Non-Urban Meter Action Plan

30 June 2025

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1. Executive Summary

The Victorian Non-Urban Metering Policy requires new and upgraded extraction sites to be metered with an AS4747-compliant meter (except for where the Policy permits this requirement to be varied). The Policy allows existing 'contemporary standard' meters to be replaced with AS4747 compliant meters at end of life, however, meters which do not meet the contemporary standard should be prioritised for replacement. The Policy recommends non-urban metering sites be telemetered, where the cost of doing so is lower than the cost of manual meter reading.

This Non-Urban Meter Action Plan presents the status of non-urban metering sites managed by GWMWater and identifies actions to achieve compliance with the Victorian Non-Urban Metering Policy.

1.1 Meter Compliance of GWMWater Non-Urban Metering Sites

GWMWater manages 15,584 non-urban metering sites:

- 97.4% of existing sites are exempt as out of scope:
  - 15,167 domestic and stock meters on regulated pipeline networks, accounting for approximately 5,509 ML/yr (2023-24).
  - 10 bulk offtake meters for regulated pipeline networks, managed by bulk entitlement metering plans.
- 0.6% of existing sites are exempt as low use:
  - 16 groundwater sites accounting for a combined 15 ML/yr (2023-24).
  - 72 surface water division sites accounting for a combined 5 ML/yr (2023-24).
- 2.0% of sites are not exempt, of which:
  - 97% have accurate metering and 55% have telemetry.
  - 99% of flow was measured with a compliant meter and 53% of flow was telemetered.
  - The 265 ML that did not go through a compliant meter went through a contemporary meter at 11 sites; GWMWater is progressing upgrade of these sites during 2025-2026.
  - The 144 un-telemetered sites have been excluded from previous telemetry programs due to lack of network availability; as reliable, cost-effective network options are becoming available, GWMWater is applying telemetry to these sites.

Regulated environmental releases are also made from GWMWater headworks storages as directed by the relevant Catchment Management Authority. These flows are not included in the above metering except for a number of metered wetland delivery points through GWMWater's regulated pipeline networks.

Table 1: Meter and telemetry compliance status of sites requiring accurate metering[i].

Water Resource	Meter Compliance Requirement	Meter Compliance Status by Sites				Telemetry Compliance Status		TOTAL (Sites)
		AS	CO	OT	UM	Telemetered	Un-Telemetered	
Groundwater Irrigation	AM	301 (96%)	11 (4%)	-	-	168 (54%)	144 (46%)	**312 (98%)**
Surface Water Irrigation	AM	7 (100%)	-	-	-	7 (100%)	-	**7 (2%)**
TOTAL		**308 (97%)**	**11 (3%)**	**-**	**-**	**175 (55%)**	**144 (45%)**	**319 (100%)**

Table 2: Meter and telemetry compliance status of take requiring accurate metering[ii].

Water Resource	Meter Compliance Requirement	Metering Compliance Status by Volume (ML)				Telemetry Compliance Status		TOTAL (Take (ML))
		AS	CO	OT	UM	Telemetered	Un-Telemetered	
Groundwater Irrigation	AM	23759 (99%)	265 (1%)	-	-	12822 (53%)	11202 (47%)	**24024 (99.9%)**
Surface Water Irrigation	AM	21 (100%)	-	-	-	21 (100%)	-	**21 (0.1%)**
TOTAL		**23780 (99%)**	**265 (1%)**	**-**	**-**	**12843 (53%)**	**11202 (47%)**	**24045 (100%)**

Although AS4747-compliant pattern approved meters are in place, these sites may not meet full AS4747 installation requirements due to lack of cost-effective means to deliver required pipework retrofits and infrastructure modifications. The standard installation for GWMWater groundwater and surface water diversion sites uses Siemens Mag8000 meters, which when installed to full AS4747-compliant pipework configuration achieve +/-2% accuracy. These meters are installed as far as practicable in accordance with these specifications and are expected to remain within +/-5% accuracy. The purpose of these meters is water accounting against licensed volume. The water resource units typically observe extraction of less than 65% of licensed volume.

1.2 Telemetry Compliance of GWMWater Non-Urban Metering Sites

All non-urban metering sites require telemetry unless this requirement is varied, as permitted by the Non-Urban Metering Policy.

- 15,352 sites (99%) have existing telemetry.
- 144 sites requiring accurate metering are un-telemetered and have been excluded from previous telemetry programs due to lack of network availability; as reliable, cost-effective network options are becoming available, GWMWater is applying telemetry to these sites.
- The remaining 88 sites are exempt from accurate metering due to low use and thus the benefit of telemetering these sites is also considered unjustified.

[i] Data based on 'Annual Metering Data Request 2023-24' (R2025-22790).

[ii] Data based on 'Annual Metering Data Request 2023-24' (R2025-22790).

1.3 Summary of Improvement Actions

GWMWater commits to the following actions to deliver the highest standard of metering which is cost-effective, and commensurate with the risk to the water resource.

Action 1: GWMWater will upgrade the remaining 11 groundwater extraction sites that require accurate metering with AS4747-compliant meters, and where feasible, telemetry, by June 2026.

Action 2: GWMWater will install AS4747-compliant pattern approved meters at any new extraction sites, and any 'sleeper' sites which become active in future.

Action 3: GWMWater is delivering telemetry to a portion of the remaining 144 groundwater extraction sites and will continue to roll this out as reliable, cost-effective network options become available.

Action 4: GWMWater will periodically undertake in-situ testing of a selection of groundwater and/or surface water diversion meters to validate the performance and accuracy of meters.

