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Bureau of Meteorology

Category 7 Reporting Handbook

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1 Introduction

The Category 7 Reporting Handbook is a companion document to *Urban Water Management Information Requirements* which is a document incorporated by reference in Part 7 of the *Water Regulations 2008* (the Regulations).

Together, the incorporated document and this handbook describe and explain the range of information which urban water utilities are required to give to the Bureau of Meteorology (the Bureau) under water information Category 7 of the Regulations.[1]

The *Urban Water Management Information Requirements* document specifies the Category 7 water information requirements, including which 'component water volumes' (i.e. W indicators and U codes) each Person Category must provide, and the spatial reporting requirements and metadata and contextual information requirements.

Sections 3 to 6 of this handbook provide further explanation and supporting notes on the requirements, clarifies any inclusions or exclusions relevant to each volume, and provides background on the purpose for collecting the information. Section 7 of this handbook provides further details on the metadata and contextual information that must be given with Category 7 information. This includes descriptions and examples for each metadata element.

1.1 Why does the Bureau collect urban water information?

Through its role as a national provider of water information, the Bureau collects and publishes data on the availability and use of water across Australia. The Bureau provides independent, transparent and nationally consistent information of the availability, condition and use of water resources.

The urban water information collected is used by a range of parties that includes government, the water industry, academia and urban water utility customers. The information and analysis produced from it supports policy, planning and investment decisions and raises public awareness of the availability and use of the nation's urban water resources.

1.2 How does the Bureau use the information it collects?

The urban water information collected under the Regulations is used to support the production of the Bureau's water resource assessments and water information products.

Inflows and outflows of urban water systems are used directly for reporting urban water information and indirectly for data validation purposes.

[1] *Water Regulations 2008*, Schedule 3, Part 8–subcategories in Category 7–information about urban water management

1.2.1 The National Water Account

The National Water Account (NWA) is published by the Bureau as part of its obligations under the *Water Act 2007* (the Act). It is

The NWA is Australia's most comprehensive water information report. It provides a retrospective analysis of water resources management for the previous financial year for ten nationally significant water regions: Adelaide, Burdekin, Canberra, Daly, Melbourne, Murray–Darling Basin, Ord, Perth, South East Queensland and Sydney.

The report discloses information about water stores and flows, water rights and water use, including those based on Category 7 of the Regulations.

1.2.2 Periodic assessments

In addition to the preparation of an annual National Water Account, the Act mandates the publication of periodic national water assessments. These periodic assessments have until 2014 been in the form of the biennial Australian Water Resource Assessment (published in 2010 and 2012). In 2015 the assessment was restructured and released as Water in Australia. Published annually, Water in Australia provides a country-wide picture of water availability and use.

1.2.3 Urban National Performance Report

The annually-produced urban National Performance Report (urban NPR) supports commitments made by State and Territory governments under the National Water Initiative (NWI) to report publicly and independently on the performance of urban water utilities (NWI clauses 75–76).The report is produced by the Bureau of Meteorology, in conjunction with State and Territory governments and the Water Services Association of Australia.

1.3 What urban water information does the Bureau collect?

To support its urban water information needs the Bureau collects information on the collection, treatment, distribution, supply and use of urban water, wastewater, recycled water and stormwater. The specific requirements of utilities (named persons) required to provide Category 7 urban information are set out in the *Urban Water Management Information Requirements* document.

1.3.1 Why are there different levels of detail in the information requirements?

The Bureau seeks information on the basis of the level of detail required for its information products and the spatial coverage of these products.

Requirements are split between a high level, utility-scale data set (designated by W indicators) and a more detailed sub-utility scale data set (designated by U codes). Only utilities located within the NWA regions for which a detailed urban water analysis is undertaken[2] are required to provide the more detailed, U code based data set.

[2] Adelaide, Canberra, Melbourne, Perth, South East Queensland and Sydney

2 Reporting urban water information

The Bureau has developed a web-based reporting application that provides utilities with a single point of access for all their urban water information reporting obligations. This includes Category 7 urban water information, Category 8 water restrictions information and information for the urban National Performance Report. If you require access to the database application, please contact the Bureau's urban water unit by emailing urbanwater@bom.gov.au.

The Bureau is committed, where practical, to supporting single point of data entry arrangements for urban water information. To date, the Bureau has established mechanisms to facilitate Category 7 data to be reported through the Queensland Water Directorate's State-wide Water Information Management (SWIM) database. It will continue to work with state agencies and utilities to explore other opportunities to offer single point of data entry arrangements.

2.1 General notes for reporting Category 7 urban water information

2.1.1 Units

All volumes should be reported in megalitres (ML).

2.1.2 Reporting year

The reporting year is the financial year e.g. from 1 July 2016 to 30 June 2017.

2.1.3 Reporting dates and deadlines

The Regulations require urban water information to be reported to the Bureau by 31 October of each year. The reporting application opens on 1 July and closes on 31 October each year.

2.2 Urban water information requirements

The urban water information requirements are divided into four system based subcategories. These subcategories along with the handbook sections detailing the requirements are summarised in Figure 2.1. A high-level summary of each subcategory is provided in Sections 2.2.1–2.2.4.[3]

[3] The *Urban Water Management Information Requirements* document is the definitive source of information on urban water reporting requirements.

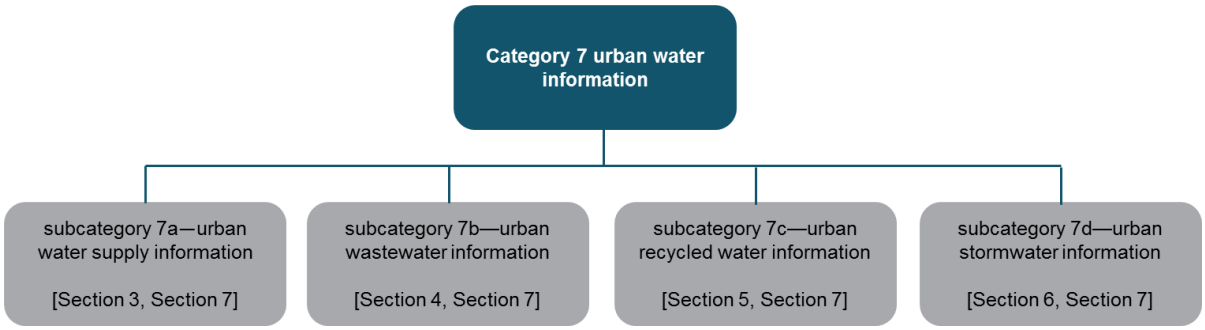

Figure 2.1 Summary of Category 7 urban water information subcategories

2.2.1 7a—Urban water supply information

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="5">7a—Urban water supply information</td><td rowspan="4">Sources</td><td rowspan="2">W1—Volume of water sourced from surface water</td><td>U1.1—Volume of surface water sourced from regulated sources, for each surface water resource</td><td rowspan="4">• Name of water resource
• Name of water management area
• Name of plant
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>U1.2—Volume of surface water sourced from unregulated sources, for each surface water resource</td></tr>
<tr><td rowspan="2">W2—Volume of water sourced from groundwater</td><td>U2.1—Volume of groundwater sourced from regulated sources, for each groundwater resource</td></tr>
<tr><td>U2.2—Volume of groundwater sourced from unregulated sources, for each groundwater resource</td></tr>
<tr><td>W3.1—Volume of water sourced from desalinated marine waters</td><td>U3.1—Volume of water sourced from desalination of marine waters, for each desalination plant</td><td>• Name of plant
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>Transfers</td><td>W5.3—Volume of water, excluding recycled water, received from other service providers or operational areas within the urban water supply system</td><td>U4.1—Volume of water, excluding recycled water, received from other service providers or operational areas within the urban water supply system, for each transfer party</td><td>• Name of water resource
• Name of transfer party
• Quantification method
• Uncertainty
• Assumptions</td></tr>
</table>

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="5">7a—Urban water supply information</td><td>Transfers</td><td>W14.3—Volume of water, excluding recycled water, exported to other service providers or operational areas within the urban water supply system</td><td>U8.1—Volume of water, excluding recycled water, exported to other service providers or operational areas within the urban water supply system, for each transfer party</td><td>• Name of water resource
• Name of transfer party
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>Production</td><td>W11.3—Volume of potable water produced for supply into the urban water supply system</td><td>U9—Volume of potable water produced for supply into the urban water supply system</td><td rowspan="4">• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td rowspan="3">Use</td><td>W8.3—Volume of water supplied to residential customers</td><td>U10.1—Volume of water supplied to residential customers</td></tr>
<tr><td rowspan="3">W9.3—Volume of water supplied to non-residential customers</td><td>U10.2—Volume of water supplied to commercial, industrial and municipal customers</td></tr>
<tr><td>U10.3—Volume of water supplied to agricultural and individual irrigation customers</td></tr>
<tr><td>U10.4—Volume of water supplied to irrigation water schemes</td></tr>
</table>

