Australian Government

MURRAY–DARLING BASIN AUTHORITY

Availability of Pattern Approved ‘non-urban’ Water Meters

Including indicative metering requirements for the Basin

April 2019

Published by the Murray–Darling Basin Authority
MDBA publication no: 45/18
ISBN (online): 978-1-925762-14-3

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Cataloguing data
Title: Availability of Pattern Approved 'non-urban' Water Meters, Murray–Darling Basin Authority Canberra, 2019. CC BY 4.0

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The Murray−Darling Basin Authority pays respect to the Traditional Owners and their Nations of the Murray−Darling Basin. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The guidance and support received from the Murray Lower Darling Rivers Indigenous Nations, the Northern Basin Aboriginal Nations and our many Traditional Owner friends and colleagues is very much valued and appreciated.

Aboriginal people should be aware that this publication may contain images, names or quotations of deceased persons.

Version control			
Version	**Revision date**	**Author/modifier**	**Distributed to**
v.1	19 December 2018	Katie Davis	
v.2	20 December 2018	MDBA Communications	(title change only)
v.3	17 April 2019	Katie Davis	

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Purpose

In June 2018 the Australian Government and the Murray–Darling Basin states agreed to the Murray–Darling Basin Compliance Compact which describes actions to strengthen compliance with water management rules in the Basin. The availability and use of water meters that meet the requirements of the relevant Australian Standard is particularly important if the community is to have confidence in water compliance arrangements.

Part three of the Compliance Compact describes actions related to Metering and Measurement, which include the commitment to publish metering policies and implementation plans addressing meter accuracy, coverage, transmission of data, and a timetable for installation, auditing and maintenance of the meter fleet. It also includes a commitment to report annually on progress with their implementation plans.

This report is published in support of the requirement of 3.8 of the Compliance Compact:

3.8	The Australian Government and Basin States will work with each other, jurisdictions, testing laboratories, meter manufacturers and industry to set a timetable for delivering a comprehensive range of pattern approved meters.

For Australia there are a number of pattern approved meters currently available. More pattern approved meters are expected on the market in the near future. The Murray–Darling Basin Authority has consulted with meter manufacturers to compile a list of meters being considered for pattern approval. The National Measurement Institute has provided a list of current pattern approved meters. Together these lists are a comprehensive compilation of current and potential pattern approved meters.

This document also provides a compilation of the pattern approved metering requirements for the Basin. This information has been provided by the states and territories.

What is a pattern approved meter?

The National Measurement Institute of Australia checks non-urban water meters for compliance with the Australian Pattern Approval Standards for Non-Urban water meters. Pattern approved compliance status is provided for meters which meet specific requirements for closed conduit meters (NMI-M10); or which meet specific requirements for open channel meters (NMI-M11); or equivalent overseas standards.

A pattern approved meter complies with these requirements within the operating range specified by the meter manufacturer.

Which pattern approved non-urban water meters are available?

Table 1. Closed Conduit Meters

Certificate of Approval Number	Meter Model	Approved sizes (DN = internal pipe diameter in millimetres)	Approved maximum continuous flowrates (Q3)
		PATTERN APPROVED	
14/3/21	Krohne Waterflux 3070	DN25 – DN600	10 m^3/h – 6,300 m^3/h
14/3/24	Siemens MAG8000	DN50 – DN1200	63 m^3/h – 12,500 m^3/h
14/3/29	Arad Octave DN50	DN50 – DN200	40 m^3/h – 400 m^3/h
14/3/30	ABB AquaMaster3 FEV2	DN40 – DN200	40 m^3/h – 1,000 m^3/h
14/3/32	Aquamonix / Pentair I500	DN50 – DN600 Provisional approval: DN700 – DN1035	36 m^3/h – 7027 m^3/h
14/3/34	Sensus WP-Dynamic	DN40 – DN400	25 m^3/h – 2,000 m^3/h
14/3/36	Euromag MUT 2200 EL	DN40 – DN1000	25 m^3/h – 3,600 m^3/h
P14/3/42	Rubicon Sonaray Pipe Meter	Provisional approval: DN600	42 m^3/h – 1313 m^3/h
		METERS BEING CONSIDERED FOR PATTERN APPROVAL	
	MACE AgriFlo XCi	not provided	not provided
	Flexim F501IP with K Transducers	DN100 – DN2400	Transit time clamp-on ultrasonics have a very large turndown, and are not limited by flow rate
	Krohne Optiflux 2300	DN25 - DN1800	16 m^3/h – 25,000 m^3/h
	ABB AquaMaster4	DN40 – DN600	not provided
	Siemens MAG5100W (Mains powered)	DN50 – DN2000	63 m^3/h – 40,000 m^3/h
	Bermad / Euromag MUT 2200 EL	DN600 - DN1000	not provided
	Arad Octave	DN250 - DN300	1,000 m^3/h – 1,000 m^3/h
	Arad WSTsb	DN50 – DN300	63 m^3/h – 1,000 m^3/h

Note – Some Q3 units have been converted to cubic meters per hour (m^3/h) for consistency.

