Department of Planning and Environment

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Review of the non-urban metering framework

Issues and options paper

October 2023

Acknowledgement of Country

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

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Review of the non-urban metering framework

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Introduction

In 2018, the NSW Government introduced a new framework to measure and meter non-urban water take, to be rolled out in stages over several years. The framework is consistent with national non-urban metering rules and guidelines, agreed upon by all Australian states and territories in 2009.

This was a commitment under the government's Water Reform Action Plan (WRAP), released in December 2017 in response to the *Independent investigation into NSW water management and compliance* conducted by Ken Matthews AO (the Matthews report) and the Murray–Darling Basin Water Compliance Review (the MDB Compliance Review).

Non-urban water metering refers to the measurement of water taken from regulated rivers, unregulated rivers and groundwater systems under a water licence. It excludes water taken under a floodplain harvesting licence as this take is measured under the floodplain harvesting measurement framework.

The purpose of the non-urban metering framework is to improve the standard and coverage of non-urban meters in NSW. Under the rules, about 95% of licensed water take capacity in NSW must be fitted with accurate, auditable and tamper-evident meters.

While there is overwhelming support for non-urban metering, compliance rates are not where they should be. More than 90% of large water users with surface water pumps larger than 500 mm have accurate, tamper-proof meters in place. However, thousands of smaller water users have not.

There are valid reasons why metering obligations are not being met by some water users. Record-breaking floods, market barriers around access to certified meter installers and validators (duly qualified persons), supply chain issues created by the pandemic and prescriptive requirements, have created obstacles.

The NSW Government is committed to addressing the low compliance rates and looking at ways to make it quicker and easier for all water users to comply. While significant strides have been made, there is still more to do based on the evidence and lessons learned since the rollout began five years ago.

A return to dry conditions is predicted and we know that communities across NSW will continue to face more extreme climate challenges in the future.

It is critical that water take is measured consistently and accurately. We can't manage what we can't measure which is why the non-urban metering framework is vital to ensuring a sustainable future for all.

Purpose

The NSW Government remains committed to full implementation of the recommendations from the Matthews report, including the principle of 'no meter, no pump'. It is five years since the reforms were introduced and it is time to review and assess the progress that has been made so far.

The purpose of the review is to look at how to accelerate implementation of the reforms to achieve the policy objectives and identify practical changes to the rules to improve compliance.

This discussion paper provides an overview of what we understand to be the most significant barriers to implementing the rules and describes potential options to address the key issues. This is based on feedback received over several years of working with water users, metering suppliers and installers to implement the rules.

The review seeks to identify changes that will:

- help deliver the reform faster than the current trajectory
- create opportunities to reduce costs
- make the rules easier to understand, implement, comply with and enforce
- make the system work more efficiently.

Any adjustments to the regulatory settings should:

- apply a risk-based approach
- focus on outcomes, rather than prescribe procedural requirements that may create barriers to compliance
- offer water users more choice about how to comply, where possible, while maintaining integrity of the system
- take advantage of the Natural Resources Access Regulator's (NRAR) capabilities in remote intelligence gathering and risk-based proactive audit.

While the review is underway, there will be no change to the regulations and compliance expectations that are already in place.

NRAR will continue to take a fair and proportionate approach to enforcing the rules.

Any changes resulting from the review will be about making it easier for water users to have a meter. The NSW Government remains committed to the principle of no meter no pump. If a licence holder has faced challenges in complying by their deadline and can show evidence of their efforts to comply, NRAR will take that into consideration.

Your views

Your voice is important. This discussion paper provides an opportunity for everyone to have their say.

Your views will help shape practical changes to the non-urban metering rules so that we can improve and speed up compliance.

We want your feedback on the issues and options outlined in this discussion paper to address the obstacles to implementation.

Feedback on the proposals can be made online at water.nsw.gov.au/metering.

Next steps

After the public consultation period, we will consider and incorporate your views, ideas and concerns into the review recommendations.

We will then:

- publish a 'what we heard' report summarising your views
- provide a final report of the non-urban metering framework review to the Minister for Water.

The objectives

The NSW Government is committed to increasing meter coverage as quickly as possible to achieve the principle of 'no meter, no pump', as recommended by the Matthews report and the MDB Compliance Review.

However, the non-urban metering framework recognises that it is not practical for meters to cover 100% of water take, as this would come at a cost that may outweigh the benefits, especially for small water users.

The non-urban metering framework is guided by four objectives (Table 1), which describe the practical application of the 'no meter, no pump' principle. These are to ensure that:

- the vast majority of licensed water take is accurately metered
- meters are accurate, tamper-proof and auditable
- undue costs on smaller water users are minimised
- metering requirements are practical and can be implemented effectively.

This section provides a more detailed description of what each of these objectives means in practice, to guide this review.

Table 1. Non-urban metering objectives explained

Non-urban metering objective	What does this objective mean?
The vast majority of licensed water take is accurately metered	The framework aims to achieve the principle of 'no meter, no pump' by requiring accurate metering covering 95% of infrastructure capacity to take licensed water across NSW. The objective also specifically refers to *licensed* water take, which excludes metering for works solely taking water under basic landholder rights. This aligns with the objectives of the National Water Initiative.
Meters are accurate, tamper proof and auditable	This objective informs the meter standards required under the rules. Meters must be: • accurate – where possible, achieving +/-5 % accuracy in the field at the time of validation • tamper evident – installed in a manner that prevents the metrological performance and/or overall operation of the meter from being interfered with • auditable – the meter and data outputs can be inspected and examined to ensure compliance.

