

MAF2:2025 (DRAFT V0.6)

For feedback from Industry Partners

This final draft is NOT ENDORSED OR PUBLISHED.

It is shared for feedback from industry partners.

Send feedback to john.guilfoyle@dcceew.gov.au
by 28 November 2025.

OFFICIAL

Contents

About the Metrological Assurance Framework 2 (MAF2)	3
Objectives of MAF2	3
Authority for the MAF2 rules and guidelines	4
Timeline of water compliance agreements and reports.....	4
Application of water compliance agreements and reports	4
Approval authority for MAF2	5
Review of MAF2	5
Metering system requirements	6
Description	6
Rules - applies to the MDB	6
Table 1: Metering system thresholds for the MDB	6
Guidelines	7
Approved meters and metering systems	8
Description	8
Rule - The range of error for an approved metering system	9
Rules - applies to the MDB	9
Guidelines – for all Australian jurisdictions	9
Competency Requirements.....	11
Description	11
Rules - applies to all Australian jurisdictions.....	11
Table 2: Competency requirements.....	12
Installation and Commissioning	13
Description	13
Rules - applies to all Australian jurisdictions.....	13
Guidelines - for all Australian jurisdictions.....	13
Validation	15
Description	15
Rules - applies to all Australian jurisdictions.....	15
Guidelines - for all Australian jurisdictions.....	17
Maintenance.....	18
Description	18

Rules - applies to all Australian jurisdictions	18
Guidelines - for all Australian jurisdictions	18
Verification	19
Description	19
Rules - applies to all Australian jurisdictions	19
Guidelines - for all Australian jurisdictions	19
Replacing a metering system	21
Description	21
Rules - applies to all Australian jurisdictions	21
Guidelines - for all Australian jurisdictions	21
Telemetry requirements	22
Description	22
Rules - applies to the MDB	22
Table 3: Telemetry thresholds for the MDB	23
Regulatory audits of water users	24
Description	24
Rules - applies to all Australian jurisdictions	24
Jurisdictional reporting	25
Description	25
Rule - applies to the MDB	25
Rules – for all Australian jurisdictions	25
Guidelines – for all Australian jurisdictions	25
Glossary	26
Schedule A - Risk profiling for metering and telemetry	29
Schedule B – compendium of authoritative references	31
National Water Agreement (draft) (2025)	31
Murray–Darling Basin water market reform roadmap (2022)	31
MDB Compliance Compact (2018)	32
National Framework for non-urban water metering (2009)	33
National Water Initiative (2004)	33

About the Metrological Assurance Framework 2 (MAF2)

In Australia, state and territory governments regulate non-urban water taken from the environment. Metering systems and connected telemetry devices help governments make sure that water is taken lawfully and sustainably.

Intergovernmental agreements are in place and all Australian states and territories have metering policies to secure compliance by water entitlement holders.

MAF2 describes controls (rules) to be set by Australian states and territories to regulate non-urban metering systems. A set of guidelines is included within MAF2 to facilitate better compliance for metering systems where the rules do not apply. Australian states and territories have agreed to apply rules and consider guidelines to ensure that compliance is achieved using jurisdictional water policies and compliance actions.

NOTE 1: Rules take precedence over guidelines. If there is doubt whether to follow a rule or a guideline, then the rule applies.

NOTE 2: MAF2 uses the definitions and requirements set out in the Australian Standard – Metering systems for non-urban water supply (AS4747-2025).

NOTE 3: Except where the jurisdiction has nominated a water supply in an urban area as a supply where MAF2 applies, the MAF2 does not cover urban water supply, or water taken from floodplains.

NOTE 4: Reference in this document to metering systems refers to non-urban water supply as devices to measure, memorise and display the volume of water that has passed in a pipe or open channel.

Objectives of MAF2

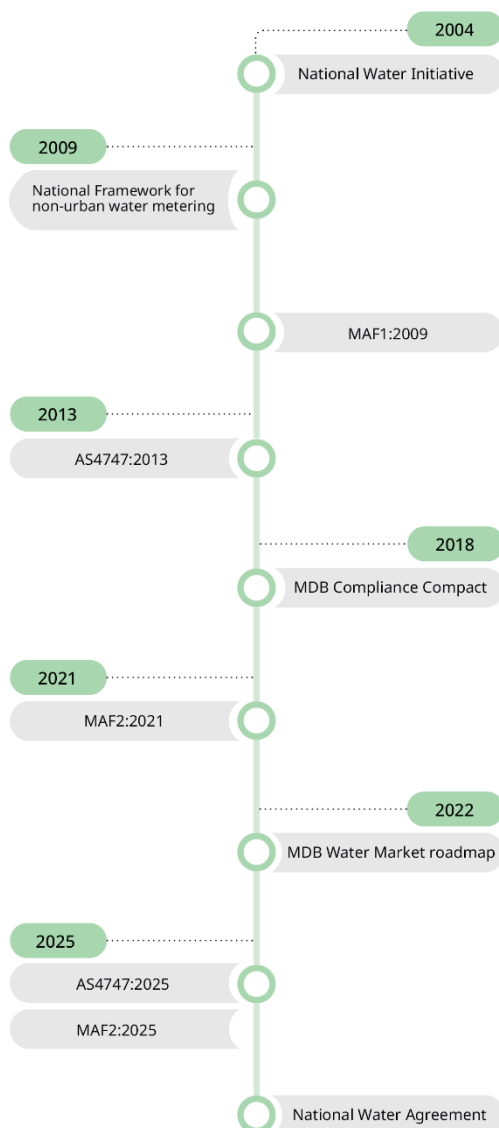
1. Jurisdictions understand their obligations for metering and telemetry regulation, and consistent policies and practices are used across the Murray-Darling Basin (MDB) and other parts of Australia.
2. Metering and telemetry requirements shall optimise coverage and be fit-for-purpose.
3. Metering systems shall be installed and maintained to be accurate and reliable.
4. Data is available as soon as practical after water is taken.
5. Metering and telemetry thresholds are practical and effective.
6. Regulatory effort is focussed to higher risk water users and higher risk water use.

