

CONSULTATION PAPER

NSW water metering framework

Policy, regulations and mandatory conditions

Published by NSW Department of Industry

Consultation paper—NSW water metering framework (policy, regulations and mandatory conditions)

First published August 2018.

industry.nsw.gov.au

PUB18/569

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Contents

Introduction	3
Background.....	5
Part 1: Who will need a meter	9
Part 2: Standards for metering equipment.....	15
Part 3: When you will need to have your meter installed (roll-out dates).....	22
Part 4: Other requirements.....	23
Part 5: Ownership of meters.....	26
Part 6: Mandatory conditions.....	27
Part 7: Review.....	28
Attachment A—Consultation questions	29
Attachment B— <i>Water Management Amendment Act 2018</i> metering-related provisions	30
Attachment C—Water sources in water sharing plans where users are already required to meter	31
Attachment D—At-risk groundwater sources.....	32
Attachment E—List of pattern-approved meters (non-urban)	33
Attachment F—Meter roll-out	34

Introduction

New metering framework

The NSW Government is committed to implementing a robust new metering framework to measure and meter water take in NSW. The new framework is a commitment under the NSW Government's Water Reform Action Plan 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).

The purpose of the new metering framework is to improve the standard and coverage of water meters in NSW. It has been informed by broad community consultation, economic analysis and technical expertise.

The new metering framework includes the draft policy (this document), the accompanying draft Water Management (General) Amendment (Metering) Regulation 2018, the *Water Management Act 2000* and the *Water Management Amendment Act 2018*. The draft regulation will commence on 1 December 2018.

Objectives of the metering framework

The objectives of the new metering framework are to ensure that:

- the take of water can be accurately and reliably determined
- meters used to measure water take are auditable, verifiable and accurate
- data from meters can be easily communicated to relevant authorities
- mandatory requirements and resources are targeted to higher risk users—that is, those that have a greater capacity to take water—and high-risk water systems
- the benefits of water measurement (including risk management benefits) outweigh the costs
- the framework is easy to understand, comply with, administer and enforce.

Purpose of this paper

The purpose of this paper is to explain the proposed requirements that water users will need to comply with, and to seek community feedback so the government can ensure the final policy and regulation are practical and can be implemented effectively.

Mandatory conditions

This paper also seeks comment on the proposed mandatory conditions in the regulation to be imposed on certain water access licences and water supply work approvals. These conditions will give effect to the new metering framework. The conditions relate to metering equipment and the keeping of records and will expand on the existing mandatory metering condition contained in section 101A of the *Water Management Amendment Act 2018*. The regulation also specifies which approvals do not need to comply with the mandatory metering condition. Proposed mandatory conditions imposed by the regulations must be publicly exhibited for 28 days before they can be imposed.

Have your say

We seek your feedback on the draft metering policy and draft regulation, including the proposed mandatory conditions. Community consultation is critical to ensuring the requirements are practical and can be implemented effectively.

This consultation paper sets out the proposed requirements under the new policy and draft regulation. It also includes a series of questions we would like your feedback on. A list containing all the consultation questions is at Attachment A.

You are invited to comment on the policy and draft regulation from 27 August to 30 September 2018. You can have your say by making a written submission or coming to a public consultation session. These sessions provide an opportunity to learn more about the proposed changes and discuss your concerns.

The sessions will be held in a number of locations throughout the state. Further details are available at the NSW Department of Industry website www.industry.nsw.gov.au/water-reform/consultation.

Submissions are due by 11.59pm on 30 September 2018. They will be published on the NSW Department of Industry website.

To make a submission, visit www.industry.nsw.gov.au/water-reform/consultation.

Once all stakeholder input has been considered, the metering policy and regulations will be finalised. The regulations will commence on 1 December 2018.

Structure of this paper

Part 1 explains which water users will be required to have a meter.

Part 2 outlines the standards that metering equipment will need to meet, including arrangements for existing meters.

Part 3 describes the staged roll-out of metering requirements, based on risk.

Part 4 describes other requirements, including record-keeping and the requirements that apply when a meter is faulty.

Part 5 describes the proposal that meters be privately owned by water users.

Part 6 contains information about the proposed mandatory conditions.

Part 7 explains the review of the regulations and policy that will occur after five years.

Background

Development of the metering framework

The Matthews Report and the MDB Compliance Review highlighted the need for a more comprehensive and robust metering framework, and for further consultation with the community. Both of these reviews made consistent recommendations to implement a ‘no meter, no pump’ policy.

The Minister for Regional Water committed to making installation of meters for all large users a top priority, and to implementing the ‘no meter, no pump’ objective in a staged process, based on risk.

However, the Matthews Report and the MDB Compliance Review both noted that metering 100% of water take may impose undue cost burdens on small users.

A robust and transparent process was important for developing the metering framework. The challenge was to balance the metering objectives against potential impacts on small, lower-risk users. The framework also needed to take into account the views and concerns of stakeholders and the community.

The process for developing the proposed metering framework comprised:

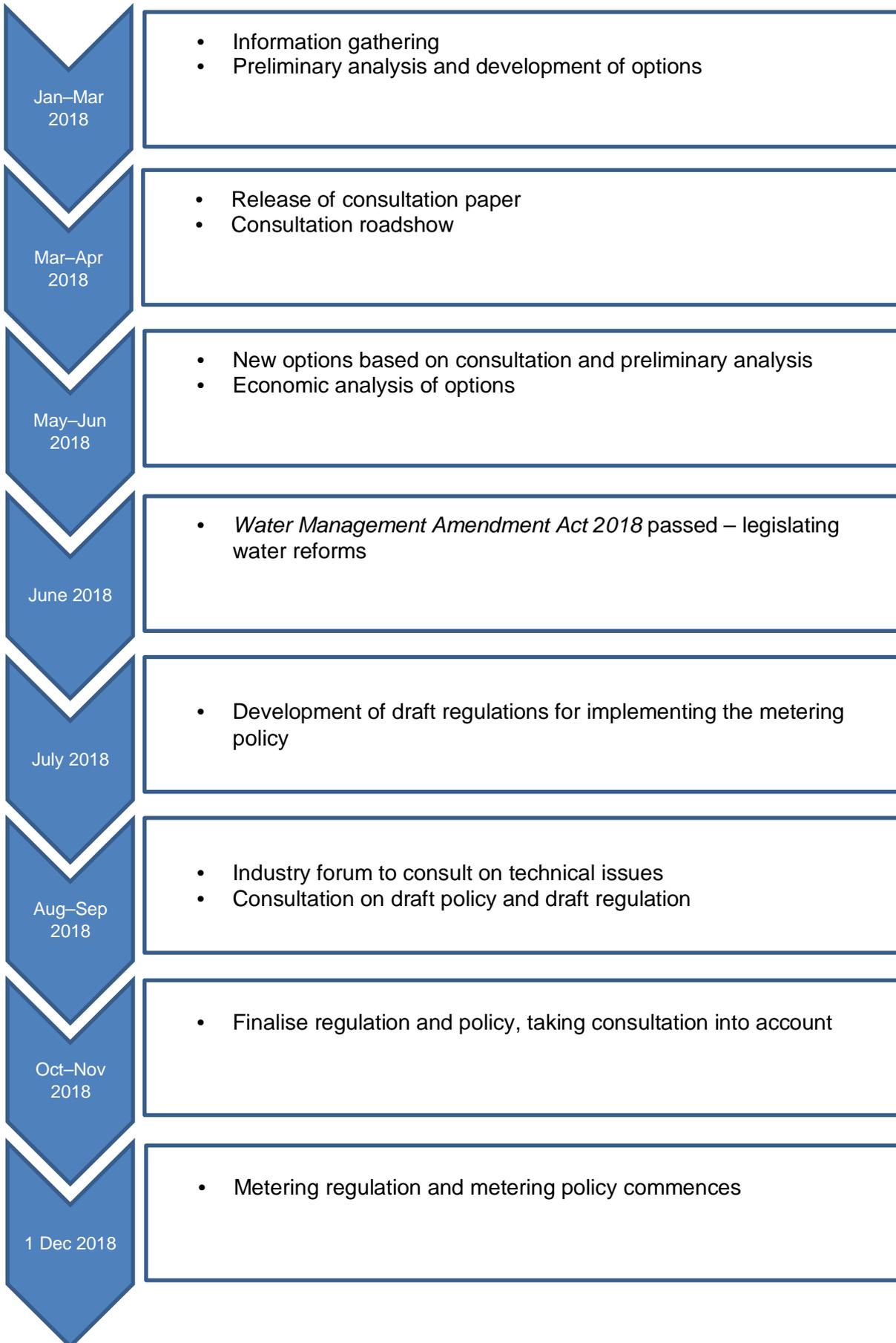
- community consultation to seek input early in the policy development process
- analysis to help define the scale of the problem to be addressed, assess the possible threshold options, and analyse the costs and benefits of policy options
- a technical workshop to seek industry and expert advice on implementation issues
- consideration of a number of other factors, including:
 - the impacts of metering for specific regions and water-source types, as well as for NSW as a whole
 - information needs for effective water management and compliance
 - the need to rebuild public confidence in water management and use through greater accountability
 - implementation issues relating to technical requirements and market opportunities
 - simplicity and ease of communication, compliance and enforcement.

