

SOUTH AUSTRALIAN LICENSED WATER USE METERING SPECIFICATION

Approved by the Minister for Environment and Water
June 2019

Explanatory statement

This specification applies to all meters required to be supplied, installed, serviced, tested, repaired, replaced or adjusted under the *Landscape South Australia Act 2019* (the LSA Act) and the *Landscape South Australia (Water Management) Regulations 2020* (the LSA Regulations).

Meters installed after 1 July 2019 must comply with the National Standards (*Australian Standard 4747: Meters for non-urban water supply*) for meter selection, installation and maintenance. Meters installed prior to 1 July 2019 are ‘grandfathered’ and can continue to operate under State-wide obligations, until the meter is replaced.

Accordingly:

- Sections 1-7 apply to meters installed **after 1 July 2019**¹.
- Sections 5-7 apply to meters installed **prior to 1 July 2019**².

The objective of this specification is to:

- Achieve compliance with the National Standards (for meters installed after 1 July 2019);
- Combine the relevant obligations from the National Standards with State-wide obligations in a single, user-friendly and easily accessible document; and
- Ensure that meters installed prior to 1 July 2019 remain exempt from the provisions of the National Standards until such time as they are required to be replaced, whilst still ensuring appropriate rigor for accuracy of water metering. This is in recognition that requiring all existing meters to be upgraded to be compliant with the National Standards would impose a considerable burden on holders of water management authorisations.

Legislative note: ‘Approved specification’ under the LSA Regulations

This specification, in conjunction with the National Standards, constitutes an approved specification under the LSA Regulations for meters installed **after 1 July 2019**. This Specification alone constitutes an approved specification for meters installed **pre 1 July 2019**.

This specification combines the relevant obligations from the National Standards with State-wide meter obligations and has been produced to assist customers to be compliant with state and national obligations. It is considered that this specification covers the selection, installation, maintenance and testing requirements for the vast majority of meters and scenarios in South Australia. Where further information or technical detail is required (i.e. meter requirements for atypical scenarios), the National Standards are to be referenced. Where a provision of this Specification is interpreted inconsistently with the National Standards, the former prevails.

¹ Includes meters installed on 1 July 2019.

² Requirements 5-7 reflect post-installation requirements including meter maintenance, provision of advice to the Department for Environment and Water and meter reading. For reference, the pre-installation requirements that apply to meters installed prior to 1 July 2019 are shown in Appendix B.



SOUTH AUSTRALIAN LICENSED WATER USE METERING SPECIFICATION

Approved June 2019

Introduction

Meters installed **after 1 July 2019** must comply with sections 1-7 of this specification.

Meters installed **pre 1 July 2019** are 'grandfathered' and must comply with sections 5-7 of this specification.

Supporting documents

South Australian Licensed Water Use Meter Policy (the Meter Policy)

Meter Specifications

Section 1. Meter selection

1.1. Meters must be pattern approved under the *National Measurement Regulations 1999* in accordance with the following standards:

- a) *NMI M 10 (parts 1 – 3 inclusive) Meters intended for the Metering of Water in Full Flowing Pipes*; and
- b) *NMI M 11 (parts 1 – 3 inclusive) Meters Intended for the Metering of Water in Open Channels and Partially Filled Pipes*.

1.2. Meters must be 'fit for purpose'. This means that the meter is suited to the intended purpose, installation configuration and operating conditions and is able to perform accurately with consideration of any potential interference that may cause doubt that the meter is reading accurately.

Section 2. Location of the meter

2.1. The meter must be accessible at all times.

2.2. Meter access and structures shall be provided/constructed to comply with the *Work, Health and Safety Act 2012* and any associated regulations and codes of practice.

2.3. No meter shall be installed deeper than 1.5 metres below ground level.

2.4. Where a meter is installed below ground, sufficient space shall be provided to facilitate easy access for maintenance and reading.

2.5. Clear, unrestricted access to meters housed indoors shall be provided at all times.

2.6. All extraction points used for licensed purposes are to be metered as close as practical to the point of extraction. Wherever possible, there are to be no off-takes prior to the meter.

2.7. All meters shall be located on the discharge side of the pump.

2.8. Where a pump is used for the volumetric measuring of water use in the Lower Murray Reclaimed Areas Irrigation Management Zone, the meter may be located on the suction side of the pump, should it not be feasible to place the meter on the discharge side of the pump.