Action 5: For the 11 groundwater extraction sites currently metered with contemporary meters, meter replacements will utilise an AS4747 compliant meter installed in conformance with the AS4747 installation standard as far as it is cost-effective to do so (i.e. to the point at which cost would exceed the benefit achieved).

2. Overview and background

2.1 Plan Framework

Key elements of this Meter Action Plan include:

Background

- Relevant guidelines and standards
- Business obligations

Business context – this provides a summary of the water resources and services that the business manages, sets the objectives of metering and provides the opportunity to identify strategic projects or specific management requirements that impact on metering such as:

- Water resource summary
- Water services provided
- Irrigation areas that are being modernised or undergoing reconfiguration,
- Water resource management areas where water availability and demand are changing,
- Groundwater management areas that have higher risks due to sustainability threats or compliance challenges
- Water resource management areas where water quality impacts on metering options
- The rationale for the business adopting metering requirements above the State Policy

Levels of service requirements

- The level of service for customers acquiring their metering information
- The reporting requirements to the State Government, regulators and other relevant external parties

Life cycle management for meters

- How the asset owner will manage its existing and future meters to provide defined levels of service
- Gaps in current meter management
- Improvement plan, including priority setting, to close gaps

Financial and economic summary

- Summary of operational and capital budgets to provide the defined services
- Average annual meter cost compared to average bill and trading value
- Unit rates and service lives for metering and their trends

Data management, analysis and reporting

- Overview of where meter data records are kept
- Analysis of meters by category, type and use
- Performance indicators and targets for metering

2.2 Background

2.2.1. Victorian Non-Urban Metering Policy Objectives

The Victorian Non-Urban Metering Policy lists the following objectives:

- *"To encourage comprehensive metering of non-urban water extraction in a way that is consistent with risks to water resources.*
- *To provide for water take to be measured accurately and reliably.*
- *To provide that meters installed are accurate and well-maintained.*
- *To ensure the benefits of water measurement outweigh the costs.*
- *To improve reporting by linking meter compliance data with water use data in the Water Register."*

The policy objectives have been adopted by GWMWater in the formation of this plan.

2.2.2. Meter Compliance Requirements

The Victorian Non-Urban Metering Policy requires non-urban metering sites be telemetered where the cost of doing so is lower than the cost of manual meter reading. The Policy requires new and upgraded extraction sites to be metered with an AS4747-compliant meter (except for where the Policy permits this requirement to be varied). The Policy allows existing 'contemporary standard' meters to be replaced at end of life, however, meters which do not meet the contemporary standard should be prioritised for replacement.

2.2.3. Meter Compliance Exemptions

The Victorian Non-Urban Metering Policy provides guidance and exemptions for new and existing works which can be summarised as (see Table 10 of the policy):

- Exempt - outside scope (EXOS): Exempt as:
  - water use is under a Domestic & Stock licence, a drainage diversion licence or registration farm dam licence
  - water is stormwater
  - the site requires stream gauging methods to be applied
  - meters managed by other Water Corporations.
- Exempt - low use (EXLU): Use at the site is below the threshold for high accuracy meters, including:
  - 'sleeper' sites
  - in unregulated surface water systems, a licence volume of less than, or equal to, 10 megalitres (ML) per year
  - in regulated surface water systems, an annual use limit of 10 ML per year or less under a water-use licence or water-use registration
  - a groundwater licence with a licence volume of less than or equal to 20 ML per year, or
  - in any of the above, a lesser volumetric threshold set by the water corporation.

- Exempt - high cost (EXHC): Disproportionate cost to benefit. The benefit assessment would consider the use volume together with the management objectives for the water resource area. Exemptions may include, but not be limited to:
    - where the site is not in use
    - the low frequency or low annual volume of take
    - excessive costs imposed by site conditions including water quality
    - adequate water measurement is provided by bulk water metering, or
    - the site is in the bottom 5 per cent of water taken (based on use) within a water resource management area
    - a suitable pattern-approved meter is not available.
- Exempt - supply system change planned (MO): Meter is located within an area planned for modernisation or reconfiguration and the meter upgrade, relocation or removal will be part of modernisation or reconfiguration.

2.2.4. *Metering Standards*

The metering standards for non-urban water are specified for two main categories of meters:

- full flowing pipe meters; and,
- open channel meters

Documentation of requirements under the assurance framework are listed in Table 3.

Table 3: Metering standards and the assurance framework for non-urban water metering

Requirement	Documents
Overall measurement requirement	Measurement Assurance Framework [2009]
Measuring instruments are fit for purpose	NMI M 10 for full flowing pipe meters [2010] and NMI M 11 for open channel meters [2009] Approved meters are called - pattern approved See Pattern approval requirements | Department of Industry Science and Resources for more information.
Measurements are made correctly	AS 4747 – Sections 1, 2, 5 & 8 for full flowing pipe meters AS4747 – Sections 1, 3, 6 & 8 for open channel meters These standards include the requirement for duly qualified personnel for most tasks – called Certified Installers and Validators. AS4747 first edition was 2008 and the current (3rd) edition was in 2013
Record-keeping to prove measurements are accurate	NMI retains records on meter testing for pattern approval AS4747 specifies the data to record

2.2.5. *Availability of pattern approved meters*

The National Measurement Institute maintains the register of pattern approved meters and meters that are in the process of seeking pattern approval. Often a family of meters

are approved in the one NMI document, and this covers a meter-model over a range of sizes.