Information from each element of the process has contributed to the draft policy and regulation.

The policy and regulation will be reviewed in five years to assess and respond to new information and technologies. This will allow the metering threshold and other aspects of the policy and regulation to be adjusted, if needed, to ensure they achieve the objectives of the metering framework.

The process for developing the draft metering policy and draft regulation is shown in Figure A.

Figure A. Metering policy development process and timetable



Consultation

The first round of consultation was held during March and April 2018. This included releasing a consultation paper on water take measurement and metering options¹, and holding a series of public meetings to provide an opportunity for communities, industry and other stakeholders to have input into the development of the policy. An Exposure Bill, the draft Water Management Amendment Bill 2018, was also released as an example of the mechanisms that could be enacted to enable key elements of the reform.

A wide range of stakeholders provided feedback during the consultation process, including Commonwealth, state and local government agencies, industry peak bodies, agricultural representative groups, water-user representative groups, Aboriginal organisations, environmental groups, irrigator corporations, water infrastructure providers, manufacturers and installers, small and large-scale farm owners, agricultural finance providers, fisheries groups, private landholders and members of the general public. In June 2018, the government released a report summarising what we heard from the community consultation².

Analysis of the submissions and feedback received from that consultation process has helped shape the policy settings of the proposed metering framework. The key messages that emerged from the consultation in relation to metering were:

- strong stakeholder support for metering the large majority of water take
- the policy should recognise the different water management risks and issues along the coast and inland
- support for staged roll-out of reforms and transitional arrangements for existing meters
- a range of views on who should own the meters and a call for funding support if meters are to be privately owned.

Economic analysis also provided evidence to support development of the metering policy.

Technical Forum

In early August 2018, the government convened an Industry Technical Forum to seek advice on the technical and operational aspects of the proposed metering policy and regulation, particularly telemetry, data requirements and options for in-situ verification of meters. Participants included water users, meter and telemetry manufacturers and installers, and academics with expertise in hydraulic engineering, data and telecommunications.

A report providing a summary of the issues discussed at the forum is available here www.industry.nsw.gov.au/water-reform/consultation.

Legislation and draft regulation

On 20 June 2018, the NSW Parliament passed the *Water Management Amendment Act 2018*.³ The Amendment Act provides for and strengthens the legal basis for the new metering framework.⁴

Specifically, the Amendment Act imposes a mandatory condition which requires holders of all water supply work approvals to have a meter. The Amendment Act provides that exceptions to the mandatory metering condition, and requirements for complying with the mandatory metering condition, are to be dealt with in regulations.

The draft regulation sets out which approval holders are excepted from the mandatory metering condition. It also provides for the mandatory metering condition to apply to certain water access licence holders. Lastly the

¹ Water take measurement and metering – consultation paper (March 2018)

www.industry.nsw.gov.au/__data/assets/pdf_file/0018/145422/water-take-measurement-and-metering-consultation-paper.pdf

² Water Reform Action Plan Community consultation – what we heard (June 2018)

www.industry.nsw.gov.au/__data/assets/pdf_file/0003/162849/Community-consultation-what-we-heard.pdf

³ www.legislation.nsw.gov.au/acts/2018-31.pdf

⁴ A list summarising the main components of the Amendment Act with respect to metering is at Attachment B.

draft regulation details the requirements that all holders of approvals and licences who are subject to the draft metering condition will need to comply with. Relevant sections of the Amendment Act and the regulation will commence on 1 December 2018.

Part 1: Who will need a meter

The proposed metering policy and regulation have been designed to significantly improve the coverage and standards of meters, in a staged manner, based on risk. This section outlines the types of water take the policy and regulation apply to, and the categories of water users that will need to install new meters, or maintain or upgrade existing meters.

Types of water take covered

The metering requirements will apply to works taking water from regulated rivers, unregulated rivers and groundwater systems under a licence, where the take can be measured with a meter. This includes:

- water supply works authorised by a water supply work approval under the *Water Management Act 2000*
- works taking water for state significant development, state significant infrastructure, or prospecting or fossicking under the *Mining Act 1992* or the *Petroleum (Onshore) Act 1991*
- works of irrigation corporations, local water utilities and major water utilities at the point of extraction from a water source (the metering requirements will not apply to individual users taking water within an irrigation corporation's area of operations unless they are directly taking water from a water source)
- works authorised to take water under the *Water Act 1912*.

The metering requirements will not apply to:

- works solely used to take water under basic landholder rights
- works where the take of water cannot be measured using a meter and the Minister has granted an exemption
- works solely used to take water that is exempt from the requirement for a water access licence
- works solely used to take water under a floodplain harvesting access licence.⁵

See section 101A in the *Water Management Amendment Act 2018* and the following clauses in the draft regulation: 229 and 231

Who will be required to have a meter

The Matthews Report and the MDB Compliance Review noted that metering all water use is unlikely to be possible or practical. The Compliance Review suggested that metering 95% of meterable take would meet the 'no meter no pump' objective, while avoiding an undue cost burden on small users.

The government's consultation during March and April 2018 considered how thresholds could be set to exempt users from the metering requirement where the benefit does not justify the cost, for example, for small water users. There was strong support for setting a threshold based on water take infrastructure size, as well as considering risks to water sources.

All users **already required to have a meter** will need to continue to be metered.

You will **also need a meter if you meet any of the proposed thresholds** that are based on:

1. infrastructure size
2. multiple works on the same licence, approval or landholding
3. at-risk groundwater sources.

Each of these categories is explained in the following sections.

⁵ The measurement of water taken under floodplain harvesting access licences will be covered by a separate monitoring and measurement framework. Information is available at this link: www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project

See following clauses in the draft regulation: 230 and 231

Works already required to have a meter

Some water users are already legally required to have metering equipment installed as a condition of their water supply work approval or their water access licence. These works will still require a meter, regardless of the infrastructure size.