Person category		Category F, Category M	Category L	
Requirements		**W indicator (ML)**	**U codes (ML)**	**Metadata and contextual information**
7a—Urban water supply information	**Use**	**Continued** **W9.3—**Volume of water supplied to non-residential customers	**U10.5—**Volume of water supplied to other customers	• Quantification method • Uncertainty • Assumptions
			U10.6—Volume of water supplied as environmental flows from the urban water supply system	
			U10.7—Volume of water supplied for own use	
		W31—Volume of water returned to surface water from the urban water supply system	**U6.1—**Volume of water returned to surface water from the urban water supply system, for each surface water resource	• Name of water resource • Name of water management area • Quantification method • Uncertainty • Assumptions
		W13—Volume of water returned as environmental flows from outside of the urban water supply system	**U14.1—**Volume of water returned as environmental flows from outside the urban water supply system, for each surface water or groundwater resource	
		W10.1—Volume of non-revenue water	**U12.2—**Volume of non-revenue water – real losses	• Quantification method • Uncertainty • Assumptions
			U12.4—Volume of non-revenue water – apparent losses	

2.2.2 7b—Urban wastewater information

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="3">7b—Urban wastewater information</td><td rowspan="2">Wastewater Collected</td><td>W16—Volume of wastewater, excluding trade waste, collected</td><td>U22.3—Volume of wastewater, excluding trade waste, collected</td><td rowspan="2">• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>W17—Volume of trade waste collected</td><td>U22.2—Volume of trade waste collected</td></tr>
<tr><td>Inflow to Plant</td><td>W18.4—Volume of wastewater inflow to wastewater treatment plants</td><td>U23.1—Volume of wastewater inflow to wastewater treatment plants (excluding to bulk wastewater treatment plants), for each wastewater treatment plant

U23.2—Volume of wastewater inflow to bulk wastewater treatment plants, for each wastewater treatment plant</td><td>• Name of plant
• Quantification method
• Uncertainty
• Assumptions</td></tr>
</table>

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="3">7b—Urban wastewater information</td><td rowspan="3">Transfers</td><td rowspan="2">W18.2—Volume of wastewater received from other service providers or operational areas within the urban wastewater system</td><td>U20.1—Volume of wastewater received from other service providers or operational areas within the urban wastewater system (excluding to a bulk wastewater treatment system), for each transfer party and wastewater treatment plant</td><td rowspan="2">• Name of plant
• Name of transfer party
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>U20.3—Volume of wastewater received from other service providers to a bulk wastewater treatment system, for each transfer party and wastewater treatment plant</td></tr>
<tr><td rowspan="2">W18.1—Volume of wastewater exported to other service providers or operational areas within the urban wastewater system</td><td>U21.1—Volume of wastewater exported to other service providers or operational areas within the urban wastewater system, for each transfer party and wastewater treatment plant</td><td rowspan="2">• Name of plant
• Name of transfer party
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>U20.4—Volume of treated wastewater received from own organisation, for each wastewater treatment plant</td></tr>
</table>

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="6">7b—Urban wastewater information</td><td>Extraction for Sewer Mining</td><td>W18.3—Volume of wastewater taken through sewer mining</td><td>U83.1—Volume of wastewater taken through sewer mining, for each reclamation plant</td><td rowspan="6">• Name of plant
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td rowspan="5">Outflow from Plant</td><td>W18.5—Volume of treated effluent outflow from wastewater treatment plants</td><td>U24.1—Volume of treated effluent outflow from each wastewater treatment plant</td></tr>
<tr><td rowspan="4">W29—Total volume of treated wastewater disposals</td><td>U25.1—Volume of treated wastewater disposals to surface water, for each wastewater treatment plant</td></tr>
<tr><td>U25.2—Volume of treated wastewater disposals to landscape, for each wastewater treatment plant</td></tr>
<tr><td>U25.3—Volume of treated wastewater disposals to sea or estuary, for each wastewater treatment plant</td></tr>
<tr><td>U29.1—Volume of treated wastewater disposals back to sewer for further treatment, for each wastewater treatment plant</td></tr>
</table>

Person category		Category F, Category M	Category L	
Requirements		W indicator (ML)	U codes (ML)	Metadata and contextual information
7b—Urban wastewater information	Outflow from Plant	**W30—**Volume of wastewater losses and discharges	**U28.4—**Volume of losses during wastewater collection process	• Quantification method • Uncertainty • Assumptions
			U28.9—Volume of losses during wastewater treatment process	
			U28.13—Volume of losses during management of treated wastewater	

2.2.3 7c—Urban recycled water information

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="4">7c—Urban recycled water information</td><td rowspan="2">Transfers</td><td>W6—Volume of recycled water received from other service providers or operational areas within the urban water system</td><td>U41.1—Volume of recycled water received from other service providers or operational areas within the urban water system, for each transfer party and wastewater treatment plant</td><td rowspan="2">• Name of plant
• Name of transfer party
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td>W15—Volume of recycled water exported to other service providers or operational areas within the urban water system</td><td>U42.1—Volume of recycled water exported to other service providers or operational areas within the urban water system, for each transfer party and wastewater treatment plant</td></tr>
<tr><td rowspan="3">Use</td><td>W20—Volume of recycled water supplied to residential customers</td><td>U44.1—Volume of recycled water supplied to residential customers, for each treatment plant</td><td rowspan="3">• Name of plant
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td rowspan="2">W21—Volume of recycled water supplied to non-residential customers</td><td>U43.5—Volume of recycled water supplied for own use, for each treatment plant</td></tr>
<tr><td>U44.2—Volume of recycled water supplied to commercial, industrial and municipal customers, for each treatment plant</td></tr>
<tr><td colspan="2"></td><td></td><td>U44.3—Volume of recycled water supplied to agricultural and individual irrigation customers, for each treatment plant</td><td></td></tr>
</table>

Person category		Category F, Category M	Category L	
Requirements		**W indicator (ML)**	**U codes (ML)**	**Metadata and contextual information**
7c—Urban recycled water information	**Use**	**Continued** **W21—**Volume of recycled water supplied to non-residential customers	**U44.4—**Volume of recycled water supplied to irrigation water schemes, for each treatment plant	• Name of plant • Quantification method • Uncertainty • Assumptions
			U44.5—Volume of recycled water supplied for groundwater recharge, for each treatment plant	
			U44.10—Volume of recycled water supplied to other customers, for each treatment plant	
		W23—Volume of recycled water supplied as environmental flows	**U44.6—**Volume of recycled water supplied as environmental flows, for each treatment plant	

2.2.4 7d—Urban stormwater information

<table>
<tr><th colspan="2">Person category</th><th>Category F, Category M</th><th colspan="2">Category L</th></tr>
<tr><th colspan="2">Requirements</th><th>W indicator (ML)</th><th>U codes (ML)</th><th>Metadata and contextual information</th></tr>
<tr><td rowspan="7">7d—Urban stormwater information</td><td rowspan="7">Use</td><td>W28.4—Volume of urban stormwater supplied to residential customers</td><td>U62.1—Volume of urban stormwater supplied to residential customers, for each stormwater harvesting scheme</td><td rowspan="7">• Name of stormwater harvesting scheme
• Quantification method
• Uncertainty
• Assumptions</td></tr>
<tr><td rowspan="6">W28.5—Volume of urban stormwater supplied to non-residential customers</td><td>U62.2—Volume of urban stormwater supplied to commercial, industrial and municipal customers, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.3—Volume of urban stormwater supplied to agricultural and individual irrigation customers, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.4—Volume of urban stormwater supplied to irrigation water schemes, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.5—Volume of urban stormwater supplied for groundwater recharge, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.6—Volume of urban stormwater supplied as environmental flows, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.10—Volume of urban stormwater supplied to other customers, for each stormwater harvesting scheme</td></tr>
</table>

3 Urban water supply system (subcategory 7a)

An urban water supply system is a system used for the collection, transmission, treatment, storage and distribution of water extracted from water sources and supplied to consumers; e.g. residential properties, commercial premises and industrial operations.

The conceptualisation of the urban water supply system for the provision of subcategory 7a—Urban water supply information is shown in Figure 3.1. The figure illustrates the inflows and outflows of the system for which information is collected. For the purposes of the Regulations recycled water and urban stormwater are reported separately to the urban water supply system under subcategory 7c and 7d respectively.

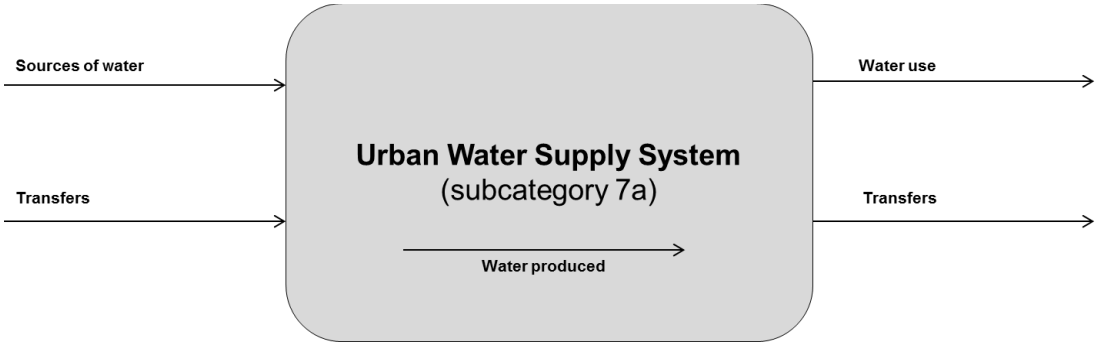

Figure 3.1 The urban water supply system

3.1 Sources of water

Information on the sources of water used by utilities supports an understanding of the availability and use of water resources across the nation. It provides insight into the diversity of supply sources and can inform water security policy, planning and management decisions.

