

# Water Quality and Reporting Guideline for a Drinking Water Service

September 2010

This publication has been compiled by Queensland Water Supply Regulator, Water Supply and Sewerage Services, Department of Energy and Water Supply.

© State of Queensland, 2013.

The Queensland Government supports and encourages the dissemination and exchange of its information. The copyright in this publication is licensed under a Creative Commons Attribution 3.0 Australia (CC BY) licence.



Under this licence you are free, without having to seek our permission, to use this publication in accordance with the licence terms.

You must keep intact the copyright notice and attribute the State of Queensland as the source of the publication.

For more information on this licence, visit <http://creativecommons.org/licenses/by/3.0/au/deed.en>

The information contained herein is subject to change without notice. The Queensland Government shall not be liable for technical or other errors or omissions contained herein. The reader/user accepts all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly from using this information.

# Contents

1.	Introduction .....	1
1.1	Aim of this guideline .....	1
1.2	Relationships to other guidelines.....	1
1.2.1	Other drinking water regulatory guidelines .....	1
1.3	Relationship to other legislation and regulations.....	2
1.3.1	Public health legislation.....	2
1.3.2	Other legislation and regulations .....	2
1.4	Other resource material .....	2
2.	Scope of the <i>Water Supply (Safety and Reliability) Act 2008</i> .....	3
2.1	Definition of drinking water .....	3
2.2	Definition of a service provider.....	3
2.3	Definition of a drinking water service provider .....	3
2.4	Definition of a water service .....	4
2.5	Definition of a drinking water service .....	4
2.6	Definition of a drinking water scheme .....	4
2.6.1	Single scheme.....	5
2.6.2	Multiple schemes.....	5
2.6.3	Multiple providers involved in the supply of drinking water .....	6
2.7	Drinking water service provider obligations—overview.....	6
2.7.1	Water quality criteria.....	7
3.	Monitoring and reporting requirements—transitional phase (stage one—under the notice).....	9
3.1	Monitoring and reporting .....	9
3.2	Water quality criteria—monitoring requirements.....	9
3.3	Standards prescribed in the Public Health Regulation.....	10
3.3.1	<i>E. coli</i> (in the reticulation system).....	10
3.3.2	Fluoride (where added to the water supply) .....	11
3.4	Water quality criteria set by the regulator .....	12
3.4.1	<i>E. coli</i> within the treatment and transmission components.....	12
3.4.2	Pathogens.....	13
3.4.3	Chemical health-related water quality criteria.....	13
3.4.4	Radiological water quality criteria.....	14
3.4.5	Parameters for which there is no guideline value in the ADWG.....	14
3.4.6	Any water quality criteria not health-related .....	14
3.5	What to do if the criteria are not met.....	15
3.6	Water quality criteria—reporting requirements.....	15
3.6.1	Current monitoring program.....	15
3.6.2	Reporting on results of monitoring program .....	15
3.6.3	Incident reporting .....	17
3.6.4	Who can do the water quality testing .....	20
3.6.5	Interpretation of test results .....	20

4.	Monitoring and reporting requirements—an approved plan (stage two—under the plan)	21
4.1	Operating under an approved plan	21
4.2	Standards prescribed in the Public Health Regulation	22
4.2.1	<i>E. coli</i> (in the reticulation system)	22
4.2.2	Fluoride (where added to the water supply)	23
4.3	Water quality criteria as set by the regulator	24
4.3.1	<i>E. coli</i> within the treatment and transmission components	25
4.3.2	Pathogens	25
4.3.3	Chemical health-related water quality criteria	26
4.3.4	Radiological water quality criteria	26
4.3.5	Parameters for which there is no guideline value in the ADWG	26
4.3.6	Any water quality criteria not health-related	27
4.4	What to do if the criteria are not met	27
4.5	Reporting requirements—noncompliance with water quality criteria	27
4.6	Who can do the water quality testing	27
4.7	Interpretation of test results	28
4.8	Further information on an approved plan	28
5.	Glossary	29
	Appendix A	33
	Appendix B	34

# 1. Introduction

The *Water Supply (Safety and Reliability) Act 2008* (the Act) commenced on 1 July 2008. The purpose of the Act is to provide for the safety and reliability of water supply throughout Queensland.

The Act is administered by the chief executive (Director-General) of the Department of Energy and Water Supply (the department). The chief executive of the department is the regulator under the Act. The chief executive of the department, as the regulator, has delegated certain powers under the Act to officers of the Queensland Water Supply Regulator.

The Act can be accessed online at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

The Act includes provisions relating to the management of drinking water quality, aimed at protecting public health. This outcome is achieved primarily through the regulatory framework for drinking water quality which requires drinking water service providers (providers) to:

- undertake monitoring and reporting on drinking water quality
- have an approved Drinking Water Quality Management Plan (the plan) in place.

A Drinking Water Service Provider Monitoring and Reporting Requirement Notice (the notice) was issued to all providers in December 2008, pursuant to section 630 of the Act. The notice requires all providers, from 2 January 2009, to monitor and report on drinking water quality until an approved plan is in place. The regulator may, at any time, re-issue the notice under section 630 of the Act to a provider varying the monitoring and reporting requirements.

Under the notice or an approved plan, it is the provider's responsibility to determine an appropriate water quality monitoring program<sup>1</sup> for the drinking water service (the service) to ensure the protection of public health.

Water quality reporting is an integral component to ensure the water quality criteria is met. The provider is responsible for ensuring the safe supply of drinking water to the community and managing incidents which compromise drinking water quality.