Section 3. Installation of the meter

3.1. Meters must be installed in accordance with either:

3.1.1 the requirements specified in the pattern approval (where the meter is pattern approved); or

3.1.2 the manufacturers specifications (where requirements for pattern approval are not available or applicable);
or

3.1.3 the following minimum requirements (where manufacturer's specifications are not available or applicable):

3.1.3.1 Ten times the pipe diameter of straight pipework³ free of flow disturbances⁴ upstream of the meter;
and

3.1.3.2 Five times the pipe diameter of straight pipework free of flow disturbances downstream of the meter; and

3.1.3.3 Twenty times the pipe diameter of straight pipework free of flow disturbances from the discharge side of the pump.

3.2. Meter installations may be undertaken by a non-certified person, noting that the meter must be validated by a certified person following installation in accordance with section 4 of this specification.

3.3. Where directed by the Minister for Environment and Water (the Minister), the installation should provide provision for in-situ testing of the meter.

3.4. In instances where it is not practical to install a meter with a diameter matching the associated pipe work, (e.g. an 80 mm meter into 80 mm pipe work), it is acceptable to install a smaller meter (e.g. a 50 mm meter into 80 mm pipe work). However, any couplings used to reduce or increase the pipe diameter for the purpose of installing a smaller or larger meter must not be fitted within ten times the pipe diameter of straight pipework upstream of the meter. Similarly, five times the pipe diameter of straight pipework is required downstream of the meter before increasing/reducing couplings can be fitted. In these instances, the resultant flow must still be within the specified flow parameters of the meter.

3.5. Meters are to be installed free from leakage with the weight of the meter supported.

3.6. In all cases the meter must be installed so that at all flow rates there is a full pipe of water immediately upstream and downstream of the meter.

3.7. Where it is possible for environmental factors (such as wind or waves) to cause the meter to register when the pump is not operating, the pipe-work must be fitted with a flap valve or some other permanent mechanism to prevent this occurring.

3.8. The meter must be installed to ensure it works within the manufacturer's specifications at all times and is kept free from interference (i.e. debris, damage due to livestock or vandalism, etc.) If or when necessary, filters are to be installed upstream of the meter.

³ Where 'straight pipework' is referenced in this specification, pipe diameter must be the same internal diameter as the internal diameter of the meter and pipework must be free of flow disturbances.

⁴ Disturbances that can cause measurement error include pumps, filters, sieves, elbow bends, valves, changes in pipe size etc.

3.9. Water meters and associated works for the volumetric measuring of water use in the Lower Murray Reclaimed Areas Irrigation Management Zone shall be installed in accordance with the document entitled *Lower Murray Reclaimed Irrigation Area Technical Specification for Inlet Structures (2004)*.

Section 4. Meter validation

4.1. Validations must occur:

4.1.1 Following installation of a new or replacement meter; or

4.1.2 Where there is an alteration or change to any feature of the meter facility which may affect metrology of the meter.

4.2. Validation is to occur as soon as practicable and within 28 days of installation or work triggering validation (work triggering validation is outlined in requirement 4.1.2).

4.3. Validations must be undertaken by a certified person and in accordance with the National Standards.

4.4. Seals are to be applied by a certified person at the time the meter installation is validated post-installation and if necessary, at the time the meter is revalidated. An 'approved security seal' must be used.

4.5. A certified person must approve the meter facility for use and complete the appropriate Water Meter Validation Certificate⁵ and provide it to the holder(s) of the water management authorisation upon completion of the validation.

4.6. It is the responsibility of the holder(s) of a water management authorisation to advise DEW of the validation and ensure a copy of the completed Water Meter Validation Certificate is provided to DEW within 14 days of the validation.

Section 5. Maintenance, repair, testing or replacement of the meter

5.1. It is the responsibility of the holder(s) of a water management authorisation to ensure the meter facility is maintained so that the meter operates within acceptable accuracy limits.

5.2. Maintenance requirements, including minimum inspection and maintenance requirements and who is permitted to perform maintenance work (including seal replacement), are outlined in:

5.2.1 The maintenance plan in Appendix A1, for meters installed **after 1 July 2019**; or

5.2.2 The maintenance plan in Appendix A2, for meters installed **pre 1 July 2019**.

5.3. If any security seals are broken as part of any work outlined in section 5 of this specification, the seals must be replaced by a person authorised under the relevant maintenance plan in Appendix A1 or A2.

Faulty meters

5.4. If the holder(s) of a water management authorisation suspects, or becomes aware of a fault (i.e. the meter fails to measure or the meter is suspected to be defective in any way), they must advise DEW within 48 hours.

5.5. The meter must be repaired, replaced and reinstalled or if relevant, reinstalled after meter accuracy is verified (through meter testing as outlined in requirements 5.7-5.16) within 28 days of notifying DEW of the fault.

⁵ An approved Water Meter Validation Certificate template is available on DEW's website or by contacting DEW – see section 7 for contact details.