Table 2. Open Channel Meters

Certificate of Approval Number	Meter Model	Approved sizes (Channel dimensions)	Approved maximum continuous flowrates (Q3)
PATTERN APPROVED			
There are currently no pattern approved open channel meters			
METERS BEING CONSIDERED FOR PATTERN APPROVAL			
	Accusonic 8510+ Multiple Path Transit-Time Flowmeter	N/A	N/A
	Rubicon SlipMeter	600mm wide gate	42 m^3/h – 1313 m^3/h

Note – Some Q3 units have been converted to cubic meters per hour (m^3/h) for consistency.

Correct as at 17/4/2019

Note: The list of pattern approved meters can also be found at the National Measurement Institute's website (noting that the NMI list includes urban and non-urban meters) www.measurement.gov.au/Publications/CertificateOfApproval/OtherInstruments/Water_utility_Meters

Indicative metering requirements for the Murray–Darling Basin States

The supply of accurate non-urban water meters for water users within the Murray–Darling Basin will facilitate improvements in water accountability. The Australian Standard for non-urban water meters (AS4747) applies for meters in most Australian jurisdictions and similar metrological requirements apply for those jurisdictions that have not yet placed the Australian Standard in their regulatory requirements.

The following indicative metering requirements are provided by New South Wales, Victoria, Queensland and South Australia. The Murray–Darling Basin Authority makes no claims about the accuracy of the jurisdictional information but notes that the metering requirements suggest an expanding market for meters which comply with the AS4747 pattern approval requirements.

For further information about the Non-urban water meter requirements please contact the appropriate state agency.

NEW SOUTH WALES

Agency: New South Wales Department of Industry

The estimated number and infrastructure sizes of works requiring meters under the new NSW metering framework for surface water and groundwater are in the following tables. These figures are indicative, based on best available data.

Number of works requiring a meter in Stage 1

Stage 1 – Largest Users		
Meter size (mm)	**Currently metered**	**Works to be metered under new requirements**
500–549	118	182
550–599	2	5
600–649	408	538
650–699	248	349
700–749	6	10
750–899	43	73
900–999	31	50
100–1,200	22	32
>1,200	9	18
TOTAL	**887**	**1257**

Number of surface water works in each region that will need to be metered in Stages 2–4

Meter size (mm)	Stage 2 – Northern inland		Stage 3—Southern inland		Stage 4—Coast	
	Currently metered	Works to be metered under new requirements	Currently metered	Works to be metered under new requirements	Currently metered	Works to be metered under new requirements
0–49	6	9	19	33	13	42
50–99	58	156	151	255	155	572
100–149	271	1,147	530	1,306	693	2,280
150–199	149	434	396	718	106	295
200–249	81	162	299	513	32	79
250–299	48	107	306	519	9	23
300–349	70	153	456	727	15	30
350–399	53	86	213	322	0	9
400–449	153	246	180	257	0	5
450–499	19	48	55	73	1	3
TOTAL	**908**	**2,548**	**2,605**	**4,723**	**1,024**	**3,338**

Stage 1 includes only pumps of 500 mm or larger.
For stages 2–4, multiple works on a single licence, work approval or landholding that meet the metering thresholds are included.

Number of groundwater works in each region that will need to be metered in Stages 2–4

Meter size (mm)	Stage 2 – Northern inland		Stage 3—Southern inland		Stage 4—Coast	
	Currently metered	Works to be metered under new requirements	Currently metered	Works to be metered under new requirements	Currently metered	Works to be metered under new requirements
<50	20	57	106	275	1	360
50–99	1	7	13	28	0	1
100–199	137	826	161	536	18	53
200–299	441	1,391	336	673	13	785
300–399	424	982	369	564	4	123
400–499	210	404	189	252	3	31
500–599	150	239	68	104	0	4
600–699	23	53	47	72	0	8
700–799	4	28	14	24	0	6
800–899	5	8	7	15	0	0
900–999	16	88	8	23	1	22
1,000–1,199	40	151	1	8	0	71
>=1,200	202	651	7	32	16	934
Excavations	24	168	13	49	0	259
TOTAL	**1,697**	**5,053**	**1,339**	**2,655**	**56**	**2,663**

Works smaller than 50 mm include spear points, which will require a meter under the new framework.
Many of the works that are larger than 1,200 mm are wells.
The size of groundwater works is based on the outside diameter specified on the drilling certificate (Form A).
While the requirement to have a meter is based on the authorised work, the meter installed may be smaller, depending on other aspects of the infrastructure (e.g. pipe or pump size).