A work is already required to have a meter if:

- the conditions of the water supply work approval require the work to have a meter
- the conditions of a water access licence require water taken under the licence to be measured by a meter
- the approval holder has received a direction from the Minister to install or maintain a meter on the work (for example, a direction made pursuant to a condition on the approval, or a direction made under section 326 of the *Water Management Act 2000*).

A list of the water sources in water sharing plans where users are already required to have a meter is at Attachment C.

Thresholds

The following thresholds are proposed to impose metering requirements based on water take infrastructure size and risks to water sources:

- infrastructure size
- multiple works
- at-risk groundwater sources.

Infrastructure-size thresholds

The government is proposing to apply thresholds based on infrastructure size. If a water supply work approval authorises the use of a work that meets the size threshold, it will be required to have a meter. This links the requirement to have a meter to the risks of individual users and their physical ability to take water.

There will be separate thresholds for surface water and groundwater and they cover open channels as well as closed pipes. The proposed thresholds are listed in Table 1 below.

Table 1. Infrastructure-size thresholds

Type of water source	Threshold
Surface water	Work authorised is 100 mm or larger
Groundwater	Work authorised is 200 mm or larger ⁶

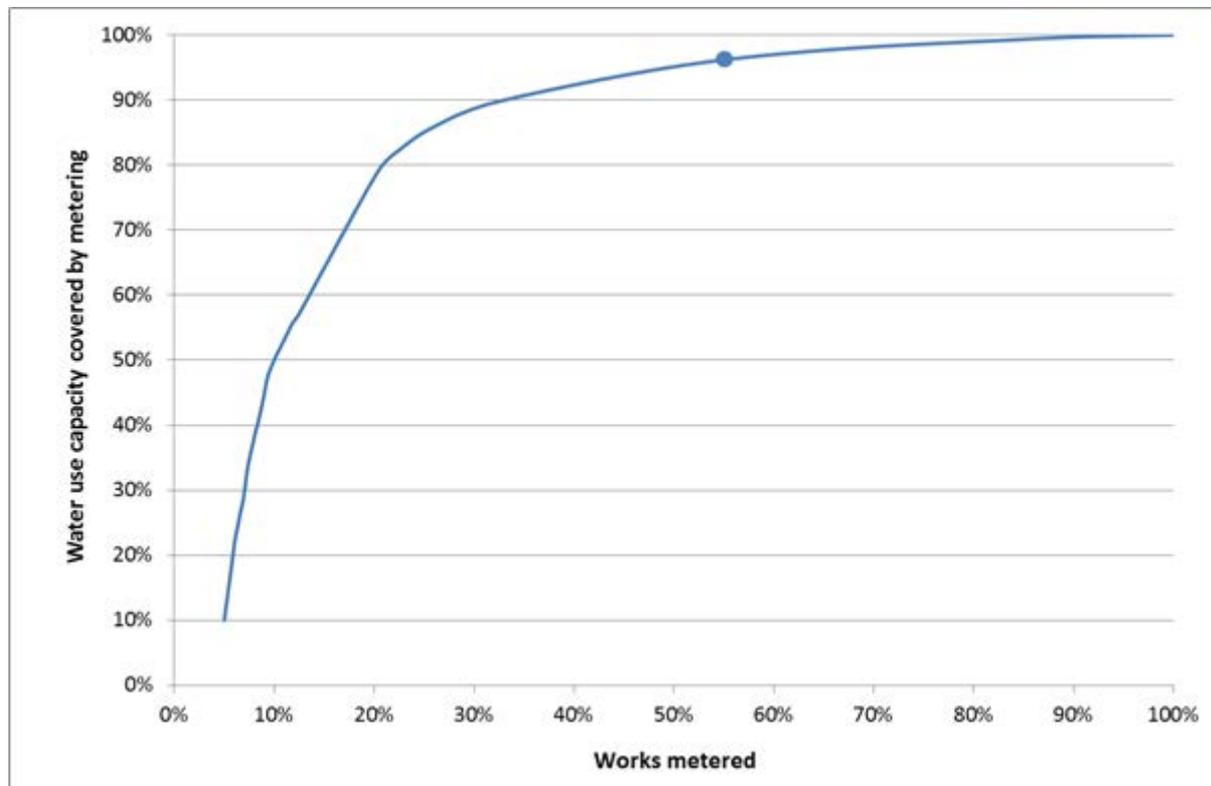
Why the infrastructure-size thresholds were selected

A threshold based on the authorised infrastructure size links the requirement to have a meter to the risks posed by individual users and their physical ability to take water. During the public consultation, there was strong support from stakeholders for metering of the vast majority of licensed water take, while minimising costs for smaller users. The proposed thresholds of 100 mm for surface water and 200 mm for groundwater will result in about 56% of licensed works being metered to required standards and coverage of over 95% of

⁶ This size measurement refers to: (a) the internal diameter of the work as specified on the approval – if the approval specifies a size for the internal diameter, or (b) the outside diameter of the work as specified on the approval – if the approval does not specify a size for the internal diameter but does specify a size for the outside diameter of the work, or (c) in all other cases, the size of the work specified on the approval.

water infrastructure capacity for existing licensed water (see Figure B). These thresholds were informed by the economic analysis prepared for the department, along with feedback from the first round of consultation and consideration of how options met other water management objectives and information needs.

Figure B. Works metered and water take coverage of infrastructure-size thresholds



How the infrastructure-size thresholds will be applied

It is proposed the requirement to install a meter will be based on the **size of the work specified on the water supply work approval**. The rationale for applying the threshold to the water supply work approval is that the requirement is simple to understand and easy to comply with and enforce, because the information on the approval can be checked to determine whether a meter is required or not.

If the size of the work on the approval meets the threshold, the work will need a meter. If the work approval does not specify a size for the work, it will also be considered to require a meter.

If an authorised work on a works approval meets the infrastructure size threshold, but the actual work installed on the ground is smaller than the threshold, the holder of the approval may wish to apply to have the approval amended to specify the actual size of the installed work.

Multiple-works threshold

It is proposed that meters will be required where there are multiple works that are below the infrastructure size thresholds that are linked with the same approval, licence or entitlement, or on the same landholding. Meters will be required on works where:

- the water supply work approval, water access licence, or *Water Act 1912* entitlement authorises the use of more than one work
- there are two or more authorised works on the same landholding.

However, this does not apply to back-up pumps, where a user is authorised to have a secondary pump that can only be used if the primary pump fails.

This option is proposed because it is easy to understand and easy to enforce.

An alternative approach is to require multiple works that are below the infrastructure size thresholds to be metered if the cumulative capacity of the works is equivalent to the thresholds, based on assumptions about average flow rates. For example, if it is assumed that a 100 mm pump is able to pump 19 litres per second and a 50 mm pump is able to pump 7 litres per second, two 50 mm pumps would not meet the threshold and therefore would not need to be metered, but three 50 mm pumps would all need to be metered.

Under this option, to meet the metering threshold a user would need:

- 3 x 50 mm pumps
- 3 x 65 mm pumps
- 2 x 80 mm pumps.

This option is more complex and thresholds may need to change over time as pumps become more efficient. Under either option, it is proposed that batteries of spear points will require a meter. Although individual spear points are small in diameter, batteries of spears can have the capacity to take significant volumes of water.

We are seeking your views on which is the preferred option and why.

See following clauses in the draft regulation: 231 (2) (a) and (b)

At-risk groundwater sources threshold

There are a number of at-risk groundwater sources in the Murray-Darling Basin where additional metering is needed to manage the risk of over-extraction.

In addition to the proposed requirements outlined above relating to infrastructure size and where meters are already legally required, there are an additional 25 identified at-risk groundwater sources where it is proposed that all water users taking licensed water will also be required to have a meter, regardless of infrastructure size (see Attachment D for the list of water sources and the related water sharing plan area).