Information on water sources is also important for understanding and comparing the relative performance of utilities. For example, the cost of treating water to an acceptable standard and supplying it to users affects the revenue collected by water utilities, their profitability and the strength of their water-usage pricing signal.

3.1.1 Water sourced from surface water

<table>
<tr><td rowspan="2">W indicator/ U code</td><td rowspan="2">W1—Volume of water sourced from surface water</td><td>U1.1—Volume of surface water sourced from regulated sources, for each surface water resource</td></tr>
<tr><td>U1.2—Volume of surface water sourced from unregulated sources, for each surface water resource</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The gross volume of water taken by the utility from surface water sources during the reporting year, in megalitres (ML).

Surface water sources includes:

✔ rivers, creeks and streams

✔ surface water storages

✔ irrigation channels

and excludes:

✘ urban stormwater.

The reported volume includes:

✔ any water returned to surface water (also reported separately under W31/U6.1)

✔ water taken by service providers operating on behalf of the utility

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ water purchased from another service provider such as a bulk water supplier (reported separately as W5.3/U4.1).

The reported volume should be based on the metered inflow of raw water to WTPs or metered extraction of raw water where it is supplied directly into the urban system without treatment.

If a WTP inflow measurement is not available an outflow measurement can be used. In such cases this should be documented in the associated footnote (W indicators) or quantification method (U codes).

Where possible, avoid reporting volumes based on meters that are upstream of a WTP. Distribution system losses and gains can influence the measured volume significantly.</td></tr>
<tr><td>U code supporting notes</td><td colspan="2">Regulated surface water sources are those subject to the controlled management of water releases and are typically subject to entitlements and annual allocation announcements.

Unregulated surface water sources are not subject to allocations.</td></tr>
</table>

3.1.2 Water sourced from groundwater

<table>
<tr><td rowspan="2">W indicator/ U code</td><td rowspan="2">W2—Volume of water sourced from groundwater</td><td>U2.1—Volume of groundwater sourced from regulated sources, for each groundwater resource</td></tr>
<tr><td>U2.2—Volume of groundwater sourced from unregulated sources, for each groundwater resource</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The net volume of water sourced by the utility from groundwater during the reporting year, in megalitres (ML).

Groundwater sources includes:

✔ aquifers, including those subject to aquifer replenishment.

The reported volume includes:

✔ water sourced by service providers operating infrastructure on behalf of the utility

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ groundwater purchased from another service provider such as a bulk water supplier (reported separately as W5.3/U4.1).

The reported volume should be based on the metered outflow of treated water from WTPs or the metered extraction of raw water where it is supplied directly into the urban system without treatment.

Where possible, avoid reporting volumes based on meters that are upstream of a WTP. Distribution system losses and gains can influence the measured volume significantly.</td></tr>
<tr><td>U code supporting notes</td><td colspan="2">Regulated groundwater sources are subject to controlled management of water releases and are typically subject to entitlements and annual allocation announcements.

Unregulated groundwater sources are not subject to entitlements and allocations.</td></tr>
</table>

3.1.3 Water sourced from desalination of marine waters

W indicator/ U code	W3.1—Volume of water sourced from desalinated marine waters	U3.1—Volume of water sourced from desalination of marine waters, for each desalination plant
General supporting notes	The net volume of water produced by the utility from the desalination of marine or estuarine water during the reporting year, in megalitres (ML). **Marine or estuarine water** excludes: ✘ surface water ✘ groundwater ✘ wastewater. The **reported volume** includes: ✔ water produced by service providers operating infrastructure on behalf of the utility ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ water purchased from another service provider such as a bulk water supplier (reported separately as W5.3/U4.1). The **reported volume** should be based on the metered outflow of treated water from WTPs or the metered extraction of raw water where it is supplied directly into the urban system without treatment. Where possible, avoid reporting volumes based on meters that are upstream of a WTP. Distribution system losses and gains can influence the measured volume significantly.	

3.2 Transfers

Information on water transfers supports an understanding of the availability and use of water resources in a regional context. It assists in understanding inter and intra catchment relationships and regional management practices and informs water security policy, planning and management decisions. For example, information on water transfers provides insight into the regional availability and use of water resources and water security and also provides information on the impact of urban centres on surrounding catchments and groundwater aquifers.

3.2.1 Water received

<table>
<tr><td>W indicator/ U code</td><td>W5.3—Volume of water, excluding recycled water, received from other service providers or operational areas within the urban water supply system</td><td>U4.1—Volume of water, excluding recycled water, received from other service providers or operational areas within the urban water supply system, for each transfer party</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The volume of water, potable and non-potable (excluding recycled water and urban stormwater) received by the utility from another service provider or operational area within the urban water supply system during the reporting year, in megalitres (ML).

Other service providers includes:

✔ bulk water utilities

✔ third party infrastructure operators

and excludes:

✘ service providers operating infrastructure on behalf of the utility.

The reported volume includes:

✔ raw water

✔ bulk water purchases

✔ any water that is subsequently exported to another utility

✔ transfers not associated with a financial transaction

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ recycled water

✘ urban stormwater.</td></tr>
</table>

3.2.2 Water delivered

W indicator/ U code	W14.3—Volume of water, excluding recycled water, exported to other service providers or operational areas within the urban water supply system	U8.1—Volume of water, excluding recycled water, exported to other service providers or operational areas within the urban water supply system, for each transfer party
General supporting notes	The volume of water, potable and non-potable (excluding recycled water and urban stormwater), exported by the utility to another service provider or operational area within the urban water supply system during the reporting year, in megalitres (ML). **Other service providers** includes: ✔ bulk water utilities ✔ third party infrastructure operators and excludes: ✘ service providers operating infrastructure on behalf of the utility. The **reported volume** includes: ✔ raw water ✔ bulk water purchases ✔ any water that is subsequently exported to another utility ✔ transfers not associated with a financial transaction ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ recycled water ✘ urban stormwater.	

3.3 Water produced

The volume of water produced provides insight into the efficiency of the urban water supply system and supports an understanding of losses and other non-revenue streams. For example, the comparison of production data with customer usage data provides insights into the performance of urban water supply systems; including system losses.

3.3.1 Potable water produced

W indicator/ U code	W11.3—Volume of potable water produced for supply into the urban water supply system	U9—Volume of potable water produced for supply into the urban water supply system
General supporting notes	The volume of potable water produced by the utility for supply into the urban water supply system, during the reporting year, in megalitres (ML). The **reported volume** is measured at the outflow of treatment plants (e.g. water treatment plants, desalination plants, disinfection plants) or at the beginning of the urban water supply system. Distribution system losses and gains can influence the measured volume significantly and should be excluded.	

3.4 Water use

Understanding water use is central to the planning and management of urban water systems. In particular, it underpins water security planning and management as well as being central to developing water policy which supports decision making at all levels of government.

Water use information also assists in understanding the role of water in the economy and hence the impact of management decisions affecting it. For example, water use information can inform an understanding of the impact of water restrictions on the economy and hence play a role in developing restriction policies.

3.4.1 Residential water use

W indicator/ U code	W8.3—Volume of water supplied to residential customers	U10.1—Volume of water supplied to residential customers
General supporting notes	The volume of water, potable and non-potable but excluding recycled water and urban stormwater supplied by the utility to residential properties during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ water received from other service providers ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ recycled water ✘ urban stormwater. The **reported volume** should: ✔ be based on customer metering data.	

3.4.2 Non-residential water use

<table>
<tr><td rowspan="6">W indicator/ U code</td><td rowspan="6">W9.3—Volume of water supplied to non-residential customers</td><td>U10.2—Volume of water supplied to commercial, industrial and municipal customers</td></tr>
<tr><td>U10.3—Volume of water supplied to agricultural and individual irrigation customers</td></tr>
<tr><td>U10.4—Volume of water supplied to Irrigation water schemes</td></tr>
<tr><td>U10.5—Volume of water supplied to other customers</td></tr>
<tr><td>U10.6 —Volume of water supplied as environmental flows from the urban water supply system</td></tr>
<tr><td>U10.7—Volume of water supplied for own use</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The volume of water, potable and non-potable but excluding recycled water and urban stormwater supplied by the utility to non-residential properties during the reporting year, in megalitres (ML).

The reported volume includes:

✔ environmental releases made from the urban water supply system, i.e. after treatment. Environmental releases to surface water are also included in the volumes reported against W31/U6.1—Volume of water returned to surface water from the urban water supply system

✔ water received from other service providers

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ recycled water

✘ urban stormwater

✘ environmental releases made outside of the water supply system. These releases are reported under W13/U14.1—Volume of water returned as environmental flows from outside of the urban water supply system.