Authority for the MAF2 rules and guidelines

The MAF2:2025 represents a collaborative effort by states and territories and the Australian Government to set the national framework for non-urban water resource compliance mechanisms. The MAF2 framework is expected to evolve as circumstances change.

Timeline of water compliance agreements and reports

The timeline illustrates the metering and telemetry policy reform milestones from 2004 until 2025.



Water compliance agreements and reports

National Water Agreement (NWA) (2025)¹

- Applies to all Australian jurisdictions.

Murray–Darling Basin water market reform roadmap (2022)

- Applies to MDB areas of New South Wales, Queensland, Victoria, South Australia and the Australian Capital Territory.

Murray–Darling Basin Compliance Compact (2018)

- Applies to MDB areas of New South Wales, Queensland, Victoria, South Australia and the Australian Capital Territory.

National framework for non-urban water metering (2009)

- Applies to all Australian jurisdictions.

National Water Initiative (2004)

- Applies to all Australian jurisdictions.

NOTE 1: See Schedule B for more detail about the agreements.

¹ Applies within a jurisdiction once signed by the relevant minister for that jurisdiction.

Approval authority for MAF2

The National Water Committee (NWC) represents all states and territories and the Commonwealth. The NWC or its successor is responsible for approving the MAF2.

Review of MAF2

The MAF2 will be due for revision after four years has elapsed since approval of this revision.

Metering system requirements

Description

The National Water Agreement (draft) (2025) principles set out the requirements for metering:

Outcome 7D – Water rights holders and the community have confidence in the integrity of water access rights and the amount of water being traded, extracted for consumptive use and managed for environmental and other public benefit outcomes.

Principles

7.23 – Metering and measurement of surface water and groundwater take is robust, fit for purpose, efficient, feasible to implement and undertaken on a consistent basis where:

- categories of entitlements or licences are identified in a water planning process as requiring metering
- water access rights are traded
- there are disputes about sharing of available water in an area
- new entitlements or licences are issued
- there is community demand.

Rules - applies to the MDB

1. Subject to the metering thresholds set out below, all take via water entitlements shall be metered with an approved metering system.
2. A jurisdiction shall publish its non-urban water metering policy including its metering thresholds.
3. Metering thresholds

MDB entitlement thresholds to install an approved metering system		
	From 1 January 2027	From 1 January 2028
Surface water take	≥ 100 megalitres	≥ 20 megalitres
Groundwater take	≥ 100 megalitres	≥ 20 megalitres

Table 1: Metering system thresholds for the MDB

4. A MDB jurisdiction may exempt itself from the metering thresholds set out above. The exemptions and reasons for non-conformance are to be published by the jurisdiction.

NOTE 1: A jurisdiction may set any criterion, such as high-risk water take for metering requirements below the thresholds.

NOTE 2: High-risk water take may include where there are high demands on the water, or where an entitlement holder trades water.

Guidelines

1. A jurisdiction that is not in the MDB should consider the relevant risks to establish its thresholds for metering.
2. A jurisdiction that is not in the MDB may use the threshold parameters set out in the Rules above to align with national compliance protocols.

Approved meters and metering systems

Description

A jurisdiction is responsible for setting and publishing its non-urban metering and telemetry policies. This includes which meters and metering systems are approved for taking non-urban surface and groundwater within jurisdictional boundaries.

- Approved meters and metering systems within the MDB are required to meet strict requirements.
- Outside of the MDB, jurisdictions have more discretion about which meters and metering systems are approved.

Conforming metering systems

- Metering systems conform to AS4747 when they are manufactured and tested to conform with National Measurement Institute (NMI) M10-1 and AS4747.2:2025 for closed conduit meters, or AS4747.3:2025 for open channel meters.
- Meters are pattern approved by the NMI when they conform with NMI M10 requirements for closed conduit meters, and NMI M11 requirements for open channel meters.
- Metering systems conform to AS4747 when they are installed and commissioned in accordance with AS4747.4:2025.
- Metering systems conform to AS4747 and MAF2 when they are validated by a person who is recognised by the jurisdiction to complete the validation in accordance with the jurisdiction's schedules and requirements for validation.

NOTE 1: The Australian Government Department of Climate Change, Energy, the Environment and Water publishes a list of pattern-approved non-urban meters.