The list of meters is available from the federal Department of Industry Science and Resources (Certificates of approval – 14 utility meters | Department of Industry Science and Resources).

2.2.6. Availability of certified meter installers and validators

Irrigation Australia provides training and certificates for Meter Installers and Validators (Training & Certification | Irrigation Australia).

Appendix A: Certified Meter Installers and Validators lists current staff and contractors that are Certified Meter Installers and Validators.

3. Business Context and Levels of Service

3.1 Water resource management areas

GWMWater provides and meters groundwater, surface water and reclaimed water to customers and licence holders across our operational region in western Victoria.

The majority of service points in use across the GWMWater region are supplied via over 13,000km of rural pipeline distribution network. This network draws on water sources in the Grampians and from the Murray River through bulk entitlement meters.

Groundwater and surface water 'take and use' diversion licence holders comprise 1.4% of GWMWater's total customer base. A risk assessment process has been used to assign a risk rating to each groundwater and surface water resource unit managed by GWMWater. These risk ratings aim to identify the potential consequence to water resource units from instances of non-compliance, such as unauthorised take. All water resource units were assessed to fall within the 'low' or 'medium' risk categories.

The largest volume surface water and groundwater users extract relatively small volumes of water compared with the DEECA 'high risk take' threshold of 5,000 ML/year take through a meter. These larger volume users extract less than 15% of the 'high risk take' volume through a single extraction point over the course of a year.

3.2 Strategic plans affecting metering

Various rural pipeline projects are in delivery which will increase the fleet of domestic and stock water meters drawing on surface water via pipeline distribution networks. Any new pipeline networks will have appropriate 'bulk offtake' metering in place, as is the case for GWMWater's existing rural pipeline networks.

3.3 Levels of Service for customers, government and regulators

Rural pipeline customers are governed by the Rural Customer Charter. Reclaimed water customers are engaged on an individual agreement.

Groundwater and unregulated surface water 'take and use' licence holders hold an authorisation to extract directly from water resource features, under the *Water Act 1989*. There is no applicable level of service as these users are not directly supplied by GWMWater.

Ninety percent of non-urban water customers can register to access their usage information over the internet through a customer portal. Information can be filtered down to hourly daily weekly and monthly data, as well as leak detection and allocation overuse alerts.

GWMWater complies with reporting requirements to the State Government and regulators.

4. Meter Fleet

4.1 High Risk Take

The Victorian Non-Urban Metering Policy states:

> Water take that is more than 5,000 megalitres average annual usage for an individual service point, excluding take under bulk water metering, is considered high risk take.
>
> Water corporations are to install meters that conform with AS4747 and telemetry at these sites and document these sites in their metering action plans.

GWMWater does not have any High Risk take under this definition.

4.2 Meter Compliance Status

GWMWater manages 15,584 non-urban metering sites as summarised in Table 4 and Table 5.

- 97.4% of existing sites are exempt as out of scope:
  - 15,167 domestic and stock meters on regulated pipeline networks, accounting for approximately 5,509 ML/yr (2023-24).
  - 10 bulk offtake meters for regulated pipeline networks, managed by bulk entitlement metering plans.
- 0.6% of existing sites are exempt as low use:
  - 16 groundwater sites accounting for a combined 15 ML/yr (2023-24).
  - 72 surface water division sites accounting for a combined 5 ML/yr (2023-24).
- 2.0% (319) sites are not exempt, of which:
  - 97% (308) have accurate metering and 55% (175) have telemetry.
  - 99% of flow was measured with a compliant meter and 53% of flow was telemetered.
  - The 265 ML that did not go through a compliant meter went through a contemporary meter at 11 sites; GWMWater is progressing upgrade of these sites during 2025-2026.
  - The 144 un-telemetered sites have been excluded from previous telemetry programs due to lack of network availability; as reliable, cost-effective network options are becoming available, GWMWater is applying telemetry to these sites.

Groundwater take is the largest volume of take on water resources, based on representative levels of use in 2023/24, comprising 24,024 ML/yr or 81% of the total metered take within the GWMWater region. Outside of bulk metering for regulated D&S pipeline systems, direct surface water diversion (irrigation) accounts for 0.09% of take being approximately 26 ML/yr.

Table 4: Meter and telemetry compliance status of GWMWater non-urban metering sites[iii].

Water Resource	Meter Compliance Requirement	Meter Compliance Status				Telemetry Compliance Status		TOTAL
		AS	CO	OT	UM	Telemetered	Un-Telemetered	
Surface Domestic & Stock	EXOS	-	-	15,167 (97.32%)	-	15,167 (97.32%)	-	**15,167 (97.32%)**
Surface - Bulk Water	EXOS	10 (0.06%)	-	-	-	10 (0.06%)	-	**10 (0.06%)**
Groundwater Irrigation	AM	301 (1.93%)	11 (0.07%)	-	-	168 (1.08%)	144 (0.92%)	**312 (2.00%)**
	EXOS	-	-	-	-	-	-	**-**
	EXLU	-	5 (0.03%)	-	11 (0.07%)	-	16 (0.10%)	**16 (0.10%)**
	EXHC	-	-	-	-	-	-	**-**
	MO	-	-	-	-	-	-	**-**
Surface Water Irrigation	AM	7 (0.04%)	-	-	-	7 (0.04%)	-	**7 (0.04%)**
	EXOS	-	-	-	-	-	-	**-**
	EXLU	-	16 (0.10%)	-	56 (0.36%)	-	72 (0.46%)	**72 (0.46%)**
	EXHC	-	-	-	-	-	-	**-**
	MO	-	-	-	-	-	-	**-**
TOTAL	-	**318 (2.04%)**	**32 (0.21%)**	**15,167 (97.32%)**	**67 (0.43%)**	**15,352 (98.51%)**	**232 (1.49%)**	**15,584 (100%)**

[iii] Data based on 'Annual Metering Data Request 2023-24'.