VICTORIA

Agency: Victorian Department of Environment, Land, Water and Planning

Victoria has comprehensive non-urban water metering. Victoria's rural water corporations manage around 47,000 meters, which are replaced at the end of their operational life. The following table is based on best available data provided in good faith by these water corporations. This information is preliminary, and subject to verification by the Victorian Department of Environment, Land Water and Planning in 2019.

Victoria is reviewing and updating its state-wide non-urban water metering policy and implementation plan in response to the Basin Compliance Compact. Changes to this policy and/or implementation plan may change the requirements for pattern approved meters. Victoria has committed to implementing the Basin Compliance Compact in accordance with principles of best practice regulation, so that the updated policy and implementation plan will be effective and proportional to the issues being addressed, and result in the greatest improvement in compliance at the least cost.

Number of non-urban water meters in Victoria

Meter type/ size	Unregulated system	Regulated system
Open Channel > 5000 ML/Yr.	0	1
Closed Conduit > 5000 ML/Yr.	7	37
Open Channel	0	2,611
Closed Conduit	3,842	35,967
Ground Water	4,454	2
Total	**8,303**	**38,618**

QUEENSLAND

Agency: Queensland Department of Natural Resources, Mines and Energy

Queensland is currently reviewing its water measurement (including non-urban water meters) policy and is determining the scope and extent of water metering that will be required across the state. While the Queensland Murray–Darling Basin is a priority, the development of a new water measurement policy is being considered in the context of Queensland's state-wide needs.

Gaps in the market for Queensland requirements:

- Pattern approved mechanical meters for <=300mm in diameter.
- Pattern approved ultrasonic meters for meters >300mm in diameter.
- Pattern approved channel meters

Meter fleet – Queensland state-wide requirements (approx.)

Queensland has around 5,000 non-urban meters in-service. Of these, around 1,400 meters are in the Queensland part of the Murray–Darling Basin. It is estimated that 15 000 new and replacement meters will be required for Queensland over the next 10 years.

Meter size (mm)	Current number of meters	Potential new meters
<100	2,500	6,000
101-200	2,000	5,400
201-300	150	1,000
301-450	100	900
451-600	100	700
>601, and including channel meters	150	1,000
TOTAL	**5,000**	**15,000**

SOUTH AUSTRALIA

Agency: South Australian Department for Environment and Water

The majority of off-takes in the South Australian portion of the Murray–Darling Basin are metered and these meters are expected to be grandfathered until the end of their operational life.

Mechanical type meters constitute a very large portion of the South Australian meter fleet and are largely considered fit-for-purpose. From the South Australian perspective, the current pattern approval list has a gap for mechanical type meters up to 300mm in diameter (there are currently no pattern approved meters for 'non potable' use that are mechanical). An example of a meter commonly used in South Australia that is considered fit-for-purpose is the mechanical type *ARAD IRT* meter.

The South Australian Implementation Plan for meters anticipates a gradual implementation of new non-urban water meters. Except where they fail beforehand, meters installed across South Australia will be replaced with AS4747 compliant meters after 30 June 2019 as they progressively come to the end of their operational life.

The following metering requirements table contains information prepared in 2008. The *Meters to be installed* row of the table refers to meters in the Eastern and Western Mount Lofty Ranges which were installed between 2012 and 2014. Considering an average meter life of 15 years, it is likely that South Australian's entire meter fleet (over 13,700 meters) will be refreshed with AS4747 compliant meters by 2034.

Meter size (mm)	Ground water	Surface water (Murray)	Meters to be installed	Meters within irrigation districts	Max flow rate (KL/h)	Max flow rate (ML/d)
<50	471	68	595	4552	<16	<0.4
50-100	3285	485	7230	477	25-100	0.6-2.4
101-200	2160	671	270	2488	150-400	3.7-9.5
201-375	408	207	0	3	500-1400	12-33
376-499	4	21	0	1	1600-2000	38-50
>=500	0	16	0	0	>2500	>60
Unknown sizes	75	0	5	780	N/A	N/A
TOTAL	**6403**	**1468**	**8100**	**8301**		

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