Grandfathered metering systems

- A jurisdiction has discretion to determine when a grandfathered metering system is an approved system, including when:
 - It was installed before an AS4747 conforming meter was required; or
 - It was installed before an appropriate AS4747 conforming meter was available; or
 - It was installed to an interim standard and was deemed to be approved at the time of installation; or
 - It is a meter for a specific purpose and no AS4747 conforming meter is available for that purpose; and

- There is no increased risk by using the grandfathered metering system, compared to using a metering system which conforms to the requirements of AS4747.
- A jurisdiction may re-define a grandfathered metering system to a metering system which conforms with AS4747 where the meter is subsequently pattern-approved and validated as compliant with the relevant pattern approval certificate.

Rule - The range of error for an approved metering system

The maximum permissible error of any approved metering system shall not exceed $\pm 5\%$ while it is in service and under normal operating conditions.

Rules - applies to the MDB

1. All new and replacement meters shall conform with AS4747 and/or be pattern approved by the NMI.
2. Grandfathered metering systems can be approved, if the meter's accuracy is considered to be within the acceptable range of error ($\pm 5\%$).

NOTE 1: The relevant manufacturer's certificate and/or validation can provide an acceptable level of confidence that the meter operates within an acceptable range of error under normal operating conditions.

3. Jurisdictions shall periodically assess the risk of approving a grandfathered metering system. Risk should be assessed at the entitlement /licence scale and for the cumulative risk to the water source if any grandfathered metering systems are approved.
4. An approved meter or metering system shall be determined to operate within the range of error under normal operating conditions. If it does not, it is not an approved meter or metering system.
5. A jurisdiction shall set out and publish its timeline for the replacement of grandfathered metering systems with approved metering systems that conform to AS4747.

NOTE 2: An exemption made by a jurisdiction that supports non-compliance with any rule shall be justified, and that justification published by the jurisdiction.

Guidelines – for all Australian jurisdictions

1. A jurisdiction should set out and publish what it considers to be an approved metering system, and where metering will be required to be installed.
2. A jurisdiction should consider telemetry as a component of an approved metering system where higher risks exist or where licensed water is traded.

3. All new and replacement meters should conform to AS4747 and/or be pattern approved by the NMI.
4. Grandfathered metering systems can be approved, if the manufacturer's certificate and validation show that the meter's accuracy is within the acceptable range of error ($\pm 5\%$).
5. A jurisdiction should set out and publish its timeline for the replacement of grandfathered metering systems with metering systems that conform with AS4747.

NOTE 1: For the MDB, if a rule and a similar guideline about approved meters or metering systems can apply, then the rule prevails.

Competency Requirements

Description

A **Competent Person** is defined within AS4747 as a ‘person who has acquired, through education, training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the task required.’

A **Certified Person** is acknowledged by a jurisdiction as a person who has successfully completed relevant training from a Registered Training Organisation such as Irrigation Australia Limited (IAL), the Australian Hydrographers Association (AHA), or another relevant industry training entity.

An **Officer of the jurisdiction** is an employee of the jurisdiction, or its regulator, who is suitably qualified or experienced, as determined by the jurisdiction.

NOTE 1: A certified person acknowledged by a jurisdiction may also be known as a Duly Qualified Person (DQP) or a Certified meter Installer (CMI).

Rules - applies to all Australian jurisdictions

1. A jurisdiction will determine and publish its qualifications and skills requirement for a person to be a competent person, or a certified person, permitted to undertake a metering task listed at column A in table 2.
2. A jurisdiction shall not permit metering tasks to be undertaken by a person except those with at least the competency requirements set out in column B and Column C in table 2.

NOTE 1: There are different competency rule requirements for the MDB (column B), and for outside the MDB (Column C).

A. Metering task	B. Minimum competency requirement for the MDB	C. Minimum competency requirement (Outside of MDB)
• Install and commission a metering system • Install and commission a telemetry device	A competent person with the skills to undertake and complete installation and commissioning in compliance with the requirements of the jurisdiction.	
• Validation of a metering system ○ initial validation ○ revalidation • Volumetric measurement of a metering system, for validation	A certified person or An officer of the jurisdiction	A competent person or An officer of the jurisdiction
• Sealing a metering system with accountable tamper evident seals	A certified person or An officer of the jurisdiction	A competent person or An officer of the jurisdiction
• Maintenance of a metering system • Maintenance of a connected telemetry device	A competent person with the skills to undertake and complete maintenance in compliance with the requirements of the jurisdiction.	
• Verification of a metering system, in-situ	An appropriately qualified person representing a NATA accredited facility, using relevant specialist equipment or standards	
• Verification of a meter, off-site	A NATA accredited facility, with relevant specialist equipment or standards	
• Remove a metering system • Replace a metering system	A competent person with the skills to undertake and complete removal and/or replacement work in compliance with the requirements of the jurisdiction.	

Table 2: Competency requirements

NOTE 2: A jurisdiction may require that a certified person or an officer of the jurisdiction undertake manufacturer accreditation training. This ensures that brand specific requirements are considered by the person during installation or maintenance. It also provides an avenue for manufacturers to endorse Certified Persons for after-sales service and ensure that new techniques are rolled out quickly.

Installation and Commissioning

Description

A metering system shall be installed and commissioned so that, at installation, it functions as designed for normal operating conditions. This includes providing confidence of its ongoing accuracy of $\pm 5\%$.

- AS4747.4:2025 sets out the installation and commissioning requirements for non-urban metering systems.
- AS4747 defines 'commissioning' as the 'process to bring a metering system into working condition according to relevant documents so it is ready for service.'