Table 5: Meter and telemetry compliance status by take volume (ML 2023/24)[iv].

Water Resource	Meter Compliance Requirement	Meter Compliance Status				Telemetry Compliance Status		TOTAL
		AS	CO	OT	UM	Telemetered	Un-Telemetered	
Surface Domestic & Stock	EXOS	-	-	5,509 (18.63%)	-	5,509 (18.63%)	-	**5,509 (18.63%)**
Surface - Bulk Water	EXOS	As per D&S meters above; the bulk meters measure this flow into the pipeline, the D&S meters measure this flow out of the pipeline.						**N/A**
Groundwater Irrigation	AM	23,759 (80.34%)	265 (0.90%)	-	-	12,822 (43.36%)	11,202 (37.88%)	**24,024 (81.23%)**
	EXOS	-	-	-	-	-	-	**-**
	EXLU	-	3 (0.01%)	-	13 (0.04%)	-	15 (0.05%)	**15 (0.05%)**
	EXHC	-	-	-	-	-	-	**-**
	MO	-	-	-	-	-	-	**-**
Surface Water Irrigation	AM	21 (0.07%)	-	-	-	21 (0.07%)	-	**21 (0.07%)**
	EXOS	-	-	-	-	-	-	**-**
	EXLU	-	-	-	5 (0.02%)	-	5 (0.02%)	**5 (0.02%)**
	EXHC	-	-	-	-	-	-	**-**
	MO	-	-	-	-	-	-	**-**
TOTAL		**23780 (80.41%)**	**268 (0.91%)**	**5509 (18.63%)**	**18 (0.06%)**	**18352 (62.06%)**	**11222 (37.94%)**	**29575 (100%)**

[iv] Data based on 'Annual Metering Data Request 2023-24'.

4.3 Meter Compliance Exemptions

Table 6: Reasons for metering variations in GWMWater non-urban meters by water resource[v]

Water Resource	Use	Reason for Variation	Meters Exempt	Comment
Groundwater	Irrigation	High Cost	312	These meters are shown with compliance status 'AS' in Table 4. However, although AS4747-compliant pattern approved meters are in place at 97% of sites requiring accurate metering, these sites may not meet full AS4747 installation requirements due to lack of cost-effective means to deliver required pipework retro-fits and infrastructure modifications. The standard installation for GWMWater groundwater and surface water diversion sites uses Siemens Mag8000 meters, which when installed to full AS4747-compliant pipework configuration achieve +/-2% accuracy. These meters are installed as far as practicable in accordance with these specifications and are expected to remain within +/-5% accuracy. The purpose of these meters is water accounting against licensed volume. The water resource units typically observe extraction of less than 65% of licensed volume. Consequently, a meter accuracy of +/-5% is adequate to control the risk of over-extraction and further investment is not justified.
		Low Use	16	Sleeper and low use sites totalling 15 ML during 2023/24. Includes Kaniva College and Apsley Football Netball Club.
Surface Water	Rural Pipeline	Outside Scope	15,167	'Domestic & Stock' or other supply meters from a rural pipeline distribution network which is metered at bulk offtake level. Includes meters used for operational intelligence rather than metering use.
	Bulk Offtake	Outside Scope	10	Metering arrangement to be specified in applicable bulk entitlement metering plan.

[v] Data based on 'Annual Metering Data Request 2023-24' (R2025-22790).

Water Resource	Use	Reason for Variation	Meters Exempt	Comment
	Direct Surface Water Diversion	Low Use	72	16 sites are sleeper sites metered with contemporary meters with zero use during 2023/24. As these sites become active, they will be assessed for upgrade to a AS4747-compliant pattern approved meter and works implemented if cost-effective. 56 sites are unmetered with take recorded at a combined 5 ML during 2023/24. The consequence of inaccurate accounting of take on the water resource is very low given the very low usage (i.e. less than 5% of the high-risk threshold).
Total			**15,255**	

4.4 Meter Telemetry Status

GWMWater manages 15,584 non-urban metering sites as summarised in Table 4 and Table 5.

- 98.51% (15,352) of GWMWater non-urban meter sites are telemetered.
- 0.92% (144) sites requiring accurate metering are un-telemetered and have been excluded from previous telemetry programs due to lack of network availability; as reliable, cost-effective network options become available, GWMWater will apply telemetry to these sites.
- The remaining 0.56% (88) sites are exempt from accurate metering due to low use and thus the benefit of telemetering these sites is also considered unjustified.

4.5 Meter Telemetry Exemptions

The 88 sites exempt from accurate metering due to low use limits the benefit of telemetering, rendering the cost unjustified and consequently these sites will not be telemetered.