## 1.1 Aim of this guideline

This guideline has been developed in accordance with section 571 of the Act<sup>2</sup> to provide information to providers about water quality criteria and water reporting requirements.

Information contained in this guideline includes details on:

- standards for the quality of drinking water prescribed in a regulation under the *Public Health Act 2005* (the Public Health Act)
- criteria stated in a guideline, if any, made by the regulator about the quality of drinking water
- water quality reporting requirements.

It is the responsibility of the provider to meet the mandatory legislative requirements of the Act and undertake the necessary actions to fulfil these requirements.

It is anticipated that this guideline will be reviewed on a regular basis.

This guideline can be accessed online at <[www.dews.qld.gov.au](http://www.dews.qld.gov.au)>.

## 1.2 Relationships to other guidelines

### 1.2.1 Other drinking water regulatory guidelines

This guideline is part of a suite of guidelines prepared to assist providers in understanding the regulatory

---

<sup>1</sup> A water quality monitoring program is required for the drinking water service and each scheme associate with the service.

<sup>2</sup> Section 571(g) and (q) of the Act allow the regulator to prepare guidelines on the quality of drinking water and on another matter relating to the administration of the Act respectively.

requirements the Act places on them. In addition to this guideline, other drinking water related regulatory guidelines include the:

- Drinking Water Quality Management Plan Guideline
- Drinking Water Quality Management Plan Auditing and Review Guideline<sup>3</sup>
- Drinking Water Quality Management Plan Annual Reporting Guideline.<sup>4</sup>

## 1.3 Relationship to other legislation and regulations

### 1.3.1 Public health legislation

At the same time the Act was established, amendments were made to the Public Health Act and the Public Health Regulation 2005 (the Public Health Regulation) to include provisions relating to drinking water quality.

As the administrator of the Public Health Act and the Public Health Regulation, Queensland Health has:

- set specific standards for drinking water quality in the Public Health Regulation
- the power to respond when drinking water supplied by a provider may present a risk to public health or be considered unsafe<sup>5</sup>.

Section 57C of the Public Health Act states drinking water is unsafe at a particular time if it would be likely to cause physical harm to a person who might later consume it, assuming nothing happened to it after that particular time and before being consumed by the person that would prevent it being used for its intended use.

Under section 57E of the Public Health Act, it is an offence for a provider to supply drinking water the provider knows, or reasonably ought to know, is unsafe.

### 1.3.2 Other legislation and regulations

The operations of a service will also be covered under other State and Commonwealth legislation, such as the *Environmental Protection Act 1994*, *Plumbing and Drainage Act 2002*, *South-East Queensland Water (Distribution and Retail Restructuring) Act 2009*, *Sustainable Planning Act 2009*, *Trade Practices Act 1974*, *Water Act 2000*, *Water Fluoridation Act 2008* (the Water Fluoridation Act), *Water Fluoridation Regulation 2008* and the *Workplace Health and Safety Act 1995*.

The requirements of the Act do not negate the requirements of other legislation unless where expressly stated. It is the responsibility of the provider to determine and ensure compliance with relevant legislative obligations. The provider is also responsible for obtaining any necessary approvals under other legislation to ensure the continued operation of the service.

## 1.4 Other resource material

It is recognised a variety of existing resources are used by industry to ensure the safe supply of drinking water. The Australian Drinking Water Guidelines 2004 (ADWG) provides a framework for managing drinking water quality based on the best available scientific evidence and provides detailed guidance for managing drinking water supplies to ensure safety and aesthetic quality at the point of use. It also provides information on the types of parameters, monitoring methodology, sampling locations and sampling frequency.

Please note criteria made by the regulator about drinking water under this guideline refer to the health guideline values of the ADWG. The ADWG can be accessed online at <[www.nhmrc.gov.au](http://www.nhmrc.gov.au)>.

---

<sup>3</sup> The Drinking Water Quality Management Plan Auditing and Review Guideline is being developed and will be made available when approved.

<sup>4</sup> The Drinking Water Quality Management Plan Annual Reporting Guideline is being developed and will be made available when approved.

<sup>5</sup> For example, Queensland Health can require action to be taken to protect public health by the issue of a public health order or an improvement notice to a provider.

## 2. Scope of the *Water Supply (Safety and Reliability) Act 2008*

The relevant drinking water quality provisions of the Act establishes a regulatory framework for drinking water by requiring providers to prepare a plan to be assessed and approved by the regulator against a range of matters, including water quality criteria prescribed by regulation under the Public Health Act or under a guideline prepared by the regulator. These water quality criteria also apply to the monitoring and reporting requirements under a notice.

The drinking water provisions of the Act apply to all providers involved in the supply of drinking water to a community or customer as described below.

These providers may also be involved in the supply of water for other purposes such as irrigation, stock, and domestic and industrial uses. The drinking water quality provisions of the Act do not apply where water is supplied for non-drinking water purposes.

### 2.1 Definition of drinking water

The Act defines drinking water to mean water for human consumption, intended primarily as water for drinking, whether or not the water is used for other purposes. Drinking water does not include:

- (a) water that is food as defined under the *Food Act 2006*<sup>6</sup>
- or
- (b) water taken or supplied for domestic purposes under the *Water Act 2000*<sup>7</sup>.

