Drinking water network environmental performance measures and guidance material

TAUMATA AROWAI

Mihi o Taumata Arowai

Ko te wai ahau
Ko ahau te wai
He whakaaturanga tātou nō te wai
Ko te ora te wai ko te ora o te tangata
He taonga te wai me tiaki
Ko wai tātou
Ko wai tātou

I am water, water is me
We are reflections of our water
The health of water is the health of the people
Water is a treasure that must be protected
We are water
Water is us

Contents

1. Introduction

The Water Services Act 2021 (the Act) introduced requirements for Taumata Arowai to monitor and report on the environmental performance of networks (Part 3, Subpart 8). These requirements are designed to provide greater transparency about the performance of networks and the impacts they have on the environment and public health. They will contribute to the continuous and progressive improvement of the quality of water services in Aotearoa New Zealand.

These requirements will also complement the general functions and objectives of Taumata Arowai under the Taumata Arowai–the Water Services Regulator Act 2020, including to give effect to Te Mana o te Wai.

This guidance document outlines the requirements for network operators in relation to environmental performance measures made under section 145 of the Act.

> **145 Environmental performance measures and targets for networks**
>
> (1) Taumata Arowai may develop, publish, and maintain—
>
> (a) environmental performance measures for networks; and
>
> (b) environmental performance targets for networks.
>
> (2) Environmental performance measures and targets for wastewater networks may include measures and targets that relate to—
>
> (a) discharges to air, water, or land:
>
> (b) biosolids and any other by-products from wastewater:
>
> (c) energy use:
>
> (d) waste that is introduced by a third party into a wastewater network (for example, trade waste).
>
> (3) Environmental performance measures and targets—
>
> (a) may apply—
>
> (i) to all networks and their operators; or
>
> (ii) to classes of network and their operators; but
>
> (b) must not apply to an individual network or network operator.
>
> (4) When developing or amending an environmental performance measure or target, Taumata Arowai must consult network operators, regional councils, and any other person it considers appropriate in accordance with section 53(2) and (3).

This document sets environmental performance measures for drinking water networks and outlines the associated:

- information that drinking water network operators must record
- timeframes within which this data must be provided to Taumata Arowai, and
- method of reporting.

This document should be read together with the Environmental Performance Measures Record Keeping Requirements for Drinking Water Network Operators Notice 2022.

The appendices of this document provide detailed definitions. These will help to ensure data is collected in a consistent way, so Taumata Arowai can make fair comparisons as to how different drinking water network operators are performing.

1.1 Environmental performance definition

The Act does not define the meaning of 'environmental performance'. The following working definition has consequently been developed to help determine the scope of network environmental performance measures. This definition will be used to inform the development of all future environmental performance measures, targets, and standards.

Environmental performance relates to the effects of water services networks – including the operation of infrastructure and associated processes – on the environment. In this context, 'environment' takes its meaning from the definition of that term in the Resource Management Act 1991. Environmental performance consequently includes consideration of a network's effects on:

(a) Ecosystems;

(b) Natural and physical resources, including their innate mauri and mana;

(c) People and communities, including the ability of mana whenua to exercise kaitiakitanga; and

(d) Social, economic, aesthetic, and cultural conditions that affect (a) to (c), including mātauranga Māori and tikanga Māori.

1.2 Rationale for this reporting

The data we receive on environmental performance measures will be summarised in a publicly available Network Environmental Performance Annual Report (the Network Report) that we will publish each year. The report will also contain examples of best practice, specific risks or concerns that relate to network performance or practices, and comparisons of how networks across the country are performing.

This reporting is intended to help protect the health of our water, people, and environment. Communities are affected because the performance of networks directly impacts their local environment and public health. Networks impact the quality of drinking water, and in turn, the resilience of our freshwater sources. Communities pay for water services through rates and/or water bills and so have an interest in how effectively that money is spent.

Environmental performance reporting will also benefit network operators by building a clear comparative picture of how networks are performing. This can be used as an evidence base for decision-making, for example, to guide investment and support resource consent applications.

Environmental performances across the networks will also benefit from taking a holistic and integrated view of prioritising the use of water, as articulated by Te Mana o te Wai. This approach of drawing from traditional Te Ao Māori thinking, underpins both the Taumata Arowai–Water Services Regulator Act 2020 and the Water Services Act 2021. It is outlined in the National Policy Statement for Freshwater Management 2020 (NPS-FW) and is a concept that refers to the fundamental importance of water and recognises that protecting the health of water, in turn protects the health and well-being of the wider environment and people. It protects the mauri of the wai (water). Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.

Our water service networks can have significant impacts on our lives and the state of our environment, from the water source (where we abstract water to drink and use in our homes and businesses) to discharge (where we dispose of our wastewater and stormwater and drinking water by-products). Applying Te Mana o te Wai will result in the sector thinking beyond complying with the established rules, to also incorporating consideration of the health of the water. By focusing on the health of the water, we will also be focusing on the health of the people – this is the key to the transformative change we need to make in the sector. It shifts the emphasis from the commercial value of water to the societal value of water. Taumata Arowai will provide guidance and support for suppliers and the sector, as we transform and participate in the new framework. The application of Te Mana o te Wai will vary from place to place, and community to community, in accordance with local responses to the principles it embodies.