These water sources in the Murray-Darling Basin have been categorised as at-risk because they meet one or more of the following criteria:

- they have recent history of extraction greater than 70% of the water sharing plan long-term average annual extraction limit (LTAAEL)
- they are over-allocated
- the entitlement and account rules combined can result in extraction exceeding the LTAAEL.

See following clauses in the draft regulation: 231 (2) (d) and Schedule 9

Exceptions to the metering requirement

A meter will not be required for works:

- solely used to take water under basic landholder rights⁷
- only taking exempt water (i.e. water that is exempt from the requirement for a water access licence)
- where the take of water cannot be measured using a meter and the Minister has granted an exemption
- solely used to take water under a floodplain harvesting access licence.

Basic landholder rights works

A work used to take water pursuant to a basic landholder right will not require a meter. However, if a work is used to take *both* basic landholder rights water and licensed water, a meter will be required if the work meets one of the other requirements for having a meter.

The government will develop and consult on reasonable use guidelines in 2019 to establish a method for determining reasonable water use for domestic and stock consumption pursuant to the basic landholder right.

Works taking exempt water

Works taking water that is exempt from the requirement for a water access licence⁸ will not need a meter. However, a work that takes *both* exempt water and licensed water will need a meter if the work meets one of the other requirements for having a meter.

Minister's exemption

Works that have been granted an exemption from the requirement to have a meter by the Minister will not need a meter. Exemptions will only be granted if the Minister is satisfied it is not possible for the take of water to be measured by metering equipment. The Minister will be able to revoke an exemption at any time.

For example, an exemption might be granted to a sand quarry operation where the take of water can only be measured by relying upon mathematical models or by weighing the wet sand and comparing it to the known weight of dry sand. However, changes in technology and to works might mean that in the future this type of take will be able to be metered and the exemption would be revoked.

Floodplain harvesting

The taking of water pursuant to a floodplain harvesting access licence will be subject to measurement requirements to be determined in stage two of the healthy floodplains project which is reforming the management of water on floodplains through the development of floodplain management plans and licensing of floodplain harvesting water extractions to make them subject to volumetric limits. The following link contains more information about this project: www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project

See following clauses in the draft regulation: 231 and 232

⁷ Basic landholder rights means domestic and stock rights, harvestable rights or native title rights, set out in sections 52-55 of the *Water Management Act 2000*.

⁸ The water access licence exemptions are specific circumstances where the take of water from a water source will not require a water access licence. The exemptions are contained in clause 21 and Part 1 of Schedule 4 to the *Water Management (General) Regulation 2018*.

Examples

Some examples of situations where a meter will, and will not, be required are set out in Table 2.

Table 2. Examples of when a meter will be required

Situation	Do you need a meter?
The size of the work specified on your approval meets the threshold for infrastructure size	Yes
The approved work is taking groundwater from one of the identified at-risk groundwater sources	Yes
The size of the work specified on your approval is below the threshold, but you have voluntarily installed a meter	No – but note the thresholds will be reviewed after five years and this requirement could change
The size of the work specified on your approval is below the threshold but your licence or work approval conditions specify that you are currently required to have a meter	Yes
The size of the work specified on your approval is above the threshold, but the work on the ground is below the threshold	Yes – or the approval could be amended to reflect the size of the work
Your work approval does not specify the size of your work	Yes
Your current approval, water access licence or <i>Water Act 1912</i> licence requires you to have a meter	Yes

Consultation questions

1. Is it easy for you to determine whether your work(s) meet the threshold? If not, why not?
2. Which option for multiple works is preferred, and why?
 - a. Should meters be required where there is more than one work (where at least one is below the threshold)? or
 - b. Should meters only be required if the cumulative capacity of the works is equivalent to the infrastructure size thresholds?
3. Are there any other types of water take that should be exempt from the metering requirements and why?

Part 2: Standards for metering equipment

This section describes the metering standards that will apply to those works that need to have a meter, as described in Part 1 of this document. This section does not apply to works that do not need to have a meter.

The government’s objective is that the vast majority of water take in NSW will have a high standard of metering. However, we also recognise the need for transitional arrangements where there may already be an existing, accurate meter in place. Users will not need to replace an accurate, well-performing meter if they are able to satisfy the transitional standards for existing meters.

Table 3. Steps users will need to take to prepare for roll-out date

Type of work	Has a meter already	Doesn't have a meter
Work meets the infrastructure- size threshold	<p>Required to:</p> <p>confirm accuracy of the meter.</p> <p>ensure metering equipment has tamper-evident seals, data logger and telemetry.</p> <p>If meter accuracy cannot be confirmed, replace it with a new meter that meets the new meter standards.</p>	Required to install a new meter that meets the new meter standards.
<p>Work is below the infrastructure-size thresholds but is required to have a meter because it is:</p> <p>a) already legally required</p> <p>b) in an at-risk groundwater source</p>	<p>Must ensure the meter is operating properly. If meter is not operating properly, replace it with a new meter that meets the new meter standards.</p>	Required to install a new meter that meets the new meter standards.

Standards that apply to your meter

New and replacement meters

Table 4 summarises the standards for **all new and replacement meters** installed on new or existing works.

- A **new work** means a work authorised by a water supply work approval that is granted on or after 1 December 2018.
- A **new or replacement meter** means a meter that is installed on a water supply work on or after 1 December 2018.

Table 4. Standards for new and replacement meters

	Pattern-approved	Installation to AS4747	Tamper-evident seals	Data logger	Telemetry	Maintenance protocol
All new or replacement meters on works that meet the infrastructure-size threshold	√	√	√	√	√	√
New or replacement meters on works below infrastructure-size threshold that are required to have a meter because they are: a) already legally required to b) in an at-risk groundwater source	√	√	√	√	-	√

Pattern-approved

All new and replacement meters will need to be pattern-approved. Pattern approval is the process of testing the pattern (design) of an instrument against an established standard by an independent body. Pattern approval determines the accuracy of a meter and is granted by the National Measurement Institute in the Commonwealth Department of Industry, Innovation and Science.

Water meters for non-urban areas are assessed for pattern approval in accordance with:

- NMI M 10—meters intended for large scale, non-potable applications
- NMI M 11—meters intended for open channel flow measurement.

Further information about pattern approval is available from the National Measurement Institute: www.measurement.gov.au/Industry/business/Pages/Water-Meters.aspx. A list of pattern-approved meters for non-urban water take current at 21 August 2018 is at Attachment E.

To support the availability of pattern approval facilities for larger, high-capacity meters and reduce market barriers, the NSW Government provided funding this year to Manly Hydraulics Laboratory to enable it to seek accreditation for testing larger non-urban water meters. Accreditation will significantly increase the flow rates that can be tested and approved in the Australian market for both closed conduit and open channel meters up to 1,200 litres/second.

Installed to Australian Standard 4747

All new metering equipment will need to be installed by a **duly qualified person** and in accordance with the requirements of *Australian Standard 4747: Meters for non-urban water supply (AS4747)*. Installation includes both initial installation of the metering equipment and any re-installation if it is removed for maintenance. Telemetry equipment will need to be installed in accordance with a data logging and telemetry protocol published on the department's website.

A **duly qualified person** will need to hold a current certificate issued by Irrigation Australia certifying that the person is qualified as a meter installer and validator, or have the qualifications, skills or expertise recognised by the Minister and published on the department's website.

Users will need to ensure that a duly qualified person:

- installs or re-installs any metering equipment in connection with their works
- carries out a validation of their metering equipment on installation and at least every five years.