The reported volume should:

✔ be based on customer metering data.</td></tr>
</table>

U code supporting notes	**Individual irrigation customers** includes: ✔ irrigation of crops ✔ recycled water supplied to forestry ✔ irrigation of agricultural products including livestock. **Irrigation water schemes** includes: ✔ large scale agricultural use via infrastructure managed by an irrigation entity. **Environmental flows** are: ✔ released under a specific environmental management plan prepared in conjunction with and/or approved by the appropriate environmental resource regulator. **Other customers** includes: ✔ all remaining uses not captured by the other non-residential use U codes (U10.1–U10.4,U10.6 and U10.7) ✔ Unbilled authorised consumption. **Own use** includes: ✔ onsite use at a WTP—including the irrigation of grounds.

3.4.3 Water returned to surface water

W indicator/ U code	W31—Volume of water returned to surface water from the urban water supply system	U6.1—Volume of water returned to surface water from the urban water supply system, for each surface water resource
General supporting notes	The volume potable and non-potable water returned by the utility to surface water from the urban supply system during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ water that has been subjected to treatment for use and subsequently returned to surface water ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ recycled water ✘ urban stormwater.	

3.4.4 Water returned to the environment

W indicator/ U code	W13—Volume of water returned as environmental flows from outside of the urban water supply system	U14.1—Volume of water returned as environmental flows from outside the urban water supply system, for each surface water or groundwater resource
General supporting notes	The volume of non-potable water supplied by the utility to the environment during the reporting year, in megalitres (ML). **Environmental flows** are: ✔ released under a specific environmental management plan prepared in conjunction with and/or approved by the appropriate environmental resource regulator. The **reported volume** includes: ✔ environmental releases made from outside of the urban water supply system, i.e. before treatment ✔ unmetered volumes—information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ water that has been subjected to treatment for use and subsequently returned to surface water. Water returned to surface water from the urban water system are reported under W31/U6.1—Volume of water returned to surface water from the urban water supply system, and W23/U44.3—Volume of recycled water supplied as environmental flows ✘ accidental or unintentional releases, unless they are incorporated into the environmental flow management regime—clarification should be sought from the State or Territory regulator on any component of unintended releases to be included in environmental flows ✘ recycled water ✘ urban stormwater.	

3.4.5 Non-revenue water

<table>
<tr><td rowspan="2">W indicator/ U code</td><td rowspan="2">W10.1—Volume of non-revenue water</td><td>U12.2—Volume of non-revenue water – real losses</td></tr>
<tr><td>U12.4—Volume of non-revenue water – apparent losses</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The volume of non-revenue water associated with the urban water supply system during the reporting year, in megalitres (ML).

Non-revenue water includes:

✔ apparent losses: including unauthorised use and customer metering inaccuracy

✔ real losses: including leakage on mains, leakage and overflows at storages, and leakage on service connections up to the point of the customer meter.

and excludes:

✘ Unbilled, authorised consumption (reported under U10.5).</td></tr>
<tr><td>U code supporting notes</td><td colspan="2">Non-revenue water losses are defined as per Water Services Association of Australia[4] (WSAA) and International Water Association [5, 6] (IWA) guidelines and are summarised in Table 3.1.</td></tr>
</table>

[4] Lambert A. and Hirner W. (2000): Losses from Water Supply Systems: Standard Terminology and Recommended Performance Measures.

[5] Water Services Association of Australia (2001). Benchmarking of Water Losses in Australia. ISSN 1 876088 96 6

[6] Alegre H., Hirner W., Baptista J.M. and Parena R. (2000) Performance Indicators for Water Supply Services. IWA Manual of Best Practice. ISBN 900222272

Table 3.1 Water use and the breakdown of revenue and non-revenue water in the urban water supply system[7]

<table>
<tr><td rowspan="11">Total water sourced</td><td rowspan="1">Water Delivered/Received</td><td rowspan="1">Authorised Consumption</td><td rowspan="1">Billed</td><td>Water Delivered/ Received</td><td rowspan="3">Revenue Water</td><td>Transfers – Water</td><td>U4.1, U8.1
Water transfers between organisations. Typically bulk water distribution to retailers.</td></tr>
<tr><td rowspan="10">Water Supplied</td><td rowspan="3">Billed</td><td>Metered use</td><td rowspan="4">Water Use</td><td rowspan="2">U10.1 – U10.6
Residential, commercial/industrial/municipal, agricultural, Irrigation Water Schemes, other customers, environmental</td></tr>
<tr><td>Un-metered use</td></tr>
<tr><td rowspan="3">Unbilled</td><td rowspan="8">Non-revenue Water</td><td rowspan="2">U10.7 e.g. metered consumption of utility itself or metered water use provided to institutions/customers free of charge; process water at treatment plant; hydrants for mains flushing; and, fire service</td></tr>
<tr><td>Metered use</td></tr>
<tr><td>Unmetered use</td></tr>
<tr><td rowspan="7">Water Losses</td><td rowspan="2">Apparent Losses</td><td>Unauthorised use</td><td rowspan="5">Non-revenue water losses</td><td rowspan="2">U12.4 e.g. illegal use from hydrants; illegal connections; meter bypass; meter tampering; e.g. meter under/over registration</td></tr>
<tr><td>Customer metering inaccuracy</td></tr>
<tr><td rowspan="5">Real Losses</td><td>Leakage on mains</td><td rowspan="5">U12.2 e.g. pipe bursts, background pipe leakage, overflows, leaks</td></tr>
<tr><td>Leakage and overflows at storages</td></tr>
<tr><td>Leakage on service connections up to point of customer meter</td></tr>
</table>

[7] The table is based on the IWA Standard International Water Balance—Lambert A., Brown T.G., Takizawa M. and Weimer D. (1999) Review of Performance Indicators for Real Losses from Water Supply Systems, Water supply Res. Technology. AQUA 48, 227-237.

4 Urban wastewater system (subcategory 7b)

An urban wastewater system is a system used for the collection, transmission, treatment, storage and disposal of wastewater collected by a utility. This includes residential properties, commercial premises and industrial operations.

The conceptualisation of the urban wastewater system for the provision of subcategory 7b—Urban wastewater information is shown in Figure 4.1. The figure illustrates the inflows and outflows of the system for which information is collected. While recycled water is reported separately to the urban wastewater system under subcategory 7c, the figure depicts the recycled water system to demonstrate the interconnectivity of the two systems.

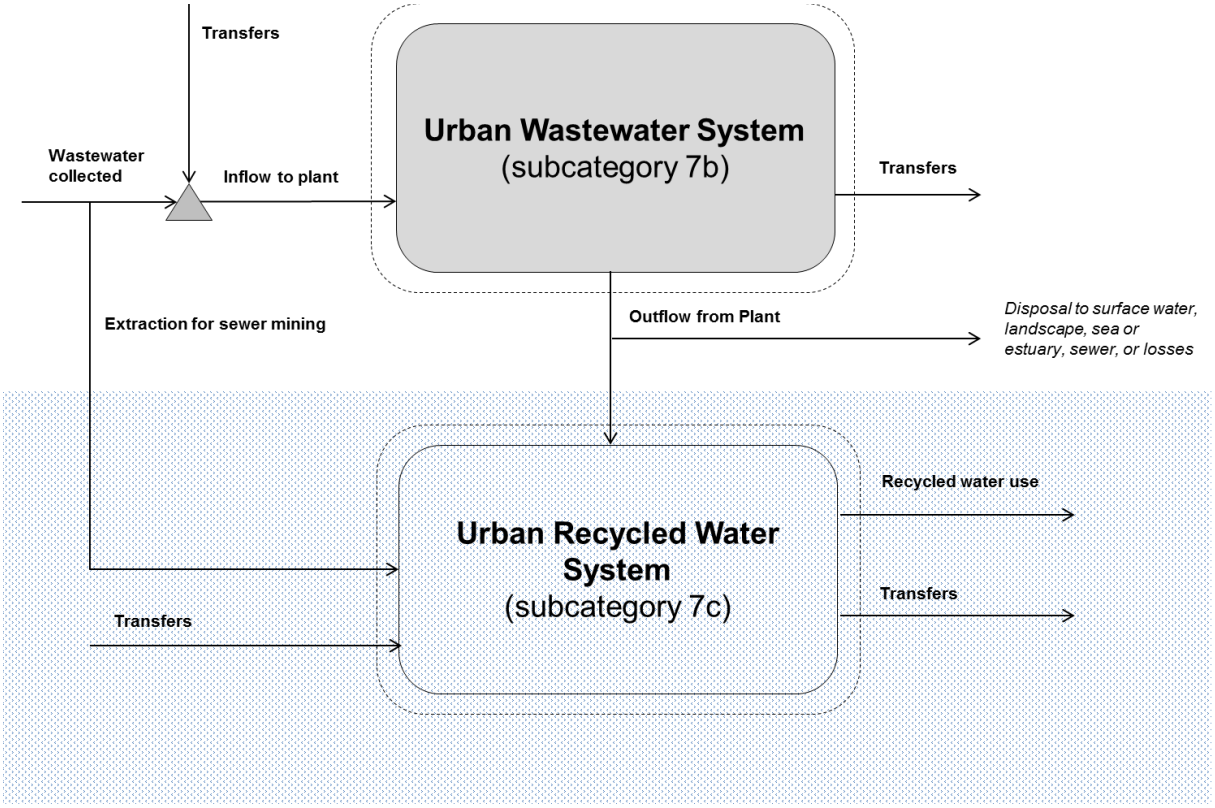

Figure 4.1 The urban wastewater system

4.1 Wastewater collected

Information on the volumes of wastewater collected by utilities supports an understanding of the use and disposal of water resources across the nation. It provides insight into the performance of wastewater and water supply systems and informs urban planning and management policies and decisions.