Rules - applies to all Australian jurisdictions

1. A metering system which incorporates a meter which complies with AS4747.2:2025 or AS4747.3:2025 shall be installed and commissioned in line with the requirements set out in AS4747.4:2025.
2. A metering system which incorporates a meter that does not comply with AS4747.2:2025 or AS4747.3:2025 shall be installed and commissioned in line with the following manufacturer's documents:
 - a. Product certifications
 - b. Product installation instructions
 - c. Design requirements

NOTE 1: If there are inconsistencies in the requirements between documents, then the metering installation shall meet the most stringent requirements of each document.

3. Installation and commissioning processes undertaken by the competent person includes sealing the metering system.
4. Where a metering system is installed in the MDB and was not validated at installation by a certified person, then the jurisdiction shall require the metering system to be validated by a certified person, or an officer of the jurisdiction. This includes affixing accountable tamper-evident seals.

Guidelines - for all Australian jurisdictions

1. AS4747.4:2025 sets out the installation and commissioning requirements for non-urban metering systems which comply with AS4747, however a jurisdiction may require that all metering systems are installed and commissioned using the relevant sections of AS4747.4:2025.

2. After assessing risk, a jurisdiction may require telemetry to be fitted to the metering system at installation.

Validation

Description

Validation is defined within AS4747 as ‘a set of activities that includes inspecting the meter to check that it is installed in accordance with relevant Standards and maintained to an acceptable state of repair, which provides an acceptable level of confidence that the meter operates within an acceptable range of error under normal operating conditions.’

Rules - applies to all Australian jurisdictions

1. A jurisdiction will determine when validation is required.

NOTE 1: The recommended schedule for validation of a metering system is at installation and after every 10 years of service.

2. A jurisdiction’s non-urban water metering policy, or similar document, will prescribe the validation requirements for metering systems for initial validation and subsequent validation during service.
3. A jurisdiction may order that a metering system is verified, instead of being validated.
4. The minimum requirements for validation are that a metering system is checked to ensure that it has been installed and commissioned and continues to meet the following:

For metering systems that conform to AS4747 -

- Requirements of closed conduit metering systems: NMI M10-1 and AS 4747.2, or
- Requirements of open channel metering systems: NMI M11-1 and AS 4747.3.
- Requirements set out in AS4747.4 at Section 3 (Installation) and Section 4 (Commissioning).
- Conditions set out in the relevant Pattern Approval certificate.
- Manufacturers’ installation and maintenance requirements.
- Jurisdictional requirements.

For metering systems which do not conform to AS4747 –

- Requirements for all metering systems set out in AS4747.4 at Section 3 (Installation) and Section 4 (Commissioning).
- Manufacturers’ installation and maintenance requirements.
- Jurisdictional requirements.

NOTE 2: If there are inconsistencies in the requirements between these documents, then the most stringent requirement shall be met.

5. Where a metering system is physically inaccessible, the jurisdiction may allow the certified person or the officer of the jurisdiction to conduct the validation using documents produced and relied upon at the time of installation.
6. For open channel metering systems, additional validation work is required to calibrate weirs, height gauges, and inspect upstream and downstream infrastructure to minimise obstructions.

Accuracy

7. During a validation, the certified person or the officer of the jurisdiction (competent person is acceptable in areas outside of the MDB) shall make best efforts to establish whether the metering system maintains its accuracy to within $\pm 5\%$. Where the accuracy of the metering system is in doubt, the competent person is to report this to the jurisdiction.

Compromised metrology and tampering

8. Validation is required for any metering system where its metrology could have been compromised through any action, for example, certain types of maintenance or tampering. The validation shall be carried out as soon as possible after the action.

Tamper-evident seals

9. A jurisdiction may allow the breaking of a seal on a metering system without requiring a validation if it is satisfied that the metrology of the metering system is not affected, or not likely to be affected.
10. If the tamper-evident seals are destroyed during validation, new tamper-evident seals are to be affixed to the metering system and the numbers recorded on the validation documentation.
11. Tamper-evident seals shall be of a type approved by the jurisdiction for sealing a metering system.

Telemetry

12. Where a telemetry device is fitted to the metering system, the validation may include that the telemetry device is checked, that it is operating within normal manufacturer specified parameters, has adequate battery life, and that it meets the telemetry rules of the jurisdiction.

Validation reporting

13. The results of the validation of a metering system will be reported to the jurisdiction by the certified person (competent person is acceptable in areas outside of the MDB) or the officer of the jurisdiction who has conducted the validation.

Guidelines - for all Australian jurisdictions

Validation schedule

1. A jurisdiction is encouraged to develop and publish a regular program of validation checks for its regulated metering systems. Recommended better practice is -
 - a. Validation completed within three months after installation and commissioning of a metering system.
 - b. Validation completed once every 5 years for operational metering systems.

NOTE 1: The level of risk associated with a particular metering system, or a class of metering system, should be used by the jurisdiction in determining the regularity and scope of validation checks.

Volumetric measurement

2. In-situ volumetric measurement may be used as a process of validation to raise confidence in the metrological performance of the meter.
3. A competent person operating a volumetric measurement device should have appropriate training in the use of the device, and the analysis of measured results from using the device.