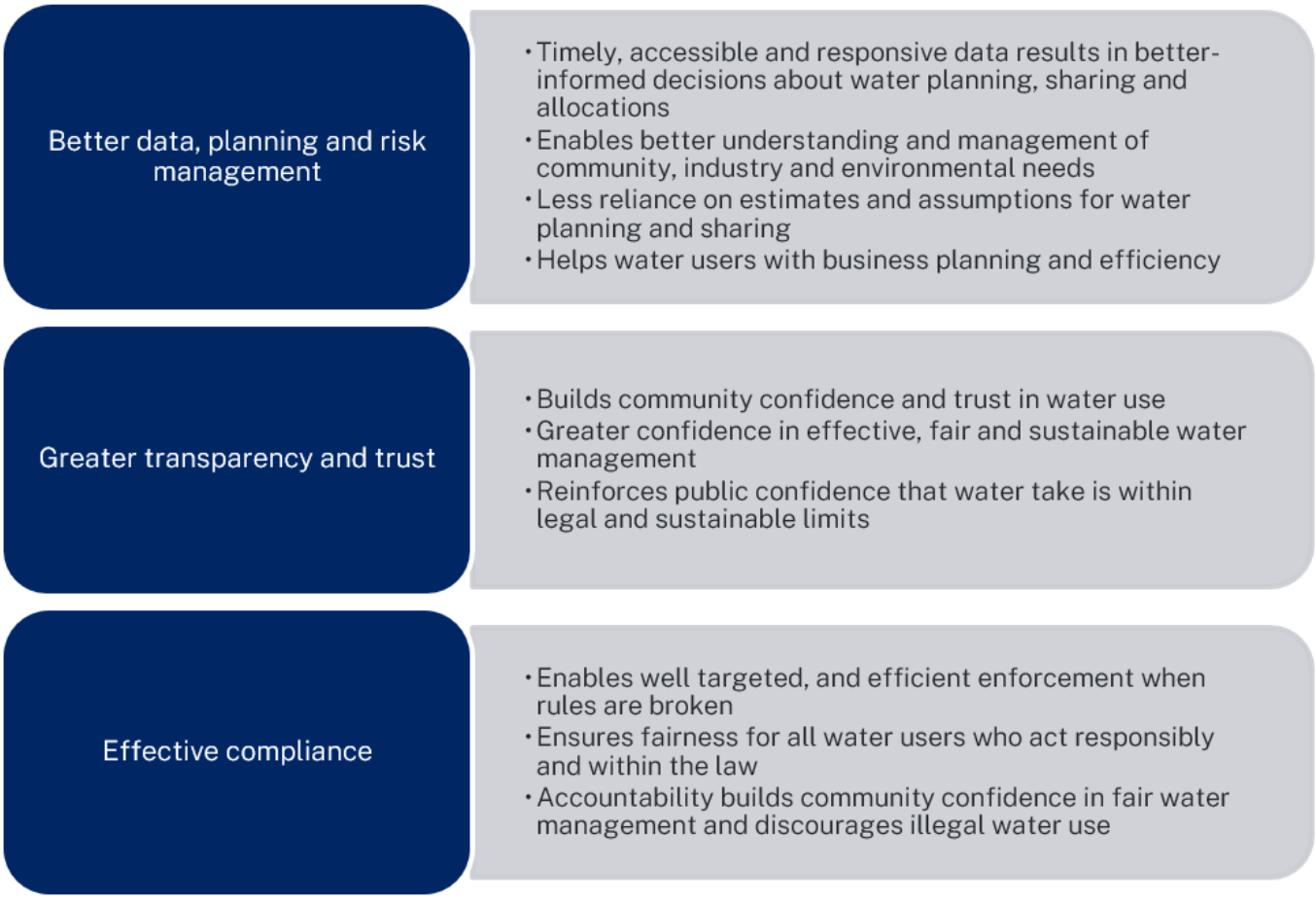
Non-urban metering objective	What does this objective mean?
	This aligns with NSW's commitments to national rules and guidance for non-urban metering (Metrological Assurance Framework 2).
Undue costs on smaller water users are minimised	This objective reflects the intention that metering requirements and associated costs should be proportionate to the risk to the water source and that costs should not significantly outweigh the benefits of metering. It also reflects the principle that the 'impactor pays'. This aligns with the *Best Practice Guidelines for minimum metering thresholds* which state: "Basin governments should take a risk-based approach that maximises the measurement of water taken, particularly for high-risk users, and avoids imposing undue costs, particularly for low-risk users. Risks that are relevant to setting the metering thresholds include risks to meeting the environmental, social, economic or cultural requirements for the water, in the local area and across the Basin."
Metering requirements are practical and can be implemented effectively	This objective means that the rules should be: • practical – a meter should only be required on works which take water from a water source and where the take can be measured with a meter • simple – the rules should be easily understood by everyone and therefore enforceable • consistent – the rules should be enduring and not need frequent revisions to operate effectively • standard – the rules should be applied uniformly as much as possible, rather than through bespoke arrangements • flexible – the rules should be focused on outcomes with appropriate flexibility and scope for discretion by the Regulator.

Benefits of metering

Accurate and timely water use data supports a range of critical functions from sustainable resource management to regulatory compliance and policy development, as explained in Figure 1.

This includes river model calibration, setting and managing extractions to water sharing plan limits, and water allocations to ensure responsible and equitable use of water resources.

Figure 1. Summary of the multiple benefits of effective water metering



Key elements of the non-urban metering framework

The purpose of the non-urban metering framework is to enable effective water resource management by improving the standard and coverage of non-urban water meters in NSW.

The framework includes:

- The *Water Management Act 2000:* the Act gives legal effect to the metering framework and imposes a condition on all water supply work approvals requiring metering equipment to be installed, used and properly maintained in connection with the work.[1]
- The Water Management (General) Regulation 2018: the Regulation sets out the requirements that must be complied with[2] by all holders of approvals and licences[3] who are subject to the metering condition. It also defines exemptions from metering requirements.[4] The Regulation defines requirements for duly qualified persons (DQPs) to install, maintain and validate metering equipment,[5] telemetry, record keeping and reporting rules,[6] and a process for faulty meters.[7]
- The NSW Non-Urban Water Metering Policy: the Policy explains the requirements and how they apply.

[1] *Water Management Act 2000*, section 101A.

[2] *Water Management (General) Regulation 2018*, clause 235, 238,

[3] Clause 229 of the *Water Management (General) Regulation 2018* applies the metering condition to licence holders in certain circumstances, such as when an approval exemption applies.

[4] *Water Management (General) Regulation 2018*, clause 230-233.

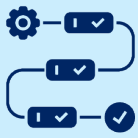
[5] *Water Management (General) Regulation 2018*, clause 236-237.

[6] *Water Management (General) Regulation 2018*, clause 244, 244A, 250.

[7] *Water Management (General) Regulation 2018*, clause 241-243.