Information on wastewater collected is also important for understanding and comparing the relative performance of utilities. It can help explain trends in recycled water production and use, revenue for sewerage services, sewerage asset performance, and operating costs and capital expenditure.

4.1.1 Non-trade waste

W indicator/ U code	W16—Volume of wastewater, excluding trade waste, collected	U22.3—Volume of wastewater, excluding trade waste, collected
General supporting notes	The volume of wastewater, excluding trade waste collected by the utility during the reporting year, in megalitres (ML). **Non-trade waste wastewater** includes: ✔ domestic sewage ✔ infiltration of groundwater in the sewage system ✔ inflow of stormwater in the sewage system ✔ illegal connections inflows and excludes: ✘ trade waste. The **reported volume** includes: ✔ wastewater collected by the utility or service providers operating infrastructure on behalf of the utility ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ transfers from other utilities or third party operators (reported under W18.2 / U20.1, U20.3) ✘ transfers from other operational areas (reported under W18.2/ U20.1, U20.3) ✘ transfers from the wastewater treatment system (reported under U20.4).	

4.1.2 Trade waste

W indicator/ U code	W17—Volume of trade waste collected	U22.2—Volume of trade waste collected
General supporting notes	The volume of trade waste collected by the utility during the reporting year, in megalitres (ML). **Trade waste** includes: ✔ liquid waste generated from any industry, business, trade, or manufacturing processes ✔ stormwater and excludes: ✘ domestic wastewater ✘ recycled water ✘ urban stormwater. The **reported volume** includes: ✔ trade waste collected by the utility or service providers operating infrastructure on behalf of the utility ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ trade waste transfers from other utilities or infrastructure operators(reported under W18.2 / U20.1, U20.3) ✘ trade waste transfers from other operation areas. (reported under W18.2 / U20.1, U20.3).	

4.2 Inflow to plant

The volume of wastewater entering treatment plants provides insight into the operation and efficiency of urban wastewater systems and supports an understanding of their performance. This information in turn supports policy as well as planning and management decisions. In addition to providing insight into the performance of the urban wastewater system, inflow information assists with data validation and ensuring the integrity of the data reported by the Bureau.

4.2.1 Wastewater inflow

<table>
<tr><td rowspan="2">W indicator/ U code</td><td rowspan="2">W18.4—Volume of wastewater inflow to wastewater treatment plants</td><td>U23.1—Volume of wastewater inflow to wastewater treatment plants (excluding to bulk wastewater treatment plants), for each wastewater treatment plant</td></tr>
<tr><td>U23.2—Volume of wastewater inflow to bulk wastewater treatment plants, for each wastewater treatment plant</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The volume of wastewater inflows to the utility’s WWTPs plants during the reporting year, in megalitres (ML).

The reported volume includes:

✔ trade waste

✔ wastewater collected by the utility or service providers operating infrastructure on behalf of the utility

✔ wastewater taken from other infrastructure operators

and excludes:

✘ wastewater supplied to other utilities or infrastructure operators

✘ wastewater transferred to plants owned or operated by the utility but outside of reporting region

✘ wastewater extracted for sewer mining.

The reported volume should be based on the metered inflow to WWTPs. Where inflow meters are not available the method for estimating inflows should be noted in the associated footnote (W indicators) or quantification method (U codes).</td></tr>
</table>

4.3 Transfers

Information on wastewater transfers supports an understanding of urban wastewater disposal in a regional context and provides a holistic understanding of the impact of urban centres on their surrounding environments. It assists in understanding inter-catchment relationships and regional management practices and informs planning and management decisions.

4.3.1 Wastewater received

<table>
<tr><td rowspan="2">W indicator/ U code</td><td rowspan="2">W18.2—Volume of wastewater received from other service providers or operational areas within the urban wastewater system</td><td>U20.1—Volume of wastewater received from other service providers or operational areas within the urban wastewater system (excluding to a bulk wastewater treatment system), for each transfer party and wastewater treatment plant</td></tr>
<tr><td>U20.3—Volume of wastewater received from other service providers to a bulk wastewater treatment system, for each transfer party and wastewater treatment plant</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The total volume of wastewater received by the utility from other service providers during the reporting year, in megalitres (ML).

The reported volume includes:

✔ trade waste

✔ transfers not associated with a financial transaction

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ recycled water

✘ urban stormwater.</td></tr>
</table>

4.3.2 Wastewater delivered

<table>
<tr><td>W indicator/ U code</td><td>W18.1—Volume of wastewater exported to other service providers or operational areas within the urban wastewater system</td><td>U21.1—Volume of wastewater exported to other service providers or operational areas within the urban wastewater system, for each transfer party and wastewater treatment plant</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The total volume of wastewater exported by the utility to other service providers or operational areas within the urban wastewater system during the reporting year, in megalitres (ML).

The reported volume includes:

✔ trade waste

✔ transfers not associated with a financial transaction

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes).</td></tr>
</table>

4.3.3 Treated wastewater received

W indicator/ U code		U20.4—Volume of treated wastewater received from own organisation, for each wastewater treatment plant
U code supporting notes	The total volume of wastewater exported by the utility to other service providers or operational areas within the urban wastewater system during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ treated trade waste ✔ transfers not associated with a financial transaction ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes).	

4.4 Extraction for sewer mining

Information on sewer mining supports an understanding of the overall urban wastewater system balance as well as an understanding of the recycling and reuse of wastewater. Understanding such extractions also informs policy, planning and management decisions.

4.4.1 Extraction for recycled water production

W indicator/ U code	W18.3—Volume of wastewater taken through sewer mining	U83.1—Volume of wastewater taken through sewer mining, for each reclamation plant
General supporting notes	The volume of wastewater extracted through sewer mining by any service provider, from the utility's sewer system during the reporting year, in megalitres (ML). The **reported volume** includes wastewater extracted by the: ✔ utility or a service provider operating infrastructure on behalf of the utility ✔ independent operators ✔ extractions not associated with a financial transaction ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes).	

4.5 Outflow from plant

Information on the wastewater discharges and disposals from WWTPs supports an understanding of the use and disposal of water resources across the nation. It provides insight into the performance of urban wastewater and water supply systems, informs urban planning and management policies and decisions and supports an understanding of the environmental impacts of urban centres.

4.5.1 Treated wastewater outflow

W indicator/ U code	W18.5—Volume of treated effluent outflow from wastewater treatment plants	U24.1—Volume of treated outflow from each wastewater treatment plant
General supporting notes	The volume of treated wastewater (effluent) discharged from a utility's wastewater treatment plants during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ treated effluent that is subsequently disposed of – also reported under W29/U25.1–3 ✔ treated effluent returned to the sewerage system ✔ treated effluent that is recycled, either directly or with further treatment ✔ losses during treatment process ✔ unmetered volumes –information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ onsite usage (reported under U43.5 and also a component of W21). The **reported volume** should be based on the metered outflows at the outlet of WWTPs. Where outflow meters are not available the method for estimating outflows should be noted in the associated footnote (W indicators) or quantification method (U codes).	

4.5.2 Treated wastewater disposal

<table>
<tr><td rowspan="3">W indicator/ U code</td><td rowspan="3">W29—Volume of treated wastewater disposals</td><td>U25.1—Volume of treated wastewater disposals to surface water, for each wastewater treatment plant</td></tr>
<tr><td>U25.2—Volume of treated wastewater disposals to landscape, for each wastewater treatment plant</td></tr>
<tr><td>U25.3—Volume of treated wastewater disposals to sea or estuary, for each wastewater treatment plant</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The volume of treated wastewater disposed of by the utility during the reporting year, in megalitres (ML).

The reported volume includes:

✔ treated wastewater disposals

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ aquifer replenishment

✘ recycling

✘ onsite use

✘ environmental releases

✘ losses that occur between leaving the WWTP and the disposal site.

The reported volume should:

✔ be based on metering at the disposal site.</td></tr>
<tr><td>U code supporting notes</td><td colspan="2">Surface water includes:

✔ rivers, creeks and streams

✔ surface water storages

✔ irrigation channels.

Landscape includes:

✔ all water in the natural environments that are not surface water or groundwater.

Sea or estuary includes:

✔ marine water bodies (e.g. seas, oceans, straits)

✔ coastal water bodies discharging to the ocean, either naturally or through flow control structures or systems.</td></tr>
</table>

4.5.3 Treated wastewater disposal to sewer for further treatment

W indicator/ U code		U29.1—Volume of treated wastewater disposals back to sewer for further treatment, for each wastewater treatment plant
U code supporting notes	The volume of treated wastewater returned from the utility's WWTP to sewer for transportation and further treatment during the reporting year, in megalitres (ML). The volumes of water captured in U29.1 provide additional information about the movement of the water described by W30/U28.4, U28.9 and U29.13.	