### 2.2 Definition of a service provider

A service provider is defined in the Act as:

- (a) a local government that owns infrastructure for supplying water or sewerage services
- (b) a water authority that owns infrastructure for supplying water or sewerage services
- (c) each person who is:
  - (i) the owner of one or more elements of infrastructure for supplying water or sewerage services for which a charge is intended to be made
  - or
  - (ii) a person nominated in a regulation as a related entity of a person who is the owner of one or more elements of infrastructure for supplying water or sewerage services for which a charge is intended to be made.

A water service provider means a person registered under Chapter 2, part 3 of the Act as a service provider for a water service.

### 2.3 Definition of a drinking water service provider

The Act defines a drinking water service provider as a water service provider for a drinking water service.

---

<sup>6</sup> This is water sold for human consumption (e.g. bottled water) or used by a food business that involves the handling of food intended for sale or the sale of food. It also includes water carried in bulk in a vehicle and intended for human consumption, regardless of the source of water.

<sup>7</sup> In the *Water Act 2000*, the term domestic purposes includes irrigating a garden not exceeding .25 ha, being a garden cultivated for domestic use and not for the sale, barter or exchange of goods produced in the garden. Domestic purposes are sometimes referred to as stock and domestic water.

## 2.4 Definition of a water service

A water service does not include a service supplied by infrastructure if:

- (a) the infrastructure is used solely for mining purposes
  - or
- (b) the service is used only by:
  - (i) the owner of the infrastructure or the owner's guests or employees including, for example, guests at a resort
    - or
  - (ii) if the owner of the infrastructure is a body corporate for a community titles scheme under the *Body Corporate and Community Management Act 1997*—the occupants of lots in the scheme.

## 2.5 Definition of a drinking water service

The Act defines a drinking water service to mean a water service that is:

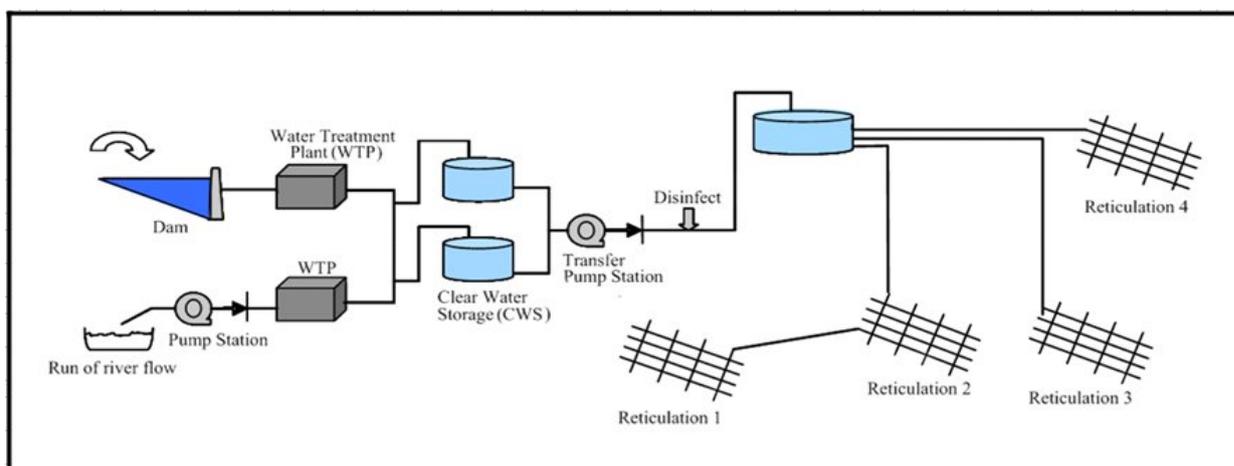
- (a) the treatment, transmission or reticulation of water for supply as drinking water
  - or
- (b) water collection in a water storage, if the water in the storage:
  - (i) includes recycled water
    - and
  - (ii) is used to augment a drinking water supply.

## 2.6 Definition of a drinking water scheme

In this guideline, a drinking water scheme (scheme) is defined as the related infrastructure components owned by a provider that forms all or part of a drinking water service that supplies a community or communities.

Figure 1 outlines the concept of a scheme. In this scenario, the scheme has more than one treatment component and sources water from a dam and a river to supply four separate reticulation systems. The components are interconnected and integrated and are therefore one scheme.

**Figure 1: An example of a drinking water scheme**



It should be noted that most providers will already have defined their scheme(s) within their service through other plans such as a Strategic Asset Management Plan or System Leakage Management Plan. If a provider is having difficulty defining their scheme(s), refer to figures 1-4 for guidance. Any additional assistance may be sought from the regulator.

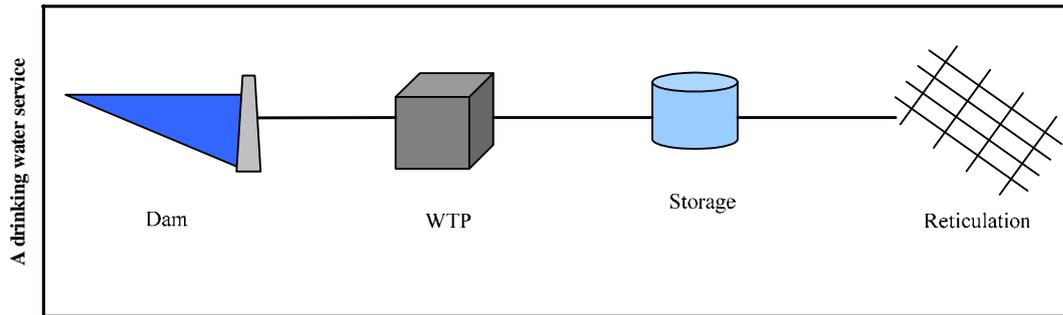
A service may consist of one or more schemes. In the majority of cases, a service supplying drinking water to one or more communities would be owned and operated by a single provider. A provider may operate a single scheme or multiple discrete schemes as shown in the diagrams below.