1.3 Who is required to undertake this monitoring and reporting?

Monitoring and reporting requirements for the environmental performance of networks apply to network operators (rather than all water suppliers). 'Network operator' has a very specific definition under the Act, which means that only networks operated by, or on behalf of councils or government departments, are captured.

At this stage, these monitoring and reporting requirements only relate to drinking water network operators but in the future, measures will be introduced that apply to wastewater and stormwater operators.

Network operators have been divided into classes to ensure that the measures and data required reflect the nature of their networks. Networks with negligible environmental impact (with regard to the size of the supply, limited extent of treatment, and fed by a rainwater tank) are excluded from monitoring and reporting.

The table below sets out each of the classes and indicates which section of this document applies to them.

Network Class	Description	Section
Council drinking water networks		
Small Council Network	• The network is operated by or on behalf of a council or council-controlled organisation. • Peak population of less than 100 people (including usual consumer numbers) **OR** • The source of the network is only from rainwater collection tanks.	Excluded from monitoring and reporting
Large Council Network	• The network is operated by or on behalf of a council or council-controlled organisation. • Peak population greater than 100 people (including usual consumer numbers) **AND** • The source of the network includes a source other than rainwater collection tanks.	Refer to Section 2.1
Government-owned and operated drinking water networks		
Small Government Network	• The network is operated by or on behalf of a government department or the New Zealand Defence Force. • Peak population of less than 100 people (including usual consumer numbers) **OR** • The source of the network is only from rainwater collection tanks.	Excluded from monitoring and reporting
Large Government Network	• The network is operated by or on behalf of a government department or the New Zealand Defence Force. • Peak population greater than 100 people (including usual consumer numbers) **AND** • The source of the network includes a source other than rainwater collection tanks.	Refer to Section 2.2

1.4 When do I need to begin monitoring and reporting, and what is the process for providing the information to Taumata Arowai?

Data collection and reporting is mandatory for drinking water network operators. This is required by the Environmental Performance Measures Record Keeping Requirements for Drinking Water Network Operators Notice 2022. The data collection period runs from 1 July to 30 June each year. The information collected is required to be reported to Taumata Arowai by **30 September** following the end of each data collection period.

The first data collection period is therefore 1 July 2022 to 30 June 2023, with the first reporting of that data due by 30 September 2023. The amount of data required to be recorded and reported, will increase in phases to reflect the ability of drinking water network operators to collect this information, and the ability of Taumata Arowai to process this information

Appendices One, Two, Three, Four and Five provide definitions for data points in the first year of reporting. The definitions for each of the performance measures and data points are important factors that determine how this information must be collected and reported. Importantly, standardised definitions ensure information is collected consistently and we can make fair comparisons between different network operators in the Network Report.

Appendix Six includes information on fields required for data collection. Network operators will be sent a copy of the full data collection spreadsheet at the end of each reporting period to populate. The spreadsheet will require a confidence grade to be assigned to each data point. Data collection confidence grades are included in **Appendix Seven**.

2. Environmental performance measures and data

The following sections outline the data requirements for each of the classes of network operator.

Key terms in this section:

- **Outcome:** categories for assessing the environmental performance of networks.
- **Performance Measure:** the matters identified in the second column of the tables in Parts 2.1 and 2.2 are environmental performance measures for drinking water networks, published for the purposes of section 145(1)(a) of the Act. Each addresses an aspect of environmental performance we are interested in measuring.
- **Data points:** a level of detail down from performance measures, these are the individual data points network operators will be required to collect.
- **Code:** correspond with definitions for each data point, set out in the next section.
- **District:** means the district/city area of a territorial authority or council-controlled organisation. Where performance measures listed in these definitions are required to be reported at a district level data only needs to relate to properties connected to the territorial authority or council-controlled organisation water supply. Where indicated in Section 2.1, data should be aggregated at a district level across all territorial authority and council-controlled organisation water supplies.
- **Department:** means all networks operated by a single government department or the New Zealand Defence Force. Where indicated in Section 2.2 data should be aggregated to the department level for government supplies.
- **Network:** means a drinking water supply operated by a drinking water network operator, with all the elements comprising a discrete system from treatment to customer(s) within a drinking water supply, including:
    - Source of raw water
    - Water treatment plants
    - The distribution system (storage and pipe Network).
- Some environmental performance measures are required to be reported at a network, rather than a district or departmental level. Tables in Section 2.1 and 2.2 outline where this is this case.

2.1 Large council supplies

Outcome	Performance Measure	Data points	Code	Network (N) or district (D) level
General asset information	Drinking water network information	Number of drinking water networks	A1	D
		Number of treatment plants	A2	D
		Number of reservoirs	A3	D
		Number of pump stations	A4	D
		Kilometres of pipe	A5	D
		Number of drinking water abstraction points	A6	N
		Drinking water network source type	A7	N
Environmental and public health is protected	Drinking water network connections	Number of residential connections in the drinking water network	EH1	N
		Number of non-residential connections in the drinking water network	EH2	N
		Total population served by the drinking water network	EH3	N
	Volume of water abstracted (m^3/year)	Water Supplied to the drinking water network (m^3/year)	EH5	N
		Water imported from other suppliers (m^3/year)	EH6	D
		Water exported to other suppliers (m^3/year)	EH7	D
		Non-residential water use (m^3/year)	EH8	N
	Resource consent compliance	Number of resource consents that are held	EH9	D
		Type of resources consent (e.g. water take consent, discharge consents, etc)	EH10	N
		Resource consent reference numbers	EH11	N
		Expiry dates for resource consents	EH12	N
Services are reliable	Fault attendance and resolution	Median hours to attend to an urgent fault	R1	D
		Median hours to attend to a non-urgent fault	R2	D
		Median hours to resolve an urgent fault	R3	D
		Median hours to resolve a non-urgent fault	R4	D
	Systems interruption	Planned interruptions (Number)	R5	D
		Third party incidents (Number)	R6	D
	Asset condition	% of pipelines that have received a condition grading	R7	D