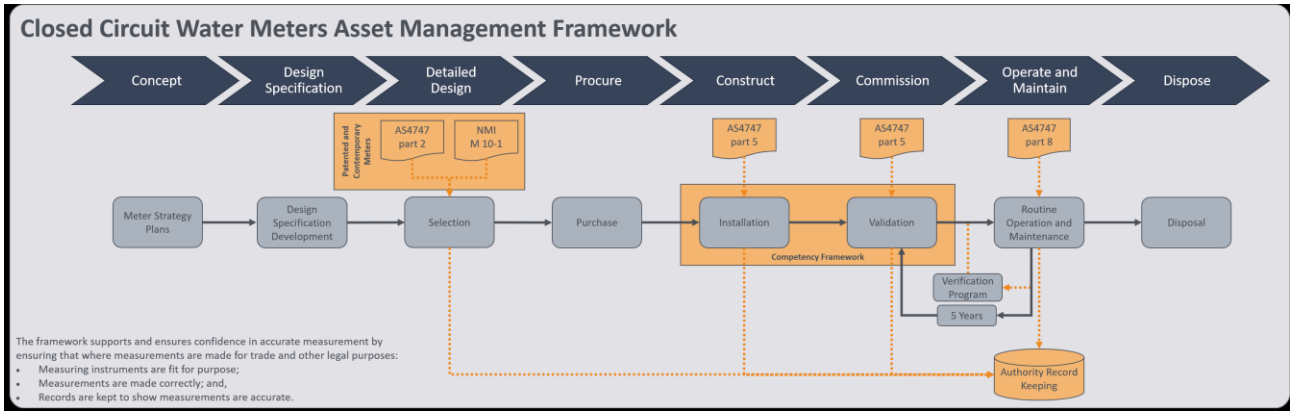
The remaining 144 un-telemetered sites are not telemetered due to historic lack of communications network availability. Telemetry is being applied to a portion of these sites with the remainder under ongoing review and additional telemetry will be considered on the basis of merit as cost-effective telemetry becomes available.

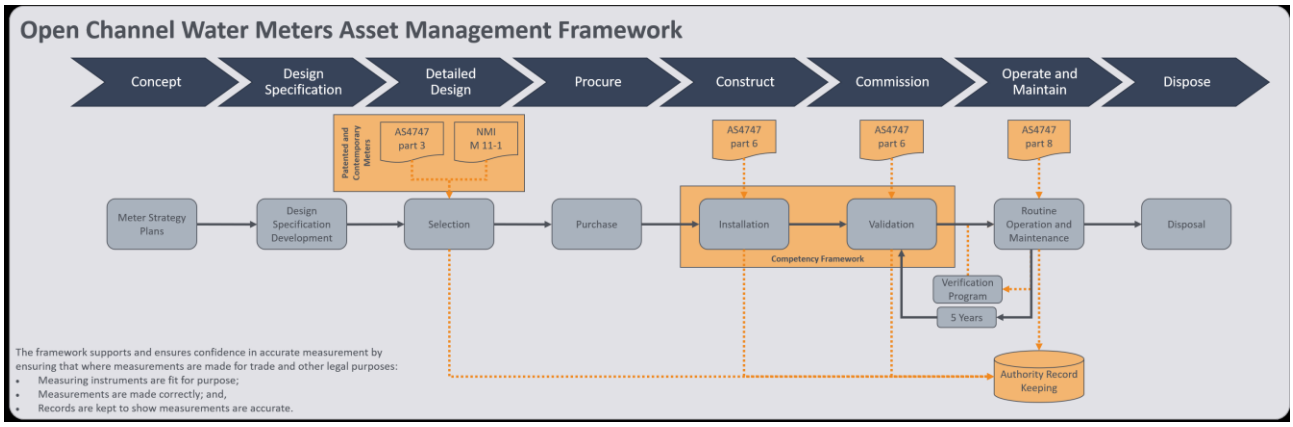
5. Meter Lifecycle Management Plan

This meter lifecycle management plan details how the organisation plans to manage and operate its meters at the agreed levels of service while optimising life-cycle costs.

5.1 Overview of meter lifecycle management

The following life-cycle diagrams show the main steps from developing Meter Action Plans through to disposal. The diagram shows the links with national standards.





5.2 Requirement to Meter

Unless exempt, an accurate meter is required. If exempt and used for billing or administrative reporting, a meter is required to the standard determined by the water business (Figure 1). In some instances, groundwater licences with a volume of equal to or less than 20 megalitres, and surface water diversion licences with a volume of equal to or less than 10 megalitres may not be metered. The need to meter low-volume users is determined case-by-case through a risk-based assessment. For all other water take, GWMWater requires appropriate metering to be in place.