NOTE 2: Some volumetric measurement devices, such as clamp-on ultrasonic devices do not conform to AS4747. These devices are useful to the certified person as a guide to likely volumetric accuracy. They are not suitable for verification.

Maintenance

Description

Metering systems shall be maintained so that they continue to function as designed for normal operating conditions. This includes providing assurance of metrological accuracy within the acceptable range of error ($\pm 5\%$).

Rules - applies to all Australian jurisdictions

1. Maintenance requirements shall follow:

- a. the manufacturers' maintenance schedule,
- b. any conditions set out by the jurisdiction,
- c. the meter's pattern approval certificate, if one applies.

NOTE 1: the various components of a metering system may have differing maintenance requirements and schedules.

2. Corrective maintenance shall be undertaken as soon as practical after a fault has been discovered within the metering system.

NOTE 2: A jurisdiction shall determine the span of time required from when a fault is discovered to when the metering system fault must be corrected.

3. If the tamper evident seals on a metering system are broken as part of maintenance, then revalidation is required. This is the case unless the jurisdiction has provided an authority that the maintenance activity undertaken is not considered to impact the metrological performance of the meter.

4. If a metering system is dismantled and/or removed during maintenance, the metrological performance of the metering system is deemed to be affected. In this case, the metering system shall be re-installed, following the installation processes.

NOTE 3: A jurisdiction may order that a metering system is verified, instead of being validated.

Guidelines - for all Australian jurisdictions

1. A jurisdiction may develop and publish a management plan to ensure the correct and timely maintenance of the metering systems it regulates.
2. A jurisdiction may use the relative risk rating of a metering system, or class of metering systems, to determine the form and schedule of preventative maintenance required.
3. A jurisdiction may impose different maintenance requirements for grandfathered metering systems.

Verification

Description

Verification assessment processes establish the accuracy of a metering system or a meter.

Verification of volumetric accuracy uses strict tolerances and provides more reliable evidence of measurement accuracy compared with validation. The metering system or meter is tested to ensure that its accuracy does not exceed the maximum permissible error rate of $\pm 5.0\%$ across the flow rate range under the rated operating conditions.

NOTE 1: The verification requirement of $\pm 5.0\%$ is greater than the pre-service laboratory-based requirement of $\pm 2.5\%$ because there are environmental, installation and wear-based errors that are not present in new metering systems tested in controlled laboratory environments.

NOTE 2: Verification is defined in the *National Measurement Act 1960*, however there is an exemption from verified compliance for meters with a maximum continuous flow rate capacity of more than 16,000 litres per hour. The NMI does not undertake compliance verification for most non-urban water meters.

NOTE 3: Verification of volumetric accuracy provides evidence of the accuracy of a meter or metering system. It is time consuming and usually expensive. In comparison, volumetric measurement as part of validation is a cheaper way to assess accuracy, but the results are not as robust.

Rules - applies to all Australian jurisdictions

1. A jurisdiction can require verification of a metering system or meter for any reason.
2. Verification includes -
 - a. the accuracy of the meter is tested using a reference device, to ensure that its metrological accuracy remains within $\pm 5\%$ of the actual volume.
 - b. the reference device itself shall be calibrated by a NATA accredited facility and have a valid NATA endorsed calibration report.
 - c. the uncertainty calibration of the reference device is not greater than $\pm 1.67\%$.

Guidelines - for all Australian jurisdictions

1. Verification is not mandatory.
2. A jurisdiction may consider verification of a metering system or meter where any of the following occur:
 - a. the verification mark on a pattern approved meter has been removed or defaced.

- b. there is suspected tampering with the metering system.
- c. the tamper-evident seals have been damaged or removed by a person that is not authorised to damage or remove the seals.
- d. the metering system is modified or adjusted, and this may affect its metrological performance.
- e. the jurisdiction requires verification for any reason.

Replacing a metering system

Description

Metering systems are to be replaced when they no longer operate within the operating parameters and thresholds set by the jurisdiction (end of life).

Rules - applies to all Australian jurisdictions

1. A jurisdiction shall require a metering system to be replaced in the following circumstances:
 - a. It is not accurate to within the acceptable range of error of $\pm 5\%$.
 - b. It is not compliant with its conditions of use, including a relevant Pattern Approval Certificate.
 - c. It is no longer considered to be an approved meter.
 - d. It must be replaced to comply with a metering policy, schedule or any lawful requirement of the jurisdiction.
 - e. It cannot be made to conform to the requirements of 1a to 1d.

Guidelines - for all Australian jurisdictions

1. Notwithstanding the rules for meter replacement, a jurisdiction can determine when a metering system must be replaced. Factors to consider include:
 - a. the durability of the meter's technology.
 - b. whether the metering system can be connected to telemetry.
 - c. the water quality at the site.
 - d. the operational time and throughput of the meter.
 - e. wear and tear, including the supporting infrastructure and pipes before and after the meter body.
 - f. risks to water resources in the local region and elsewhere.
2. A jurisdiction may develop and publish a deemed end-of-life replacement schedule to ensure that its metering fleet is continually renewed. (eg: an approved metering system is replaced after 25 years from installation).

Telemetry requirements

Description

Telemetry devices connected to metering systems automatically collect and transmit data on water use in near real time. Each jurisdiction collects the data for compliance and water management purposes.