5.6. Once the meter has been reinstalled, it is the responsibility of the holder(s) of a water management authorisation to advise DEW within 14 days (see section 6.2.4 for further information). If testing has occurred, a certificate of accuracy verifying that the meter operates within acceptable accuracy limits must be provided within this timeframe.

Meter accuracy testing

5.7. A meter may be required to be tested, if deemed necessary by the Minister, to verify that the meter is operating within acceptable accuracy limits if:

5.7.1 Meter security seals are broken by a person not authorised under this specification;

5.7.2 It is reasonably suspected that the meter is not operating within acceptable accuracy limits;

5.7.3 Maintenance activities that affect or will affect the metrology of the meter are undertaken by a person not authorised under this specification (see Appendix A for examples of activities that may affect metrology of a meter); or

5.7.4 Where otherwise directed by the Minister.

5.8. Laboratory testing of a meter must be performed by an 'approved testing facility'.

5.9. Where a meter is tested in a laboratory it must meet an accuracy requirement of plus or minus four (4) percent before being reinstalled and used for licensed purposes.

5.10. In-situ testing of the meter may be permitted where it can be demonstrated, to the Minister's satisfaction, that the process proposed to be used will yield reliable results.

5.11. Where a meter is tested in-situ, it must meet an accuracy requirement of plus or minus five percent before being used for licensed purposes.

5.12. If the meter security seals are broken as part of testing, they may be replaced by the approved testing facility.

5.13. If the meter is tested to be outside relevant acceptable accuracy limits, the meter must not be reinstalled or used for licensed purposes unless or until the meter is repaired and it is demonstrated through a certificate of accuracy that the meter operates within acceptable accuracy limits. Alternatively a replacement meter that is compliant with these specifications could be installed.

5.14. The meter must be tested and reinstalled, or where relevant repaired or replaced and reinstalled, within 28 days of an activity triggering testing (as outlined in 5.7 above).

5.15. DEW must be notified (see section 6.2.4) within 14 days of the meter being reinstalled (or if in-situ testing has occurred, within 14 days of the meter being tested).

5.16. Validation by a certified person may be used in place of testing where the meter is an electronic type meter, provided a completed validation certificate confirms that the meter is approved for use. Testing may still be required, however, if the certified person is unable to verify that the meter is functioning properly and deems it necessary to confirm meter accuracy or if directed by the Minister.

Note: if a meter is being tested as a result of a disputed penalty charge under section 79 of the LSA Act, the testing process is outlined in the LSA Regulations.

Meter replacement

5.17. Meters must be replaced:

5.17.1 When the meter reaches the end of its functional life; or

5.17.2 If the meter is not in compliance with the relevant provisions of these specifications, as directed by the Minister.

5.18. End of meter functional life can be determined by:

5.18.1 The holder(s) of the water management authorisation at any time; or

5.18.2 The Minister where:

- The performance of a meter (which has already undergone any required repair or maintenance work), when tested, is outside of the acceptable accuracy limits outlined in this specification;
- It is deemed that the meter should be replaced with consideration for one or more of the following factors: age, usage, wear, life expectancy, historic, current and expected reliability/accuracy, internal and external condition of the meter or meter security seals or historic and current operating (e.g. environmental or water quality) conditions.

Section 6. Advice to the DEW

6.1. Advice must be provided to DEW when a meter is installed, validated, repaired, replaced, removed, tested, a fault is suspected or identified or a '5-yearly inspection' is performed, within the timeframes outlined in this specification, through:

6.1.1 the online meter notification form, available on DEW's website; or

6.1.2 otherwise be provided to the appropriate regional office of DEW using the contact information below.

Prescribed Water Resource Area	Office	Contact No.	Office address
McLaren Vale, Northern Adelaide Plains, Western Mount Lofty Ranges, Far North	Adelaide	(08) 8463 6876	GPO Box 1047 Adelaide SA 5000
River Murray, Angas Bremer, Eastern Mount Lofty Ranges, Mallee, Marne Saunders, Peake Roby and Sherlock, Clare Valley, Barossa Valley, Eyre Peninsula	Berri	(08) 8595 2053	PO BOX 240 Berri SA 5343
All prescribed areas within the South East region	Mount Gambier	(08) 8735 1134	PO Box 1046 Mount Gambier SA 5290
Email (all areas): DEWWaterLicensing@sa.gov.au			

6.2. When providing advice to DEW as per 6.1 above, the water authorisation number (e.g. water licence number), the name that appears on the authorisation and the following information⁶ for each activity must be provided:

6.2.1 When a meter is installed and validated – required within 14 days of validation⁷

- If validation required, completed Water Meter Validation Certificate confirming that the meter has been approved for use,
- Date of installation and meter reading at the time of installation,
- Name and contact details of the meter installer,
- Whether the meter is used for frost protection as well as irrigation purposes (only if the meter is located in a prescribed area within the South East region of South Australia),
- If not already provided on Water Meter Validation Certificate, any security seal numbers installed on the meter facility.

