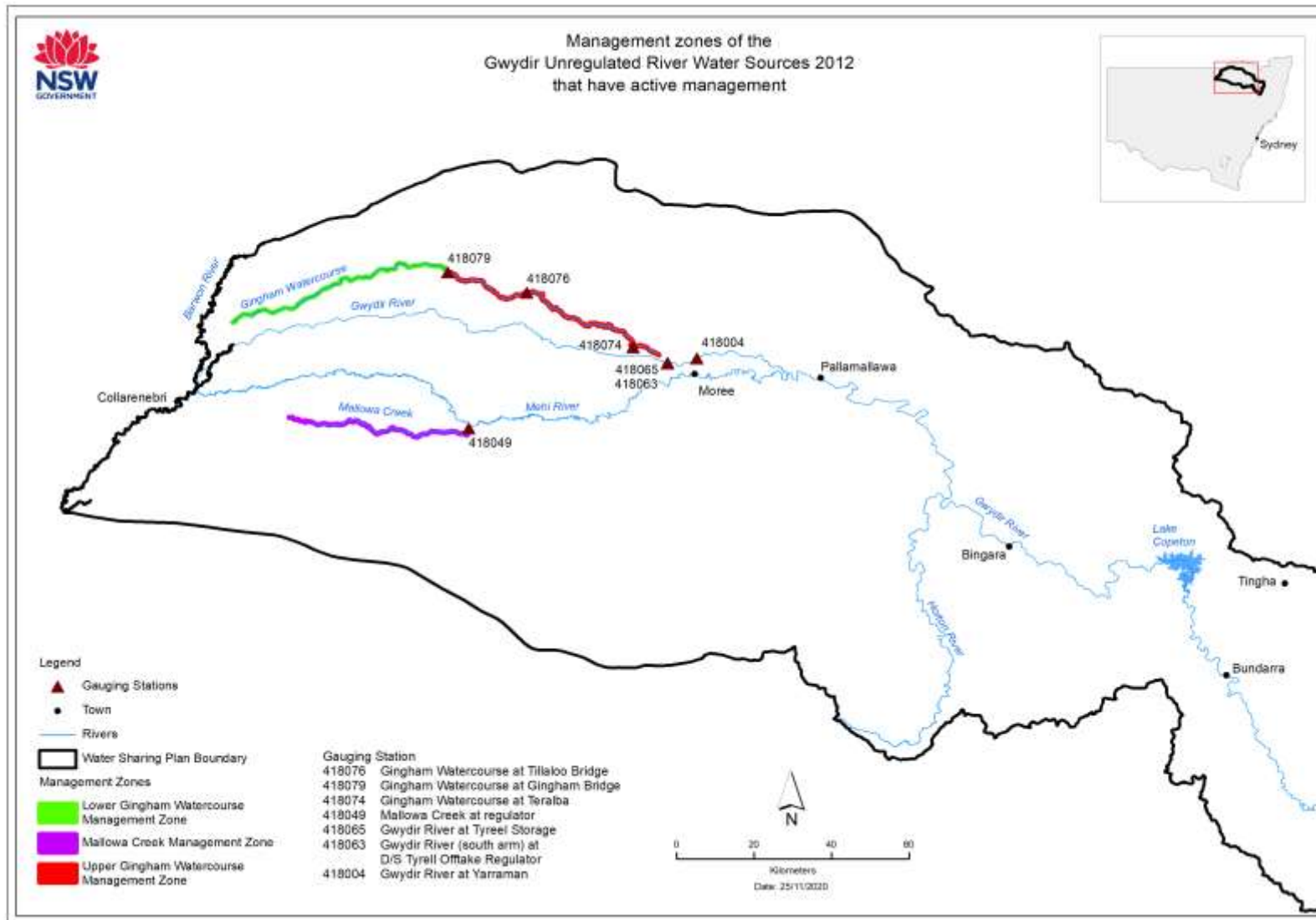
Table 7: Terms and abbreviations used throughout the manual