Outcome	Performance Measure	Data points	Code	Network (N) or district (D) level
		% of pipelines in poor or very poor condition	R8	D
		Average age of water pipelines	R9	D
		% of above ground assets that have received a condition grading	R10	D
		% of above ground assets in poor or very poor condition	R11	D
	Water pressure	Average system pressure	R12	N
		Has a reference level for water pressure been set?	R13	D
	Water restriction days	Number of days water restrictions applied	R14	D
		Number of affected connections	R15	D
	Sufficient fire-fighting water available	Have you adopted the FENZ Code of Practice (SNZ PAS 4509:2008)?	R16	D
		Fire hydrants tested in the previous five years (%)	R17	D
Resources are used efficiently	Drinking water network water losses	Estimated total drinking water network water loss (m^3/year)	RE1	N
		Current annual real loss (CARL) (litres/service connection/day or m^3/km of mains/day)	RE2	N
		Infrastructure Leakage Index (CARL/UARL)	RE3	N
	Water use	Median residential water consumption (L/day/connection)	RE4	N
		Do you have a water conservation education programme in place?	RE5	D
		Number of residential connections with water meters	RE6	D
		Number of non-residential connections with water meters	RE7	D
	Energy efficiency	Electricity use (kWh)	RE8	D
		Energy use from other fuels (GJ)	RE9	D
		Energy generation (GJ)	RE10	D
Services are resilient	Critical assets	Have you undertaken an assessment to identify critical assets?	RL1	D

2.2 Large government supplies

Outcome	Performance Measure	Data points	Code	Network (N) or department (D) level
General asset information	Drinking water network information	Number of drinking water networks	A1	D
		Number of treatment plants	A2	D
		Number of reservoirs	A3	D
		Number of pump stations	A4	D
		Kilometres of pipe	A5	D
		Number of drinking water abstraction points	A6	N
		Drinking water network source type	A7	N
Environmental and public health is protected	Drinking water network connections	Number of residential connections in the drinking water network	EH1	D
		Number of non-residential connections in the drinking water network	EH2	D
		Total population served by the drinking water network	EH3	N
	Volume of water abstracted (m^3/year)	Water Supplied to the drinking water network (m^3/year)	EH5	N
		Water imported from other suppliers to the network (m^3/year)	EH6	D
		Water exported to other suppliers from the network (m^3/year)	EH7	D
		Non-residential water use (m^3/year)	EH8	N
	Resource consent compliance	Number of resource consents that are held	EH9	N
		Resource consent type (e.g. water take consent, discharge consents, etc)	EH10	N
		Resource consent reference numbers	EH11	N
		Expiry dates for resource consents	EH12	N
Services are reliable	Fault attendance and resolution	Median hours to attend to an urgent fault	R1	D
		Median hours to attend to a non-urgent fault	R2	D
		Median hours to resolve an urgent fault	R3	D
		Median hours to resolve a non-urgent fault	R4	D
	System interruptions	Planned interruptions (Number)	R5	D
		Third party incidents (Number)	R6	D
	Asset condition	% of pipelines that have received a condition grading	R7	D
		% of pipelines in poor or very poor condition	R8	D
		Average age of water pipelines	R9	D

Outcome	Performance Measure	Data points	Code	Network (N) or department (D) level
		% of above ground assets that have received a condition grading	R10	D
		% of above ground assets in poor or very poor condition	R11	D
	Water pressure	Average system pressure	R12	N
		Has a reference level of pressure been set?	R13	D
	Water restriction days (*across networks not individual supplies)	Number of days water restrictions applied	R14	D
		Number of affected connections	R15	D
Resources are used efficiently	Drinking water network water losses	Estimated total drinking water network water loss (m^3/year)	RE1	N
		CARL (current annual real loss) (m^3/main/day or L/connection/day)	RE2	N
		Infrastructure Leakage Index (CARL/UARL)	RE3	N
	Water use	Do you have a water conservation education programme in place?	RE5	D
Services are resilient	Critical assets	Have you undertaken an assessment to identify critical assets?	RL1	D

Appendix One: General asset information

Definitions

This section provides definitions for data points in the first year of reporting (2022/23)

The definitions for each of the environmental performance measures and data points are important factors that determine how this information must be collected and reported. Importantly, standardised definitions ensure information is collected consistently and we can make fair comparisons between drinking water network operators in the Network Report.

We understand the definitions may not allow a drinking water network operator to capture their full performance story. We encourage drinking water network operators to provide supporting commentary when information is provided at the end of each reporting period.