6.2.2 When a meter is revalidated – required within 14 days of revalidation

- Completed Water Meter Validation Certificate confirming that the meter has been approved for use.

⁶ Additional fields may be required to be completed on the meter notification form or further information requested from DEW

⁷ Or within 14 days of installation if validation is not required (e.g. for meters installed pre 1 July 2019)

6.2.3 When a fault is suspected or identified – within 48 hours

- Type, size and serial number of meter,
- Exact location of the meter (GPS coordinates if available), and
- Date the fault was suspected or identified and meter reading at that time (or if not known, current meter reading).

6.2.4 When a meter is repaired or tested (including where seals are otherwise replaced) – required within 14 days of reinstallation

- Type, size and serial number of meter,
- Exact location of the meter (GPS coordinates if available),
- Date of removal and reading on meter at time of removal,
- Nature of repairs and name and contact details of repairer (If repaired),
- Name and contact details of tester, whether the test was performed, in a laboratory or in-situ, and a certificate of accuracy if approved for use (If tested),
- Date of reinstallation and meter reading at the time of reinstallation, and
- Any new or replaced security seal numbers installed on the meter facility.

6.2.5 When a meter is removed permanently or relocated

- Type, size and serial number of meter,
- Exact location of the meter (GPS coordinates if available),
- Date of removal and reading on meter at time of removal,
- New meter location (if meter relocated); and
- If relocated, relevant information in 6.2.1 above.

6.2.6 When a '5-yearly inspection' is undertaken

- Type, size and serial number of meter,
- Exact location of the meter (GPS coordinates if available),
- A completed '5 yearly inspection report',
- The information in 6.3.4 above (if repairs are required), and
- Any new or replaced security seal numbers installed on the meter facility.

Section 7. Meter reading

7.1. Meters are to be read at least once a year.

7.2. Where directed or required by a condition of water management authorisation, meter readings are to be provided by the holder of the authorisation to DEW within the timeframes specified in the direction or condition(s).

7.3. Where it is not a requirement that the holder(s) of a water management authorisation provide meter readings, DEW will arrange for meters to be read at least once a year. In cases where the meter is installed in a locked compound the key must be available upon request. Where advised in writing, or where a condition of authorisation requires, the holder(s) of a water management authorisation must provide a duplicate key to a locked compound to DEW for its retention (including on an ongoing basis where subsequent changes to the lock are made).

7.4. The meter reading must be accessible at all times.

Glossary

Acceptable accuracy limits	An accepted level of confidence that the meters will operate within an accuracy range of plus or minus five percent under in-situ conditions.
Approved security seal	An approved seal is a seal that is capable of clearly showing whether the meter facility has been tampered with, dismantled or subject to post-validation alterations, and includes a unique identifying number (unless otherwise approved by DEW).
Approved testing facility	A 'verifying authority' appointed under the <i>National Measurement Act 1960</i> or a testing facility otherwise approved by the Minister.
Certified person	A person who holds a current certification issued by a nationally recognised, industry-based certification scheme. At the time of this specification being approved, a certified person is a person holding a certificate issued by Irrigation Australia Limited that is in force certifying that the person is qualified as a meter installer and validator.
Competent person	A person employed in the meter or irrigation industry who is suitably qualified to maintain and repair meters or is a certified person as defined below.
DEW	This refers to the Department for Environment and Water or any subsequent or equivalent department name.
Holder of a water management authorisation	The holder of a water licence, water resources works approval or other authorisation pursuant to the LSA Act, or someone that has been authorised to act as their agent.
In-situ testing	Testing of a meter without removing it from the meter facility.
Meter Notification Form	The online Meter Notification Form or any subsequent equivalent online form storing the information outlined in 6.1 of this specification.
Meter security seal	The seal applied by the meter manufacturer (and any replacement seal applied thereafter by a person approved under this specification) that connects the meter register to the meter body or any other physical or digital seal applied by the manufacturer to protect metrology of the meter.
Meter facility	The meter facility includes the meter itself, any ancillary pipework, wiring, supporting structure and telemetry equipment and apparatus.
Metrology	Measurement accuracy of the meter.
Minister	The Minister for Environment and Water, or any subsequent Ministers, for which the LSA Act or subsequent Acts are vested, including their delegates.
National Standards LSA Act	Australian Standard – Meters for non-urban water supply AS 4747. Refers to the <i>Landscape South Australia Act 2019</i> or if repealed, any subsequent replacement Act.
LSA Regulations	Refers to the <i>Landscape South Australia (Water Management) Regulations 2020</i> or if repealed, any subsequent replacement Regulations.
NMI	National Measurement Institute, the peak measurement body responsible for trade measurement and setting of reference standards.
Pattern approval	Pattern approval is the process where the NMI of Australia examines and tests the design of a meter against the published national standard to ensure it meets certain technical and metrological requirements and retains its accuracy over a range of environmental and operating conditions.
Pipework security seal	A seal connecting the meter to pipework and applied to any other pipework on the meter facility that protects the metrology of the meter. Pipework security seals must be an approved seal.
Trained person	A person who is working under the direct supervision of, and has been internally trained by, a certified person to perform the activities permitted under this specification (i.e. seal and battery replacement).
Rep of meter manufacturer	A person who is employed or a representative of the meter manufacturer and who is suitably qualified to perform repairs on the meter.
Validation	A validation is an inspection of a meter and installation to ensure the meter is pattern approved, laboratory verified and correctly installed and there is an acceptable level of confidence that it operates within acceptable limits of plus or minus five percent under in-situ conditions, performed by a certified person.

