

Rural water management program

Proposals for strengthening non-urban water measurement

CONSULTATION PAPER

September 2019



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Introduction

Our water supply is a precious resource for all Queenslanders, and especially for irrigators, farmers, growers and miners. We all share a responsibility for using it fairly and equitably. The Queensland Government, through the Department of Natural Resources, Mines and Energy (the department) is committed to driving more transparent and accountable water management to support communities, economic development and environmental needs on behalf of all of us.

The Rural Water Management Program (RWMP) is strengthening the ways Queensland's water resources are managed, measured and reported. It was launched in response to the findings of an independent expert panel appointed by the Queensland Government in 2017 to audit non-urban water measurement and compliance.

The Independent Audit found that:

- a significant number of meters do not meet national standards
- existing meter validation and maintenance processes are flawed
- meter reading is done infrequently, resulting in a lack of available information
- metering is implemented inconsistently across the state.

The independent panel's recommendations, most of which were supported in full or in principle by the Queensland Government, identified the need for enhancements in water measurement, regulation and compliance, and information transparency, in order to better manage our vital resources for all water users.

The RWMP builds on our existing programs and is delivering projects to:

- strengthen water measurement
- provide transparent water information
- enhance our regulatory approach
- enable robust compliance.

While the Murray-Darling Basin catchments are a priority, the program has a state-wide focus and will deliver a series of actions to strengthen community confidence in the way Queensland's water resources are accessed and managed.

Strengthening water measurement is one of the key components of the RWMP. Accurately measuring, recording and reporting water take provides transparency and assurance that water is being appropriately managed and that water entitlement holders are meeting their obligations. This makes water meters a critical tool for measuring the take of water.

This consultation paper outlines new policy proposals to improve the standard and coverage of non-urban water measurement and support increased transparency and access to water information across Queensland by:

- providing greater clarity on where a water meter will or won't be required
- introducing telemetry to ensure the collection of real-time data about water use
- identifying a framework to improve the accuracy of water meters
- including a phased implementation of metering based on the level of pressure and risk to water resources.

This paper explains the draft policy proposals and seeks input into the development of a new non-urban water measurement policy for Queensland.

Have your say

We are seeking feedback from the community on the draft proposals to ensure that any new policy is practical and can be implemented effectively. We are particularly interested in comments from water entitlement holders about:

- what forms of water take should be metered, rather than measured in other ways
- whether thresholds can be applied to determine where meters are required
- whether telemetry is a viable and desirable option for data gathering, including how real-time water data should be collected and where it should be available
- issues, assurances and standards around data loggers
- requirements for and application of accuracy testing
- requirements for the validation and maintenance of meters
- record keeping requirements
- the timeframes and approach for implementing the proposals.

Feedback on these proposals can be made in writing from Monday 9 September to 5pm Friday 13 December, 2019. You can make your submission by email, post or online:

- Online: complete the [online submission form](#) at www.getinvolved.qld.gov.au
- Email: RWMP@dnrme.qld.gov.au
- Post:
Department of Natural Resources, Mines and Energy
Attn: Executive Director, Water Markets
PO Box 15216
City East QLD 4002

Non-urban water measurement framework

The draft policy proposals will be key considerations as we develop a new non-urban water measurement policy to deliver more accurate and reliable measurement across Queensland. The final policy will need to work to the benefit of water entitlement holders, the community and government. It will also need to align with the National Framework for non-urban water metering, allowing Queensland to meet its national water measurement obligations.

Why we need to measure water take

Accurately measuring, recording and reporting water take helps ensure our water resources are managed sustainably. It's also important for effectively implementing Queensland's water plans, including their provisions for how water is shared. Our water plans ensure that water is allocated sustainably to support communities, facilitate economic development and meet environmental needs.

Accurate measurement of water can benefit communities, industry and the environment by:

- providing transparency and assurance that water is being appropriately shared and managed
- ensuring water take complies with water plan requirements to protect environmental flows
- providing water entitlement holders with reliable evidence that they are meeting their regulatory obligations
- ensuring that water take is consistent with water entitlements
- facilitating the operation of water markets and trading.

Objectives of the non-urban water measurement framework

- Ensure the take of water under water entitlements is accurately measured and reported.
- Water measurement information effectively supports the delivery of water planning and management objectives.
- Identify where metering will be required and how we will implement it.
- Ensure adequate standards for metering that give assurance of meter performance and accuracy.
- Provide certainty to water entitlement holders regarding their water measurement obligations.
- Support the optimum utilisation of water made available through water entitlements.
- Meet Queensland's obligations in the Murray-Darling Basin.

Who will need a meter?

The draft policy proposals seek to make clear the entitlements or forms of water take for which a meter will be required.