Figure 2. Summary of the key components of the non-urban metering framework

Summary of the key components of the non-urban metering framework

Rules and Pathways		Staged rollout of metering rules is based on risk and geographic location. **Compliance pathways:** • no meter needed (exempt/inactive) • use existing meter* • new meter needed. **If installed before 1 April 2019 and subject to evidence of accuracy*
Technology		Open market approach to developing metering equipment (meters and LIDs). **Requirements to install:** • pattern-approved meters (in compliance with AS4747) • approved local intelligence devices (LIDs) • telemetry connection (surface water pumps ≥ 200 mm, voluntary) • tamper-evident seals.
Installation, validation and maintenance		**Open market approach** Work approval holder engages a DQP to install, validate and maintain meters and LIDs.
Certification		DQPs complete and upload forms and certificates to the DQP Portal on behalf of the work approval holder to demonstrate compliance. **Notification of:** • intent to install • meter validation • LID installation.
Ongoing reporting		Water take and other information is recorded and reported. • Water take additionally determined by WaterNSW meter read (annual) or • meters with telemetry automatically transmit data to the government's data acquisition service (DAS).

Progress in implementing the non-urban metering reforms

Implementation of the non-urban metering reforms is slower than anticipated (Table 2).

The first stage covering large surface water pumps (Tranche 1) has a 70% compliance rate for active works. While around 90% of surface water pumps greater than 500 mm have accurate meters installed, many of the remaining works not in compliance do not yet have telemetry installed.

The second stage of implementation covering northern inland water users and five large groundwater water sharing plans has only a 25% compliance rate for active works capable of taking water, 21 months after the deadline.

On the current trajectory, it is estimated that it could take another 10 years to achieve full compliance with the metering reforms.

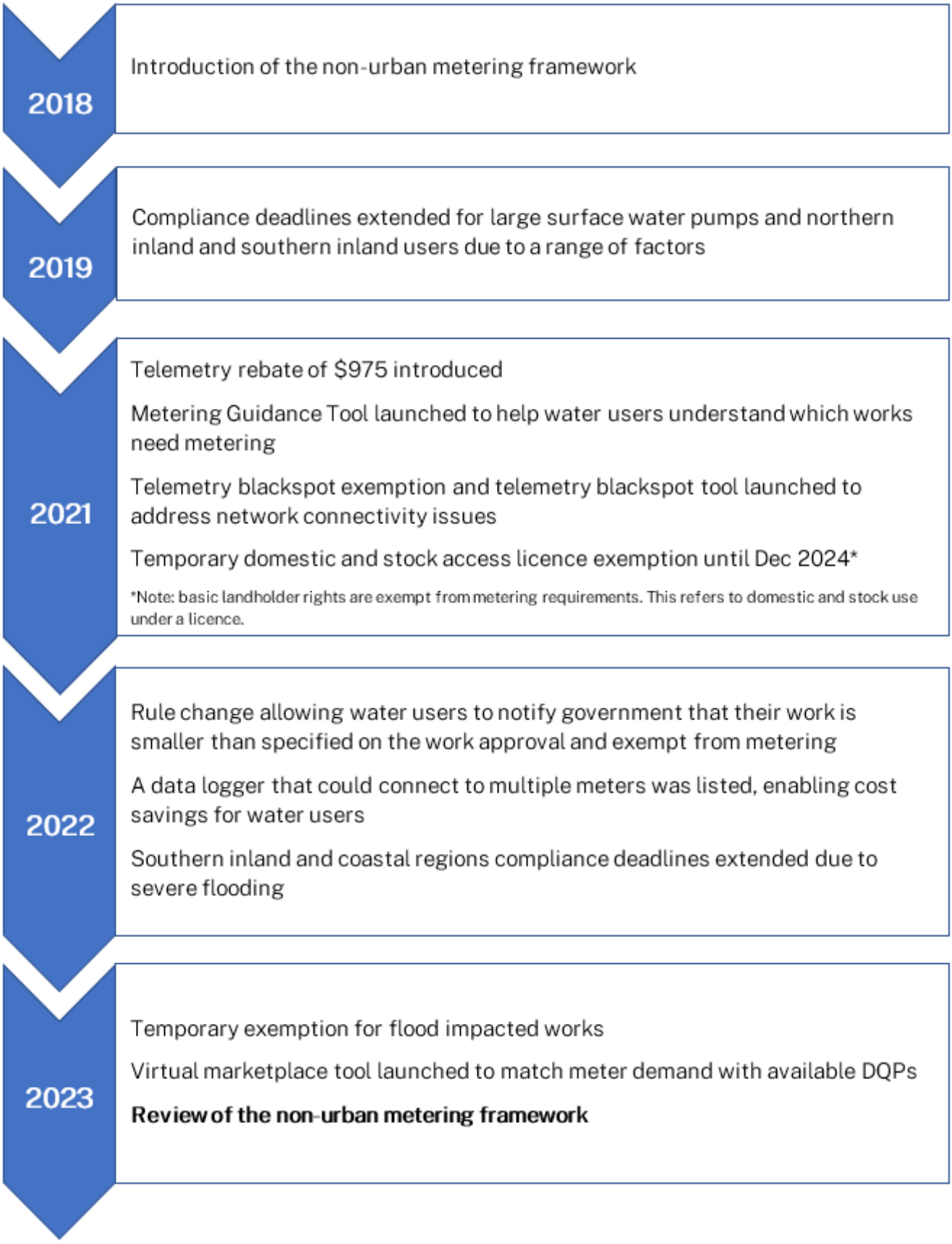
Table 2. Summary of the stages of metering implementation and current data on compliance rates across NSW

Stage	Water users	Original compliance date	Extension (from original date)	Current compliance date	Compliance rate
1	Surface water pumps >500 mm	1 December 2019	12 months	1 December 2020	>70% (data from fieldwork)
3	Northern Inland	1 December 2020	12 months	1 December 2021	25%
3	Southern Inland	1 December 2021	18 months	1 June 2023	38%
4	Coastal	1 December 2022	24 months	1 December 2024	N/A, compliance date not yet reached

Note: This table presents compliance rates for works assumed to be active. The compliance rates exclude works that data systems indicate are likely to be unable to take water and therefore are not intended to be metered under the framework.

The government has introduced initiatives to support the reform rollout and encourage compliance over the last five years (Figure 3). This has included making changes to the metering rules to address issues that have arisen and providing incentives and support to encourage compliance, such as the telemetry rebate.

Figure 3. Timeline of key changes and initiatives



Implementation challenges

What we have heard about barriers to implementation

Not enough active duly qualified persons to meet water users' demand

Water users are experiencing significant challenges in contracting a duly qualified person (DQP) to install and validate meters and local intelligence devices (LIDs) by the relevant compliance deadline.