APPENDIX A1:

Maintenance Requirements - Meters installed

post 1 July 2019

These provisions apply to meters installed after 1 July 2019.

Note: If the meter was installed prior to 1 July 2019, please refer to Appendix A2.

Refer to the 'Maintenance activities – meters installed post 1 July 2019' table in Appendix A1 when applying the requirements below.

Annual requirements

A1.1. The requirements in column 1, that are adjacent to a tick (✓) in column 2, are those activities that are required to be carried out annually (or more frequently if necessary). These requirements aim to ensure that the requirements of this specification (regarding ensuring the meter is not defective and the site is accessible) are complied with.

5-yearly requirements

A1.2. All meters must be serviced at least every five years to ensure they continue to operate within acceptable accuracy limits. The following must be undertaken, as a minimum, every five years (or more frequently if necessary):

A1.2.1. A '5-yearly inspection' including –

- the items specified in column 1, adjacent to a tick (✓) in column 2, are required to be inspected; and
- Where the 5-year inspection identifies a need for repairs, maintenance or work to ensure these requirements are met (or to otherwise ensure the meter operates within acceptable accuracy limits), the work must occur within 28 days of the inspection.

OR

A1.2.2. A validation in accordance with section 4 of this specification, approving the meter facility for use.

A1.3. Notwithstanding the above, the Minister may direct that a validation occur instead of a 5-yearly inspection or, where there are reasonable grounds to do so, at any other time.

A1.4. If any maintenance activities that affect or may affect the metrology of the meter are undertaken by a person not authorised under this specification, or if meter security seals are otherwise broken by a person not authorised under this specification, then the meter is to be tested to ensure it continues to operate within acceptable accuracy limits in accordance with section 5 of this specification. Activities that trigger testing if undertaken by a person not authorised under this specification include, but are not limited to, activities 20-25 in the table below.

General requirements

A1.5. Inspections and maintenance activities may be undertaken by:

A1.5.1. The entitlement holder, except if the activity requires the removal of a pipework security seal or a meter security seal or affects or will affect the metrology of the meter; or

A1.5.2. A certified person; or

A1.5.3. Where a certified person is not qualified to repair a meter, and a 'representative of the meter manufacturer' is required, the representative of the meter manufacturer.

A1.6 If any security seals are broken as part of maintenance, or at any other time, they must be replaced with an approved security seal by:

A1.6.1 a certified person, at the time of performing maintenance and/or validation; or

A1.6.2 an approved testing facility, if meter security seals are removed for testing; or

A1.6.3 by the representative of the meter manufacturer, if maintenance is performed by a representative of the meter manufacturer; or

A1.6.4 a trained person.

A1.7 DEW must be notified (see section 6.2.4) within 14 days of any repair work (including seal replacement).

A1.8 DEW may fit seals to meter installations.