Entitlements proposed to require a meter

Policy proposals

| Entitlements requiring a water meter |
|---|
| <ul style="list-style-type: none">• Water Allocations* (entitlement tradeable separate from land)• Water Licences – Relocatable (entitlement is tradeable but must be attached to land)• Water Licences – Other** (excluding stock & domestic licences) – if specified in a water plan or water regulation• Where supplemented and unsupplemented¹ water entitlements are taken through the same works• Bulk water offtakes for water supply schemes• Water taken under special agreements where required under the agreement or as a condition of a water entitlement or permit associated with the agreement. |
| <p>* The timing of improved metering for supplemented water allocations will be considered in consultation with water service providers taking account of price path processes.</p> <p>**Thresholds may be set in water plans and under regulation to avoid the unnecessary metering of small water licences which have negligible individual or cumulative impacts. The precise volume involved will vary between areas so must be assessed based on local conditions.</p> |

Supporting information

Water allocations (tradeable water rights) and relocatable water licences have carefully specified volumes which makes their use more easily measurable. It is important that these categories of water entitlement are metered, particularly to support water markets.

Most other water entitlements are water licences. These cover a wide range of purposes and sizes across the state and are attached to specified parcels of land. Some licences have a specific volume able to be taken or a maximum area able to be irrigated, while others are limited by the type of use and conditions for taking water.

Under the policy proposals:

- general stock and domestic water licences will not be metered. These licences have no volume specifications and are limited by the type of use and conditions under which water can be taken
- water licences which are already required by regulation to have a meter would continue to require one
- in areas under a water plan, the requirement for remaining water licenses to be metered would be assessed using a risk-based approach through the state's well-established water planning and assessment processes. This will enable landholders and other stakeholders to have their views considered and for local needs and risks be addressed in a flexible way.

¹ A **supplemented** water entitlement is one which is enhanced by releases of water from government-owned water storages. An **unsupplemented** entitlement is not enhanced by supplies from government-owned water storages.

While some states have specified whole-of-state volume thresholds for metering, this approach has not been proposed for Queensland. Because of wide variations across the state, a small volume of water in one location may be quite significant and important to measure but relatively insignificant in another. As a result, state-wide thresholds may not allow the flexibility needed to best determine where metering is required

Consultation question 1: Considering the proposal for who will need a meter, please provide your feedback on which types of water take or water entitlements should be subject to metering.

Consultation question 2: Should there be thresholds or limits on the requirement for a meter? If so, what would they be and why?

Purchase and ownership of metering equipment

Consistent with the existing policy, water entitlement holders will continue to be responsible for all costs relating to installing, maintaining and operating their meters and measurement equipment.

Attachment 1 provides an outline of potential costs for meter installations.

Proposed future metering equipment and requirements

All meters and installations must be accurate, verifiable and auditable to provide confidence in water measurement. To ensure this, metering equipment (meters, data loggers, telemetry) and its installation, validation and maintenance will need to comply with the department's non-urban water metering standards. These standards will outline and explain the technical requirements for meters. The new proposed standards are consistent with, and will need to be followed in conjunction with the Australian Standard AS 4747: Meters for non-urban water supply².

This table summarises proposed metering equipment and standards for different types of non-urban water metering.

Table 1 Summary of metering equipment and standards proposals

| | Meter - Pattern approved | Data logger | Telemetry - required on a priority basis | Validated to AS4747 or equivalent | Maintenance including accuracy |
|---|--------------------------|-------------|--|-----------------------------------|--------------------------------|
| Existing unsupplemented meters | ✓ some exceptions | ✓ | ✓ | ✓ | ✓ |
| New or replacement unsupplemented meters | ✓ some exceptions | ✓ | ✓ | ✓ | ✓ |
| Joint meters* | ✓ | ✓ | ✓ | ✓ | ✓ |
| Water supply and distribution scheme bulk-off take meters | ✓ | ✓ | ✓ | ✓ | ✓ |

*Meters taking both supplemented and unsupplemented water.

Attachment 2 provides more information about the proposed standards for non-urban water metering.

New or replacement meters (including joint meters and bulk meters)

Policy proposals

It is proposed that all new and replacement meters would need to meet the departmental standards which align with AS4747.

Installation of pattern approved meters will be required, with limited exceptions. These requirements will be set out in the departmental standard.

Supporting information

To ensure that accurate, reliable and timely information is available to support water management, compliance, information transparency and water market operation, it is essential that meters are installed, operating and maintained appropriately.