Disruption due to the COVID-19 pandemic and flooding

The global pandemic resulted in disruption to supply chains which had significant impacts on the supply of metering equipment, resulting in long lead times, and inability to access DQPs due to lockdowns and restricted contact. The backlog generated during this time was substantial.

Severe flooding across NSW also impacted heavily on the metering rollout. Meters were destroyed and damaged and sites couldn't be accessed for equipment installation, maintenance or validation. While the government extended rollout dates, implementation continues to be affected.

Some water users report that it is not financially viable to become compliant

The costs involved are of particular concern to small or infrequent water users. In particular, the costs associated with pattern-approved meters (compliant with AS4747) and additional data logger and telemetry requirements.

Many works that do not take water are shown to require metering

Government data systems cannot identify works on a water supply work approval that do not require metering. These may include unconstructed works, derelict works or reticulation works that do not take water from the water source.

Rules are not always practical or easily understood and communication of the reforms has led to confusion

Water users have expressed concern it is not always clear which water agency they should be talking to; WaterNSW, the Natural Resources Access Regulator or the Department of Planning and Environment (the department). Some water users felt the advice was sometimes inconsistent between the different agencies which led to further confusion about the rules. Concern has also been raised about the way the rules are written; they are not always practical nor easily understood.

Metering requirements for small water users are inconsistent and create confusion

Some small water users have raised concerns they are unable to access the work-size metering exemption because it does not apply if previous water sharing plan conditions required universal metering.

Compliance timeframes are not achievable resulting in stress for water users

Water users have expressed concern that compliance deadlines are unrealistic and unachievable due to external impacts outside of their control such as flooding, supply chain disruptions and difficulties accessing DQPs. Water users say they are anxious they are not compliant because of these issues.

Existing third-party telemetry systems cannot be used to comply with requirements

Water users have expressed concerns they must install equipment, specifically, telemetry-enabled data loggers, that meet the needs of government when they already have functional telemetry systems that are not accepted because of data and cyber security requirements.

Exemptions may result in unacceptable metering data gaps and a perception that many water users are not compliant

There are some concerns that existing metering exemptions will result in data gaps that will compromise the effective management of water resources and detection of non-compliance with the water sharing plan rules.

Measuring overland flow take isn't always practical using non-urban metering equipment

Unregulated river licence holders have expressed concerns that measuring their overland flow take — akin to how floodplain harvesting take occurs — is not practical and is cost prohibitive under the non-urban metering rules.

Meters are generally installed correctly but data loggers and telemetry are more challenging

More challenges are being encountered with the installation of data loggers and telemetry, due to system limitations, challenges with implementing emerging technologies and equipment failure in the field.

Water users are not reporting meter readings preventing effective water resource management

Lack of self-reported meter data can lead to potentially lower available water determinations being made because full usage is assumed when data is unavailable or inaccurate.

Issues with data systems

DQPs report that they are not able to rectify errors quickly and efficiently and there is a high administrative burden involved with recording meter installations and validations. Water users say they see little benefit to them in telemetered data as the systems are challenging to navigate and they are not able to easily access their meter data.

Floodplain harvesting measurement

The NSW Floodplain Harvesting Policy 2018 and associated Floodplain Harvesting Measurement Policy 2020 are also being implemented in NSW.

These two policies together manage and measure floodplain water extractions more effectively to protect the environment and the reliability of water supply for downstream water users, ensure compliance with the requirements of the *Water Management Act 2000* and meet the objectives of the National Water Initiative.

While this review of the non-urban metering framework does not address matters specific to floodplain harvesting measurement, the rollout of floodplain harvesting measurement is facing similar implementation challenges. There may be lessons from this review that could be applied in the floodplain harvesting measurement context in the future.

Government-owned meters

Government-owned meters were installed ahead of the rollout of the metering framework through a number of pilot programs running from 2010-2012. There are 2,822 government-owned meters, mainly in the southern Basin and Hawkesbury-Nepean region. These meters are used by private water users but are owned and maintained by WaterNSW. The maintenance costs for the meters are included in the water users' fees set by the Independent Pricing and Regulatory Tribunal (IPART).

In the southern Basin, the government-owned meter fleet is either fully compliant or on the pathway to compliance with the metering rules, or the customers have opted out of the fleet.

Previous consultation processes have indicated a strong preference for these meters to remain in government ownership, despite the broader policy requiring private ownership and maintenance of meters across the state.

This issue is not directly relevant to this review of the Regulation. However, as these meters approach end of life, discussions need to start about ongoing costs of replacement and maintenance of this meter fleet as part of the 2025-2030 IPART price determination.

Addressing the barriers to implementation

The following section outlines the key issues that are creating barriers to the metering reform and a range of options being considered to respond. The options presented are consistent with the objectives of the metering framework and government commitments.

Underpinning the possible responses is an intention to better match metering obligations to the risk that the water use poses to a water source while maintaining the policy outcome of accurately metering the vast majority of licensed water take. This is expected to ease bottlenecks and address known barriers to implementation while accelerating uptake.

Importantly, the issues and options presented here are the starting point for a discussion with water users and the broader community. The options have not yet been scoped and fully costed.

Your feedback will inform where to focus more detailed analysis to improve the rules and how they are implemented.

Ensuring that metering requirements only apply to works taking water

What is the problem?

Many works are unintentionally identified as requiring metering

The metering conditions apply to all works on a water supply work approval,[8] except those works which are exempt under the Regulation including works used solely for basic landholder rights or those not nominated by an access licence.

The intention of the metering framework is that only works taking licensed water from a water source are required to be metered. However, water users' statements of approval and the government databases currently do not distinguish between works taking licensed water from a water source and those works used for other purposes. This means that there are 'unintended works' — that is, works that do not take licensed water — that appear to require a meter. Unintended works include works that don't take water from the water source, unconstructed works, derelict works, or works used solely for basic landholder rights.

Desktop analysis indicates that approximately 32% of all work approvals only authorise one work (pump or bore) and in these cases, it is possible to assume the pump or bore needs to be metered unless it is used solely to take water under basic landholder rights. The remaining 68% of work

[8] *Water Management Act 2000*, section 101A.

approvals authorise two or more works per work approval, making it difficult to determine which of those works take licensed water and are intended to require metering.

This is leading to water user confusion, less efficient compliance activities and more difficulties detecting potential illegal take.