Maintenance activities – Meters installed post 1 July 2019	Annual Requirements	5-yearly Requirements
1. Ensure the site is WHS compliant and is accessible and safe for inspections or work at the site	√	√
2. Meter security seals and pipework security seals are present and intact	√	√
3. Meter appears to be in working order and does not appear defective (i.e. rotation of register)	√	√
4. Batteries and/or solar panels are working	√	√
5. For electronic meters – there are no error messages on display or obvious faults	√	√
6. General cleaning and housekeeping, suction clear, cleaning solar panel, clear away debris, excess soil, check for vermin issues/damage and check that site is weed free		√
7. Meter, pipework and other fittings within the meter facility have structural integrity, there are no leaks		√
8. Meter is installed in accordance with these specifications (e.g. minimum straight lengths of pipework up and downstream of the meter, flow disturbances eliminated)		√
9. Meter display is clear and readable		√
10. Weather proof seals are intact		√
11. Air relief valve (if present) is functioning under operating conditions		√
12. Electrical cables and communication cables appear to be in good condition – visual check		√
13. If have telemetry, telemetry pole, antenna and any other infrastructure (i.e. fence around it) appear in good condition		√
14. Complete any other inspections and basic maintenance as per the meter manufacturer's or pattern approval requirements (if specified)		√
15. Provide a completed 5-yearly inspection report or validation certificate to the Department		√
16. Internal pipe is clear of internal damage/deposits/misalignments and impellor is working (for mechanical meters) ⁸		See footnote
17. Validation	To be carried out as directed or required to ensure the meter operates within accuracy limits	
18. Battery replacement ⁹		
20. When pump has started/ water flowing, totalizer correctly operates		
21. Tolerance assessment on components		
22. Electronic validation - If electronic meter - correct software version and configuration, electronic check against internal reference source that is set at the time of calibration		
22. Fixing a mechanical failure		
23. Replacement of flow meter or flow computer		
24. Replacing Printed Circuit Board (PCB), electrical component		
25. Software upgrade or altering software settings		
26. If have telemetry - no fault notifications		
27. If have telemetry - effective signal transfer between transmitter, sensor and data logger		

This list outlines key maintenance activities only and does not preclude other maintenance work that is required to ensure meter accuracy and integrity

⁸ It is recommended that this occur every 5 years where there is poor water quality (e.g. sediment or iron bacteria) as it may cause the meter to read inaccurately (read slow or fast).

⁹ Battery replacement may be undertaken by the entitlement holder, provided meter security seals are not broken. If meter security seals are broken, batteries may be replaced by a certified person or a trained person

APPENDIX A2

Maintenance Requirements - Meters installed pre 1 July 2019

These provisions apply to meters installed prior to 1 July 2019.

Note: If the meter was installed after 1 July 2019, please refer to Appendix A1.

Refer to the 'Maintenance activities – meters installed pre 1 July 2019' table in Appendix A2 when applying the requirements below.

Annual requirements

A2.1. The requirements in column 1, adjacent to a tick (✓) in column 2, are those activities that are required to be carried out annually (or more frequently if necessary). These requirements aim to ensure that licence conditions and the requirements of this specification (regarding ensuring the meter is not defective and the site is accessible) are complied with.

5-yearly requirements

A2.2 All meters must be serviced at least every five years to ensure they continue to operate within acceptable accuracy limits. The following must be undertaken, as a minimum, every five years (or more frequently if necessary):

A2.2.1. A '5-yearly inspection' including –

- the items specified in column 1, adjacent to a tick (✓) in column 2, are required to be inspected; and
- If the 5-yearly inspection identifies a need for repairs, maintenance or work to ensure these requirements are met (or to otherwise ensure the meter operates within acceptable accuracy limits), the work must occur within 28 days of the inspection.

OR

A2.2.2. A validation in accordance with section 4 of this specification, approving the meter facility for use.

A2.3. Notwithstanding the above, the Minister may direct that a validation occur instead of a 5-yearly inspection or, where there are reasonable grounds to do so, at any other time.

A2.4. If any maintenance activities that affect or may affect the metrology of the meter are undertaken by a person not authorised under this specification, or if meter security seals are otherwise broken by a person not authorised under this specification, then the meter is to be tested to ensure it continues to operate within acceptable accuracy limits in accordance with section 5 of this specification. Activities that trigger testing if undertaken by a person not authorised under this specification include, but are not limited to, activities 20-25 in the table below.

General requirements

A2.5 Inspections and maintenance activities may be undertaken by:

- A2.5.1 The entitlement holder, except if the activity requires the removal of a pipework security seal or a manufacturer's security seal and/or may affect the metrology of the meter; or
- A2.5.2 A competent person.