Performance measure: drinking water network information

A1 Number of drinking water networks

The number of distinct drinking water supply systems, operated by a drinking water network operator. A network includes:

- the source of raw water
- water treatment plants
- the distribution system (storage and pipe **Network**).

There may be only one, or several networks with a territorial authority's district/city or operated by a department or the New Zealand Defence Force. For example, New Plymouth District Council operates four discrete networks, that are geographically dispersed and service separate settlements in Ōkato, New Plymouth, Ōakura and Inglewood.

A common water source does not constitute a common network. For example, Nelson City Council partially supplies water to Richmond, in the Tasman District. Despite sharing a connection to the Roding Dam, networks that are operated by these two councils are considered separate.

A2 Number of water treatment plants

A water treatment plant is defined as the location of equipment that directly enables any form of treatment that improves water quality, towards making the water safe to drink. For example, a cartridge filter, an Ultraviolet (UV) unit, a sand filter, a clarifier, or a chlorine dosing system, are all examples of water treatment plants.

Where multiple treatment components are used in a collective process, or located in a common building, compound, or discrete geographic area, these are considered a single treatment plant.

A3 Number of reservoirs

Total number of water supply reservoirs, operated by the network operator, (but excluding raw water storage, including bulk storage reservoirs and sub-surface suction tanks where applicable) in the council or council-controlled organisation's city/district.

Includes distribution system reservoirs, tanks, treated water tanks, and reservoirs. Does not include bulk raw water storage facilities, or small break pressure rural tanks.

If one site or location has more than one tank/reservoir, then count each tank/reservoir separately.

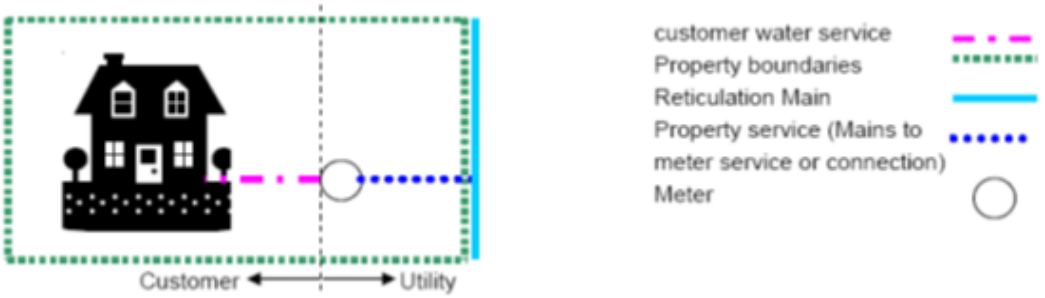
A4 Number of pump stations

Includes any pump station used to deliver treated drinking water after the final stage of the water treatment process. Do not include treatment plants with a pump station on site to deliver treated water into the water distribution system.

A5 Kilometres of pipe

Total length of public water mains (excluding private laterals). This includes all trunks, reticulation mains and service leads up to the meter, or point of supply for the supply of potable water.

It does not include lengths associated with customer water services within private property boundaries (as indicated on the figure below), or source works such as bore fields not associated with the reticulated water supply network. Do not count disused pipe lengths, even if they are maintained for possible future use.



A6 Number of drinking abstraction points

Total number of physical points where water is abstracted to supply the network, may include multiple bores, or multiple abstraction points within the same surface water body. May also include multiple different water sources, i.e., groundwater and surface water.

A7 Drinking water source type

For each abstraction point select from bore, roof, spring, lake, or river/stream/creek.

Appendix Two: Environmental and public health is protected

Definitions

This section provides definitions for data points in the first year of reporting (2022/23).

The definitions for each of the environmental performance measures and data points are important factors that determine how this information must be collected and reported. Importantly, standardised definitions ensure information is collected consistently and we can make fair comparisons between drinking water network operators in the Network Report.

We understand the definitions may not allow a drinking water network operator to capture their full performance story. We encourage drinking water network operators to provide supporting commentary when information is provided at the end of each reporting period.

Performance measure: drinking water network connections

EH1 Number of residential connections in the drinking water network

Total number of residential connections serviced by a reticulated drinking water network. Include method for determining number of serviced connections in multi-unit buildings in the comments field.

The total number of residential connections provides a proxy for water serviced properties. The total number of connections should be determined by providing the total number of household units:

- connected to the network operator's network and/or
- the subject of separate billing for the drinking water supply (fixed and/or consumption).

A single residential building will usually contain a single household unit. Multi-unit buildings should be counted based on the number of separate household units. The approach used to determine this figure is to be specified in the comments field. This may be determined based on the number of household units that are separately billed/rated e.g., a multi-unit apartment building with only one supply connection but with 100 apartments, each receiving a separate water bill will be counted as 100. If a multi-unit complex (e.g., retirement village) received a single bill, but consists of multiple household units these should be included, where information is available to do so.

A tenanted property which is separately metered and in respect of which the tenant is liable for water usage counts as one property (i.e., the owner and tenant of a single rented property are not counted as separate connections).

This includes:

- connected but non-rateable properties.

This does not include:

- vacant lots that are connected, or
- rated but unconnected properties.

EH2 Number of non-residential connections in the drinking water network

Total number of non-residential connections serviced by a reticulated drinking water network.

Non-residential is defined as any business or other activity that is not identified as residential.