This can be achieved by requiring all new and replacement meters to stringently meet the proposed new departmental standards which align with the Australian Standard AS4747. This includes

² AS 4747 is available on [Standards Australia](https://standards.australia.gov.au/) website

requirements for data loggers (to record and store meter data) and telemetry (to transmit meter read data to the department).

Entitlement holders can also take water under both unsupplemented and supplemented water entitlements. Where this is the case, the water take often occurs through a single meter. These meters are referred to as joint meters or dual-purpose meters.

While the supplemented component needs to be accounted for to the water supply scheme operator (such as water accounting and charging), the unsupplemented component needs to be accounted for to the department. This is to check if the unsupplemented take is consistent with entitlements and access conditions, such as time or flow thresholds. As a result, all joint meters must meet the required standards.

Pattern approval

Pattern approval is the process of testing the pattern (design) of an instrument against an established standard by an impartial body.

For water meters, pattern approval determines whether a meter is able to remain accurate in a range of environmental and operating conditions. Meters are tested to meet the accuracy requirements of AS4747 and must be installed according to the pattern approval and/or manufacturers specifications.

Consultation question 3: What factors need to be considered in requiring pattern approved meters where these are available on the market?

Data recording, storage and transmission

Policy proposals

As part of strengthening transparency and accountability, the policy proposals recommend introducing requirements for the recording, storage and electronic transmission of real-time meter read information as a standard requirement for metering.

A data logger (a device to record and store meter data) is proposed to be included on all new and replacement installations. A new data logger standard outlining specific requirements is being developed.

A telemetry device (to transmit data to the department) is proposed to be included on new and replacement meter installations. The timing for this requirement will be on a priority basis, such as in high risk areas and the Murray-Darling Basin.

Water entitlement holders would be responsible for the cost of including these devices as part of their metering installations.

Supporting information

Making data more available through devices such as data loggers and the use of telemetry provides opportunities to significantly improve water information management, sharing and transparency.

Data loggers

A data logger is a recording device fitted to your meter that measures water use throughout the day. These devices can record and store data for a number of years, ensuring it's auditable and verifiable.

Information captured by data loggers can show how you use water over time. The data can help you make your water use more efficient by identifying issues like leaking pipes, broken fixtures and incorrectly set irrigation systems. The data they provide can also potentially allow you to enter the water trading market as a buyer or seller.

Telemetry

Telemetry is the automatic transmission of data for monitoring. The technology is already used in the agriculture, irrigation and water industry sectors, and its cost and availability has improved significantly in recent years. It is a valuable tool for water measurement, management and reporting.

Telemetry devices can use available communication networks to automatically transmit data from meters, pumps and other devices. The department would provide systems to securely receive, store and report the data, including providing water entitlement holders with timely access to their water use information. This up-to-date data would enhance the department's water management capabilities.

Like data loggers, telemetry data provided back to entitlement holders could support more informed farm management decisions on matters such as water and energy use and minimising water losses, leading to reduced input costs and improving farm profitability. It could also help identify opportunities to enter the water market as a seller or buyer of water.

There has been no decision about what information would be made available beyond the department and individual water entitlement holders. Information privacy requirements are a key consideration.

In the Murray-Darling Basin, the requirement for telemetry on certain entitlements has already been agreed as part of Queensland's commitments to the Murray-Darling Basin Compliance Compact.

Many water entitlements have timing triggers and pumping or water level thresholds that apply to the taking of water. These timing triggers and thresholds underpin the equitable sharing of available water among entitlement holders on a real-time basis and also serve to protect water for the environment and other water users. Situations like these make the availability of real-time information through telemetry a valuable and important way to give entitlement holders and the community confidence that water is being shared fairly and environmental outcomes are being achieved.

It's important that water entitlement holders are able to demonstrate that they're meeting their obligations. Telemetry provides a way to do this in a timely, efficient and transparent manner. Access to real-time data would also allow the department to more effectively hold entitlement holders that unfairly take water outside of their entitlements to account.

The department is assessing transmission network options for telemetered data to ensure reliable coverage is available.

Consultation question 4: In consideration of data recording, storage and transmission, are there circumstances where you consider telemetry is not beneficial?

Consultation question 5: Should there be thresholds or limits on the requirement for telemetry? If so, what would they be and why?

Consultation question 6: Are there any circumstances where you believe data loggers are not beneficial? If so, please describe these and why.

Consultation question 7: What information would you require from the department to be certain about what your data logger is required to do and which device to install?

Consultation question 8: What privacy and commercial-in-confidence considerations do you think are important in relation to the department's and the water entitlement holder's storage, access to and use of water use data?

Existing Meters

Policy proposals

Where water entitlement holders are already required to have a meter, or where a meter is already installed, they will continue to require one.