The primary mechanism currently available to identify a work as not taking any water is to make these works 'inactive' which requires water users pay a fee of $603.50. Water users report this process is not fit for purpose and is prohibitively expensive, particularly since they must pay that same fee again to make the work active if it is used in the future. There is also distrust from water users that government may make the inactive status of a work permanent.

Possible responses

The regulatory framework and government data systems need to clearly identify those works on work approvals that take licensed water from the water source and require meters. This would:

- reduce water user confusion about which of their works require a meter
- allow government to provide a more accurate picture of meter coverage and compliance rates
- enable more efficient and targeted compliance action.

Initial analysis has shown that correctly identifying the works intended to be exempt could reduce the number of works assumed to require meters from just over 30,000 to around 13,600 (approximately 55% reduction).

It needs to be easier for water users to identify for government whether works are used to take licensed water from a water source or not. This could be done by:

- requiring water users to identify those works that *do* take licensed water from a water source, and deeming those not notified as not taking licensed water and not subject to metering requirements, or
- water users could identify those works that *do not* take licensed water, or which only take water under a basic landholder right, and all other works would be assumed to take licensed water from a water source and be subject to the metering requirements.

Government would then amend the work approval to reflect how the works are used. This would be supported by a process to confirm the validity of the nominated works. Penalties for failing to provide the advice or for incorrectly providing advice relating to a work that requires metering would apply.

Focus question:

- What would make it easier for water users to give government this information?

Reviewing metering requirements to target risk more effectively

What is the problem?

The current rules may not meet the policy objective of minimising undue costs on smaller water users.

All water supply works require a meter unless an exemption applies. There is currently a work size-based exemption, which links the requirement to have a meter to the risks of the individual work and the physical ability to take water (regardless of access licence shares or volume of take). This approach was preferred and supported with stakeholder feedback when the framework was established because:

- compliance can be assessed against a static characteristic (pump or bore size), as opposed to volume-based thresholds which are more variable due to trading
- it linked the requirements to risk, based on physical ability to take water via the work, and captured the majority (95%) of water take capacity by setting the thresholds at 100 mm and 200 mm for surface water pumps and groundwater bores respectively
- it represented the point at which cost benefit analysis showed the metering requirements could be set to capture the majority of water take capacity and minimise undue costs on smaller water users.

Evidence from implementation of the current rules suggests that they may be imposing disproportionate costs for the risk posed by some water users, particularly smaller or infrequent water users.

The large number of small or infrequent water users required to meter under the rules is also creating a demand for meter installations that cannot be met by the current market of active DQPs.

Many small water users are required to meter at a cost that may be disproportionate to the risk posed by the water take.

The current exemptions based on work size thresholds do not apply across all water sources. This is because there were already universal metering requirements in place across 13 surface water sharing plans before the introduction of the non-urban metering framework.

The intent of the Regulation was to maintain or enhance metering requirements rather than roll back on existing requirements. However, the overlapping rules appear to be creating confusion and may impose undue costs on small, low-risk water users. It also creates a perceived inequity between existing and new work approval holders, as new work approval holders in the same water source *can* access the size-based exemptions as they were not subject to the universal metering condition.

Universal metering is also required in 55 at-risk water sources because the level of licensed entitlement is equal to, or above, the sustainable limit for extraction of water from these water sources. Metering conditions were in place in these water sources before the rollout of the metering framework. There have been government water buyback programs to ensure sustainability in some

of these water sources and continued monitoring, and therefore metering, of these water sources, is critical to ensure the level of actual take remains below the sustainable limit. Using Australian standards for non-urban metering (AS4747), which is more costly, may be disproportionate to the risk posed by small water users in some of these systems.

Possible responses

Enable less prescriptive measurement standards for low-risk water users in water sources subject to universal metering requirements

Measuring water take from regulated rivers and at-risk water sources that are fully or heavily allocated is very important regardless of the amount taken by individual users as it enables better management of these systems. More water sources may be identified as 'at-risk' in the future, triggering the need for universal metering in those sources.

However, to balance the data needs with the costs imposed on small water users, less prescriptive metering requirements that reduce metering costs could be considered for works that require meters under the rules but are below the current work size exemption thresholds.

This could include installing and maintaining a flow meter and data logger according to the manufacturers' specifications and removing the requirement for mandatory DQP installation.

This would provide lower-risk water users with a choice of how they can comply with metering requirements (that is, they can still choose to have a DQP install a pattern-approved meter if they wish).

It would also enable the limited market of active DQPs to focus on higher risk meter installations.

Assess whether metering requirements would be better defined by volume-based thresholds, with associated measurement and reporting requirements reflecting risk to a water source

The review is considering whether thresholds reflecting the volume of water take or entitlement would provide better outcomes for the objectives of the policy than the current exemption thresholds based on work size. Many of the other Murray–Darling Basin jurisdictions define smaller, low-risk water users this way based on their usage limit or entitlement. This recognises that work size is not always the best indicator of actual take or risk, such as when a smaller pump is used continuously, or a large pump is only used intermittently.

The intention is to better target metering obligations to the level of risk posed to the water source while upholding the policy's goal to accurately meter the vast majority of licensed water take. This aims to address barriers to implementation caused by a limited market of active DQPs and accelerate metering compliance.

An option being examined is a stratified approach to metering requirements based on categories of water take volume (see Table 3). It is based on the following principles:

- that all licensed water take should be measured and reported

- that the vast majority of water take (greater than 95% of total licensed entitlement) should be metered in accordance with national commitments and the Australian Standard for non-urban metering
- measurement requirements should be imposed reflecting risk to water sources, and less prescriptive and less costly measurement requirements could apply to lower-risk take, subject to annual reporting of volume taken and equipment maintenance
- universal metering in 'at-risk' water sources must be maintained, but lower cost options could be enabled for smaller users in these systems.

Table 3. Possible model for state-wide volume-based metering and measurement obligations (note: the volume ranges are indicative only)

Volume threshold	Measurement standard	Reporting requirement
100 ML or greater annual usage or entitlement • covers more than 95% of licensed entitlement state-wide • larger users.	Current NSW metering standards apply: • pattern-approved meter and installation in accordance with AS4747 • DQP for installation, validation, maintenance and 5 yearly revalidation • data logger and telemetry.	Annual confirmation that: • data submitted by telemetry is accurate • all licensed water was taken through meter(s) on nominated works.
10 ML to 100 ML annual usage or entitlement*	Measurement required, with less prescriptive metering standards: • flow meter (AS4747 and pattern approval not mandated) • self-installation without DQP validation • 'telemetry ready' data logger.	Monthly reporting of water take (as per current requirement for metered works without telemetry). Annual confirmation that: • monthly statements are correct • meter installed and maintained in accordance with manufacturer's specifications • all licensed water was taken through meter(s) on nominated works.
Less than 10 ML annual usage or entitlement* • small users, generally low risk to water source • infrequent/intermittent users.	No meter is mandated, but trade is prohibited without a measurement device (subject to the Access Licence Dealing Principles Order 2004).	Annual reporting of water take (as per current requirement for works without meters).