### 2.6.1 Single scheme

In figure 2, the provider’s service is a single scheme. This scenario is representative of a service provided by many small providers. The scheme may also include:

- one or more raw water sources of various types (e.g. dams, weirs, rivers, creeks, bores, ocean)
- one water treatment plant providing water to multiple reticulation systems
- multiple water treatment plants providing water to a single reticulation system
- one reticulation system that may include multiple interconnected communities.

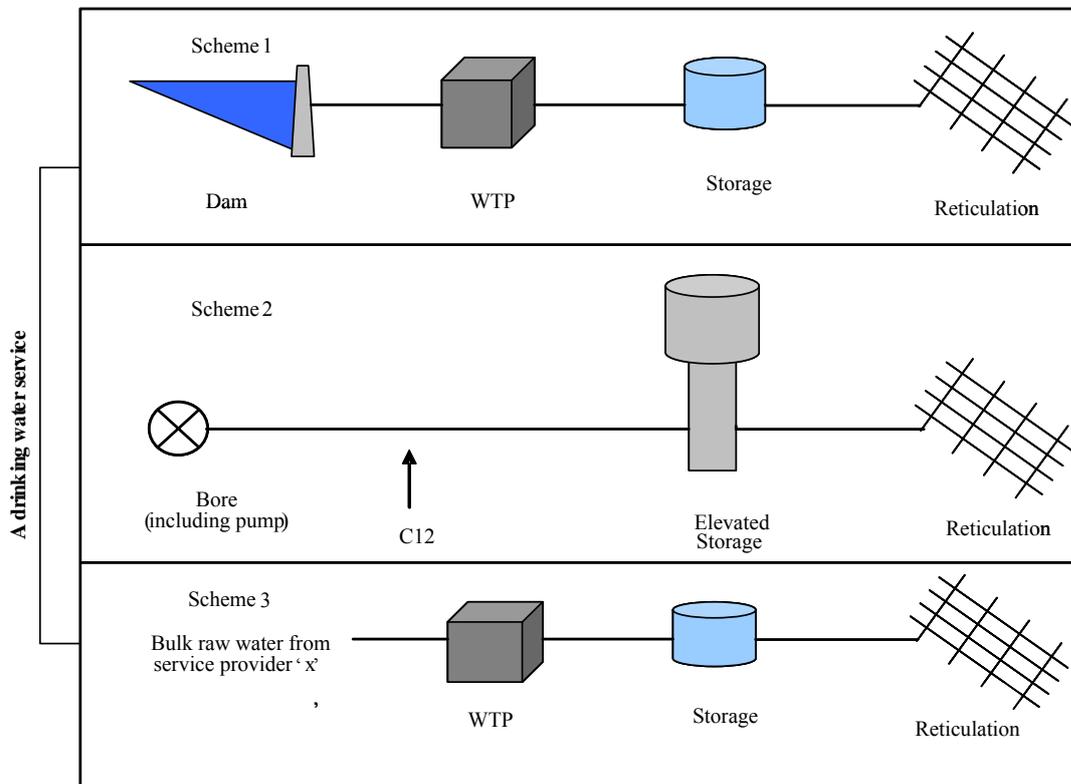
**Figure 2: A drinking water service that consists of a single scheme**



### 2.6.2 Multiple schemes

In some cases, a provider’s service may comprise multiple schemes as shown in figure 3. This is most likely to be representative of a service provided by medium or large providers, but may also include some small providers.

**Figure 3: A drinking water service that consists of multiple schemes**

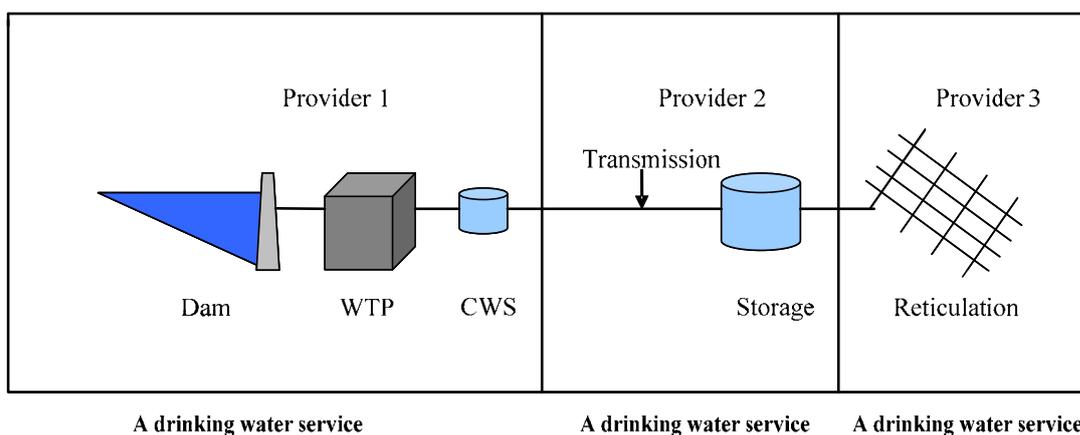


### 2.6.3 Multiple providers involved in the supply of drinking water

There are situations where the supply of drinking water to a community may involve multiple providers, with each provider responsible for a different component. A provider that is part of these connected drinking water services may also be responsible for other discrete schemes as part of its service.