Transitional arrangements are proposed so that an existing meter can remain in service if:

- it can be shown to be reading accurately (within plus or minus 5%)
- a data logger is or can be fitted
- it is maintained in accordance with the provisions of the new departmental standards.

Under the proposals, an existing meter which can't meet these requirements would need to be replaced in accordance with the proposed standards.

Supporting information

Transitioning existing meters

Some existing meters may be able to be retained. Transitional arrangements for existing meters would need to take into account accuracy and maintenance, the ability to record readings (i.e. data logger compatibility) and whether the existing interim standard has been met.

Where an existing meter doesn't meet the proposed standards but can be verified to read accurately (+/-5%), can be fitted with a data logger and has been maintained in accordance with the standards, that meter does not need to be replaced until end of life or until it is no longer reading accurately. The proposed standard will set out the timeframes for end of life.

Transitional arrangements will be developed in conjunction with the new metering standards.

Faulty meters

It is possible that an existing meter could become faulty. The *Water Regulation 2016* requires water users to report faulty meters. Under the existing requirements:

- a water user must inspect their meter and/or recording device each time they submit a meter reading to verify that their meter is not faulty
- if a water user becomes aware at any time that their meter has ceased to work or is faulty, they must notify the department and either repair the meter or replace it with one which meets the required standard
- when a water entitlement holder notifies the department about their faulty meter they are given 60 business days (12 weeks) to repair and have the meter validated, provided they maintain the required water use records during this period
- during this period, the meter is still an approved meter. If it is not possible to meet the 12-week timeframe, the water entitlement holder can apply for a further extension based on their specific circumstances.

Consultation question 9: How well do the proposed transitional arrangements balance improved meter accuracy and minimising costs for existing meter owners?

Validation and maintenance of meters

Policy proposals

Water entitlement holders will continue to be responsible for validating and maintaining meters.

Entitlement holders must ensure that a validator (certified meter installer) validates their meter and meter installation against the departmental standards.

Entitlement holders will still be required to lodge a validation certificate with the department.

All meters must be maintained in accordance with the departmental standards, which will set out requirements to ensure ongoing accuracy and operation of meters based on meter type.

Entitlement holders will be required to retain records of meter installation, validation and maintenance and provide these to the department on request.

Periodic testing of meters is proposed to ensure ongoing accuracy.

Supporting information

Enhanced meter validation and maintenance processes will ensure that meters comply with required standards, are installed in accordance with specifications and are operating effectively. The costs associated with validation and maintenance will continue to be the responsibility of entitlement holders.

Proposed reforms include periodic meter accuracy testing for meters commencing once meters reach end of life. The proposed standard will set out the timeframes for end of life. This is a change from the existing policy, but is essential where metering is the mandated form of measurement and is needed to provide confidence that accuracy is being achieved.

Validation

The Water Regulation prohibits entitlement holders from validating their own meter.

Validation is a set of activities to inspect a meter, checking that it's pattern approved, installed in compliance with the relevant standards and maintained to an acceptable state. Validation provides confidence that the meter will operate within an acceptable range of error under normal operating conditions.

While validation is an existing requirement, it has been enhanced. A more rigorous validation process and documentation is proposed to be included in the departmental standard. Validators will be required to record details of works, meter body specifications (including pattern approval details, meter flow capabilities and power source), information on the type of data logger installed and commissioning details confirming the level of accuracy and test method used by the manufacturer.

Validation must be conducted by a certified meter installer (a validator). An entitlement holder cannot validate their own meter installation. Where a meter meets the validation requirements in the standard, a validator will issue a certificate. This validation certificate must be provided to the department.

The departmental standard will outline the schedule and timeframes for meter validations. Non-pattern approved meters are proposed to be subject to more frequent validation.

Maintenance

General maintenance, including an annual, visual inspection to ensure the meter is operational, is proposed. An entitlement holder can conduct this inspection, which would need to be documented.

Tamper evident seals

Tamper evident seals provide visible, identifiable evidence of meter tampering, dismantling or alterations. They must be applied whenever a meter is installed or maintained. If a seal is broken the meter must be re-validated by a validator.

For example, re-validation may be required where the workings of a meter are accessed as part of maintenance and the tamper evident seals have been broken.

Requirements to keep and provide records

Entitlement holders will be required to keep and provide records in relation to meter installations, validation, maintenance and – in some circumstances – water take. Retaining this information will help entitlement holders show they are meeting their obligations and ensure meter records are auditable and verifiable. There may be circumstances where this information must be provided to the department or made available on request. The departmental standards will outline further details about record keeping requirements.

Consultation question 10: What do you see being the effects of the proposed changes to validation and maintenance requirements?