Duly qualified persons will be required to:

- provide a certificate to the relevant user, in the approved form, that the installation or re-installation of metering equipment has been done in accordance with AS4747
- provide a certificate to the relevant user, in the approved form, that the metering equipment has been validated in accordance with AS4747
- notify the Minister if they know or reasonably suspect that metering equipment they are installing or are carrying out work on has been tampered with.

It will be an offence under the new regulation if a duly qualified person fails to do any of the above. It is also an offence under section 91J of the *Water Management Act 2000* for a person to make a statement or furnish information in connection with a metering record the person knows to be false or misleading.

See following clauses in the draft regulation: 235 and Schedule 8

Tamper-evident seals

Metering equipment will require tamper-evident seals. It will need to be sealed after installation and resealed following re-installation or maintenance. It is proposed that sealing will need to meet the requirements of AS4747 and:

- include physical seals for the hardware and electronic seals for the software (for example alarms, passwords, or digital signatures or certificates to limit access and to ensure the telemetry data is sealed for use by and transfer to authorised users)
- be capable of clearly showing whether metering equipment has been interfered with
- not prevent the reading of the meter or affect the operation of the telemetry system (where there is one)
- have a means of identifying whether and describing how interference has occurred with data readings or other electronic functions of the equipment (including telemetry).

Data loggers

Data loggers will need to be able to:

- collect and record time-series water take data hourly. Data recorded must include the time and date, whether the pump is on or off (or in the case of gravity-fed systems, when the gate or valve is open/closed), how long water was taken for, the flow rate and cumulative volume, and
- store that information on the data logger for at least 12 months.

The Minister will publish a data logging and telemetry protocol on the department’s website which will set out further specifications for data loggers, such as:

- the requirements for transfer of and access to data
- other data requirements such as contextual data about the meter itself, the location and links to approvals and licences, maintenance data including power data (e.g. battery charge, solar cell faults), and compliance data, including evidence of tampering.

See following clauses in the draft regulation: clause 4 of Schedule 8

Telemetry

It is proposed that metering equipment requiring telemetry will need to be able to:

- transmit data from the data logger at least once every 24 hours, and
- transmit specific types of and formats of data to authorised users while ensuring the data is authentic and not tampered with.

The Minister will publish a meter data and telemetry protocol on the department’s website that will set out further specifications for telemetry, for example:

- how often data needs to be transmitted for different water users
- the specific types of data that need to be transmitted, including:
 - volume of take
 - time, date and duration of water take
 - power supply data – data regarding battery life or if power is not getting to the meter
 - interference with any metering equipment, such as changes in the integrity of the meter
 - metadata including location and meter identification number
- data custodians and the specific retention and backup requirements for each custody
- the specific methods for ensuring data authenticity and compliance
- any requirements for installation of telemetry equipment.

See following clauses in the draft regulation: clause 6 of Schedule 8

Ownership of data

It is proposed that the government will own the data that it receives. However, this will not prevent water users from using their own data for other purposes.

Box 1 contains some proposed principles for the data and telemetry protocol.

Box 1. Principles for data and telemetry protocol

The data and telemetry protocol will set out the requirements for collecting, recording and transmitting data related to water meters and water take. The protocol will be designed to make sure that water meter data is fit for purpose, can be readily accessed by those who need it and is secure and reliable.

The principles outlined below will guide requirements for data loggers and telemetry in the protocol. The requirements in the protocol will be:

1. outcomes-focused – the protocol will aim to specify minimum requirements for data recording, storage and transmission to achieve the outcomes required
2. non-proprietary – the protocol will not specify a particular technology or system
3. supportive of innovation and adoption of new technologies
4. supportive of market responses – requirements will not constrain the market for telemetry and data services
5. robust – to ensure that data and its transmission is accurate, secure and reliable
6. fit for purpose – so that relevant data is collected and made available to support:
 - water resource planning and management
 - compliance with regulatory requirements
 - water system operation
 - customer billing
 - meter maintenance
 - on-farm water management
7. Clear—the protocol will specify what data needs to be collected and transmitted, how often, storage periods, data and communication formats and security requirements.

Telemetry coverage

Telemetry coverage was discussed at the Industry Technical Forum in August 2018. The department sought information from industry about technology options, including options for mobile network blackspot areas. Industry feedback provided at the forum was that there are technology options available to overcome communication black spots for telemetry and that the different options will have different costs. The technology options identified besides the mobile network included the national broadband network, satellite technology and the Long Range Wide Area Network (LoRaWAN).

Maintenance protocol

Metering equipment will need to be:

- validated by a duly qualified person in accordance with AS4747 every five years
- maintained in accordance with a maintenance protocol approved by the Minister and published on the department’s website. The protocol will contain requirements for maintenance such as:
 - the frequency that maintenance needs to be carried out
 - the different types of maintenance for different components of the metering equipment
 - requirements for maintenance of telemetry equipment.

Users will need to keep records of all maintenance that is carried out.

See following clauses in the draft regulation: clause 2 of Schedule 8

Standards for existing meters

Table 5 below sets out the standards for existing meters.

An **existing meter** means a meter that was installed on a water supply work before 1 December 2018. Any meter installed after 1 December 2018 on a work that requires a meter under Part 1 will need to meet the new meter standards.

By the roll-out date, users with existing meters that meet the infrastructure size thresholds will need to either:

- install a meter that meets the new standards, or
- demonstrate that the existing meter meets certain requirements.

Users with existing meters that are below the infrastructure size thresholds but are still required to have a meter will need to ensure the metering equipment continues to operate properly. When it is no longer operating properly, the meter will need to be replaced with one that meets the new standards.

Table 5. Standards for existing meters

	Comply with existing metering requirements	Confirm existing meter is accurate	Pattern-approved	Tamper-evident seals	Data logger	Telemetry	Maintenance protocol
Works that meet the infrastructure-size threshold	√ until roll-out date	√ by roll-out date and at five-year intervals	-	√ from roll-out date			
Works below infrastructure-size thresholds that are required to have a meter because they are: a) already legally required to b) in an at-risk groundwater source	√	-	-	-	-	-	- but must ensure metering equipment is operating properly ⁹

Confirming an existing meter is accurate

Users with existing meters on works that meet the infrastructure size threshold who wish to keep those meters will need to demonstrate that the measurement performance of the meter in the field is within the limits of error of +/-5% by the relevant roll-out dates.

If the existing meter is **pattern-approved** the user will need to have a duly qualified person validate the metering equipment in accordance with the requirements of AS4747, or provide evidence that it has been validated within the last five years.

If the existing meter is **not pattern-approved** the user will need to:

- provide written manufacturer's certification that the maximum error of the meter does not exceed +/- 2.5% after manufacture
- have a duly qualified person validate the metering equipment in accordance with the requirements of AS4747.

⁹ In accordance with section 91H (2) of the *Water Management Act 2000*.

If the meter does not meet the requirements above, users will need to take other measures to confirm the measurement performance of their meter in the field is within +/-5%. This might include in-situ volumetric measurement or in-series metering with another temporary pattern-approved meter.

Users will need to provide a written report to the Minister setting out the steps taken to confirm the accuracy of their meter.

If users are unable to confirm that the measurement performance of their meter in the field is within +/-5%, they will need to install a new meter that complies with the new meter standards.

Users will also need to install a data-logger, tamper-evident seals and telemetry, if not already installed.

See clause 8 of Schedule 8 in the draft regulation

Maintenance requirements for existing meters

Users with existing works that meet the infrastructure-size thresholds and who wish to keep their meters will need to ensure the meter is operating properly until the relevant roll-out date. From the roll-out date, they will be required to comply with the new maintenance protocol.