Where a single non-residential connection services multiple tenancies, but multiple accounts are issued, the number of connections (in this case 1), not the number of accounts should be recorded.

EH3 Total population served by the network

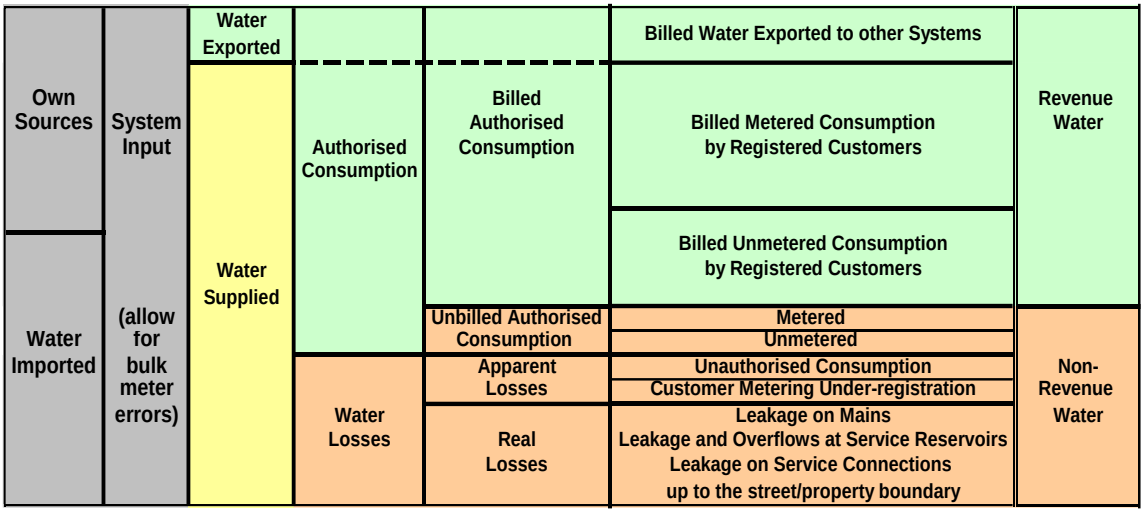
The number of consumers served by each drinking water network. This should be consistent with values entered in Hinekōrako, and calculated using the approach outlined here.

Performance measure: volume of water abstracted (m^3/year)

EH5 Water supplied to the drinking water network (m^3/year)

Volume of water supplied in area under the network operator's jurisdiction. This is 'Water Supplied' in terms of the standard Water Balance (see below, diagram should be read left to right). It includes system losses after the treatment plant.

If multiple networks are operated, provide information for each network separately.



EH6 Water imported from other suppliers (m^3/year)

Volume of water imported from a separate supplier that is used to supply the drinking water network(s). This is 'Water Imported' in terms of the standard water balance shown in EH5.

EH7 Water exported to other suppliers (m^3/year)

Volume of water provided by the network operator that is exported for use to other water networks. This is 'Water Exported' in terms of the standard water balance shown in EH5.

EH8 Non-residential water use (m^3/year)

Water consumption for non-residential properties, including rural and agricultural uses, and outdoor areas.

If rural schemes include a known number of residential properties, which are not separately metered, an estimate of residential consumption should be subtracted from non-residential water consumption. This water use can be determined by multiplying the number of residential properties in the rural scheme, by the estimated average daily residential water consumption.

If multiple networks are operated, provide information for each network separately.

Performance measure: resource consent compliance

EH9 Number of resource consents that are held

Include all resource consents related to drinking water network operation. Include consents related to water permits, discharge permits (to land, air, or water), coastal permits and land use consents.

EH10 Resource consents held for drinking water networks (e.g. water take consent, discharge consents, etc)

For each of the listed consents identified in EH9 above describe whether the consent relates to:

- Water permits - take, use, dam, and divert.
- Discharge permits - to land, air, and water.
- Coastal permits - construction, deposit, disturb, and alter.
- Land use consent - build, excavation, and damage to habitat.

EH11 Resource consent reference number

List the resource consent reference number for each of the resource consents listed, in accordance with EH10.

EH12 Expiry dates for resource consents

List expiry dates for each of the resource consents listed, in accordance with EH10.

Appendix Three: Services are reliable

Definitions

This section provides definitions for data points in the first year of reporting 2022/23.

The definitions for each of the environmental performance measures and data points are important factors that determine how this information must be collected and reported. Importantly, standardised definitions ensure information is collected consistently and we can make fair comparisons between drinking water network operators in the Network Report.

We understand the definitions may not allow a drinking water network operator to capture their full performance story. We encourage drinking water network operators to provide supporting commentary when information is provided at the end of each reporting period.

Performance measure: fault attendance and resolution

R1 Median hours to attend an urgent fault

The median time from when a network operator receives notification of an urgent fault or unplanned service interruption to a drinking water network, to when service personnel reach the site in response.

An urgent fault is one that directly results in a complete loss of service for one or more connections. For example, a complete interruption of supply, or provision of water that is not safe or not known to be safe to drink.

This measure only refers to confirmed faults with the network, not all customer complaints. For example, time taken to attend a customer complaint, that is later determined to be on the customer side of the boundary does not need to be captured.

Extreme events, such as civil defence events may skew overall trends in performance. Any such events should be clearly identified in the comments section.