Term or abbreviation	Definition
AEW	<p>Active environmental water.</p> <p>AEW is water in the Gwydir Unregulated River Water Sources that, on any given day, the Minister identifies or determines as requiring protection from extraction. In accordance with the manual, this protection arises from the following:</p> <ol style="list-style-type: none"> HEW flowing from a water source upstream of the Upper Gingham Watercourse, Lower Gingham Watercourse or Mallowa Creek management zones, or a licence holder's notification to the Minister of that licence holder's intention to protect the water from extraction under clause 40 of this plan.
Gwydir Unregulated WSP	The <i>Water Sharing Plan for the Gwydir Unregulated River Water Sources 2012</i>
Basic landholder rights	Domestic and stock rights, harvestable rights or native title rights
CEWO	Commonwealth Environmental Water Office
Cease-to-pump rules	Any term or condition on a works approval, access licence or <i>Water Act 1912</i> entitlement that prohibits the taking of water in a particular circumstance
CtP condition	<p>Commence-to-pump/cease-to-pump threshold.</p> <p>The minimum flow rate at which a licence holder in an unregulated river or stream may commence to pump, or the flow rate below which the licence holder must cease to pump</p>
Day	The 24-hour period from 9am on any day to 8.59am the following day
The Department	NSW Department of Planning, Industry and Environment – Water
NSW Environmental Water Register	The register of HEW maintained by WaterNSW, and accessible at https://www.industry.nsw.gov.au/water/environmental-water-hub/public-register/environmental
Flow class	<p>The size of a flow level in an unregulated river.</p> <p>A flow class is determined using flow class thresholds at flow reference points defined in the Gwydir Unregulated WSP. Flow class thresholds can be adjusted to protect AEW.</p>
Flow class thresholds	The flow class thresholds defined in the Gwydir Unregulated WSP

Term or abbreviation	Definition
HEW	Held environmental water. HEW is water available under a WAL for the purposes of achieving environmental outcomes.
Management zone	An area within a water source in which particular rules, such as daily extraction limits and restrictions on dealings, apply Management zones are defined in the Gwydir Unregulated WSP.
MDBA	Murray-Darling Basin Authority
NRAR	Natural Resource Access Regulator
PEW	Planned environmental water. PEW is water committed for fundamental ecosystem health or other specified environmental purposes, either generally or at specified times or in specified circumstances, which cannot be taken or used for any other purpose. PEW is identified and managed through rules in water sharing plans established under the WM Act.
Regulated river	A river that is declared by the Minister, by order published in the Gazette, to be a regulated river
Regulated river supplementary WAL	A supplementary WAL (including a subcategory of such a licence) that entitles its holder to shares of water from a regulated river
River	A river is: a) any watercourse, whether perennial or intermittent, and whether comprising a natural channel or a natural channel artificially improved b) any tributary, branch or other watercourse into or from which a watercourse referred to in paragraph (a) flows, or c) anything declared by the regulations to be a river, whether or not it also forms part of a lake or estuary, but does not include anything declared by the regulations not to be a river.
Unregulated rivers	Any river not declared by the Minister, by order published in the Gazette, to be a regulated river
WAL	Water access licence
Water available	The volume of water available to unregulated river access licence holders on any given day
Works approval	Water Supply Works Approval

Term or abbreviation	Definition
Water source	<p>A water source is the whole or any part of:</p> <ul style="list-style-type: none">a) one or more rivers, lakes or estuaries, orb) one or more places where water occurs on or below the surface of the ground (including overland flow water flowing over or lying there for the time being). <p>This definition includes the coastal waters of the State.</p> <p>Each water source referred to in this manual is defined in the relevant water sharing plan.</p>
WM Act	<i>Water Management Act 2000</i>