By using telemetry alongside accurate metering systems, water management decisions can be made with the benefit of up-to-date information. Telemetry supports robust monitoring and timely compliance of high-risk water take. Telemetry also supports confident trading on the water market.

MDB ministers have agreed to the following:

Murray–Darling Basin water market reform roadmap (2022)

Recommendation 20: The Commonwealth and Basin state governments should work together to develop rules and guidelines that support consistent and accurate metering and telemetry across the Murray–Darling Basin. This includes:

- Basin governments agreeing to the common principles and rules for telemetry across the Murray–Darling Basin. This will include thresholds for telemetry and the priority meters that will need to be telemetered. It will also include data and information requirements to support current water market needs.
- Each Basin state designing and publishing its approach to how telemetry will be used – including the meters that will need telemetry, and any exemptions that will apply.

NOTE 1: The roadmap was agreed in principle by Murray–Darling Basin Ministerial Council on 12 October 2022 and the implementation funding agreement was signed on 24 February 2023.

Rules - applies to the MDB

1. A jurisdiction shall develop and publish its telemetry implementation plan or put in place its telemetry policy by 31 December 2026.
2. A jurisdiction shall include surface water and groundwater in its telemetry implementation plan, or its telemetry policy.
3. A jurisdiction shall not require telemetry devices to be installed on metering systems which are not used to take water.

4. All new and replacement metering systems shall conform with the telemetry thresholds.

5. Determining risk

- a) A jurisdiction shall ensure that high-risk water take has a metering system with connected telemetry, and it has the power to determine what is high-risk water take.

However, the thresholds set out below are the minimum requirement.

NOTE 1: High-risk water take may include where there are high demands on the water, or where an entitlement holder trades water.

6. Telemetry thresholds

MDB entitlement thresholds to install telemetry		
	1 January 2027	1 January 2029
Surface water take	≥ 200 megalitres	≥ 100 megalitres
Groundwater take	≥ 500 megalitres	≥ 200 megalitres

Table 3: Telemetry thresholds for the MDB

7. An MDB jurisdiction may exempt itself from the telemetry thresholds set out above. The exemptions and reasons for non-conformance shall be published by the jurisdiction.

NOTE 2: Each jurisdiction will report annually to the MDB IGWC about its conformance with the telemetry thresholds.

Regulatory audits of water users

Description

A regulatory audit is a formal examination by a regulatory agency to ensure a water user complies with relevant laws, regulations, and industry standards.

When a jurisdiction conducts a regulatory audit for water taken from non-urban sources, the metering systems and telemetry used by the water user will be an indicator of compliance.

(draft) National Water Agreement Principle 5E

Effective compliance and enforcement regimes are in place with clear, open and transparent objectives.

Principle 5.11: Compliance and enforcement systems focus on proactive metering regulation and increasing awareness of obligations.

Rules - applies to all Australian jurisdictions

1. A jurisdiction shall develop and publish its non-urban water metering policy, to ensure that water users understand their obligations and can make informed choices about compliance with the policy.
2. A jurisdiction shall develop an effective compliance and enforcement strategy with clear, open and transparent objectives.
3. A jurisdiction shall develop a program to validate metering systems within its boundaries.
4. A jurisdiction's compliance strategy shall be commensurate with risks and values associated with a water resource.

Jurisdictional reporting

Description

All jurisdictions are required to make an annual report describing compliance with metering policies and agreements.

(draft) National Water Agreement principle 7D:

Principle 7.24: Public reports are released that cover metered water use and associated compliance and enforcement actions and the availability of water access entitlements or licences against the rules for availability and use.

Rule - applies to the MDB

1. MDB jurisdictions have committed to make an annual report to the MDB IGWC, about non-urban water meters in the jurisdiction, in the form required by the Inspector-General.

Rules – for all Australian jurisdictions

2. A jurisdiction shall collect data and make an annual report on its website about the compliance with its metering and telemetry policies and rules.
3. A jurisdiction shall collect and publish data to conform with NWA principle 7.24².

Guidelines – for all Australian jurisdictions

1. A jurisdiction should consider the following data sets to include within its annual metering and telemetry report:
 - a. Volume of surface water taken
 - b. Volume of groundwater taken
 - c. % of water take which is metered
 - d. Number of approved meters in use
 - e. Number of approved meters that do not conform with AS4747
 - f. % of approved meters with telemetry installed

² Once signed by the relevant jurisdiction.

Glossary

Acceptable range of error – in service (also known as maximum permissible error or MPE)	The accuracy of an approved metering system shall not exceed $\pm 5\%$ while it is in service.
Approved metering system	A metering system which is approved by a jurisdiction for taking non-urban surface and groundwater within jurisdictional boundaries.
AS4747	The Australian standard which mandates the design, capabilities, installation and commissioning requirements of meters used for non-urban water supply.
AS4747 conforming meter or metering system	Meters conform with AS4747 when they are manufactured and tested to conform with AS4747.2:2025 for closed conduit meters, or AS4747.3:2025 for open channel meters.
Certified Person Certified Meter Installer	Is acknowledged by a jurisdiction as a person who has successfully completed relevant training from a Registered Training Organisation such as Irrigation Australia Limited (IAL), the Australian Hydrographers Association (AHA), or another relevant industry training entity.
Commissioning	Process to check that a metering system is installed according to relevant documents and is ready for service.
Competent Person	A person who has acquired, through education, training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the task required.
Duly Qualified Person	Meaning a Certified Person.
End of life	A metering system which no longer operates within the operating parameters, and thresholds set by the jurisdiction
Entitlement	A licence to take water.
Grandfathered metering systems	Non-urban water meters which are not Pattern Approved but which have been approved by a jurisdiction to remain in-service, subject to conditions including ongoing metrological accuracy of not more than $\pm 5\%$ maximum permissible error limit in-field conditions.