4.5.4 Losses

W indicator/ U code	W30—Volume of wastewater losses and discharges	U28.4—Volume of losses during wastewater collection process
		U28.9—Volume of losses during wastewater treatment process
		U28.13– Volume of losses during management of treated wastewater
General supporting notes	The volume of treated and untreated wastewater losses and spills from the utility's urban wastewater system during the reporting year, in megalitres (ML). **Losses and spills** includes: ✔ system overflows up stream of WWTP ✔ WWTP plant bypasses (e.g. wet weather flows) ✔ evaporation and infiltration losses ✔ sludge removal.	
U code supporting notes	**Losses during wastewater collection process** includes: ✔ any spills/overflows from collection systems (including detention/storages and storages structures) that occur before primary treatment (i.e. screening). **Losses during wastewater treatment process** includes: ✔ wet weather bypass that have received treatment ✔ evaporation, from treatment ponds. **Losses during management of treated wastewater** includes: ✔ pipe bursts and leaks in the disposal system ✔ meter inaccuracy.	

5 Urban recycled water system (subcategory 7c)

An urban recycled water system is a system used for the collection, transmission, treatment, storage and supply of recycled water collected by a utility.

The conceptualisation of the urban recycled water system for the provision of subcategory 7c—Urban recycled water information is shown in Figure 5.1. The figure illustrates the inflows and outflows of the system for which information is collected. While the urban wastewater system is reported separately to the urban recycled water system under subcategory 7b, the figure depicts the urban wastewater system to illustrate the interconnectivity of the two systems.

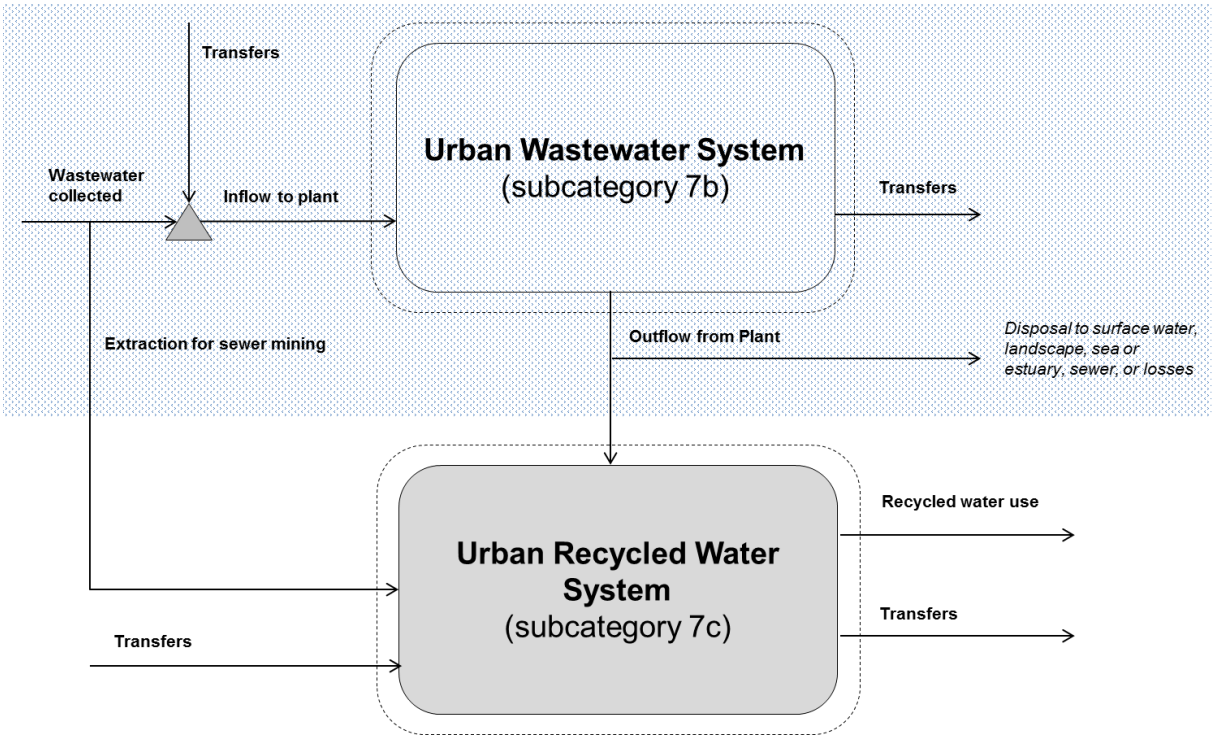

Figure 5.1 The urban recycled water system

5.1 Transfers

Information on recycled water transfers supports an understanding of the urban wastewater and recycled water systems in a regional context. It assists in understanding inter-catchment relationships and regional management practices and informs planning and management decisions.

5.1.1 Recycled water received

W indicator/ U code	W6—Volume of recycled water received from other service providers or operational areas within the urban water system	U41.1—Volume of recycled water received from other service providers or operational areas within the urban water system, for each transfer party and wastewater treatment plant
General supporting notes	The total volume of recycled water received by the utility from other service providers or operational areas within the urban water system, during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ bulk recycled water purchases ✔ any water that is subsequently exported to another utility ✔ water extracted through sewer mining ✔ recycled water received from independent operators ✔ transfers not associated with a financial transaction ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ water extracted from aquifers subject to aquifer replenishment ✘ treated urban stormwater ✘ recycled water received from a service provider operating infrastructure on behalf of the utility.	

5.1.2 Recycled water delivered

W indicator/ U code	W15—Volume of recycled water exported to other service providers or operational areas within the urban water system	U42.1—Volume of recycled water exported to other service providers or operational areas within the urban water system, for each transfer party and wastewater treatment plant
General supporting notes	The total volume of recycled water exported by the utility to other service providers or operational areas within the urban water system, during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ bulk recycled water exports ✔ water extracted through sewer mining ✔ transfers not associated with a financial transaction ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ water extracted from aquifers subject to aquifer replenishment ✘ treated urban stormwater ✘ recycled water exported to a service providers operating infrastructure on behalf of the utility.	

5.2 Recycled water use

Understanding urban recycled water use is central to policy, planning and management decisions. For example, information on recycled water use provides insight into the role of alternative water sources in managing water security through source diversification and can provide an important measure of success for policy and investment decisions aimed at increasing the use of this resource.

Recycled water use information also assists in understanding the role of the resource in the economy. Understanding usage patterns and trends can inform policy and investment decisions that impact on the recycled water sector and users of the resource.

5.2.1 Residential recycled water use

W indicator/ U code	W20—Volume of recycled water supplied to residential customers	U44.1—Volume of recycled water supplied to residential customers, for each treatment plant
General supporting notes	The total volume of recycled water supplied by the utility to residential customers during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ potable water used to top-up the recycled water system ✔ recycled water derived from sewer mining ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ water extracted from aquifers subject to aquifer replenishment using recycled water (reported under W2/U2.1-2) ✘ treated urban stormwater.	

5.2.2 Non-residential recycled water use

<table>
<tr><td rowspan="6">W indicator/ U code</td><td rowspan="6">W21—Volume of recycled water supplied to non-residential customers</td><td>U43.5—Volume of recycled water supplied for own use, for each treatment plant</td></tr>
<tr><td>U44.2—Volume of recycled water supplied to commercial, industrial and municipal customers, for each treatment plant</td></tr>
<tr><td>U44.3—Volume of recycled water supplied to agricultural and individual irrigation customers, for each treatment plant</td></tr>
<tr><td>U44.4—Volume of recycled water supplied to irrigation water schemes, for each treatment plant</td></tr>
<tr><td>U44.5—Volume of recycled water supplied for groundwater recharge, for each treatment plant</td></tr>
<tr><td>U44.10—Volume of recycled water supplied to other customers, for each treatment plant</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The total volume of recycled water supplied by the utility to non-residential customers during the reporting year, in megalitres (ML).

The reported volume includes:

✔ potable water used to top-up the recycled water system

✔ recycled water derived from sewer mining

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ water extracted from aquifers subject to aquifer replenishment using recycled water (reported under W2/U2.1-2)

✘ treated urban stormwater (reported under W28.5 / U62.2, U62.3, U62.4, U62.5, U62.6, U62.10)

✘ recycled water supplied as environmental flows (reported under W23/U44.6).</td></tr>
</table>

U code supporting notes	**Own use** includes: ✔ recycled water used on-site external to the treatment process. **Commercial, industrial and municipal customers** includes: ✔ recycled water supplied to golf courses ✔ heavy industry and commercial areas.
U code supporting notes continued	**Individual irrigation customers** includes: ✔ irrigation of crops ✔ recycled water supplied to forestry ✔ irrigation of agricultural products including livestock. **Irrigation water schemes** includes: ✔ large scale agricultural use via infrastructure managed by an irrigation entity. **Groundwater recharge** includes: ✔ aquifer replenishment schemes. **Other customers** includes: ✔ recycled water supplied to customers not captured in U43.5, U44.2, U44.3, U44.4, U44.5, and U44.10 and excludes: ✘ recycled water supplied as environmental flows (reported under U44.6).