Supplemented water

Policy proposals

To achieve greater consistency in the standards for how water take is measured, these policy proposals would also apply to supplemented water (water supply or distribution scheme water). The only exception would be for channel irrigation schemes, where only the offtake to the scheme will need to meet the new standards.

Supporting information

Supplemented water take is a significant proportion of all water taken under water entitlements in Queensland. This take is currently subject to metering as determined by the water supply scheme operators and has not been required to meet the department's interim standards. This has resulted in unsupplemented water users being held to a higher standard than supplemented water users.

To give water users, industry and the community confidence that the state's water is being used fairly and equitably, all forms of water take must be subject to accurate water measurement. Consistent measurement standards for all take under water entitlements will mean more transparent and equitable water use for everyone.

Implementation timeframes for supplemented water measurement would be developed in close consultation with water supply and distribution scheme operators. Queensland's Murray-Darling Basin commitments and future price path determinations will be considered in these discussions.

Implementation approach and timing

It is proposed that the implementation of metering under a new non-urban water measurement policy across the state will be phased in over a number of years.

An implementation plan will be developed with timeframes informed by risks arising through pressure on available water resources as well as through water plan requirements and national commitments. The implementation plan will draw on information from water planning processes, water management priorities and the outcomes of this and related community consultations. This includes:

- detailed hydrologic assessments of watercourses and aquifers
- identifying environmental risks and needs
- reviewing the degree of development and demand pressure for water
- the need to ensure equitable sharing of the available resource.

The Queensland Murray-Darling Basin will be a priority focus for implementation, especially in relation to delivering metering commitments under the Murray-Darling Compliance Compact. Under these commitments, Queensland must ensure water entitlements in the Queensland Murray-Darling Basin are accurately measured by 2025.

The proposed timeframe for implementing the policy proposals allows industry and water entitlement holders to adapt to the new metering requirements. This timeframe also allows government to develop enhanced water information systems to collect, store and report water meter data.

However, metering is also an ongoing process as water entitlements are activated transferred or traded. Information about metering in the short-term will continue to be available to support water markets and trading.

The implementation of metering for supplemented water entitlements will be phased in over time in close consultation with water supply and distribution scheme operators, taking into account price path timeframes.

Consultation question 11 – Are there any other matters which need to be considered in determining an effective implementation plan?

Other forms of water measurement

While this paper focuses on metering, other technologies and approaches could also be used to improve measurement and provide solutions where metering is not suitable. The department is investigating, trialling and considering other measurement options for improved water management.

Alternative measurement approaches can include sensors on pumps and storage sensors, desktop satellite imagery analysis and the use of remote sensing technologies such as Lidar to assess storage volumes and potential growth.

The department could potentially use these approaches to monitor or further develop methodologies to estimate forms of take under water permits, overland flow (where an entitlement is not required) and through statutory authorisations, (e.g. stock and domestic, prescribed activities under water regulation). This would improve the department's capabilities to manage the state's water resources sustainably and holistically.

More information

Find out more about the measurement policy proposals and consultation process at www.dnrme.qld.gov.au.

Attachment 1: Costs – installation and maintenance of meters and measurement equipment

Consistent with the existing policy, water entitlement holders will be responsible for all costs relating to installing, maintaining and operating their meters and measurement equipment.

The introduction of data loggers and telemetry as a mandatory requirement on meter installations may lead to new costs for water entitlement holders.

Cost estimates per installation* are:

- for smaller meters (up to 200 mm) – \$8,000 to \$12,000
- for medium-sized meters (approximately 300 mm) – \$14,000 to \$18,000
- for large meters (450 mm to 600 mm) – \$25,000 to \$50,000
- for very large meters (approximately 1200 mm) – \$90,000 to \$100,000.

**The unit cost of meters, including data loggers and telemetry, as well as associated costs such as pipework, labour and validation, have been taken into account.*

Initial estimates indicate that the cost to retrofit telemetry to an existing meter ranges from \$500 to \$5000. The cost may be higher for complex metering installations.

The cost for enhanced validation requirements is expected to be \$200 - \$300 per validation, as the majority of the costs are generally associated with the validator accessing the site (travel costs) and these costs will not change under the new proposals.

Attachment 2: Further information about proposed non-urban water metering standards and requirements

It is anticipated that in the future all new and replacement meters in Queensland will be required to be pattern approved.

Requirements for very large meter installations

However, given the current limited supply market* and alternate technologies available for closed conduit full pipe meter installations greater than 600 millimetres in diameter, the department may consider the use of a non-pattern approved meters** for these very large meter installations. The proposed standards will be regularly reviewed and as the supply market for pattern approved meters improves this exception will be removed. In the interim, more frequent validation and accuracy requirements will apply where non-pattern approved meters have been installed. Enhanced maintenance requirements for all meters is outlined in the Maintenance section of this attachment.