Volume threshold	Measurement standard	Reporting requirement
At-risk water sources	Universal metering required. Less prescriptive metering standards available for annual use less than 100 ML.	Monthly reporting of water take (as per current requirement for metered works without telemetry). Annual confirmation that: • monthly statements are correct • meter installed and maintained in accordance with manufacturer's specifications • all licensed water was taken through meter(s) on nominated works.

**NRAR able to issue directions to impose the same obligations as > 100 ML users for any water take offences that are considered to have a material, adverse effect on a water source.*

Such a model is consistent with national commitments and the intention of the NSW non-urban metering policy, as it maintains and increases metering coverage compliant with the Australian Standard for non-urban metering (AS4747) for the vast majority of licensed water take in NSW.

At the same time, it allows smaller and lower-risk water users to use less costly options for flow measurement which would be supported by standardised reporting of water take, measurement equipment and its maintenance.

As water use patterns differ across NSW, volume-based thresholds may also need to vary between water sources to help manage risk. For example, different volume thresholds may need to be set for regulated, unregulated and groundwater, or coastal and inland. This requires further analysis, which is currently being undertaken.

Focus questions:

- Should there be flexibility in metering and measurement standards reflecting risk to water sources, or should there be one standard across the board?
- Would it be easier to understand and comply with metering rules based on entitlement or volume of take than the current approach based on infrastructure size?
- If a volumetric approach was to be implemented, should it be consistent across the state, or tailored by catchment to reflect the different water use behaviours and water management risks in different areas?
- What are the practical implementation challenges that water users might experience in complying with metering requirements based on volume of take or entitlement?
- Are there any issues specific to different industries that take water under a licence that should be considered in relation to the possible options described?

Revisiting installer requirements to accelerate progress

What is the problem?

There are not enough active duly qualified persons to install all the meters required.

Under the framework certified meter installers or, in the case of open channel meters, certified practising hydrographers, must install, maintain, and validate meters.

Becoming a certified meter installer (referred to as a duly qualified person, or DQP, in NSW) involves completing specific certification requirements and a three-day course run by Irrigation Australia Limited. Additional course requirements and skills are required to become a certified practising hydrographer.

Data indicates that of the approximately 230 qualified DQPs registered with WaterNSW, only 114[9] have operated in NSW, and only 86[10] have been actively installing metering equipment this year. Although the first stage of the rollout has a compliance rate of 70%, the limited number of active DQPs available to install, maintain and validate meters for the remaining stages is unlikely to meet water users' demand.

Some of the reasons that appear to be contributing to the limited number of active DQPs include:

- installing meters has a high administrative burden, entails regulatory risk and there is limited support for costs incurred when metering equipment (including data loggers) fails and needs fixing and/or replacement
- labour and workforce shortages in regional areas
- a disconnect between DQPs and water users. The vast geographical distances and limited number of customers in some parts of the state make it challenging to service some areas, coupled with the inability to easily identify areas where services are in demand. A Metering and Measurement Virtual Marketplace was recently launched to address this issue, but the tool is still in its infancy.

The DQP Portal which is used to record installation and validation of metering equipment data has contributed to the high administrative burden experienced by DQPs. WaterNSW has recently upgraded the DQP Portal to address this issue and is committed to ongoing improvements based on feedback.

All meters must also be re-validated every five years by a DQP. The requirement for revalidations in coming years is likely to further exacerbate the supply/demand challenges already being experienced. In NSW, revalidation includes accuracy testing in the field. Feedback indicates that few DQPs are able, or willing, to complete in-field accuracy testing and the cost is prohibitive.

The previous section outlined possible options of not requiring DQPs to install and validate meters for low-risk user categories. Some further possible responses to address the market limitations are described here.

[9] Based on the number of duly qualified persons who have commenced a telemetry registration in the WaterNSW DQP portal

[10] 'Active' defined as duly qualified persons who have started or progressed a non-government owned local intelligence device installation in the DQP Portal this calendar year (2023)

Possible responses

Government coordinating DQP services to match supply with demand, coupled with increased support services for DQPs

This would involve the government identifying demand for metering within a geographic location so DQPs can scale up and roll out meter installation/validation more efficiently. This could potentially make it more economically viable for DQPs to service areas not currently covered by local DQPs.

This option would also involve greater government support to DQPs including, for example, providing concierge service to support the installation and registration of meters and local intelligence devices, and use of the DQP Portal.

Government installation in targeted areas

Similar to the above, this would involve government identifying demand for the installation of AS4747 meters within a geographic area. However, rather than only matching DQPs to demand, it could involve government providing DQP services in areas where it identifies a shortage, on a fee-for-service basis.

Options to increase the DQP workforce by expanding definitions for who can be a DQP

This would aim to expand the potential DQP workforce by amending the rules to enable other workers with the necessary skills to complete meter installations and validations (such as engineers, surveyors, plumbers and electricians).

This would be supported by a short online course that is part of the DQP registration process to ensure the skilled workforce has adequate training. This would also respond to the reported issue of course costs, ongoing fees and the loss of income from time spent completing a course.

Enabling less prescriptive installation pathways for closed conduit meters

The rules could be amended to enable anyone to install pattern-approved, closed conduit meters, provided they are validated by a DQP within six months. This option is consistent with the national framework and the requirements in other jurisdictions, such as Queensland.

This option overcomes the potential issue of not having enough DQPs to install meters in the first instance. However, this may result in a bottleneck of DQPs available to validate meters six months after installation. There is also a risk that the DQP may refuse to validate the meter installation and the burden of non-compliance rests with the water user.

Review maintenance and five-yearly revalidation requirements

It is proposed to review and update the maintenance and revalidation requirements to ensure they are practical, while maintaining the integrity of the installations. This would include revisiting the requirement for in-situ accuracy testing which is not mandated under the national metering standards.