5.2.3 Environmental use

W indicator/ U code	W23- Volume of recycled water supplied as environmental flows	U44.6—Volume of recycled water supplied as environmental flows, for each treatment plant
General supporting notes	The total volume of recycled water supplied by the utility to the environment during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ recycled water discharged to waterways (rivers, seas, natural wetlands) for environmental purposes as prescribed by the environmental regulator ✔ recycled water derived from sewer mining ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ non-harvestable forests and bushland if the regulator determines this is 'disposal' rather than 'beneficial use' ✘ water extracted from aquifers subject to aquifer replenishment with recycled water ✘ treated urban stormwater.	

6 Urban stormwater system (category 7d)

An urban stormwater system is a system used for the collection, transmission, treatment, storage and supply of stormwater water managed by a utility.

The conceptualisation of the urban stormwater water system for the provision of subcategory 7d—Urban stormwater information is shown in Figure 6.1. The figure illustrates the outflows of the system for which information is collected.

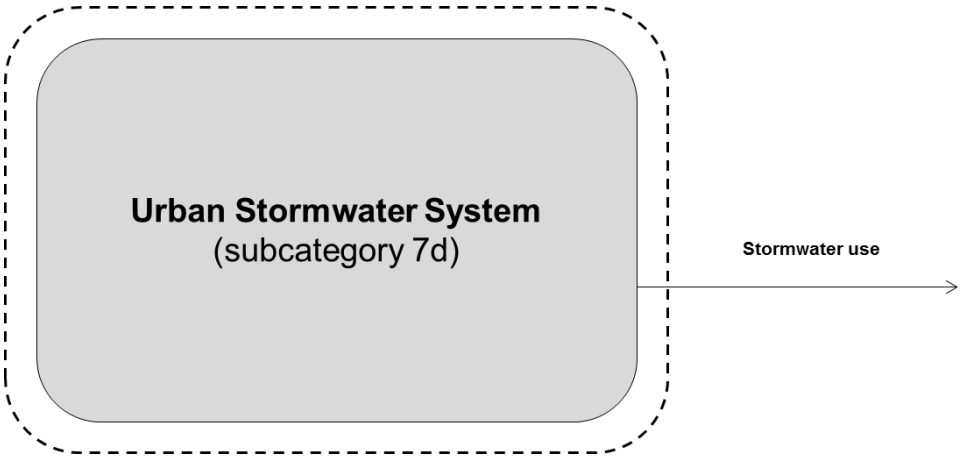

Figure 6.1 The urban stormwater system

6.1 Stormwater use

Understanding urban stormwater use is central to policy, planning and management decisions. For example, information on stormwater use provides insight into the role of alternative water sources in managing water security through source diversification. It can provide an important measure of success for policy and investment decisions aimed at increasing the use of this resource.

6.1.1 Residential stormwater use

W indicator/ U code	W28.4– Volume of urban stormwater supplied to residential customers	U62.1—Volume of urban stormwater supplied to residential customers, for each stormwater harvesting scheme
General supporting notes	The total volume of urban stormwater supplied by the utility to residential customers during the reporting year, in megalitres (ML). The **reported volume** includes: ✔ potable water used to top-up the urban stormwater supply system ✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes) and excludes: ✘ water extracted from aquifers subject to recharge with urban stormwater (extractions from aquifer replenishment schemes are reported under W2/U2.1-2).	

6.1.2 Non-residential stormwater use

<table>
<tr><td rowspan="6">W indicator/ U code</td><td rowspan="6">W28.5—Volume of urban stormwater supplied to non-residential customers</td><td>U62.2—Volume of urban stormwater supplied to commercial, industrial and municipal customers, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.3—Volume of urban stormwater supplied to agricultural and individual irrigation customers, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.4—Volume of urban stormwater supplied to irrigation water schemes, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.5—Volume of urban stormwater supplied for groundwater recharge, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.6—Volume of urban stormwater supplied as environmental flows, for each stormwater harvesting scheme</td></tr>
<tr><td>U62.10—Volume of urban stormwater supplied to other customers, for each stormwater harvesting scheme</td></tr>
<tr><td>General supporting notes</td><td colspan="2">The total volume of urban stormwater supplied by the utility to non-residential customers during the reporting year, in megalitres (ML).

The reported volume includes:

✔ urban stormwater discharged to waterways (rivers, seas, natural wetlands) for environmental purposes as prescribed by the environmental regulator

✔ potable water used to top-up the urban stormwater supply system

✔ unmetered volumes – information on estimates should be included in the associated footnote (W indicators) or quantification method (U codes)

and excludes:

✘ water extracted from aquifers subject to recharge with urban stormwater (extractions from aquifer replenishment schemes are reported under W2/U2.1-2).</td></tr>
</table>

U code supporting notes	**Own use** includes: ✔ recycled water used on-site, external to the treatment process. **Commercial, industrial and municipal customers** includes: ✔ golf courses, heavy industry and commercial areas. **Individual irrigation customers** includes: ✔ irrigation of crops ✔ recycled water supplied to forestry ✔ irrigation of agricultural products including livestock. **Irrigation water schemes** includes: ✔ large scale agricultural use via infrastructure managed by an irrigation entity. **Groundwater recharge** includes: ✔ aquifer replenishment schemes. **Other customers** includes: ✔ recycled water supplied to customers not captured in U43.5, U44.2, U44.3, U44.4, U44.5, and U44.10 and excludes: ✘ recycled water supplied as environmental flows (reported under U44.6).

7 Explanatory material on metadata requirements

This section provides explanatory notes about the metadata and contextual information that urban utilities in Category L must give to the Bureau along with their Category 7 urban water management information in subcategories 7a, 7b, 7c and 7d.

The metadata requirements are detailed in Section 2.2 and listed in the document titled *Urban Water Management Information Requirements,* where it is stated:

'Metadata and contextual information must be given with U code volumes only. There is no requirement to provide metadata or contextual information with W indicator volumes. Hence, person Categories F and M are not required to provide any metadata or contextual information with Category 7 information. Person Category L is required to give all metadata and contextual information with Category 7…if it is in a person's possession, custody or control.'

7.1 Common and subcategory-specific elements

There is a total of eight metadata and contextual information elements. Table 7.1 sets out the metadata elements which are applicable to each U code volume.

Some of the elements are common to each U code volume. Other elements are specific to particular groups of U codes (except in the case of 'Sources' within subcategory 7a—Urban water supply information, where the metadata elements are not the same for each U code).

Table 7.1—Metadata and contextual elements

		Metadata elements for U codes								
Subcategory	**Group**	**U codes**	**Name of water resource**	**Name of water management area**	**Name of plant**	**Name of transfer party**	**Name of stormwater harvesting scheme**	**Quantification method**	**Uncertainty**	**Assumptions**
7a—Urban water supply information	**Sources**	U1.1	✓	✓	✓			✓	✓	✓
		U1.2	✓	✓	✓			✓	✓	✓
		U2.1	✓	✓	✓			✓	✓	✓
		U2.2	✓	✓	✓			✓	✓	✓
		U3.1			✓			✓	✓	✓
	Transfers	U4.1	✓			✓		✓	✓	✓
		U8.1	✓			✓		✓	✓	✓
	Production	U9						✓	✓	✓
	Use	U10.1						✓	✓	✓
		U10.2						✓	✓	✓
		U10.3						✓	✓	✓
		U10.4						✓	✓	✓
		U10.5						✓	✓	✓
		U10.6						✓	✓	✓
		U10.7						✓	✓	✓
		U6.1	✓	✓				✓	✓	✓
		U14.1	✓	✓				✓	✓	✓
		U12.2						✓	✓	✓
		U12.4						✓	✓	✓

		Metadata elements for U codes								
Subcategory	**Group**	**U codes**	**Name of water resource**	**Name of water management area**	**Name of plant**	**Name of transfer party**	**Name of stormwater harvesting scheme**	**Quantification method**	**Uncertainty**	**Assumptions**
7a—Urban water supply information	**Wastewater Collected**	U22.2						✓	✓	✓
		U22.3						✓	✓	✓
	Inflow to Plant	U23.1			✓			✓	✓	✓
		U23.2			✓			✓	✓	✓
7b—Urban wastewater information	**Transfers**	U20.1			✓	✓		✓	✓	✓
		U20.3			✓	✓		✓	✓	✓
		U21.1			✓	✓		✓	✓	✓
		U20.4			✓			✓	✓	✓
	Extraction for Sewer Mining	U83.1			✓			✓	✓	✓
	Outflow from Plant	U24.1			✓			✓	✓	✓
		U25.1			✓			✓	✓	✓
		U25.2			✓			✓	✓	✓
		U25.3			✓			✓	✓	✓
		U29.1			✓			✓	✓	✓
		U28.4						✓	✓	✓
		U28.9						✓	✓	✓
		U28.13						✓	✓	✓

		Metadata elements for U codes								
Subcategory	**Group**	**U codes**	**Name of water resource**	**Name of water management area**	**Name of plant**	**Name of transfer party**	**Name of stormwater harvesting scheme**	**Quantification method**	**Uncertainty**	**Assumptions**
7c—Urban recycled water information	**Supply**	U41.1			✓	✓		✓	✓	✓
		U42.1			✓	✓		✓	✓	✓
	Use	U44.1			✓			✓	✓	✓
		U43.5			✓			✓	✓	✓
		U44.2			✓			✓	✓	✓
		U44.3			✓			✓	✓	✓
		U44.4			✓			✓	✓	✓
		U44.5			✓			✓	✓	✓
		U44.10			✓			✓	✓	✓
		U44.6			✓			✓	✓	✓
7d—Urban stormwater information	**Use**	U62.1					✓	✓	✓	✓
		U62.2					✓	✓	✓	✓
		U62.3					✓	✓	✓	✓
		U62.4					✓	✓	✓	✓
		U62.5					✓	✓	✓	✓
		U62.6					✓	✓	✓	✓
		U62.10					✓	✓	✓	✓

7.2 Metadata and contextual information for Category 7

This section describes the eight metadata elements (Table 7.1).