In-situ volumetric measurement	Volumetric testing of the metering system in its normal operating conditions.
Installation and commissioning	Fitting and commissioning approved metering systems in accordance with the relevant NMI documents, Australian Standards or Technical Specifications and manufacturer's specifications.
Jurisdiction	An Australian state or territory.
Metering system Meter	A device (meter) or a group of associated devices that is intended to measure the quantity of water that passes a specified point. A metering system may include a telemetry device.
Metrology	The components of a metering system which are calibrated to measure the water flow.
Maintenance	Work carried out to maintain the metering system in accordance with the manufacturer's maintenance schedule and pattern approval conditions.
Murray–Darling Basin States (MDB)	Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia.
NATA	National Association of Testing Authorities (NATA) which provides assessment, accreditation and training services to laboratories and technical facilities.
National Measurement Institute NMI	The National Measurement Institute (NMI) is Australia's peak measurement body responsible for biological, chemical, legal and physical measurement.
Non-urban water	Non-urban water is taken for purposes like agriculture, industry, and stock and domestic use. Non-urban water includes water sourced from surface water and groundwater resources and is typically taken and used outside of urban or metropolitan areas. Non-urban water take is managed under regulations and licensing arrangements that differ from those for urban water.
Non-urban Water Meter	An instrument intended to measure, memorise and display the volume of water passing through the measurement transducer in non-urban conditions.

Officer of the jurisdiction	An employee of the jurisdiction, or its regulator, who is also a certified person.
Pattern Approved meter	A type of a measuring instrument that complies with the relevant statutory requirements.
Pattern Approval certificate	A certificate, published by the National Measurement Institute, which describes the design (including type and size) of the Pattern Approved meter. The certificate includes any conditions for the installation, maintenance and use of the meter.
Regulator	A relevant Australian jurisdiction's authority responsible for water management, including a government department, agency and/or a Water Service Provider.
Regulatory Audit	A formal examination by regulatory agencies to ensure an entity complies with relevant laws, regulations, and industry standards, identifying any non-compliance and recommending corrective actions.
Shall	Indicates a statement which is mandatory.
Should	Indicates a recommendation.
Tamper-evident seals	An accountable fastener which prevents access to a telemetry device, or the body of a meter, or to the calibrated parts within a meter. Tamper-evident seals are destroyed when access is attempted.
Telemetry device	A device which automatically collects and transmits data about the quantities of water measured by a connected metering system or monitoring device.
Validation Re-validation	A set of activities that includes inspecting the meter to check that it is installed in accordance with relevant Standards and maintained to an acceptable state of repair, which provides an acceptable level of confidence that the meter operates within an acceptable range of error under normal operating conditions.
Verification Re-verification	The process whereby a meter is inspected by an appropriately qualified person representing a NATA accredited facility, using relevant specialist equipment or standards to ensure that the meter conforms with its approved pattern, operates within the maximum permitted error (MPE) rates, and is stamped or certified as evidence of conformity.

Schedule A - Risk profiling for metering and telemetry

For guidance (not mandatory)

(draft) National Water Agreement – Principle 5.10

Metering, monitoring and compliance activities are commensurate with risks to, and values associated with, the resource and provide for water user accountability.

Jurisdictions can use this method to determine where metering systems and telemetry may be required. The method might also be useful in determining the types of meters and telemetry devices that the jurisdiction will approve to be installed. However, a jurisdiction may decide to develop its own risk assessment methods and tools to determine risk-based metering and telemetry needs.

Check list and process

- What water use are you assessing for metering and/or telemetry?
- What are the economic, and/or environmental, and/or social and/or cultural impacts of the water taken at this location (x-axis).
- What are the current controls and demand for the water (y-axis).

Risk assessment method	Economic consequences	Environmental consequences	Social & cultural consequences
Category 3 Highest levels of demand for water resources Controlled and mandated water resource management requirements Low level of compliance	Consider: - Sustaining agricultural yields. - Non-agricultural industries. - Water trading Consider basin wide & downstream impacts including:	Consider: - Connectivity between groundwater and surface water. - Overland flows. - Water trading. - Watering requirements for environmental water holders. - Environmentally significant sites. - Treaty protected areas such as RAMSAR sites.	Consider: - Critical human needs. - Sites of cultural significance. - Water access amenity for local and downstream communities. - Access by industry especially for the viability of a community. - Access to water for stock and wildlife.
Category 2 Moderate demand on water resources. Targeted water resource management requirements	The economies and industries that rely on the water.		

Category 1 Low demand on water resources. Limited water resource management needs High level of compliance	Any vulnerable towns and communities.	- Susceptibility to drought. - Climate change. - Base flows in low-flow periods.	Poor community confidence in water management
--	---	--	---

Determine priority

- d) After considering the impacts against the various consequences listed in the table above, determine whether the impacts are minor, moderate or major.
- e) Next consider the current demand for water and the controls in place to determine the category of water management already in place, or that should be in place.
- f) Use the Priority Assessment Matrix to determine the relative priority for mandating metering and telemetry.