*As at 4 July 2019 there were only 2 pattern approved non-urban closed conduit full pipe water meters for (greater than) DN600 to DN1000 installations; only 1 pattern approved meter for DN1200 installations, and no pattern approved meters were available for meters over DN1200. Further, there are currently no pattern approved meters available for open channel or partially filled pipe installations.

**For large meter installations, the use of a pattern approved meter should always be considered in the first instance. However, where a non-pattern approved meter is the only feasible option, the following factors would be considered for use of the meter:

| Factors to be considered | ‘Installations (greater than) 600 mm nominal diameter’ |
|--|---|
| Performance => | As specified in <i>AS4747.2 Clause 4.3.2.1</i> or <i>Clause 4.3.3</i> (for closed conduit full pipes) As specified in <i>AS4747.3 Clause 7.3.2.1</i> or <i>Clause 7.3.3</i> (for open channels) |
| How => | In accordance with the requirements of <i>AS4747.2 - Clause 4.3.1.2</i> or <i>Clause 4.3.1.3</i> (for closed conduit full pipes) In accordance with the requirements of <i>AS4747.3 - Clause 7.3.1.2</i> or <i>Clause 7.3.1.3</i> (for open channels) |
| Other aspects => | Shown to comply with <i>AS4747.2</i> : <ul style="list-style-type: none"> - <i>Clause 1.1 Scope</i>; - <i>Section 2 Materials</i>; - <i>Section 3 Design</i>; and - <i>Section 5 Product Documentation</i>. |
| Certification of submission to the department => | <i>certified meter installer</i> (for a proposed meter which defines its own geometry). <i>certified meter installer</i> , with training certification by the meter manufacturer (for a proposed meter which does not define its own geometry). <i>certified practicing hydrographer</i> (for a proposed open channel meter). |

Meter installation

All non-urban meters will be required to be installed in compliance with the Pattern Approval certificate and the appropriate Australian Standards.

All meters for non-urban use shall be installed in accordance with the relevant NMI documents, Australian Standards or Technical Specifications or manufacturer's specifications (where these reflect NMI documents and Australian Standards), such that there is an acceptable level of confidence that the meters will operate within the maximum permissible limits of error ($\pm 5\%$) allowable under in situ conditions.

(Source – National Framework for Non-urban Water Metering)

The proposed new Queensland metering standard would mandate that meters are to be installed and commissioned as per the requirements of *Australian Standard 4747 – Meters for Non-Urban Water Supply*.

Validation

All non-urban meters will be required to be validated by a certified validator after installation and before water is taken through the meter under the entitlement.

Post-installation validation shall apply to all non-urban meters to ensure there is an acceptable level of confidence newly installed meters operate within the maximum permissible limits of error allowable under in situ conditions ($\pm 5\%$).

Post-installation validation shall be undertaken by a certified validator or certified installer who also holds certified validator status.

To validate a meter after installation, the certified validator shall undertake the following best practice checks:

- *Check the meter (or measuring system, including its component parts) to ensure it has a verification mark and is correctly installed in accordance with the relevant NMI documents, Australian Standards or Technical Specifications and manufacturer's specifications:*

For closed conduits:

- *check the installation to ensure that the lead-in / lead-out pipe lengths are of the specified length*
- *For closed conduits, check the meter internals (via meter capsule removal or lead-in /lead out disassembly) and where necessary remove and clean pipe lengths to ensure they are straight, round and free from obstruction. (The checks which may be undertaken shall vary with the type of meter, e.g. the range of checks possible with an electro-magnetic meter differs greatly from those possible with a mechanical meter).*
- *For open channels, calibrate weirs and height gauges and inspect upstream and downstream infrastructure to minimise potential obstructions impacting on the performance of the measuring device.*

Where appropriate, seal the meter with a seal that is approved by the relevant government department, agency or water service provider to prevent tampering.

Approve the meter and installation for use and issue a validation certificate to the meter owner/user.

Certified installers, maintainers and validators shall hold certification issued by a nationally recognised, industry-based certification scheme. Certification will be competency-based and will recognise qualifications and/or equivalent experience.

(Source – National Framework for Non-urban Water Metering)

Under a new Queensland metering standard it is proposed that:

- A *certified meter installer*, commission, validate and seal a pattern approved meter, post installation.
- A *certified meter installer*, install, commission, validate and seal a non-pattern approved meter, which defines its own geometry.
- A *duly qualified person*, install, commission, calibrate, validate and seal a meter, which does not define its own geometry or is measuring in a partially full pipe.
- A *certified practicing hydrographer*, install, commission, calibrate, validate and seal an open channel meter.