Users with existing works that are below the infrastructure size thresholds (but are required to have a meter because they are already legally required to or they are in an at-risk groundwater source) and who wish to keep their meters will need to ensure the meter operates properly.¹⁰ If the meter no longer operates properly, it will need to be replaced with one that complies with the new meter standards.

Consultation questions

4. Are there any barriers to implementing the proposed metering standards that should be considered?
5. What additional information should be included in the data logging and telemetry protocol?
6. Should telemetry be installed by a duly qualified person? What qualifications should the person have? What other options should be considered?
7. What methods could be used to demonstrate the accuracy of existing meters in the field? Is guidance needed on the methods that can be used?

¹⁰ It is a requirement of section 91H (2) of the *Water Management Act 2000* to ensure the proper operation of any metering equipment that has been installed in connection with a water management work.

Part 3: When you will need to have your meter installed (roll-out dates)

The requirement to install a new meter or upgrade an existing meter to meet the new standards will be rolled out in a staged manner. The proposed roll-out dates for each region are shown in Table 6 below. The list of water sharing plans within each of the regions is provided in Attachment F.

Table 6. Roll-out dates for meters

Stage	Works covered	Roll-out date
1	Surface water work with an approval that authorises a work 500 mm or larger	1 December 2019
2	Inland northern region: All remaining works in the water sources in the listed water sharing plans	1 December 2020
3	Inland southern region: All remaining works in the water sources in the listed water sharing plans	1 December 2021
4	Coast: All remaining works in the water sources in the listed water sharing plans	1 December 2023

The proposed staged roll-out takes a risk-based approach by ensuring that the largest water users in NSW are metered and telemetered within a year of the metering requirements commencing, by December 2019.

The staged roll-out of the metering requirements over the following four years will allow time for the market to adjust to meet demand (e.g. demand for pattern-approved meters and certified installers).

Water users may choose to voluntarily comply with the new requirements before the roll-out date for their region.

See clause 230 in the draft regulation

Part 4: Other requirements

Requirements to keep and provide records for taking water

Water users with meters

Users will be required to keep the following records about metering equipment for five years:

- a certificate provided by a duly qualified person certifying that the metering equipment has been installed or re-installed in accordance with AS4747
- a certificate provided by a duly qualified person certifying that after validation the metering equipment is in accordance with AS4747
- if required, the manufacturer’s certificate of the accuracy of the metering equipment
- a record of any check of the accuracy of the metering equipment.

Copies of the certificates from a duly qualified person will need to be provided to the Minister within 28 days of receipt.

There will also be a mandatory condition requiring water users to keep the following records about water take for five years:

- information about the purpose for which water was taken
- information about water being taken in compliance with any conditions (for example, cease to pump or commence to pump conditions).

See following clauses in the draft regulation: 236 and 241

Under section 91J of the *Water Management Act 2000*, it is an offence to fail to keep metering records you are required to keep. It is also an offence to make a statement, or furnish information that you know to be false or misleading in connection with a metering record you are required to keep.

Users who do not have metering equipment

From 1 December 2019, licensed water users who don’t have a meter will be subject to a new mandatory condition requiring them to keep certain records about their water take. This will replace any existing log book requirements.

Users will be required to keep the records in the manner and form approved by the Minister as notified on the department’s website. It is intended that an online portal will be developed so that water users will be able to make and submit these records through the portal.

See following clauses in the draft regulation: clause 243B

Faulty meters

The government recognises that occasionally meters will break down or simply stop operating. In such cases, users will need to act swiftly. It is an offence under the *Water Management Act 2000* to take water while a meter is not operating or not operating properly. It is also a new offence under the *Water Management Amendment Act 2018* if the holder of a work approval fails to give notice that metering equipment is not working or not working properly within 24 hours of becoming aware of that fact.

Faulty metering equipment means metering equipment that is not operating properly or is not operating. This includes where the data logger is not working or when power supply is lost.

Users will need to report faulty metering equipment and will only be permitted to continue taking water if they comply with the requirements below.

Users must report faulty metering equipment

Within 24 hours of becoming aware that metering equipment is faulty, users will be required to report the following information to the Minister in the form approved by the Minister:

- their name and contact details
- the type and location of the metered work
- any relevant approval or access licence numbers
- the purposes for which water take from the metered work is used
- a description of the method that will be used to determine quantity of water taken while the metering equipment is faulty.

Options will be made available to provide this information by email or telephone.

See the following clauses in the draft regulation: 237 and 238

Taking water when metering equipment is faulty

Where metering equipment is faulty, a user will be able to continue taking water in accordance with section 911 (3) of the *Water Management Act 2000*, if the user complies with the following proposed requirements under the regulations:

- keep a logbook
- use an alternative means to determine the quantity of water taken if directed to do so by the Minister
- repair or arrange for the repair of the metering equipment.

Keeping a logbook when your meter is faulty

Users will need to record the following information in a logbook in an approved form:

- the purposes for which the water taken from the metered work is used
- if a pump is being used to take water – the size of the pump, the maximum extraction rate of the pump and the dates and times during which the pump is operating
- if the water taken from the metered work is being used for irrigation – the area of land that is irrigated by the water
- the last available reading of the metering equipment before it became faulty and the first available reading once it is repaired
- any other information that the Minister, by notice in writing to the person, directs the person to record.

If directed to do so by the Minister, the user must use an alternative means to determine the quantity of water taken and must record that information in the log book.

Users must provide a copy of the logbook to the Minister as soon as possible after the metering equipment has been repaired.

See clause 239 of the draft regulation

Repair of faulty meters

Users must repair, or cause metering equipment to be repaired, within 21 days of becoming aware it is faulty.

If they become aware the equipment cannot be repaired within that period, they must notify the Minister and apply for an extension, setting out the reasons why the repair is not able to be carried out in that timeframe and the date by which it is proposed to be completed. More than one extension application may be made.

As soon as possible after the faulty metering equipment has been repaired, the user must provide the following information to the Minister in the approved form:

- the date the metering equipment was repaired
- a description of any repairs
- evidence the metering equipment has been repaired (such as a statement from the person who repaired it).

See clause 240 of the draft regulation

Part 5: Ownership of meters

The proposed policy is that meters will be privately owned. During community consultation many stakeholders, including industry representatives and property owners, expressed support for either private ownership or a mixed-ownership model.

The government proposes a private ownership model because it will provide:

- greater choice and flexibility for licence holders to invest in the meters and technologies that best suit their business needs
- clarity of compliance responsibilities as all requirements for meter purchase, installation, maintenance, use, repair and replacement will rest with the water user.

This policy approach aligns with the legal position under the *Water Management Act 2000* which is that the obligation to install, use and maintain meters rests with the licence and approval holder, regardless of who owns the metering equipment.

The draft regulations will not prevent meters from being owned or supplied by a third-party service provider. However, the obligations to ensure that the meter meets the required standards will remain with the licence and approval holder(s).

In line with this proposed policy, it is also proposed that existing government-owned meters will transfer to private ownership. Some water users that currently have a government-owned meter have raised concerns about the proposal to transfer meter ownership.

It should be noted that the transfer of government-owned meters will not form part of the regulations made following this consultation. However, we would like your feedback on how the transfer should occur and the key requirements that should apply.

See section 91H of the *Water Management Act 2000* and sections 101A and 399A of the *Water Management Amendment Act 2018* and clause 229 of the draft regulation.

Consultation questions

8. What factors need to be considered and what safeguards need to be in place for the proposed transfer of government-owned meters to private ownership? What needs to happen before the transfer can occur?
9. What information and support will water users need to help select metering products and services that meet the required standards? Would you be comfortable with a third party meter provider being responsible for the meter?