A provider supplies bulk treated water to a second provider who is responsible for the transmission of the water to a third provider. This third provider is responsible for the reticulation to the community served, as shown in figure 4. This is representative of the service most likely provided by large providers.

**Figure 4: Multiple providers with three drinking water services**



## 2.7 Drinking water service provider obligations—overview

The drinking water quality legislative requirements under the Act apply to all providers, regardless of their size and complexity. These legislative requirements are being phased in over time to allow providers to adjust the operation of the service to meet these requirements.

In accordance with the Act, a provider must not carry out a drinking water service unless there is:

- a transitional period applicable to the provider under section 628 of the Act (Stage One)  
or
- an approved plan<sup>8</sup> for the service under section 92 of the Act (Stage Two).

The transitional period does not apply to a provider if the service carried out by the provider includes:

- (a) water collection in a water storage, if the water in the storage:
  - (i) includes recycled water  
and
  - (ii) is used to augment a drinking water supply
 or
- (b) the treatment of water intended for drinking that is sourced from a water storage, or water released from a water storage, mentioned in paragraph (a).

Any new drinking water service provider after 1 July 2008 must have an approved plan one year after the day of becoming a provider.

The notice issued by the regulator applies during the transitional period and requires providers to monitor and report on drinking water quality for the service, and each scheme associated with the service, until an approved plan is in place. The regulator may, at any time, re-issue the notice under section 630 of the Act to a provider varying the monitoring and reporting requirements. Table 1 outlines the statutory timeframes for requiring an

<sup>8</sup> A plan is a documented, risk-based system for managing the supply of drinking water. The implementation of an approved plan is intended to protect public health through the identification and management of risks.

approved plan.

**Table 1: Statutory timeframes for requiring an approved plan**

Provider <sup>9</sup>	Timeframes
Large	Must have an approved plan in place by 1 July 2011
Medium	Must have an approved plan in place by 1 July 2012
Small	Must have an approved plan in place by 1 July 2013
Providers that store or treat source water containing recycled water <sup>10</sup> intended to augment a drinking water supply	Must have an approved plan before recycled water used to augment a drinking water supply can be added to the source water
New drinking water service provider (after 1 July 2008)	Must have an approved plan one year after the day of becoming a provider
Under section 629 of the Act, the regulator may require the plan to be prepared at an earlier time, if the regulator is satisfied or reasonably believes the continued operation of the service may have an adverse effect on public health.	

### 2.7.1 Water quality criteria

The water supplied from a provider's service needs to be consistent with the water quality criteria for drinking water as defined in the Act. Schedule 3 of the Act defines water quality criteria as:

for drinking water, means all of the following:

- (i) the standards for the quality of drinking water prescribed in a regulation under the Public Health Act
- (ii) the criteria stated in a guideline, if any, made by the regulator about the quality of drinking water
- (iii) the criteria for the quality of drinking water stated in a condition applying to a drinking water quality management plan.

Under the definition of water quality criteria for drinking water, standards are prescribed under the Public Health Regulation and water quality criteria set by the regulator, where the Public Health Regulation has not set a standard. While the respective legislation refers to them differently, they both set limits for parameters that providers must meet. The standards for *Escherichia coli* (*E. coli*) and fluoride (where added) under the Public Health Regulation must be met by all providers. Water quality criteria set by the regulator apply where the Public Health Regulation has not set a standard.

The standards prescribed under the Public Health Regulation are the minimum water quality monitoring requirements that apply to a provider's service and each scheme associated with the service. These standards apply regardless of whether the provider is operating under the notice or an approved plan.

The regulator has the power to set water quality criteria for parameters where Queensland Health has not set a standard under the Public Health Regulation. The criteria set by the regulator in this guideline are based on the health guideline values of the ADWG. The regulator may also set criteria for which there is no guideline value in the ADWG.

The provider should determine the appropriate parameters for the water quality monitoring program based on the risks to the service and each scheme associated with the service. The criteria apply only if the parameter forms part of the provider's monitoring program for the service and each scheme associated with the service.

It is the responsibility of the provider to implement changes to the monitoring and reporting program to ensure

<sup>9</sup> For the definition of large, medium and small service provider, see the glossary of this guideline, or schedule 3 of the Act.

<sup>10</sup> In the context of this guideline, recycled water refers to recycled water that is used to augment a drinking water supply and is commonly known as purified recycled water (PRW).

compliance with the Act is maintained. There are no exemptions from these requirements under the Act. The water quality monitoring and reporting requirements that apply under the notice, and an approved plan, are discussed further in Chapters 3 and 4 of this guideline respectively.

### 3. Monitoring and reporting requirements—transitional phase (stage one—under the notice)

#### 3.1 Monitoring and reporting

In December 2008, the regulator issued all providers with the notice under section 630 of the Act, that requires monitoring and reporting on drinking water quality from 2 January 2009 until an approved plan is in place. Any new providers (that is, those becoming a provider after 1 July 2008) will also be issued with the notice from the regulator requiring them to undertake monitoring and reporting until an approved plan is in place. The regulator may, at any time, re-issue the notice under section 630 of the Act to a provider specifying different monitoring and reporting requirements on a case-by-case basis.