Focus questions:

- Who should install metering equipment?
- Do you think there would be benefits from government involvement in the DQP market? For example:
  - if government contracted and coordinated DQP services then passed on the costs?
  - if government provided fee-for-service DQPs?
- What forms of further training or support would make it more viable for already qualified DQPs to actively participate in the market?
- Is there benefit in revisiting the skill sets and training required for DQPs? Are the current training and certification requirements limiting the market or are the other factors more significant?

Making data systems and equipment standards more fit for purpose

What is the problem?

It takes longer to install data loggers and telemetry and this is typically where installation challenges are being experienced

The rollout of telemetry is an important element of the non-urban water metering framework to transmit timely water extraction data securely from a meter to government and back to water users.

However, as meters are not compliant until a data logger is installed, water users and DQPs have indicated that issues involving the installation of data loggers and telemetry[11] are affecting their ability to meet compliance deadlines.

Telemetered data should enable NRAR, WaterNSW and the department to undertake compliance, enforcement, billing, and other water management activities to enable more effective management of the water source. It is also the intention that water users can access this data via a private online dashboard and receive notifications when their equipment is not operating properly.

Significant progress has been made in this area. However, as with any evolving technology, the full potential of telemetry data is yet to be fully realised. As we continue to implement this important element of the framework, challenges which may compromise the quality and reliability of data transmitted in some cases need to be addressed.

The government sets the standards for data loggers and telemetry requirements and maintains a list of tested and assessed data loggers that meet Data Logging and Telemetry Specifications 2021. The list currently does not provide any form of guarantee of these devices including warranty,

[11] In NSW we use the terminology 'local intelligence device' to refer to a data logger and telemetry

reliability or suitability of listed devices, including for specific environmental conditions, metering equipment configurations or signal interfaces.

Some of the known issues with data loggers and telemetry include:

- Many approved data loggers are newly developed and despite meeting specifications, there are issues arising with field installation. There are reports of data logger failures due to the premature degradation of battery life, for example, or other faulty mechanics (alarm settings) of the device.
- Market-driven preferences for data loggers may be compromising data quality. The Regulation does not prescribe the combinations of meters with data loggers. This appears to be resulting in the market opting for data loggers that do not perform optimally with certain meters, resulting in poor quality and unreliable data.
- Data logger and telemetry installation remain a challenge. Installing, configuring and connecting data loggers with meters can be complex. This results in errors due to high rates of incorrect installations and incompatible equipment combinations.
- The systems underpinning telemetry installation may not be meeting expectations. The systems are not meeting anticipated data outcomes, and there are significant resource requirements to amend or add data loggers in the government system. Some water users report the data provided does not meet their business management needs.
- Specifications for data loggers and telemetry may be stifling industry innovation and imposing additional costs on water users and DQPs. The specifications do not allow use of pre-existing mature telemetry systems (for example, SCADA systems) which are excluded due to data and cyber security requirements. The specifications also prevent DQPs from configuring devices in the field, inhibiting the ability to 'carry a spare' or purchase local intelligence devices in bulk.

Possible responses

Review of the Data Logging and Telemetry Specifications 2021

A specific and comprehensive review of the Data Logging and Telemetry Specifications 2021 is warranted. While the specifications were guided by best practice principles, practical implementation experience indicates the need to ensure they are meeting the needs of water users, government and the broader objectives of the metering framework.

Decoupling data loggers and telemetry from meter installation requirements

Government intends that data loggers and telemetry must feature in the metering framework. However, the metering rollout could be sped up if compliance requirements were changed to allow meters and data loggers to be installed and made compliant separately.

This would effectively allow for a pause on data logger requirements while data systems and rollout options are improved and enable the available DQP workforce to focus resources on meter installations.

Government coordinating bulk procurement and installation or, in certain circumstances, government-owned data loggers and telemetry systems

Data logger and telemetry rollout may be better supported through bulk procurement and co-ordinating installation using the existing DQP workforce and/or government provided services. A coordinated approach could enable cost savings and efficiencies and resolve some of the existing inefficiencies. Timeframes for data logger installation would be extended to account for this.

An extension to this option could include government ownership of data loggers and telemetry in certain circumstances. For example, telemetry is not mandatory in at-risk water sources where universal metering is required. However, more frequent data is needed to effectively manage the water source.

Government prescribing which data loggers and meters must be used together

Reducing the number of listed data loggers may help to ensure equipment selected in combination is fit for purpose. Fewer combinations could allow for improved and tailored DQP training.

This could be facilitated by developing standards for permitted meter and data logger combinations and specifying environmental settings where they can be installed. Technologies that are not appropriate could be excluded and evidence from DQPs and digital specialists included in the decision making on any future changes.

Ensure duly qualified persons are better trained and supported

This would respond to an identified need for better, more tailored training for DQPs to install data loggers and telemetry. It would also include additional frontline support so DQPs have access to information and help when needed.

Focus questions:

- Would separating the requirements for meter installation from data loggers and telemetry be beneficial? Would an extension of the compliance timeframes for data logging requirements be helpful?
- Would government support for rolling out data loggers and telemetry be beneficial?
- What are the benefits and risks if government was more prescriptive about the suitable products/technologies and combinations of meters and data loggers?
- Do water users want access to more frequent meter data?
- Is it important to be able to use existing telemetry systems that are currently excluded (e.g. SCADA)?
- What forms of training and support would make it easier for DQPs to navigate data logger and telemetry installation?

Improving water use reporting

What is the problem?

Limited reporting of water take information is compromising effective water resource management

As part of the non-urban metering framework, new conditions for recording and reporting water take were implemented. The requirements vary depending on the standard of metering equipment installed.

In summary:

- Water users with works not required to meter must annually report licensed water take and water taken under basic landholder rights.
- Users with works required to meter, but not connected to telemetry, must report licensed water take and water taken under basic landholder rights monthly. WaterNSW downloads data logger records annually.
- Users with works required to meter and connected to telemetry transmit data to the data acquisition service daily. Monthly reporting of water taken under basic landholder rights is also required.

Despite these new streamlined reporting requirements, there are significant gaps in water take data being sent to WaterNSW. The current rate of reporting is so low in some water sources it is difficult to manage the resource.

All water users are potentially affected by this limited water take reporting. In the absence of accurate information, government must make more conservative assumptions for water resource management and factor this into management decisions (for example, by reducing available water determinations).

Interventions have been trialled to increase water take reporting compliance, like issuing reminder letters. These have helped, but the compliance rates are still too low for sufficient confidence in resource management.