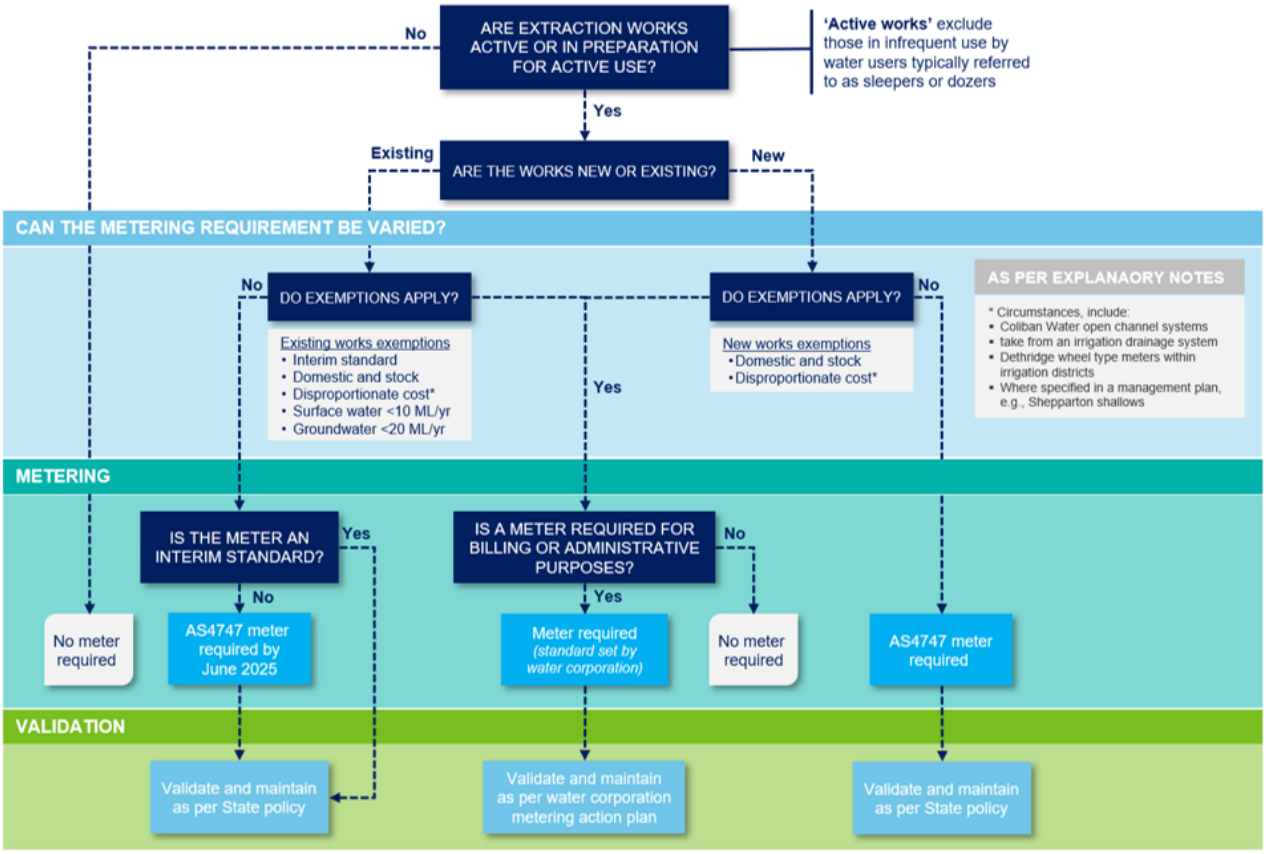


Figure 1: Requirement to meter flow diagram (Victorian Non-Urban Water Metering Policy, 2025)

5.3 Meter selection

5.3.1. General selection requirements

AS4747 compliant meters will be used at sites requiring accurate meters. Meter selection for exempt sites will prioritise cost-effective metering.

The preferred meters are:

- Mechanical meters for domestic and stock connections less than DN100
- Electromagnetic flow meters for all other sizes

GWMWater currently has no plans to install open channel meters.

5.3.2. Full flowing pipe meter selection process

For full flowing pipe meter sites, important information includes:

- Connection pipe details upstream and downstream
- Proposed power supply source details: mains, battery, solar (noting solar will require checking on shading and orientation)
- Flow range
- Water quality

- Site access constraints and safety
- Checklist of possible technical challenges

5.3.3. Technical challenges for full flowing pipe meters

Individual site situations can make accurate metering difficult to implement. Factors that may impact on metering performance include:

- Unusual flow conditions upstream and downstream of the meter that might result in the meter being unfit for purpose, for example, excessive swirl (turbulence)
- Water quality and floating debris that affects the meter
- Air entrapment
- Loss of power supply
- Vibrations from pumps that may affect the meter performance and/or its life
- Tampering

To control these issues, where practical, meters are installed to the standards specified by the supplier and manufacturer.

5.3.4. Open channel meters

GWMWater currently has no plans to install open channel meters.

5.4 Meter installation

AS4747 – Part 5 covers the installation requirements for full flowing meters and AS4747 – Part 6 covers the installation requirements for open channel meters.

The standard adopted for meter installations by GWMWater at new sites or at meter replacement, where an accurate meter is required under the Policy, is:

1. Install an AS4747-compliant pattern approved meter; and
2. Complete the installation to AS4747 installation compliance, except where the cost of doing so outweighs the benefit, in which case, meters will be installed to AS4747 standards as far as it is cost-effective to do so.
3. Tamper evident seals will be installed at meter replacement.
4. Tamper evident seals will be replaced when disturbed for maintenance activity.

5.4.1. Existing Groundwater Meter Sites

A key example of where full installation compliance is not cost-effective is at existing groundwater meter sites, many of which require extensive and complex modification to pipework and infrastructure to comply with the AS4747 installation standard. This pipework is owned and maintained by the landowner. These sites have existing infrastructure and pipework that determines the extent, and associated cost, of modifications required to achieve a fully AS4747 compliant installation.

GWMWater has replaced 95% of groundwater meters with AS4747-compliant pattern approved Siemens Mag8000 meters. Tests have confirmed that existing pipework can

achieve high meter accuracy of better than +/- 2% (refer sample location test certificates - Appendix B). These locations were assessed to require significant pipework modification and at significant cost to meet full AS4747 compliance.

Mag8000 meters typically achieve with +/-2% accuracy[vi], consequently there is confidence that these sites achieve the objective of +/-5% metering accuracy. Furthermore, the meters are not used for billing. Rather, they are used to ensure take of the resource is appropriately measured and managed, and water use against entitlements are not exceeded. Each of the water resource units has been assessed as 'low' or 'medium' risk, including risk of unauthorised take, and typically observe a total extraction of less than 65% of licensed volume[vii]. The conclusion is that there is confidence that meters are accurate and any possible inaccuracies would pose an insignificant risk. As a result, there is insignificant risk arising from this non-conformance to the full AS4747 standard.