Part 6: Mandatory conditions

The draft regulation contains mandatory conditions proposed to be imposed on water supply work approvals and certain water access licences in relation to metering equipment and the keeping of records.

The proposed mandatory conditions expand on the existing mandatory condition contained in section 101A of the *Water Management Amendment Act 2018*. The draft regulation and section 101A of the Amendment Act will commence on 1 December 2018.

Proposed mandatory conditions imposed by the regulations must be publicly exhibited for 28 days before they can be imposed.

Mandatory metering condition—requirement to install, use and properly maintain metering equipment

The *Water Management Amendment Act 2018* and the Water Management (General) Regulation 2018 will impose mandatory conditions on water supply work approvals, certain water access licences and *Water Act 1912* licences or other entitlements that will require the holder to install, use and properly maintain metering equipment (see section 101A of the Amendment Act and clause 229 of the draft regulation).

The draft regulation provides for the metering mandatory condition to be rolled-out in stages. It also excepts particular licence and approval holders from the condition.

The draft regulation prescribes the standards for metering equipment that will need to be complied with as part of the mandatory metering condition. These are contained in Schedule 8 of the draft regulation and set out in Part 2 of this paper.

Mandatory condition—recording additional information about water take

The draft regulation proposes to impose a mandatory condition for those users who are subject to the metering mandatory condition to report additional information about their take of water (see clause 241 of the draft regulation).

This includes information about the purpose for which the water was taken, the conditions and compliance with conditions of the approval, licence or entitlement (if any) that permit the water to be taken. The record must be made within 24 hours of the water being taken and must be kept for five years.

Mandatory condition—keeping of records of water take by persons not required to meter

It will be a mandatory condition for holders of water supply work approvals, certain water access licences and *Water Act 1912* licences who are not required to have a meter to make and keep records of their water take (see clause 243B of the draft regulation). These requirements will be similar to the current logbook requirements. This mandatory condition will not apply where metering equipment is already installed, or where the mandatory metering equipment condition applies.

Consultation questions

10. Do you have any comments on any of the proposed mandatory conditions?

Part 7: Review

The government will take an adaptive approach to water metering in NSW. The metering policy and regulation will be reviewed after five years to assess its performance against the objectives. The metering policy and regulation will be modified, if needed, to take account of new information about coverage, cost and water take.

Aspects of the policy and regulation that may be considered in the review include:

- the thresholds
- coverage of meters – works metered and water take
- costs of metering
- benefits realised from metering.

The review is a requirement of the Act and the regulation, and will be published on the department's website.¹¹

Consultation questions

11. What issues and data should be considered in the five-year review to assess the performance of the metering framework against its objectives?

¹¹ Section 115B (4) of the *Water Management Act 2000* and clause 242 of the draft *Water Management (General) Amendment (Metering) Regulation 2018*.

Attachment A—Consultation questions

Table 7. List of consultation questions

No.	Question
Part 1 Who will need a meter	
1	Is it easy for you to determine whether your work(s) meet the threshold? If not, why not?
2	Which option for multiple works is preferred, and why? <ul style="list-style-type: none"> a) Should meters be required where there is more than one work (where at least one is below the threshold)? b) Should meters only be required if the cumulative capacity of the works is equivalent to the infrastructure-size thresholds?
3	Are there any other types of water take that should be exempt from the metering requirements and why?
Part 2 Standards for metering equipment	
4	Are there any barriers to implementing the proposed metering standards that should be considered?
5	What additional information should be included in the data logging and telemetry protocol?
6	Should telemetry be installed by a duly qualified person? What qualifications should the person have? What other options should be considered?
7	What methods could be used to demonstrate the accuracy of existing meters in the field? Is guidance needed on the methods that can be used?
Part 5 Ownership of meters	
8	What factors need to be considered and what safeguards need to be in place for the proposed transfer of government-owned meters to private ownership? What needs to happen before the transfer can occur?
9	What information and support will water users need to help select metering products and services that meet the required standards? Would you be comfortable with a third-party meter provider being responsible for the meter?
Part 6 Mandatory conditions	
10	Do you have any comments on any of the proposed mandatory conditions?
Part 7 Review	
11	What issues and data should be considered in the five-year review to assess the performance of the metering framework against its objectives?

Attachment B—*Water Management Amendment Act 2018* metering-related provisions

On 20 June 2018, Parliament passed the *Water Management Amendment Act 2018*.¹² The Amendment Act provides for the following provisions in relation to metering.

Table 8. Water Management Amendment Act 2018 – metering provisions

Amendment	Provision (in <i>Water Management Act 2000</i> when amended)
Mandatory conditions to be imposed on all water supply work approvals that require metering equipment to be installed, used and properly maintained, and provides for exemptions to be prescribed in regulations	Section 101A
Regulations to impose mandatory conditions on access licences and approvals in specified circumstances, including in relation to metering equipment and measurement of water flows and reporting of water take	Section 115
Regulations to prescribe the standards and requirements the metering equipment must meet, including in relation to installation and maintenance, the keeping of records and the protocol that must be followed in the event of a meter failure	Sections 91I, 91IA and 115B
New offence provisions with respect to providing false or misleading information in connection with metering records or the metering requirements that will be set out in the regulations, and failing to notify when a meter is not working	Section 91IA and 91J(2)
Expand an existing offence provision in relation to use of metering equipment as well, so that it is an offence where a person does not comply with the metering requirements that are in the regulations, and other minor amendments to existing metering offence provisions	Sections 91H, 91I and 91J
Expand an existing direction’s power to enable a person to be directed to use metering equipment	Section 326
Enables regulations to be made to prescribe a scheme for the transfer of ownership of metering equipment	Section 399A

¹² www.legislation.nsw.gov.au/acts/2018-31.pdf

Attachment C—Water sources in water sharing plans where users are already required to meter

Users with works in water sources in the following water sharing plans are already required to have a meter installed. This list is not exhaustive, and may not cover all of the users that have current licence or approval conditions requiring a meter.

Table 9. Water sharing plans where meters already required

Water sharing plan
Water Sharing Plan for the Gwydir Regulated River Water Source 2016
Water Sharing Plan for the Lower Gwydir Groundwater Source 2003
Water Sharing Plan for the Lower Lachlan Groundwater Source 2003
Water Sharing Plan for the Lower Macquarie Groundwater Sources 2003
Water Sharing Plan for the Lower Murray Groundwater Source
Water Sharing Plan for the Lower Murrumbidgee Groundwater Sources 2003
Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016
Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2009
Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008
Water Sharing Plan for the Paterson Regulated River Water Source 2007
Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003
Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016

Attachment D—At-risk groundwater sources

Table 10. List of at-risk groundwater sources

Water source	Water sharing plan
Currabubula Alluvial Groundwater Source	Water Sharing Plan for the Namoi Unregulated Water Sources 2012
Cudgegong Alluvial Groundwater Source Upper Macquarie Alluvial Groundwater Source Bell Alluvial Groundwater Source Talbragar Alluvial Groundwater Source	<i>Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012</i>
Upper Murray Groundwater Source	<i>Water Sharing Plan for the Murray Unregulated and Alluvial Water Sources 2011</i>
Kyeamba Alluvial Groundwater Source Mid-Murrumbidgee Zone 3 Alluvial Groundwater Source Wagga Wagga Alluvial Groundwater Source Billabong Creek Alluvial Groundwater Source Bungendore Alluvial Groundwater Source Gundagai Alluvial Groundwater Source	<i>Water Sharing Plan for the Murrumbidgee Unregulated and Alluvial Water Sources 2012</i>
Peel Alluvium Water Source	<i>Water Sharing Plan for the Peel Valley Regulated, Unregulated, Alluvium and Fractured Rock Water Sources 2010</i>
Belubula Valley Alluvial Groundwater Source Upper Lachlan Alluvial Groundwater Source	<i>Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012</i>
Lower Darling Alluvial Groundwater Source	<i>Water Sharing Plan for the Lower Murray Darling Unregulated and Alluvial Water Sources 2011</i>
Manilla Alluvial Groundwater Source Quipolly Alluvial Groundwater Source Quirindi Alluvial Groundwater Source	<i>Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012</i>
Macintyre Alluvial Groundwater Source NSW Border Rivers Downstream Keetah Bridge Alluvial Groundwater Source NSW Border Rivers Upstream Keetah Bridge Alluvial Groundwater Source	<i>Water Sharing Plan for the NSW Border Rivers Unregulated and Alluvial Water Sources 2012</i>
Gunnedah-Oxley Basin MDB (Spring Ridge) Management Zone of the Gunnedah-Oxley Basin MDB Groundwater Source	<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>
Orange Basalt Groundwater Source Young Granite Groundwater Source	<i>Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011</i>