A provider operating under the notice in existence at 29 September 2010 is required to perform the water quality monitoring and reporting requirements as outlined in table 2 below. Further details of these requirements are provided in this guideline from section 3.2 onwards.

**Table 2: Providers monitoring and reporting requirements under the notice**

Monitoring requirements	Reporting requirements
<p>Monitor for water quality standards as specified in the Public Health Regulation (including the detection and non-detection of <i>E. coli</i> in the reticulation system)</p> <p>Continue with any current drinking water quality monitoring program(s) (where one is in place)</p>	<p>Report the current drinking water quality monitoring program(s)</p> <p>Report any incident that will, or is likely to, adversely affect drinking water quality</p> <p>Report drinking water quality monitoring results according to a defined list of parameters<sup>11</sup></p>

The water quality criteria stated in this section of the guideline apply to providers operating under the notice which came into effect on 2 January 2009. When operating under the notice, a provider must:

- monitor for *E. coli*<sup>12</sup> in the reticulation system of a service
- continue monitoring for water quality parameters that form the drinking water quality monitoring program<sup>13</sup> for the service and each scheme associated with the service. (Note: where a drinking water quality monitoring program exists, these parameters<sup>14</sup> must be within the criteria made by the regulator under this guideline about the quality of water)
- report any water quality parameter that does not meet the standards as set by the Public Health Regulation or the criteria set by the regulator.

#### 3.2 Water quality criteria—monitoring requirements

Water quality monitoring requirements apply to a service. Where a provider's service consists of more than one scheme, the monitoring and reporting of water quality must be done on an individual scheme basis. The monitoring should have a whole of scheme focus and include each of the scheme's components of treatment, transmission and reticulation as appropriate. Similarly, where there are multiple providers involved in the supply of drinking water to a community, the water quality monitoring and reporting requirements must be undertaken by

<sup>11</sup> The notice was amended in March 2009 requiring providers to report on a defined list of parameters. The defined list of parameters is available online at <[www.dews.qld.gov.au/water/regulation/pdfs/dwqra\\_appendix\\_a.pdf](http://www.dews.qld.gov.au/water/regulation/pdfs/dwqra_appendix_a.pdf)>.

<sup>12</sup> This is a standard prescribed under the Public Health Regulation.

<sup>13</sup> The monitoring program for source, treatment, transmission and reticulation components of a service must be documented as part of the current monitoring program and supplied to the regulator in accordance with the notice issued to providers under section 630 of the Act.

<sup>14</sup> The parameters for inclusion in a drinking water quality monitoring program should be based on the risks related with the service and each scheme associated with the service.

each provider for:

- the respective treatment, transmission and reticulation component the provider owns as part of the service
- any other drinking water scheme(s) the provider may own and operate as part of the service.

The provider should monitor for any parameters that may represent a risk to the health or aesthetic quality of the drinking water based on current knowledge of the water quality issues for individual schemes. Providers that do not have a current monitoring program will need to commence monitoring for *E. coli*. Further, the regulator may, at any time, re-issue the notice under section 630 of the Act to a provider specifying additional monitoring requirements. This may also include monitoring for parameters for which there is no guideline value available in the ADWG or for which the regulator has not set a water quality criteria.

It is not a requirement under the Act for a provider to report on any aesthetic water quality parameters being monitored. However, as part of an effective drinking water quality monitoring program, providers should include health-related and aesthetic parameters to ensure public health is protected. Aesthetic parameters are often a good indicator of whether the overall scheme is functioning effectively. The monitoring undertaken under the notice should provide information to support the development of the plan including an ongoing drinking water quality monitoring program.

Information on these water quality criteria monitoring requirements relating to the standards prescribed in the Public Health Regulation and water quality criteria set by the regulator about drinking water quality is discussed in the following sections of this guideline.

### 3.3 Standards prescribed in the Public Health Regulation

Guideline sections 3.3.1 and 3.3.2 relate to the standards prescribed under the Public Health Regulation and follow a standard format, including a section or sub-section number and title, introductory paragraphs and standards. The standards describe the specific requirements the provider must meet. These requirements are mandatory as they are legislative requirements under the Public Health Regulation and use the word must. Information required as a must is considered the minimum amount of information needed to address the standard.

The standards prescribed in the Public Health Regulation are the minimum water quality criteria that all providers must meet. These are described below in guideline sections 3.3.1 and 3.3.2. It is the responsibility of the provider to ensure these requirements are met and ensure they are aware of any changes to the legislation. Currently the Public Health Regulation prescribes *E. coli* and fluoride (where added) as standards for the quality of drinking water. In the case of fluoride (where added), three pieces of legislation apply—the Water Fluoridation Act, the Water Fluoridation Regulation and the Public Health Regulation. Where a provider is legislated to add fluoride to the drinking water supply, the specific monitoring and reporting requirements are stipulated under the Water Fluoridation Act and Water Fluoridation Regulation. While the Water Fluoridation Act and Water Fluoridation Regulation are referenced throughout this guideline, they are administered by Queensland Health. The relationship between the Public Health Regulation, the Water Fluoridation Act and Water Fluoridation Regulation is a result of fluoride being prescribed as a standard in the Public Health Regulation. As such, reference to fluoride will be made using the Public Health Regulation unless stated otherwise.

#### 3.3.1 *E. coli* (in the reticulation system)

*E. coli* is a thermotolerant coliform present in faeces and is regarded as the most specific indicator of recent faecal contamination. The presence of *E. coli* in the reticulation system suggests inadequate treatment and disinfection, regrowth or infiltration in a distribution system.