Despite this confidence in metering accuracy, there remains a case for achieving full AS4747 installation compliance on principle, however the cost of doing so outweighs the benefit. Consequently, the metering requirement at existing groundwater meter sites has been varied on the basis of disproportionate cost, noting that the sites are in all other ways compliant and are considered to meter at better than +/-5% accuracy. GWMWater will periodically undertake in-situ testing of a selection of groundwater and/or surface water diversion meters using a 'strap-on' style meter or equivalent technology to validate the performance and accuracy of meters.

5.5 Meter maintenance

Section 2.7 of AS4747 – Part 8 covers the maintenance requirements for both meter categories. Appendix C of the standard is an informative section covering competencies and activities. The standard adopts a categorisation framework for maintenance activities of corrective, preventative and predictive.

GWMWater carries out maintenance when a defect is detected, and also as a preventative measure (e.g. meter battery replacement prior to predicted battery failure). Maintenance will consist of repair or replacement, with consideration for minimising lifecycle costs. Where large distances are involved, consideration is given to replacement and salvage of the replaced meter for repair and later reuse.

5.6 Meter validation

Section 2.4 of AS4747 – Part 8 covers the validation requirements for both meter categories.

Where AS4747 compliant meters are required, meters will be validated:

- 5-yearly

[vi] As per Siemens. This was confirmed by an in-situ verification at a GWMWater groundwater meter site, see Appendix B.

[vii] Based on water account data. See https://waterregister.vic.gov.au/images/documents/Victorian-Water-Accounts-2018-2019.pdf.

- After maintenance involving removal and re-installation of the meter

The metering requirement at all GWMWater non-urban metering sites has been varied (see Section 4.3). Consequently, no meters receive regular validations under this plan.

For groundwater meters that are exempt due to high cost of compliance, GWMWater has still utilised the most accurate metering that is cost-effective. GWMWater undertakes periodic validations as spot-checks to satisfy confidence in meter performance.

Historically there has been a lack of certified meter installers and validators within or near to the GWMWater region. This has made it impractical and cost prohibitive to routinely utilise the services of certified installers and validators. Certified installers are guided by the manufacturer's installation specifications when certifying an installation, and the meter specifications are suitable to accurately measure the profile of the water being measured. A certified installer will have limited input outside these requirements. Validators test the meter to ensure its operational parameters have not drifted from the factory settings since installation. Validation does not directly relate to the accuracy of the meter, or its ability to perform within the required specification, but that the meter is still operating in a mechanically or electronically sound manner.

5.6.1. Remote Validations

Under AS4747 -Part 8, validation tasks may be completed and logged remotely using the telemetry system provided the process is approved by a certified meter validator.

5.7 Meter verification

Section 2.5 and 2.6 of AS4747 – Part 8 covers the in-situ volumetric measurement and verification requirements for both meter categories. These are non-mandatory sections of the standard and with current methods, these tests are not cost-effective and are limited to testing only one flow supply situation - as all variables must be maintained during the test.

The Victorian Non-Urban Metering Policy states:

> If meters are validated in line with the scheduled requirements, verification is not required unless it is to determine if the meter has been functioning accurately.

Historically, a selection of meters have been verified. In recent years storage of these records has moved to the Document Management System (TRIM Folder 01/41 'Asset Management – Monitoring Equipment'). Verifications are high cost compared to the low volumes and low risks of inaccurate take, and offer limited assurance beyond existing risk controls. Consequently, verifications are typically utilised only when other risk controls are in question. More often, if a meter accuracy is in question, replacement can be more cost effective than verification.

GWMWater will periodically undertake in-situ testing of a selection of groundwater and/or surface water diversion meters using a 'strap-on' style meter or equivalent

technology to validate the performance and accuracy of meters. This action is not directly intended to satisfy validation or verification requirements under AS4747.

5.8 Meter Replacement

A meter is replaced if it ceases working or fails a verification and cannot be returned to proper operating condition.

Proactive meter replacement programs have occurred in recent years where this has presented a more cost-effective method of transitioning to telemetered metering.

5.9 Telemetry

Telemetry may be added when the meter is first installed or be retrospectively added to installed meters.

GWMWater has installed telemetry on rural pipeline domestic and stock (RPIP1) meters (Elster V100 with Taggle MCR-1 AMR module or equivalent). Telemetry units are replaced at failure and do not require maintenance.

Larger meters used for operational intelligence (e.g. RPIP2), including bulk offtake meters, are interfaced with GWMWater's SCADA system and have more sophisticated telemetry. Maintenance or replacement is undertaken in components of this telemetry as needed.

5.10 Disposal and decommissioning plan

There are no plans to decommission any rural pipeline customer meters or any meters which record the take of surface water or groundwater by licensed users. In the event that rural pipeline customer meters are to be decommissioned, the meter is removed and the pipe capped.

There are a number of redundant and out of service water pump stations and the flow meters at these sites are to be decommissioned along with the site. This will have no impact on water accounting, and these meters are outside the scope of this plan.

Metering data is retained in the billing system and will be available for viewing at any time. The meter attribute data in recorded in the asset management system. At meter replacement and disposal, this data is retained.