Attachment E—List of pattern-approved meters (non-urban)

Table 11. List of non-urban pattern-approved meters prepared by the National Measurement Institute dated 21 August 2018*

* This list has been prepared by the National Measurement Institute and is correct at the date of publication (August 2018). However the list is subject to change. Refer to the National Measurement Institute’s website for the most current list of pattern-approved meters (note that at the date of publication, the water meters in the online NMI list include both urban and non-urban meters):

www.measurement.gov.au/Publications/CertificateOfApproval/OtherInstruments/Water_utility_Meters

Certificate of Approval number	Meter model	Approved sizes (DN = internal pipe diameter in millimetres)	Approved maximum continuous flowrates (Q3)
14/3/21	KROHNE Model WATERFLUX 3070	DN25 – DN600	10 m ³ /h – 6,300 m ³ /h
14/3/24	Siemens Model MAG8000	DN50 – DN1200	63 m ³ /h – 12,500 m ³ /h
14/3/29	Arad Model Octave DN50	DN50 – DN200	40 m ³ /h – 400 m ³ /h
14/3/30	ABB Model AquaMaster3 FEV2	DN40 – DN200	40 m ³ /h – 1,000 m ³ /h
14/3/32	Pentair Model I500	DN50 – DN600	10 L/s – 1414 L/s
14/3/34	Sensus Model WP-Dynamic	DN40 – DN400	25 m ³ /h – 2,000 m ³ /h
14/3/36	Euromag Model MUT 2200 EL	DN40 – DN600	25 m ³ /h – 3,600 m ³ /h
P14/3/42	Rubicon Sonaray Pipe Meter	DN600	1 ML/d – 31.5 ML/d

Attachment F—Meter roll-out

The water sources referred to in stages 2 to 4 in the table below have been grouped into regions. Some water sharing plans contain water sources which span across these regions. To ensure that the roll-out dates are clear and consistent for users, all water sources will remain in the same region as the relevant water sharing plan for the purposes for the metering roll-out.

Table 12. Meter roll-out stages

Stage 1 - December 2019	Stage 2 Northern inland - December 2020	Stage 3 Southern inland - December 2021	Stage 4 Coast - December 2023
<p>Surface water works with an approval that authorises a work that is 500 mm or larger</p>	<p>All remaining works in water sources in the following water sharing plans:</p> <p>Barwon-Darling Unregulated and Alluvial Water Sources 2012</p> <p>Castlereagh River Unregulated and Alluvial Water Sources 2011</p> <p>Gwydir Regulated River Water Source 2016</p> <p>Gwydir Unregulated and Alluvial Water Sources 2012</p> <p>Intersecting Streams Unregulated and Alluvial Water Sources 2011</p> <p>Lower Gwydir Groundwater Source 2003</p> <p>Lower Macquarie Groundwater Sources 2003</p> <p>Macquarie and Cudgegong Regulated Rivers Water Source 2016</p> <p>Macquarie Bogan Unregulated and Alluvial Water Sources 2012</p> <p>Namoi Unregulated and Alluvial Water Sources 2012</p> <p>NSW Border Rivers Regulated River Water Source 2009</p> <p>NSW Border Rivers Unregulated and Alluvial Water Sources 2012</p> <p>NSW Great Artesian Basin Shallow Groundwater Sources 2011</p> <p>NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011</p> <p>NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</p> <p>Peel Valley Regulated, Unregulated, Alluvium and Fractured Rock Water Sources 2010</p> <p>Upper and Lower Namoi Groundwater Sources 2003</p> <p>Upper Namoi and Lower Namoi Regulated River Water Sources 2016</p> <p>North Western Unregulated and Fractured Rock Water Sources 2011</p> <p>NSW Great Artesian Basin Groundwater Sources 2008</p>	<p>All remaining works in water sources in the following water sharing plans:</p> <p>Belubula Regulated River Water Source 2012</p> <p>Lachlan Regulated River Water Source 2016</p> <p>Lachlan Unregulated and Alluvial Water Sources 2012</p> <p>Lower Lachlan Groundwater Source 2003</p> <p>Lower Murray Darling Unregulated and Alluvial Water Sources 2011</p> <p>Lower Murray Groundwater Source</p> <p>Lower Murray Shallow Groundwater Source 2012</p> <p>Lower Murrumbidgee Groundwater Sources 2003</p> <p>Murray Unregulated and Alluvial Water Sources 2011</p> <p>Murrumbidgee Regulated River Water Source 2016</p> <p>Murrumbidgee Unregulated and Alluvial Water Sources 2012</p> <p>New South Wales Murray and Lower Darling Regulated Rivers Water Sources 2016</p>	<p>All remaining works in water sources in the following water sharing plans:</p> <p>Bega and Brogo Rivers Area Regulated, Unregulated and Alluvial Water Sources 2011</p> <p>Bellingher River Area Unregulated and Alluvial Water Sources 2008</p> <p>Brunswick Unregulated and Alluvial Water Sources 2016</p> <p>Central Coast Unregulated Water Sources 2009</p> <p>Clarence River Unregulated and Alluvial Water Sources 2016</p> <p>Clyde River Unregulated and Alluvial Water Sources 2016</p> <p>Coffs Harbour Area Unregulated and Alluvial Water Sources 2009</p> <p>Deua River Unregulated and Alluvial Water Sources 2016</p> <p>Greater Metropolitan Region Groundwater Sources 2011</p> <p>Greater Metropolitan Region Unregulated River Water Sources 2011</p> <p>Hunter Regulated River Water Source 2016</p> <p>Hunter Unregulated and Alluvial Water Sources 2009</p> <p>Lower North Coast Unregulated and Alluvial Water Sources 2009</p> <p>Macleay River Unregulated and Alluvial Water Sources 2016</p> <p>Murrah-Wallaga Area Unregulated and Alluvial Water Sources 2010</p> <p>Nambucca Unregulated and Alluvial Water Sources 2016</p> <p>North Coast Coastal Sands Groundwater Sources 2016</p> <p>North Coast Fractured and Porous Rock Groundwater Sources 2016</p> <p>Paterson Regulated River Water Source 2007</p> <p>Richmond River Area Unregulated, Regulated and Alluvial Water Sources 2010</p> <p>Snowy Genoa Unregulated and Alluvial Water Sources 2016</p> <p>South Coast Groundwater Sources 2016</p> <p>Towamba River Unregulated and Alluvial Water Sources 2010</p> <p>Tuross River Unregulated and Alluvial Water Sources 2016</p> <p>Tweed River Area Unregulated and Alluvial Water Sources 2010</p> <p>Hastings Unregulated and Alluvial Water Sources (expected to commence September 2018)</p>