Queensland has proposed to use:

- A *duly qualified person*, as described, as they will have *certified meter installer* accreditation, plus specialised training certification by the particular meter manufacturer.
- A *certified practicing hydrographer*, as described, due to their specialised training in open channel/watercourse measurement. A *certified practicing hydrographer* has received professional recognition of their specialised skills through certification by the Australian Hydrographic Surveys Certification panel.

Maintenance of meters – proposed timeframes for validation (ongoing)

The following four tables detail the maintenance schedule proposed in a new standard by meter type.

CLOSED CONDUIT METERS FULLY CHARGED

Table 1a – Pattern Approved Meter:

| Meter Type | Inspection certificate | All meters |
|--------------------------------------|---|--|
| Mechanical | <p><i>Priority meter:</i> 6 monthly</p> <p>All other meters: Annually</p> | <p>Timetable/Sequence:</p> <p>1) Before 5th year of service ends-> <i>validation certificate (by certified meter installer)</i>.</p> <p>2) Before 10th year of service ends: a) replace element and stem assembly, where flow tube in good condition (AS4747 recommends replacing element and stem assembly after 10 years of service) -> <i>validation certificate (by certified meter installer)</i>; or b) where flow tube not in good condition, replace with a new meter which meets the requirements of the Qld Standard.</p> <p>3) Before 15th year of service ends-> <i>validation certificate (by certified meter installer)</i>.</p> <p>4) Before 20th year of service ends: a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard (AS4747 recommends replacing entire assembly after a maximum of 20 years of service); or b) a conforming <i>accuracy test</i> and <i>validation certificate (by certified meter installer)</i> is provided – 3 yearly (continuing).</p> |
| Electronic | | <p>Timetable/Sequence:</p> <p>1) 5 yearly (e.g. before 5th year of service ends, before 10th year of service ends, etc.) -> <i>Validation certificate (by certified meter installer)</i>.</p> <p>2) Before 30th year of service ends: a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard (AS4747 recommends replacing meter after a maximum of 30 years of service); or b) a conforming <i>accuracy test</i> and <i>validation certificate (by certified meter installer)</i> is to be provided – 3 yearly (continuing).</p> |
| Any meter with suspect read accuracy | | <p>Within 3 months, or at next available flow event thereafter:</p> <ul style="list-style-type: none"> - a conforming <i>accuracy test (by certified meter installer)</i> is provided. |

Table 1b – Non-Pattern Approved Meter:

| Meter Type | Inspection certificate | All meters |
|---|--|---|
| Mechanical | | <p>Timetable/Sequence:</p> <ol style="list-style-type: none"> 1) Before 3rd year of service ends -> conforming <i>accuracy test</i> and <i>validation certificate</i> (by certified meter installer). 2) Before 6th year of service ends: <ol style="list-style-type: none"> a) replace element and stem assembly, where flow tube in good condition -> conforming <i>accuracy test</i> and <i>validation certificate</i> (by certified meter installer); or b) where flow tube not in good condition, replace with a new meter which meets the requirements of the Qld Standard. 3) Before 9th year of service ends: <ol style="list-style-type: none"> a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>accuracy test</i> (by certified meter installer) is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier. |
| Electronic – defines own geometry | <p>Priority meter: 6 monthly</p> <p>All other meters: Annually</p> | <p>Timetable/Sequence:</p> <ol style="list-style-type: none"> 1) 3 yearly (e.g. before end of 3rd year of service, before end of 6th year of service, etc.) -> conforming <i>accuracy test</i> and <i>validation certificate</i> (by certified meter installer). 2) Before 15th year of service ends: <ol style="list-style-type: none"> a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>accuracy test</i> (by certified meter installer) is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier. |
| Electronic – does not define own geometry | n/a | <p>All other meters - timetable/sequence:</p> <ol style="list-style-type: none"> 1) 3 yearly (before 3rd year of service ends, before 6th year of service ends, etc.) -> conforming <i>calibration report</i> and <i>validation certificate</i> (by duly qualified person). 2) Before 15th year of service ends: <ol style="list-style-type: none"> a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>calibration report</i> (by duly qualified person) is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier. <p><i>Priority meter installation</i> - timetable/sequence:</p> <ol style="list-style-type: none"> 1) Annually (before end of 12 months, before end of 24 months, etc.) -> conforming <i>calibration report</i> and <i>validation certificate</i> (by duly qualified person). 2) Before 15th year of service ends: <ol style="list-style-type: none"> a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>calibration report</i> (by duly qualified person) is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier. |
| Any meter with suspect read accuracy | | <p>Within 3 months, or at next available flow event thereafter:</p> <ul style="list-style-type: none"> - Meter defines own geometry – conforming <i>accuracy test</i> (by certified meter installer). - Meter does not define own geometry – conforming <i>calibration report</i> (by duly qualified person). |