Appendix B – Map showing Gwydir management zones

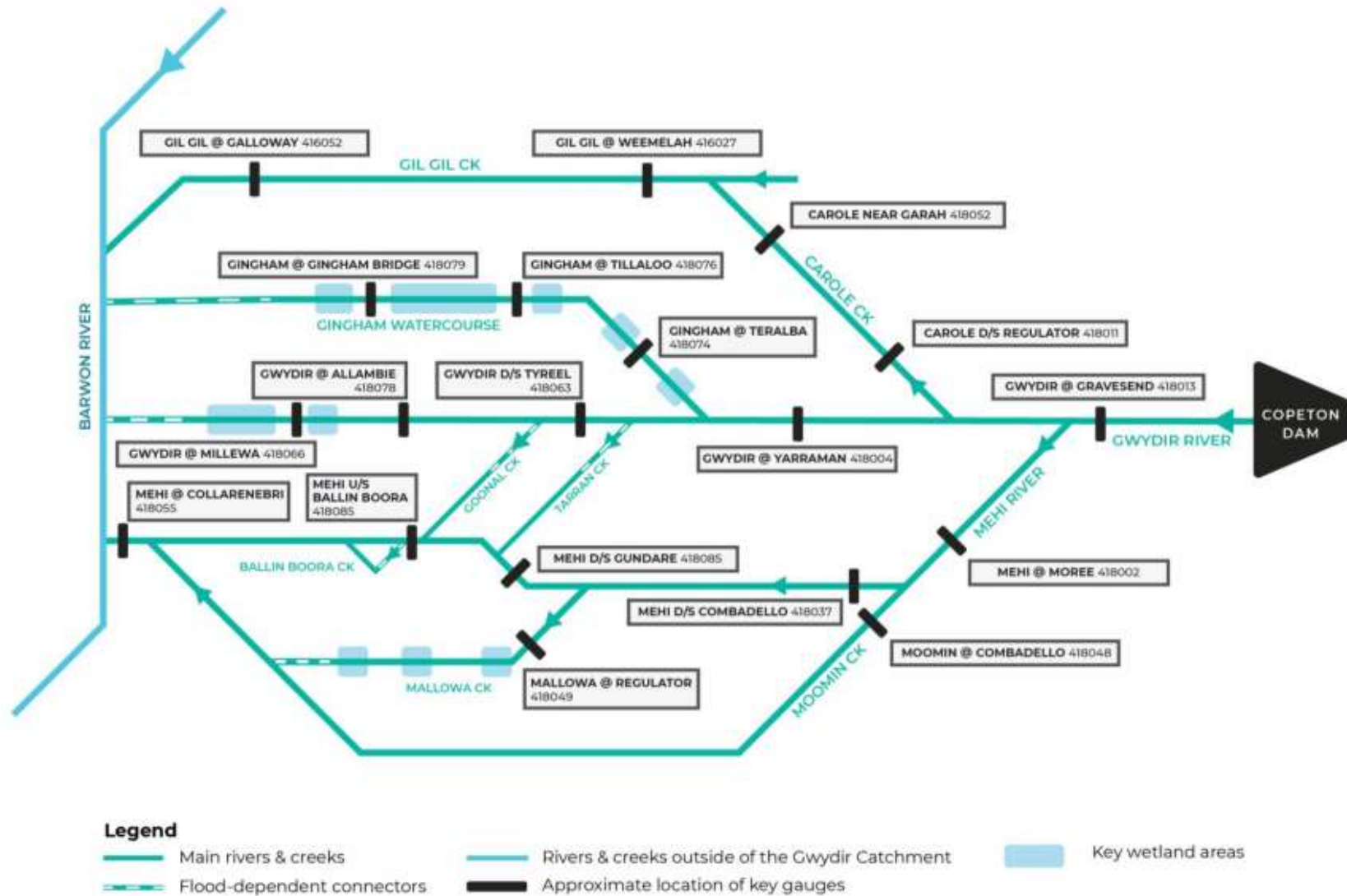


Appendix C – Number of licences and access conditions for the management zones in which active management applies