R2 Median hours to attend a non-urgent fault

The median time from when a network operator receives notification of a non-urgent fault or unplanned service interruption to a drinking water network, to when service personnel reach the site in response.

A non-urgent fault is any fault that is not considered an urgent fault. Examples include, reduced pressure of supply, or an aesthetic issue with the water supply if it can be confirmed the water is still safe to drink.

R3 Median hours to resolve an urgent fault

The median time from when a network operator receives notification of an urgent fault or unplanned service interruption (as defined in R1) to the time that service personnel confirm permanent return to service. A permanent resolution/return to service does not necessarily imply asset reinstatement, as this does not impact on the service itself.

This measure only refers to confirmed faults with the network, not all customer complaints. For example, time taken to attend a customer complaint, that is later determined to be on the customer side of the boundary does not need to be captured.

R4 Median hours to resolve a non-urgent fault

The median time from when a network operator receives notification of a non-urgent fault or unplanned service interruption (as defined in R2) to the time that service personnel confirm permanent return to service. A permanent resolution/return to service does not necessarily imply asset reinstatement, as this does not impact on the service itself.

Performance measure: systems interruptions

R5 Planned interruptions

Total number of planned drinking water network interruptions for maintenance or renewal works, excluding water meter or water restrictor replacements. A network interruption is any event causing a total loss (cessation or outage) of water supply.

An interruption can affect just one customer, or it can affect many customers, but it is only counted once e.g. one break affects 30 dwellings in a street but only one interruption is recorded.

It excludes interruptions that occur in the customer water connection (i.e. within privately owned pipes), or interruptions caused by meter or water restrictor replacement programmes.

R6 Third party incidents

The number of unplanned interruptions to service caused by third parties.

An 'incident' can affect just one customer, or it can affect many customers, but it is only counted once e.g. one break affects 30 dwellings in a street but only one incident is recorded. If one break affects one dwelling, then one incident is recorded.

Third party incidents are the number of incidents where one or more customers experience an unplanned total loss of water supply service caused by third parties (i.e. not the network operator or its contractor(s)).

It excludes interruptions caused by bursts or leaks in the property service connection i.e. mains to meter connection (see figure overleaf) or customer water service connection.

Performance measure: Asset condition

R7 Percentage of pipelines that have received a condition grading

The percentage of pipelines (both above ground and underground), by length, that have received a condition grade using a standardised grading structure or methodology.

All pipelines that have received a condition grade should be included, regardless of the mix of attributes being used to assign the grades. For example, not only pipelines assessed using direct inspection methods should be included, but also pipelines that have received a condition grading based on interpolation of age or other factors. Provide information on the approach used to determine the condition grading in the comments field.

R8 Percentage of pipelines in poor or very poor condition

The percentage of pipelines (both above ground and underground), by length, that have received a poor or very poor condition grade.

This value should be a percentage of all pipelines, not a percentage of pipelines that have received a condition assessment.

The definitions of poor, and very poor condition, should align with the definitions provided in the IPWEA International Infrastructure Management Manual (IIMM):

- Poor Condition – Consider Renewal
- Very Poor Condition – Approaching Unserviceable.

If condition grades used do not adhere to these definitions, specify the alternate condition grading approach, or definition in the comments.

For Asbestos Cement pipelines, further guidance is provided in the definition of poor and very poor condition assets in the Water New Zealand, National Asbestos Cement Pressure Pipe Manual. These categories may also provide guidance for other pipe materials and so are provided here for reference:

- Poor condition assets: less than 25 % of the life of a new AC pipe remaining.
- Very Poor: pipe failure due to deterioration can be expected within a few years and some pipe failures may have already occurred.

R9 Average age of water pipelines

Weighted average age of all water pipelines within all of the network operators drinking water networks. This should be calculated by taking into account the length and age (in years) of pipelines as follows.

$$\frac{\sum(length\ of\ pipeline\ \times age\ of\ pipeline)}{\sum length\ of\ pipeline}$$

R10 Percentage of above ground assets that have received a condition assessment

The percentage of above ground assets, of the kinds listed below, that have received a condition grade using a standardised grading structure or methodology:

- Water treatment plant buildings, including ancillary buildings
- Above ground service reservoirs, including contact tanks within the distribution zone
- Pumping stations, including above ground ancillary buildings (such as detached chemical storage sheds).

The individual condition grading of components of each of these assets does not need to be considered.

Provide information on the approach used to determine the condition grading in the comments field.

R11 Percentage of above ground assets in poor or very poor condition

The percentage of above ground assets (defined in R10) that have received a poor or very poor condition, in alignment with the definition in the International Infrastructure Management Manual:

- Poor Condition – Consider Renewal
- Very Poor Condition – Approaching Unserviceable.

If condition grades used do not adhere to these definitions, specify the alternate condition grading approach, or definition in the comments.

Further guidance is provided in the definition of poor and very poor condition assets in the Water New Zealand, Visual Assessment Manual for Utility Assets. The Manual expands on the International Infrastructure Management Manual definitions, provided here for reference:

- Poor: Either not working or is working poorly because of damage or deterioration. Condition or structure is poor or structural integrity is in question.
- Very Poor: Needs urgent attention.

The individual condition grading of components of each of these assets need not be considered.

This value should be a percentage of all assets, not a percentage of assets that have received a condition assessment.