Maintenance activities – Meters installed pre 1 July 2019	Annual requirements	5-yearly requirements
1. Ensure the site is WHS compliant and is accessible and safe for inspections or work at the site	√	√
2. Meter security seals and pipework security seals are present and intact	√	√
3. Meter appears to be in working order and does not appear defective (i.e. rotation of register)	√	√
4. Batteries and/or solar panels are working	√	√
5. For electronic meters – there are no error messages on display or obvious faults	√	√
6. General cleaning and housekeeping, suction clear, cleaning solar panel, clear away debris, excess soil, check for vermin issues/damage and check that site is weed free		√
7. Meter, pipework and other fittings within the meter facility have structural integrity, there are no leaks		√
8. Meter is installed in accordance with these specifications (i.e. minimum straight lengths of pipework up and downstream of the meter, flow disturbances eliminated)		√
9. Meter display is clear and readable		√
10. Weather proof seals are intact		√
11. Air relief valve (if present) is functioning under operating conditions		√
12. Electrical cables and communication cables appear to be in good condition – visual check		√
13. If have telemetry, telemetry pole, antenna and any other infrastructure (i.e. fence around it) appear in good condition		√
14. Complete any other inspections and basic maintenance as per the meter manufacturer's or pattern approval requirements (if specified)		√
15. Provide a completed 5-yearly inspection report or validation certificate to the Department		√
16. Internal pipe is clear of internal damage/deposits/misalignments and impellor is working ¹⁰		See footnote
17. Validation	To be carried out as directed or required to ensure the meter operates within accuracy limits	
18. Battery replacement ¹¹		
19. When pump has started and water is flowing, the totalizer is correctly operating		
20. Tolerance assessment on components		
21. Electronic validation - If electronic meter - correct software version and configuration, electronic check against internal reference source that is set at the time of calibration		
22. Fixing a mechanical failure		
23. Replacement of flow meter or flow computer		
24. Replacing Printed Circuit Board (PCB), electrical component		
25. Software upgrade or altering software settings		
26. If have telemetry - no fault notifications		
27. If have telemetry - effective signal transfer between transmitter, sensor and data logger		

This list outlines key maintenance activities only and does not preclude other maintenance work that is required to ensure meter accuracy and integrity.

¹⁰ It is recommended that this occur every 5 years where there is poor water quality (e.g. sediment or iron bacteria) as it may cause the meter to read inaccurately (read slow or fast).

¹¹ Battery replacement may be undertaken by the entitlement holder, provided meter security seals are not broken. If meter security seals are broken, batteries may be replaced by a competent person

APPENDIX B

Meter selection, location and installation requirements for Meters installed pre 1 July 2019

Explanatory note

Meters installed pre 1 July 2019 were required to comply with previous State-wide provisions that are different to those outlined in this specification. Of most significance, meters installed prior to 1 July 2019 are not required to be pattern approved or validated, like meters installed post 1 July 2019 are required to be. An extract from the most recent South Australian Licensed Water Use Meter Specification approved June 2015 is provided below for reference¹². Given these meters are already installed, these provisions will be relevant for determining if a meter was installed in accordance with the previous provisions for compliance purposes.

1. Meter selection

1.1. The meter must be an irrigation type meter supplied from a manufacturer compliant with Australian Standard/New Zealand Standard (AS/NZS) 9001 (Quality management systems).

1.2. The meter must have a permanent and unique identifying number.

1.3. The meter must function within an accuracy range of +/-2.5% as indicated by a National Association of Testing Authorities (NATA) accredited (or equivalent) certificate of accuracy from the manufacturer. The test must have been conducted on each individual meter.

1.5 The meter must be 'fit for purpose'. This means that the meter is suited to the intended purpose, installation configuration and operating conditions and is able to perform accurately with consideration for any potential interference that may cause doubt that the meter is reading accurately.

1.6. The meter shall be selected with consideration to the diameter of the pipe work and the expected operating flow rates i.e. maximum continuous flow rate and the minimum flow rate.

1.7. All meter components, including castings, shall be sound, clean and free of imperfections and the meter body coated internally and externally with high quality coating to resist the effects of corrosion and mechanical damage.

1.8. Where the meter is an in-line type and is connected using flanges, then these flanges shall meet the

requirements of AS 2129.

1.9. The meter register unit and meter body must be able to be sealed with security devices consistent with Clause 2.5 of AS 3565.1 - 2004.

1.10. The meter register must be resistant to condensation and fogging.

1.11. Units displayed in the meter register must be metric and clearly specified.

1.12. The meter shall be capable of being fitted with an electronic output device (EOD) to allow for transmission of information to distant points. This may be by way of an EOD included on/in the supplied meter or by the availability of an optional and fully compatible EOD device that can easily be retrofitted to each meter at a future date.

1.13. If the meter relies in any way on an electrical power source, then it shall have a non-volatile memory to ensure that recorded data is not lost in the event of a power or battery failure. In this instance, the meter must retain the last meter reading at the time of the failure. Data must be able to be retrieved at all times.

1.14. If the meter relies on a mains power source it must be hard wired to ensure that the power source cannot be deliberately interrupted.

1.15. In addition to the above requirements, water meters associated with rehabilitation project inlet structures for volumetric measuring of water use in the Lower Murray Reclaimed Areas Irrigation Management Zone only, shall be of the following types: ultrasonic flow meter; point source magnetic flow meter; full bore magnetic flow meter. They must also have an EOD that provides for the storage of digital data and the downloading of this data to data loggers. Cabling from the meter to the EOD should have a degree of protection of IP68 or better and should comply with AS1939.