*E. coli* is occasionally detected in reticulation systems that are operating effectively. The presence of *E. coli* in a sample does not necessarily indicate the drinking water is unsafe. However, detection should prompt an investigation to ensure the source water, treatment, transmission or reticulation components of a service have not been compromised.

**Standards**

The provider must meet the standards prescribed under the Public Health Regulation for *E. coli* in the reticulation system of the service.

In addressing these standards the provider must:

- monitor for *E. coli*
- monitor at the frequency of sampling relevant to the service
- achieve a nil colony forming units per 100mL (nil cfu/100mL) value per sample
- achieve a 98 per cent annual value of samples (i.e. 98 per cent of samples for a 12-month period must be nil cfu/100mL).

Information for addressing these standards is provided below.

**Monitor for *E. coli***

If a provider does not currently monitor for *E. coli*, monitoring must commence and providers must ensure sample analysis results meet the requirements as defined in the Public Health Regulation. If providers are currently monitoring for *E. coli*, monitoring must be continued and providers must ensure the results meet the requirements as specified in the Public Health Regulation.

**Monitor at the frequency of sampling relevant to the service**

The minimum number of *E. coli* samples for each service is dependent upon the total population supplied by the reticulation system as described in Schedule 3A of the Public Health Regulation<sup>15</sup> (refer to Appendix A for the Public Health Regulation requirements and Appendix B for information on determining the minimum frequency of sampling).

**Achieve a nil colony forming units per 100mL (nil cfu/100mL) value per sample**

The value for *E. coli* in a reticulation system of a service is nil cfu/100mL for each sample as specified in the Public Health Regulation. If *E. coli* is detected in a sample, a follow-up sample from the same location must be taken immediately and tested for *E. coli*. The follow-up sample is in addition to the minimum total number of samples required, as detailed above, and does not form part of routine monitoring for assessment against the annual value, but should be included in the summary of sampling provided in the next routine report (e.g. quarterly report).

**Achieve a 98 per cent annual value of samples (i.e. 98 per cent of samples must be nil cfu/100mL)**

The Public Health Regulation gives allowance for occasional detection of *E. coli* in the reticulation system of a service. Over a 12 month period, 98 per cent<sup>16</sup> of all samples taken must be nil cfu/100mL for *E. coli*. However, all occasions in which *E. coli* is detected in a sample must be investigated and reported to the regulator (refer to guideline section 3.6.3).

The Public Health Regulation sets the standards for *E. coli* in the reticulation system only. Further details for *E. coli* reporting requirements for the treatment and transmission components of a service as per the water quality criteria set by the regulator are detailed in guideline section 3.4.1.

**3.3.2 Fluoride (where added to the water supply)**

Schedule 1 of the Water Fluoridation Regulation lists the providers that are legislated to add fluoride to the drinking water supplies and the date this must be completed by. Section 13 of the Water Fluoridation Regulation also stipulates the monitoring requirements for providers that add fluoride to the drinking water supply by requiring providers analyse fluoridated water. It is the responsibility of the provider to meet these legislative requirements<sup>17</sup>. The Water Fluoridation Act and Water Fluoridation Regulation are administered by Queensland

<sup>15</sup> The Public Health Regulation can be accessed online at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

<sup>16</sup> A guidance note on how to calculate the annual value can be found at <[www.dews.qld.gov.au/water/regulation/pdfs/dw\\_quarterly\\_ecoli\\_explanatory\\_notes.pdf](http://www.dews.qld.gov.au/water/regulation/pdfs/dw_quarterly_ecoli_explanatory_notes.pdf)>

<sup>17</sup> For more information on fluoridation requirements refer to the Water Fluoridation Act and the Water Fluoridation Regulation. The Water Fluoridation Act and the Water Fluoridation Regulation can be accessed online at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

Health.

Where a provider is legislated to add fluoride to the drinking water supply, providers must monitor for this parameter and ensure the results are within the levels specified in the Water Fluoridation Regulation. In all instances where fluoride is added, the fluoride level must be below the standard described in the Public Health Regulation. In the case where there are multiple providers involved in supplying drinking water, it is the responsibility of the provider that adds the fluoride to the drinking water supply to monitor and report the results to the regulator.

### **Standards**

Where fluoride is added to a drinking water supply, the provider must meet the standards prescribed in the Public Health Regulation.

In addressing these standards the provider must:

- monitor for fluoride at the frequency of sampling as prescribed
- ensure the fluoride concentration level does not exceed 1.5mg/L per sample.

### **Standards**

Where fluoride is added to a drinking water supply, the provider must meet the standards prescribed in the Water Fluoridation Act and Water Fluoridation Regulation.

In addressing these standards the provider must:

- monitor for fluoride at the frequency of sampling as prescribed
- achieve a concentration level between 0.6mg/L and 0.8mg/L, dependent on the location of water supply.

Information for addressing these standards is provided below.

### **Monitor for fluoride (where added) at the frequency of sampling as prescribed**

In accordance with section 13 of the Water Fluoridation Regulation, the provider must collect at least one sample of the fluoridated water from the water supply at a point where the fluoridated water has a consistent concentration of fluoride each day. In addition, the provider must carry out a prescribed analysis of the fluoridated water to measure the concentration of fluoride of the fluoridated water each day.