7.2.1 Name of water resource

Description

The name of the water resource from or to which a volume of water is sourced, received or returned.

Notes

Water resource is defined in the *Water Act 2007* as:

> '(a) surface water or groundwater, or
>
> (b) a watercourse, lake, wetland or aquifer (whether or not it currently has water in it);

and includes all aspects of the water resource (including water, organisms and other components and ecosystems that contribute to the physical state and environmental value of the water resource).'

Water resources may be rivers, reservoirs, creeks, seas or estuaries. In the case of groundwater resources, the name of the resource could be given as the unique groundwater bore asset ID.

Examples for surface water

- Upper Murrumbidgee River
- Dean Reservoir
- Termeil Creek
- The Coral Sea
- Derwent Estuary

Examples for groundwater

- Mirrabooka Proclaimed Groundwater Area
- Lancefield Groundwater management Area
- Leederville aquifer
- Murrayville Limestone
- Licence ID: BEE12345
- State bore ID: WRK12345

7.2.2 Name of water management area

Description

The name of the water management area from which a water volume is sourced, or to which a water volume is returned.

Note

Water management area is defined in the Water Regulations 2008 as:

'An area (however described) used by an agency of the Commonwealth or an agency of a State for the purposes of managing surface water or ground water.'

Example

- Logan Basin WRP – Logan River
- Maribyrnong Basin

7.2.3 Name of plant

Description

The name of a treatment plant of the reporting organisation relevant to a particular urban water system. This may be a water treatment plant, wastewater treatment plant or recycled water treatment plant, as relevant to the system

7.2.4 Name of transfer party

Description

The name of the service provider from which water is received, or to which water is transferred. In the case where the transfer is from another operational area of the reporting utility, the reporting utility's name or their defined operational area is the name of the transfer party.

7.2.5 Name of stormwater harvesting scheme

Description

The name of a stormwater harvesting scheme or treatment plant in the utility's urban stormwater system.

Example

- Blackmans Swamp Stormwater Harvesting Scheme
- Eastern Melbourne Parks and Gardens Stormwater Harvesting Scheme

7.2.6 Quantification method

Description

The means by which a reported volume was determined.

Examples

- metered volume
- SCADA (Supervisory Control and Data Acquisition)
- customer meter readings
- estimate
- calculated as A+ B - C (providing a clear indication of locations of the variables, the systems the variables are based on and the quantification method for the variables, e.g. calculation of billed volumes minus estimate of losses).

7.2.7 Uncertainty

Description

The margin of doubt in the accuracy of a result of a measurement, usually denoted as +/- x% which provides the width of the margin of doubt. In addition, the confidence level (as a percentage) gives an indication of certainty that the 'true value' is within the defined margin.

Example

- +/-5%, at a level of confidence of 85%

(Note: if the uncertainty was given as per the above example for a volume of 800ML, that means the reporting party has 85% confidence that the 'true value' for the measured volume lies within the range 760 ML – 840 ML)

7.2.8 Assumptions

Description

Factors framing the understanding of data provided that are considered to be true in the absence of evidence.

Example

- meter accuracy is within the manufacturer’s specifications

Glossary

For completeness this glossary includes relevant terms appearing in the *Water Act 2007* and the *Water Regulations 2008*; including the document, *Urban Water Management Information Requirements*. For more general water definitions of terms and acronyms used in the Bureau of Meteorology's water information products and services, refer to the Australian Water Information Dictionary (http://www.bom.gov.au/water/awid/).

Aquifer replenishment is the deliberate adding of water to an aquifer.

Bulk wastewater service provider is an entity who imposes a bulk charge for a sewerage service

Bulk wastewater treatment system is an urban wastewater system used by a bulk wastewater service provider.

Bulk water service, defined in Water Regulations 2008 Regulation 1.03, means one or more of the following:

a) a service that is provided for the storage of water that is primarily stored on-river
b) a service that is provided for the delivery of water that is primarily delivered on-river.

Bulk water supplier is an entity who imposes a bulk water charge for a bulk water service.

Desalination is the process of removing salts from water.

Environmental flows are releases made under a specific environmental management plan prepared in conjunction with and/or approved by the appropriate environmental resource regulator.

Groundwater, as defined in the Water Act 2007 Part 4 means:

a) water occurring naturally below ground level (whether in an aquifer or otherwise) or
b) water occurring at a place below ground that has been pumped, diverted or released to that place for the purpose of being stored there;

but does not include water held in underground tanks, pipes or other works.

Irrigation water scheme has the same meaning as irrigation network, defined in Section 7 of the Water Act 2007.

Non-potable water is water that is not intended for use as a drinking water supply.

Non-revenue water is water that is produced but for which revenue is not collected. It includes unauthorised, unbilled consumption; authorised but unbilled consumption and real losses from transmission mains, storage facilities, distribution mains or service connections.

Plant means the treatment plant, relevant to the particular urban water system, of the reporting organisation. It includes water treatment plants ***(WTP)***, wastewater treatment plants ***(WWTP)*** and water reclamation plants ***(WRP)***.

Potable water is water that is intended for use as a drinking water supply. Potable water should materially meet the Australian Drinking Water Guidelines 2011 (ADWG) or equivalent.

Raw water is water that has been extracted but untreated.

Recycled water is wastewater which, upon appropriate treatment, is suitable for an intended reuse application. It excludes any urban stormwater use.

Reporting year is the period 1 July to 30 June for the year of reporting.

Sewage – see wastewater. For the purposes of the *Water Regulations 2008* Category 7–Urban water information reporting requirements, the term 'wastewater' and 'sewage' can be used interchangeably. The term 'wastewater' has been used throughout the document.

Sewerage system is the network of pipes, pumps and storages used to collect and transport wastewater to wastewater treatment plants and discharge points.

Stormwater harvesting scheme is a system that collects and accumulates excess rainfall that has runoff urban surfaces, for treatment and storage prior to reuse.

Surface water as defined in the *Water Act 2007* Part 4 includes:

a) water in a watercourse, lake or wetland and
b) any water flowing over or lying on land:
   i. after having precipitated naturally or
   ii. after having risen to the surface naturally from underground.

Trade waste (industrial waste) is the liquid waste generated from any industry, business, trade, or manufacturing process.

Transfer party means another service provider or other operational area within one's own operation. Transfer party includes: water utility; defined operational area of a utility; private water manager.

U codes are detailed component water volumes describing the availability, movement and use of water within urban water systems. Typically, U code volumes are at the plant or transfer party scale and provide a detailed breakdown of W indicator volumes.

Urban recycled water system is a system used for the collection, transmission, treatment, storage and supply of recycled water collected by a utility.

Urban stormwater is water within the urban stormwater drainage system.

Urban stormwater system is a system used for the collection, transmission, treatment, storage and supply of stormwater managed by a utility.

Urban wastewater information is information about wastewater that is disposed of through a sewerage system, as defined in Water Regulations 2008 Regulation 1.03.

Urban wastewater system is a system used for the collection, transmission, treatment, storage and disposal of wastewater collected by a utility. This includes residential properties, commercial premises and industrial operations.

Urban water supply information is information about water supplied by urban water utilities, as defined in Water Regulations 2008 Regulation 1.03.

Urban water supply system is a system used for the collection, transmission, treatment, storage and distribution of water extracted from water sources and supplied to consumers; e.g. residential properties, commercial premises and industrial operations.

Utility is the collective term used in this handbook to refer to the water utilities, councils and bulk water suppliers required to provide urban water information (named persons).

Wastewater is water that originates from a combination of residential, trade waste or commercial activities, surface runoff, or stormwater, and from sewer inflow (including from illegal connections) or infiltration (water affected in quality by anthropogenic influence.

Wastewater treatment plant (WWTP) is the general name given to a plant used to treat wastewater collected through the urban wastewater system.

Water management area means an area (however described) used by an agency of the Commonwealth or an agency of a State for the purposes of managing surface water or ground water, as defined in Water Regulations 2008 Regulation 1.03.

Water reclamation plant (WRP) is the general name given to a plant used to treat effluent for recycling (see Recycled water).

Water treatment plant (WTP) is the general name given to a plant typically used to treat water sourced from surface or groundwater for supply into the urban water system.

W indicators are component water volumes describing the availability, movement and use of water within urban water systems. W indicators are the water resources indicators used to compile the urban National Performance Report. W indicator volumes are at the scale of the urban National Performance Reporting regions.