Table: Risk priority matrix

Risk profile	Impact for economic, environmental, social, cultural or other consequences		
	Minor impact	Moderate impact	Major impact
Category 1 Lowest impact	Low priority	Low priority	Medium priority
Category 2 Moderate impact	Low priority	Medium priority	High priority
Category 3 High impact	Medium priority	High priority	High priority

Schedule B – compendium of authoritative references

National Water Agreement (draft) (2025)

APPLIES TO: All Australian jurisdictions (*once signed by the relevant jurisdiction*).

Outcome 5E – Effective compliance and enforcement regimes are in place with clear, open and transparent objectives.

Principles

5.10. Metering, monitoring and compliance activities are commensurate with risks to, and values associated with, the resource and provide for water user accountability.

5.11. Compliance and enforcement systems focus on proactive metering regulation and increasing awareness of obligations.

Outcome 7D – Water rights holders and the community have confidence in the integrity of water access rights and the amount of water being traded, extracted for consumptive use and managed for environmental and other public benefit outcomes.

Principles

7.23 – Metering and measurement of surface water and groundwater take is robust, fit for purpose, efficient, feasible to implement and undertaken on a consistent basis where:

- categories of entitlements or licences are identified in a water planning process as requiring metering
- water access rights are traded
- there are disputes about sharing of available water in an area
- new entitlements or licences are issued
- there is community demand.

7.24 – Public reports are released that cover metered water use and associated compliance and enforcement actions and the availability of water access entitlements or licences against the rules for availability and use.

7.25 – Water regulation for non-urban water conforms with Australian standards and agreed national approaches to non-urban water metering.

Murray–Darling Basin water market reform roadmap (2022)

APPLIES TO: MDB areas of New South Wales, Queensland, Victoria, South Australia and the Australian Capital Territory.

Recommendation 20: The Commonwealth and Basin state governments should work together to develop rules and guidelines that support consistent and accurate metering and telemetry across the Murray– Darling Basin. This includes:

- Basin governments agreeing to the common principles and rules for telemetry across the Murray–Darling Basin. This will include thresholds for telemetry and the priority meters that will need to be telemetered. It will also include data and information requirements to support current water market needs.
- Each Basin state designing and publishing its approach to how telemetry will be used – including the meters that will need telemetry, and any exemptions that will apply.

NOTE 1: Roadmap agreed in principle by Basin Ministerial Council on 12/10/22 and the implementation funding agreement signed on 24/2/23.

MDB Compliance Compact (2018)

APPLIES TO: MDB areas of New South Wales, Queensland, Victoria, South Australia and the Australian Capital Territory.

Meter accuracy

3.2 (i) All new and replacement meters must comply with AS4747 including pattern approval and verification, by no later than June 2025;

3.2 (ii) Commencing immediately, and until June 2025:

(a) All new and replacement meters to comply with AS4747 where available

(b) Where an AS4747 compliant meter is not available the use of an interim meter that has been verified with a manufacturer's certificate of accuracy to within $\pm 5\%$ is acceptable.

3.2 (v) Any exemptions to 3.2 (i) made by the state to be supported by a justification published on the relevant state agency website.

Meter coverage

3.3 (i) All take via water entitlements to be metered by June 2025;

3.3 (ii) Any exemptions to 3.3 (i) made by the state to be supported by a justification, such as a regulatory impact assessment, published on the relevant state agency website.

Transmission of data

3.4(i) A program to progressively automate the reporting of water take, regardless of how that is measured, no later than 2025.

3.4(ii) Any exemptions to 3.4 (i) made by the state to be supported by a justification, such as a regulatory impact assessment, published on the relevant state agency website.

National Framework for non-urban water metering (2009)

APPLIES TO: All Australian jurisdictions.

Jurisdictions will use best efforts to:

- develop and implement metering policies to conform to MAF2, and
- set and enforce practical implementation dates and thresholds for metering, and
- require all new and replacement meters to be Pattern Approved or conform to AS4747, and
- require that metering systems are regularly validated. This may include checks of the meter accuracy within $\pm 5\%$.

National Water Initiative (2004)

APPLIES TO: All Australian jurisdictions.

National Water Initiative (NWI) Section 87: Generally metering should be undertaken on a consistent basis in the following circumstances:

- (i) for categories of entitlements identified in a water planning process as requiring metering.
- (ii) where water access entitlements are traded.
- (iii) in an area where there are disputes over the sharing of available water.
- (iv) where new entitlements are issued; or
- (v) where there is a community demand.

NWI Section 88: Recognising that information available from metering needs to be practical, credible and reliable, develop and apply:

- (i) a national meter specification.
- (ii) national meter standards specifying the installation of meters in conjunction with the meter specification by providing for:
 - a practical, credible and reliable approach that provides national standards for meter construction, installation and maintenance
 - a Metrological Assurance Framework, and
 - implementation of the national standards through national measurement and water legislation.

NWI Section 89: Develop and apply national guidelines covering the application, scale, detail and frequency for open reporting addressing metered water use and associated compliance and enforcement actions.