OPEN CHANNEL & PARTIALLY FULL PIPE METERS

Table 2a – Pattern Approved Meter:

| Meter Type | Inspection certificate | All meters |
|--------------------------------------|-------------------------------|---|
| Partially filled pipe | Priority meter: 6 monthly | <p>Timetable/Sequence:</p> <p>1) 5 yearly (e.g. before 5th year of service ends, before 10th year of service ends, etc.) -> Validation certificate (by duly qualified person).</p> <p>2) Before 30th year of service ends:</p> <p>a) the meter is to be replaced with a new meter which meets the requirements of this Qld Standard (AS4747 recommends replacing meter after a maximum of 30 years of service); or</p> <p>b) a conforming <i>accuracy test</i> and <i>validation certificate (by duly qualified person)</i> is provided – 3 yearly (continuing).</p> |
| Open Channel | All other meters: Annually | <p>Timetable/Sequence:</p> <p>1) 5 yearly (e.g. before 5th year of service ends, before 10th year of service ends, etc.) -> Validation certificate (by certified practicing hydrographer).</p> <p>2) Before 30th year of service ends:</p> <p>a) the meter is to be replaced with a new meter which meets the requirements of this Qld Standard (AS4747 recommends replacing meter after a maximum of 30 years of service); or</p> <p>b) a conforming <i>accuracy test</i> and <i>validation certificate (by certified practicing hydrographer)</i> is provided – 3 yearly (continuing).</p> |
| Any meter with suspect read accuracy | | <p>Within 3 months, or at next available flow event thereafter:</p> <ul style="list-style-type: none"> - Partially filled pipe – conforming <i>accuracy test (by duly qualified person)</i>. - Open channel – conforming <i>accuracy test (by certified practicing hydrographer)</i>. |

Table 2b – Non-Pattern Approved Meter:

| Meter Type | Inspection certificate | All meters |
|--|-------------------------------|---|
| Partially filled pipe – defines own geometry | Priority meter: 6 monthly | <p>Timetable/Sequence:</p> <p>1) 3 yearly (e.g. before 3rd year of service ends, before 6th year of service ends, etc.) -> conforming <i>accuracy test</i> and <i>validation certificate (by duly qualified person)</i>.</p> <p>2) Before 15th year of service ends:</p> <p>a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or</p> <p>b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>accuracy test (by certified meter installer)</i> is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier.</p> |
| Partially filled pipe – does not define own geometry | All other meters: Annually | <p>All other meters - timetable/sequence:</p> <p>1) 3 yearly (before 3rd year of service ends, before 6th year of service ends, etc.) -> conforming <i>calibration report</i> and <i>validation certificate (by duly qualified person)</i>.</p> <p>2) Before 15th year of service ends:</p> <p>a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or</p> <p>b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>calibration report (by duly qualified person)</i> is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier.</p> |
| Partially filled pipe – does not define own geometry | n/a | <p><i>Priority meter installation</i> - timetable/sequence:</p> <p>1) Annually (before end of 12 months, before end of 24 months, etc.) -> conforming <i>calibration report</i> and <i>validation certificate (by duly qualified person)</i>.</p> <p>2) Before 15th year of service ends:</p> <p>a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or</p> <p>b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>calibration report (by duly qualified person)</i> is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier.</p> |
| Open channel | n/a | <p>Timetable/sequence:</p> <p>1) Annually (before end of 12 months, before end of 24 months, etc.) -> conforming <i>calibration report</i> and <i>validation certificate (by certified practicing hydrographer)</i>.</p> <p>2) Before 15th year of service ends:</p> <p>a) the meter is to be replaced with a new meter which meets the requirements of the Qld Standard; or</p> <p>b) approval for the continued use of a non-pattern approved meter is a matter for negotiation with the department -> conforming <i>calibration report (by certified practicing hydrographer)</i> is also to be provided. The factors to be considered by the department in the use of a non-pattern approved are described earlier.</p> |
| Any meter with suspect read accuracy | | <p>Within 3 months or at next available flow event thereafter:</p> <ul style="list-style-type: none"> - Partially filled pipe (defines own geometry) – conforming <i>accuracy test (by duly qualified person)</i>. - Partially filled pipe (does not define own geometry) – conforming <i>calibration report (by duly qualified person)</i>. - Open channel – conforming <i>calibration report (by certified practicing hydrographer)</i>. |