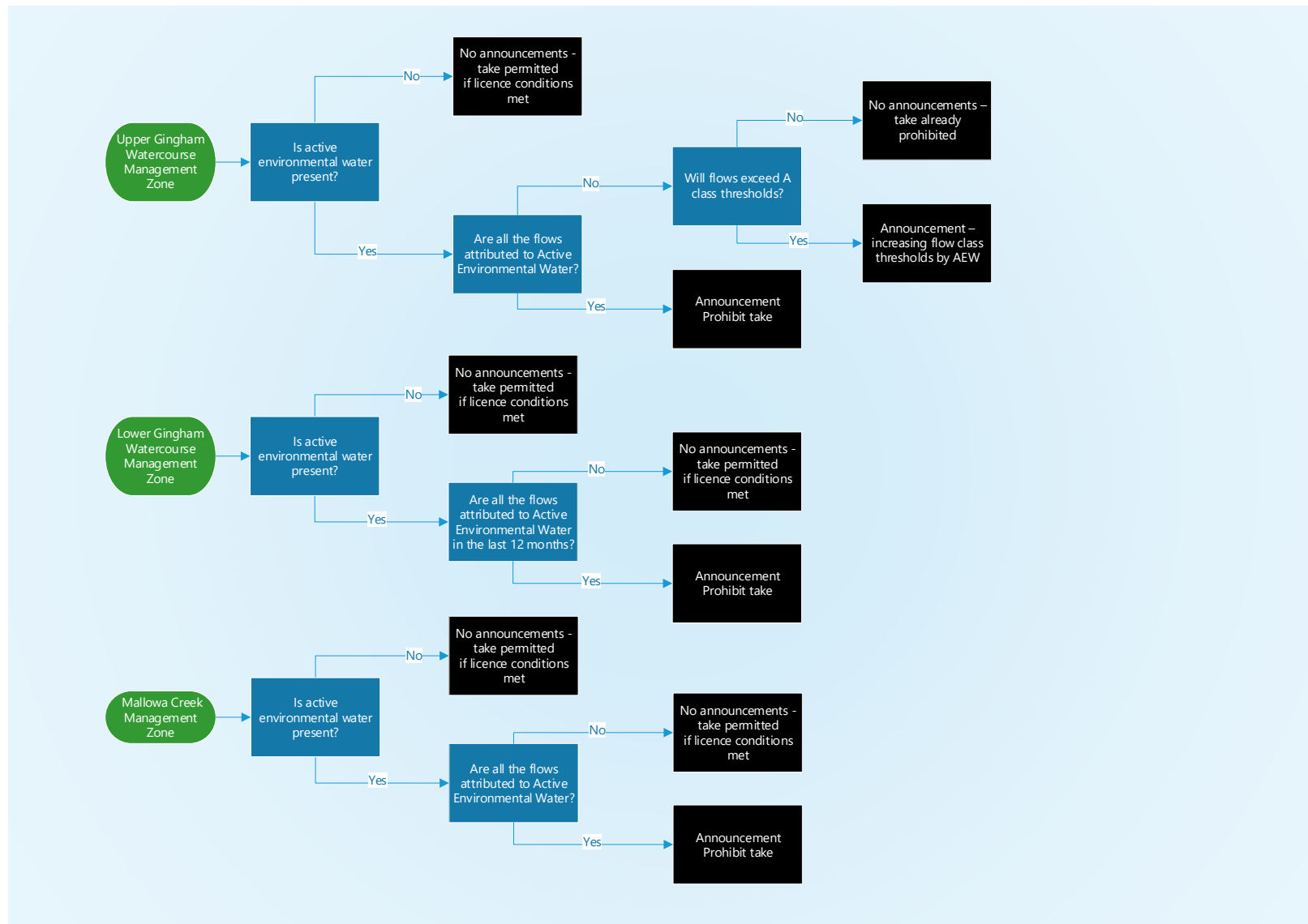
Table 8: licences and their conditions in the Upper Gingham Watercourse, Lower Gingham Watercourse and Mallowa Creek management zones at time of publication

Management Zone	Licence details	CtP thresholds
Upper Gingham Watercourse	Licence 1 – 648 shares Licence 2 – 5 shares (Domestic and Stock)	1. Below 250 ML/day at the Gingham Channel at Tillaloo Bridge gauge (418076)
Lower Gingham Watercourse	Licence 3 – 1612 shares	2. A flow of less than 175 ML/day at the Gingham Bridge gauge (418079) within the previous 12 months, or 3. Less than 4000 ML/year at the Gingham Bridge gauge (418079) over the previous 12 months, or 4. No visible flow in the Gingham Watercourse at Morialta Road
Mallowa Creek	Licence 4 - 7 shares Note – this licence is domestic and stock	1. When there is no visible flow in the water source at the location where water is to be taken, or 2. If water is taken from an in-river or off-river pool, when the volume of water in that pool is less than its full capacity

Appendix D – Schematic of Gwydir river management system



Appendix E – Flow diagram of active management announcement decisions



Appendix F – Annual active management reporting and review cycle

Table 9 Annual active management reporting and review cycle

Activity	Year implemented	Year for reporting, review and amendments				
	Implement active management	Report	Consult	Review	Consult	Prepare revised manual (if required)
Responsibilities						
NSW Department of Planning, Environment and Industry – Water						
WaterNSW						
NSW Department of Planning, Industry and Environment – Environment, Energy and Science						
NRAR						
Timing	Year 1	Year 2				
July						
August						
September						
October						
November						
December						
January						
February						
March						
April						
May						
June						

Appendix G – Hydrometric stations used for active management in the Gwydir Unregulated WSP

The gauges listed in Table 10 are required for active management in the Gwydir, for forecasting and determining AEW and determining access announcements.

Table 10: River flow gauges required for active management in the Gwydir

Gauge number	Gauge name
418076	Gingham Watercourse at Tillaloo Bridge
418079	Gingham Watercourse at Gingham Bridge
418074	Gingham Watercourse at Teralba
418049	Mallowa Creek at regulator
418065	Gwydir River at Tyreel Storage
418063	Gwydir River (south arm) at downstream Tyrell Offtake Regulator
418004	Gwydir River at Yarraman