Performance measure: water pressure

R12 Average system pressure

Average distribution system pressure. Methods for calculation are outlined in Appendix E of the Water New Zealand: Water Loss Guidelines February 2010.

If multiple drinking water networks are operated provide information for each network separately.

R13 Pressure levels of service

Has a reference level for water pressure been set? A yes or no response is required.

The reference level may have been set to respond to customer levels of service, for backflow prevention, or to meet firefighting requirements. If yes, please provide information in the comments field on the reference level set.

Performance measure: water restriction days

R14 Water restriction days

The total number of days water restrictions were in place across the district or department area.

R15 Number of affected properties

The proportion of customers affected by water restrictions, with each individual connection counted as a connected property. For example, if a water supplier providing water to 4,000 connections, operates four separate networks, with 1,000 connections in each network, and only one network had water restrictions, this would be considered 25% (1,000/4,000).

Performance measure: sufficient fire-fighting water available

R16 Have you adopted the Fire and Emergency New Zealand Code of Practice (SNZ PAS 4509:2008)

Has your organisation adopted the Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008)? A yes or no response is required.

R17 Fire hydrants tested in the previous five years

If the answer to R16, is yes, what percentage of key fire hydrants were inspected in the previous five years (as defined in Clause G5 of Appendix G SNZ PAS 4509:2008) Firefighting Water Supplies Code of Practice?

Appendix Four: Resources are used efficiently

Definitions

This section provides definitions for data points in the first year of reporting (2022/23).

The definitions for each of the environmental performance measures and data points are important factors that determine how this information must be collected and reported. Importantly, standardised definitions ensure information is collected consistently and we can make fair comparisons between drinking water network operators in the Network Report.

We understand the definitions may not allow a drinking water network operator to capture their full performance story. We encourage drinking water network operators to provide supporting commentary when information is provided at the end of each reporting period.

Performance measure: drinking water network water losses

RE1 Estimated total drinking water network water loss (m^3/year)

Total drinking water network water losses, calculated as the difference between system input and authorised consumption, as illustrated in the water balance figure below.

If multiple networks are operated provide information for each network separately.

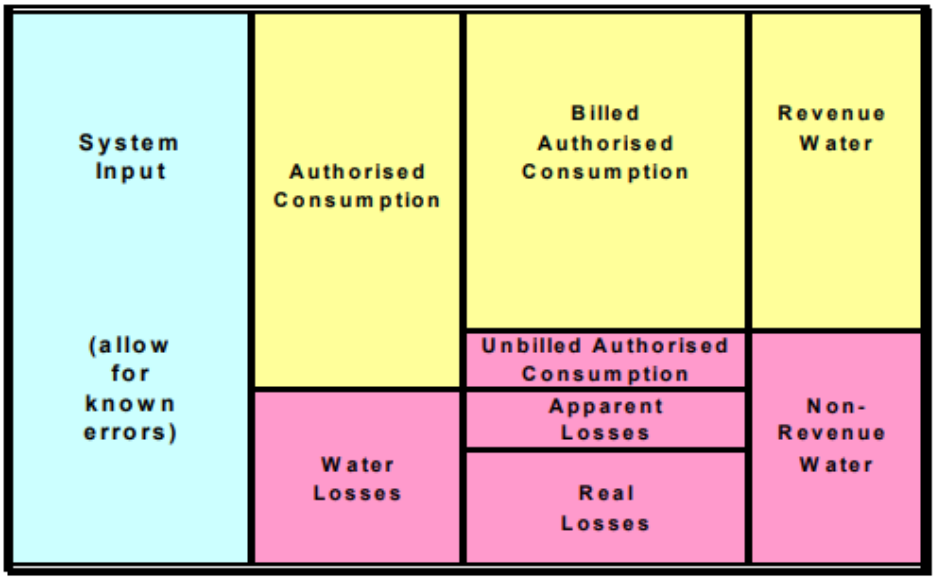


Figure 2.1: A simplified IWA Standard Water Balance

RE2 CARL (current annual real loss) (L/connection/day, m^3/km mains/day)

Current annual water losses from the pressurised system, and overflows from service reservoirs, up to the point of measurement (or estimation) of customer consumption. The annual volume lost through all types of leaks, bursts and overflows depends on frequencies, flow rates, and average duration of individual leaks and overflows.

Real Losses are calculated as the difference between Water Losses and Apparent Losses. Apparent Losses relate to unauthorised consumption (theft or illegal use) plus customer meter under registration (where how much water is being supplied to a connection is unknown because that connection has been missed off the metering programme).

Current Annual Real Losses should be reported at a drinking water network level. When the Density of Connections is 20/km or more, losses should be reported in litres/service/connection/day. When the Density of Connections is less than 20/km, losses should be reported in m^3/km mains/day.

If multiple networks are operated provide information for each network separately.

RE3 Infrastructure Leakage Index (CARL/UARL)

Infrastructure Leakage Index (ILI) is the non-dimensional ratio of Current Annual Real Losses (CARL) to Unavoidable Annual Real Losses (UARL). The ILI measures how effectively infrastructure activities (speed and quality of repairs, active leakage control and pipe materials management) are being managed at current operating pressure. An approach for calculating ILI is outlined in the Water New Zealand Water Loss Guidelines and associated, Bench loss calculator.