5.11 Improvement plan

5.11.1. Actions to Achieve Meter Compliance

New sites will be fitted with an AS4747-compliant meter, unless there is a valid reason for varying this requirement. GWMWater manages 15,584[viii] existing non-urban metering sites. Ninety-eight percent of existing sites are exempt as out of scope (see Section 4.3). At the remaining 2% of sites, GWMWater seeks to install the highest accuracy metering that is cost–effective. Consequently, GWMWater has utilised AS4747-compliant pattern

[viii] Data based on 'Annual Metering Data Request 2023-24' (R2025-22790).

approved meters at 97% of sites requiring accurate metering. The remaining 3% of sites will be upgraded to AS4747-compliant pattern approved meters ahead of June 2026. Installation of these meters will include assessment of necessary pipework modifications to achieve full compliance with AS4747 meter installation requirements. These modifications will be made where the benefit outweighs the cost, and otherwise, meters will be installed to AS4747 standards as far as it is cost-effective to do so (see Section 5.4).

Unmetered 'sleeper' irrigation will require works to meet compliance in the event they are to be brought into operation. GWMWater will assess unmetered 'sleeper' irrigation sites and undertake works where required, based on an assessment of cost-benefit and risk.

5.11.2. Actions to Achieve Telemetry Compliance

15,352 sites (99%) have telemetry. The 88 sites exempt from accurate metering due to low use limits the benefit of telemetering, rendering the cost unjustified and consequently these sites will not be telemetered.

The remaining 144 un-telemetered sites are under ongoing review and additional telemetry is being delivered on the basis of merit as cost-effective telemetry becomes available.

5.11.3. Improvements to the Asset Database to Facilitate Reporting

Fields are being created within our asset management and billing management system to house the additional asset reporting data required.

5.12 Forward Look Capital Program

GWMWater maintains a forward look capital program funding planned and reactive replacement of meters. Works related to compliance with the Victorian Non-Urban Metering Policy include upgrade of a residual number of groundwater meters as outlined in Section 5.11 (including telemetry requirements) and a reactive budget allowance for groundwater and surface water diversion meters.

Table 7: Indicative forward look capital program[ix]

Budget Code & Description	Budget by Financial Year ($'000)				
	25/26	26/27	27/28	28/29	29/30
60200 - Surface Water Diversion Metering	8	9	9	10	10
70500 - Groundwater Meter Replace Program	107	19	20	22	24

[ix] To view current budgets the reader is referred to the GWMWater Corporate Plan.

6. Data management, analysis and reporting

6.1 Status of current data management, analysis and reporting

The billing system (Technology One) logs all quarterly readings. Hourly reading on meters fitted with data logging devices is stored externally from the billing system in a data warehouse.

The asset management information system (Technology One) houses the asset data.

Data from these systems is exported and uploaded to DEECA.

Appendix A: Certified Meter Installers and Validators

Trained providers can be found on Irrigation Australia – the registered training provider for the CMI training, publishes an extensive list on their website:

Certification Directory | Irrigation Australia:
<https://irrigationaustralia.com.au/directory?mtype=Certification%20Directory>

Appendix B: Example Groundwater Meter In-Situ Verification

SIEMENS Instrument Calibration Certificate

Customer	
Name	GWM Water
Adresss	PO Box 481 Horsham VIC 3402
Phone	0419 869 334
Email	Kane.clark@gwmwater.com.au

Job Details	
Job Number	520000314830
Site	Wall Rd, Panitya North
Calibration Date	3/4/2020
Due Date	3/4/2021

Instrument Data

Description	N/A	**Location**	Wall Rd, Panitya North
TAG Number	N/A	**Power Supply**	Battery Powered
Make	Siemens MAG8000	**Range**	N/A
Model	7ME6810-4HN33-3CA0-Z M11+M94	**Input**	N/A
Serial No	667920D349	**Output**	N/A

Calibration Results

Flow rate (l/s)	Test meter		Master meter		Error
	Volume(Kl)	Increment	Volume (Kl)	Increment	
48	21.35		25.762		
47.3	29.92	8.57	34.247	8.485	-1.00%
47	38.45	8.53	42.705	8.458	-0.85%
47.3	46.96	8.51	51.127	8.422	-1.04%
47.3	55.49	8.53	59.529	8.402	-1.52%
46.9	64.09	8.6	68.091	8.562	-0.44%
				Average Error	-1.11%

SIEMENS Instrument Calibration Certificate

Comments:

Performed the flow testing using a Siemens clamp on flow meter.

Test results are within acceptable range as the clamp on system has an uncertainty of 2% and the meter under test has an uncertainty of 0.5%

Above Ground Installation (Wall rd Panitya)

Flow Tube & Components

- Correct Glands? Installed in factory
- Field Cables in conduit? Yes
- Straight Pipe achieved? Min 5 X Diameter Upstream & Min 3 X Diameter Downstream Achieved
- Flow tube positioned correctly? Yes
- Gaskets & Earthing Plates used? Yes
- Remote Sensor Potted for IP68 Rating? Potted in Factory

Remote Transmitter & Components

- Remote Transmitter in field box for protection? Yes
- Remote transmitter potted for IP68 Rating ? Potted in factory
- Transmitter working as calibrated? Yes
- Correct glands? Installed in factory

Calibration Equipment (Traceability)
Siemens Portable Clamp On S/N: 64036

Tested by:

Name:	Wiman Budiman	**Address:**	885 Mountain Hwy
Company	Siemens Australia Ltd		Bayswater, VIC 3153
Date:	3/04/2020		
Signature:	Budiman Wiman		

Unrestricted Melbourne Head Office 885 Mountain Highway, Bayswater VIC 3153 Australia Telephone (03) 9721 2000
A.B.N. 98 004 347 880

Automation & Drives