Possible responses

Requiring annual water user attestation of water take and confirmation of metering equipment

It is proposed to introduce a comprehensive requirement for all water users to annually attest to the volume of licensed water taken, and how it has been measured.

This would require water users with data loggers and telemetry to confirm the accuracy of the transmitted water take data annually, reconciling the annual volume of licensed water taken.

Water users without telemetry would need to confirm the accuracy of the submitted monthly water reports every year, confirming the annual volume of licensed water take.

It would also be an opportunity every year for water users to:

- confirm which works are taking licensed water and how they are metered, including that the meters or measurement devices have been maintained appropriately
- confirm the currency of water user contact information.

This volume attestation would be recognised in the Regulation, with penalties for providing incorrect information or no information at all. Complemented by a risk-based and proactive NRAR audit program and remote intelligence capabilities, this would support desktop compliance assessments by NRAR, reducing costs to all water users.

Focus questions:

- How can we improve the mechanisms for water use reporting?
- What would make it easy for water users to complete an annual attestation of the volume of water taken and how it was measured?

Ensuring a measurement pathway for take of overland flow in unregulated water sources

What is the problem?

It is not practical to measure overland flow take using non-urban metering equipment

Overland flow[12] can be taken under different types of licensed entitlement such as floodplain harvesting licences and unregulated river licences. While these different licensed entitlements can all be used to take overland flow, they are currently subject to different measurement rules.

Overland flow taken with an unregulated river licence must be metered in accordance with the non-urban metering framework. This means only closed conduit or open channel metering equipment is permitted to be used.

If overland flow is taken with a floodplain harvesting licence, it must be measured through either point-of-intake metering equipment (closed conduit metering under the metering framework) or storage measurement equipment, under the floodplain harvesting measurement framework.

In many cases, it would be more practical and cost effective if users taking overland flow with an unregulated river licence could measure their take using storage measurement devices, as is allowed under the floodplain harvesting measurement framework.

[12] Overland flow is water flowing over or lying on the ground, but not water within the bed of a river.

Possible response

Enabling appropriate measurement technology for overland flow take in unregulated systems

It is proposed to amend the Regulation so that overland flow taken under unregulated river access licences can be measured by more appropriate equipment that better suits this type of water take. This would align with floodplain harvesting measurement rules and the measurement outcomes of the national standards and agreements.

It is proposed to exempt water users taking overland flow under an unregulated access licence from metering requirements until alternative provisions are in place. This will give water users legal certainty while appropriate requirements and any system upgrades to support implementation are developed. In the interim, water take recording and reporting rules, and the proposed annual attestation of water take would apply.

Focus question:

- Will this proposed change enable appropriate measurement and reporting of overland flow take in unregulated river entitlements?

Strengthening compliance and enforcement powers

What is the problem?

Strengthened compliance tools are needed to ensure efficient and effective enforcement outcomes

NRAR is responsible for compliance and enforcement of water laws in NSW, including the metering rules. Its focus has been to ensure high-volume, active works are compliant, educating water users about the rules and their obligations in the lead up to their compliance deadlines, and monitoring and enforcing compliance amongst groups whose deadline has passed.

To ensure fairness and ongoing proper operation of meters, NRAR needs clear, effective and efficient enforcement tools. In practice, NRAR has found that better tools are needed to reinforce the obligations of all water users, backed up by more effective enforcement powers to encourage compliance.

There are a number of areas where changes are needed to provide for more effective use of enforcement tools.

Possible responses

Improving provisions around faulty meter equipment

An approval holder is required to repair a meter within 21 days of becoming aware their equipment is faulty, or notify WaterNSW and apply for an extension if it cannot be repaired in this timeframe.[13] However, there is no limit to the number or duration of extensions to repair meters, and no application mechanism to cover circumstances where a meter needs to be replaced.

It is proposed to amend the Regulation to ensure that meters are repaired, or replaced when repair is not possible, in a timely way. For example, the Regulation could include parameters such as time limits for meter repairs or limits on the number of extensions and rollovers. Provisions could also be included when a meter must be replaced rather than repaired (for example, enabling alternative water take recording methods while the faulty meter is replaced).

Clarifying definitions for offence provisions

Under the Act (s. 91I), it is an offence to take water when metering equipment is not installed or is not working. Clarifying some of the terminology associated with these provisions would enable NRAR to enforce the rules more effectively.

Enabling NRAR to issue directions requiring calibration and proper operation of metering equipment

The Act enables NRAR to issue directions to install, replace, use and maintain metering equipment.[14] However, this does not extend to requiring meter calibration or ensuring that metering equipment is operating properly. Enabling NRAR to issue a direction to ensure that the metering equipment is operating properly would ensure that all metering equipment is held to the same standard.

Focus question:

- Do you think the suggested improvements to compliance and enforcement tools will clarify the expectations on water users and make the system fairer?

[13] *Water Management (General) Regulation 2018,* clause 243.

[14] *Water Management Act 2000,* section 326.

Glossary

Table 4. Glossary of terms used in this document

Term or abbreviation	Definitions and descriptions
AS 4747	Australian Standard AS 4747, 2013, meters for non-urban water supply. This standard is updated from time to time by Standards Australia
CMI	Certified meter installer, also known as a DQP
DAS	The data acquisition service is a cloud-based platform used by the department, WaterNSW and NRAR for the purposes of acquiring and storing data from metering equipment
DQP	Duly qualified person, as defined in the dictionary to the *Water Management Act 2000* and in clause 236 of the Regulation
DQP Portal	Online portal for DQPs to register for installing telemetry, filling in validation of metering equipment, accuracy testing and open channel design
Local intelligence device / LID	A combined data logger and telemetry unit that complies with the Data Logging and Telemetry Specifications 2021
Metering equipment	Any device used for, or in connection with measuring the flow of water and any ancillary wiring, pipework, telemetry equipment or apparatus and any supporting structure
NRAR	NSW Natural Resources Access Regulator
Open channel	A channel or conduit used for conveying water that is not enclosed
Pattern-approved	Pattern-approval means the design of these meters has been verified by the National Measurement Institute (NMI) to meet national metrological specifications. A list of these meters is published here: https://www.agriculture.gov.au/sites/default/files/documents/mdb-pattern-approved-non-urban-meters.pdf
Regulation	Water Management (General) Regulation 2018 (NSW)
Water take data	The flow rate and cumulative volume of water taken, or the height storage for floodplain harvesting data