ILI was developed specifically for comparisons of leakage management performance between different systems with different infrastructure characteristics (connection density, length of service connections, average pressure). ILI should always be interpreted with some measure of pressure, and only used for tracking progress provided all justifiable pressure reduction is achieved.

ILI = Current Annual Real Losses (CARL)/ Unavoidable Annual Real Losses (UARL).

CARL is Current Annual Real Losses volume in m^3/year.

UARL is Unavoidable Annual Real Losses (UARL) in m^3/year where:

If multiple networks are operated provide information for each network separately.

Performance measure: water use

RE4 Median residential water consumption (L/day/connection)

If water consumption based on residential water metering is available, provide median water use per connection.

If multiple networks are operated provide information for each network separately.

In the absence of median values, this field can be left blank and mean water use for each drinking water network will be calculated during analysis.

RE5 Do you have a water conservation education programme in place?

This is a yes or no question, more details of the education programme, if in place, can be included in the comments field.

RE6 Number of residential meters

The number of residential water meters installed.

If a single meter is installed on a multi-unit complex this is only counted as one meter.

RE7 Number of non-residential meters

The number of non-residential water meters installed. If a commercial premises maintains multiple sub-meters within the tenancy and these are maintained by the water supplier each meter should be counted.

Performance measure: energy efficiency

RE8 Grid electricity use (kWh)

The total grid-sourced electricity consumed by the drinking water network's pumps, water treatment plants, and other network components.

Do not include electricity use related to fleet vehicles or offices.

Do not include electricity generated on site, for example through solar panels or micro-turbines.

Sources of energy other than electricity, including biomass, diesel, and gas should be separately reported in the field below.

RE9 Energy use (GJ)

The total energy consumed from external sources other than electricity, by water system pumps, water treatment plants, and other network components. This could include fuel provided by biomass, diesel, or gas.

Do not include energy use related to fleet vehicles or offices.

RE10 Energy generation (GJ)

The total energy generated onsite. This could include energy generated by micro-turbines or through co-location of renewables on site. Include the source of energy generation in the comments section.

Appendix Five: Services are resilient

Definitions

This section provides definitions for data points in the first year of reporting (2022/23).

The definitions for each of the environmental performance measures and data points are important factors that help to determine how this information must be collected and reported. Importantly, standardised definitions ensure information is collected consistently and we can make fair comparisons between drinking water network operators in the Network Report.

We understand the definitions may not allow a drinking water network operator to capture their full performance story. We encourage drinking water network operators to provide supporting commentary when information is provided at the end of each reporting period.

Performance measure: Critical assets

RL1 Have you undertaken an assessment to identify critical assets?

A yes or no response indicating whether a comprehensive assessment to determine critical assets is undertaken.

Critical assets are those for which the financial, business, or service level consequences of failure are sufficiently severe to justify more rigorous policies for proactive inspection, maintenance, and renewal.

They are defined in the Infrastructure Asset Grading Guidelines 1999, as assets where failure would have significant consequences, either in the ability of the system to provide services to customers or the effect on the environment.

There are no specific rules for identification of critical assets. It is a matter of technical assessment and judgement, based on the level of risk arising and the consequences of failure.

Appendix Six: Data collection fields

Supplied fields for data collection

Supplied fields on the data collection template, aligned with those in this definition guide are as follows:

Outcome	Performance Measure	Code	Data points	Units

Required fields for data collection

Data	Data Confidence	Data Source	Reporter Name	Comments
Data pertaining to the financial year beginning 1 July and ending 30 June in the following calendar year. Data entered is to align with data provided in the definition guide.	Data confidence values are required wherever drop-down boxes appears in the 'Data Confidence' column.	Where data is sourced from (e.g. Asset Management System, Water Balance Report etc). This field is included to assist with audits however is not mandatory.	Who provided the data? This field is included to assist with audits however is not mandatory.	An optional field to provide supporting context, note deviations from standard data definitions, list reasons data is not provided, or provide additional information if required.

Appendix Seven: Data confidence

Data confidence definitions

	Highly reliable/ Audited	Reliable/ Verified	Less Reliable	Uncertain	Very uncertain
Processes	Formal process to collect and analyse data. Process is documented and always followed by all staff.	Strong process to collect data. May not be fully documented but usually undertaken by most staff.	Process to collect data established. May not be fully documented but usually undertaken by most staff.	Semi formal process usually followed. Poor documentation. Process to collect data followed about half the time.	Ad hoc procedures to collect data. Minimal or no process documentation. Process followed occasionally.
Asset Data	Very high level of data confidence. Data is believed to be 95-100% complete and +/- 5% accurate. Regular data audits verify high level of accuracy in data received.	Good level of data confidence. Data is believed to be 80-95% complete and +/- 10% to 15% accurate. Some minor data extrapolation or assumptions have been applied. Occasional data audits verify reasonable level of confidence.	Average level of data confidence. Data is believed to be 50-80% complete and +/- 15 to 20% accurate. Some data extrapolation has been applied based on supported assumptions. Occasional data audits verify reasonable level of confidence.	Not sure of data confidence, or data confidence is good for some data, but most of dataset is based on extrapolation of incomplete data set with unsupported assumptions.	Very low data confidence. Data based on very large unsupported assumptions, cursory inspection, and analysis. Data may have been developed by extrapolation from small, unverified data sets.