2. Location of the meter

2.1. It is recognised that some sites will require detailed consideration to determine the best method of metering. Further advice on where to locate meters is available by contacting the appropriate office of the Department. However it is the responsibility of the water entitlement holder to ensure that the meter is installed in accordance with the manufacturer's specifications.

¹² Minor updates have been made to accuracy requirements to align with the National Metering Standards to make them 2.5% rather than the previous 2%.

2.2. The meter must be accessible at all times. The water entitlement holder shall demonstrate, with the installation and housing of the meter, due diligence in meeting their responsibilities as defined in the Work Health and Safety Act 2012 and Work Health and Safety Regulations 2012 and any associated Codes of Practice in relation to persons, who may in their work install, repair, maintain, replace, dispose of, read or adjust the meter.

2.3. Meters located on riverbanks or steep slopes shall be provided with suitable access ways with handrails and kick plates and complies with the Work Health and Safety Act 2012 and the Work Health and Safety Regulations 2012.

2.4. No meter shall be installed deeper than 1.5 metres below ground level.

2.5. Where a meter is installed below ground, sufficient space shall be provided to facilitate easy access for maintenance and reading.

2.6. Clear, unrestricted access to meters housed indoors shall be provided at all times.

2.7. All extraction points used for licensed purposes are to be metered as close as practical to the point of extraction. Wherever possible, there are to be no off-takes prior to the meter.

2.8. All meters shall be located on the discharge side of the pump.

2.9. Where a dam collects water from the surface or a watercourse, a meter must be installed to determine the volume of water extracted from the dam even if the dam is also filled from other sources. Additional meters must be installed to measure the volume(s) of water delivered from any other source(s).

2.10. In relation to water meters for the volumetric measuring of water use in the Lower Murray Reclaimed Areas Irrigation Management Zone, where a pump is used, the meter may be located on the suction side of the pump, should it not be feasible to place the meter on the delivery side of the pump.

3. Installation of the meter

Flow meters and associated devices (such as EOD, earthing leads etc.) are to be installed in accordance with the manufacturer's specification, however installation is governed by the following minimum standards:

3.1. Meters are designed to measure straight flowing water free of disturbances. Disturbances that can cause measurement error include pumps, filters, sieves, elbow bends, valves, changes in pipe size, etc. A minimum of ten diameters of straight pipe must be fitted immediately upstream of the meter, and a minimum of five diameters of straight pipe immediately downstream of the meter to minimise this flow disturbance.

3.2. Where meters are being installed into existing installations, and the above straight pipe requirement cannot be met, it may be acceptable for the meter to be installed with a minimum of five diameters of straight pipe⁴ upstream of the meter, and a minimum of two diameters¹ immediately downstream. However, Departmental approval must be specifically granted in these instances.

3.3. In instances where it is not practical to install a meter with a diameter matching the associated pipe work (i.e. an 80mm meter into 80mm pipe work), it is acceptable to install a smaller meter (i.e. a 50 mm meter into 80 mm pipe work). However, any couplings used to reduce or increase the pipe diameter for the purpose of installing a smaller or larger meter must not be fitted within ten diameters of straight pipe⁴ upstream of the meter. Similarly, five diameters of straight pipe⁴ are required downstream of the meter before increasing/reducing couplings can be fitted. In these instances, the resultant flow must still be within the specified flow parameters of the meter.

3.4. Meters are to be installed free from leakage with the weight of the meter supported. It is recommended that a "loose" ring or expansion joint be installed into the pipe work following the minimum lengths of straight pipe downstream of the meter to provide for easy servicing.

3.5. In all cases the meter must be installed so that at all flow rates there is a full pipe of water immediately upstream and downstream of the meter.

3.6. Where it is possible for environmental factors (i.e. wind or waves) to cause the meter to register when the pump is not operating, the pipe-work must be fitted with a flap valve or some other permanent mechanism to prevent this occurring.

3.7. It is the responsibility of the water entitlement holder to ensure that the meter is working within the manufacturer's specifications at all times and is kept free from interference (i.e. debris, damage due to livestock or vandalism etc.). Experience has shown that meters are less prone to jamming if installed downstream of a filter.

3.8. All meters requiring onsite configuration, as specified by the manufacturer, are to be installed by an installer certified by the manufacturer as having undergone training by the manufacturer in the installation of the particular meter and that the installer is competent to perform such installations.

3.9. The installation of water meters associated with volumetric measuring of water use in the Lower Murray Reclaimed Areas Irrigation Management Zone must be installed in accordance with the document entitled 'Lower Murray Reclaimed Irrigation Area Technical Specification for Inlet Structures (2004)