### **Ensure the concentration level does not exceed 1.5mg/L per sample**

Schedule 3A of the Public Health Regulation specifies the maximum concentration level for fluoride at a point where the fluoridated water has mixed to a consistent fluoride concentration as 1.5mg/L. Instances where fluoride is detected at a level greater than 1.5mg/L in a sample must be investigated and reported to the regulator (refer to guideline section 3.6.3).

### **Achieve a concentration level between 0.6mg/L and 0.8mg/L**

Section 6 of the Water Fluoridation Regulation defines the level of concentration each provider must achieve depending on the location of water supply.

## **3.4 Water quality criteria set by the regulator**

Guideline sections 3.4.1 to 3.4.6 relate to the drinking water criteria set by the regulator about drinking water quality and follow a standard format, including a section or sub-section number and title, introductory paragraphs and criteria. The criteria describe the specific requirements the provider must meet. These requirements are mandatory as they are legislative requirements under the Act and use the word must. Information required as a must is considered the minimum amount of information needed to address the criteria.

The criteria set by the regulator apply predominantly to parameters that form part of the drinking water quality monitoring program for a service and each scheme associated with the service.

It is recognised that on occasion, samples that do not comply with the water quality criteria will be detected. This is not an offence; however, the failure to report the detection to the regulator and failure to take action to protect public health is an offence under the Act.

### **3.4.1 *E. coli* within the treatment and transmission components**

The Public Health Regulation sets the standard for *E. coli* only in the reticulation component of a service. The

regulator has set the following criteria for the treatment and transmission components of a service.

If *E. coli* is detected in a sample, a follow-up sample from the same location must be taken immediately and tested for *E. coli*. The follow-up sample is in addition to routine monitoring. All occasions in which *E. coli* is detected in a sample must be investigated and reported to the regulator (refer to guideline section 3.6.3).

The frequency of sampling and the sampling locations for *E. coli* in both treatment and transmission components of a service are not set by the regulator. The frequency of sampling should be determined by the provider using a risk assessment process.

#### Criteria

Where *E. coli* is monitored in the treatment and/or transmission components of a service, the provider must:

- achieve a nil cfu/100mL value per sample
- achieve a 98 per cent annual value of samples (i.e. 98 per cent of samples for a 12-month period must be nil cfu/100mL)
- undertake a follow-up sample immediately where *E. coli* is detected in a sample.

### 3.4.2 Pathogens

Infection is the main, but not only, problem associated with microorganisms in drinking water. For instance, certain algae and bacteria can produce toxins that affect humans. The toxins may remain in the water even when the organisms responsible have been removed. Human enteric viruses occur in water largely as a result of contamination with sewage and human excreta. As sewage mixes with receiving water, viruses are carried downstream. The length of time they remain detectable depends on temperature, their degree of absorption to particulate matter, penetration of sunlight into the water and other factors. Consequently, enteric viruses can be found at the intakes to water treatment plants if the water is polluted by sewage.

Monitoring should be undertaken for specific pathogens if water contamination is suspected or a risk assessment of the service recommends it. Pathogens, for example, viruses, bacteria, protozoa and helminths, should not be detected in treated water in the transmission and reticulation components of a service, as established in the ADWG. As such, the criteria made by the regulator for pathogens are based on the ADWG that state no pathogens should be present in any water sample taken.

The detection of pathogens in any water sample is an incident as defined by the regulator and as such must be reported to the regulator. A contamination investigation should be carried out by the provider where a pathogen is detected. The results of the investigation must be reported to the regulator (refer to guideline section 3.6.3).

#### Criteria

Where a provider monitors in the treatment and/or transmission and/or reticulation component of a service for pathogens, there must be no pathogens present in any water sample taken.

### 3.4.3 Chemical health-related water quality criteria

Health-related chemical parameters, for example, pesticides, disinfection by-products and metals, should be monitored across source, treatment, transmission and reticulation components of a service. The criteria set by the regulator, for chemical water quality parameters, are those stated in the ADWG in the tables relating to chemical parameters. The values stated in the ADWG, and set by the regulator, apply at any point beyond the final treatment step that affects the concentration of the particular chemical.

If the concentration of a chemical is detected above the health guideline value stipulated in the ADWG (or the health value in the case of pesticides), leaving the treatment system or in the transmission or reticulation components, it is defined as an incident and must be reported to the regulator (refer to guideline section 3.6.3).

#### Criteria

Where a provider monitors in the treatment and/or transmission and/or reticulation component of a service for health-related chemical parameters, the provider must achieve the values as per the ADWG for health-related chemical parameters.

### 3.4.4 Radiological water quality criteria

The criteria for radionuclides apply to the initial screening level of the raw or source water or drinking water where applicable. The radiological screening levels are:

- for gross alpha activity: 0.5 Becquerels per litre (Bq/L)
- for gross beta activity, after the subtraction of the contribution from potassium-40: 0.5Bq/L.

Levels greater than the screening levels must be reported to the regulator (refer to guideline section 3.6.3) and are a trigger for further investigation and, if required, an assessment to identify specific radionuclides and determine their activity concentrations. The total estimated dose per year from all the radionuclides in the drinking water, excluding the dose from potassium-40, must be calculated and the risk assessed in consultation with the regulator.

#### Criteria

Where radiological screening is undertaken in the treatment and/or transmission and/or reticulation component of the service, a provider must:

- achieve for gross alpha activity <0.5Bq/L
- achieve for gross beta activity <0.5Bq/L (after the subtraction of the contribution from potassium-40).

### 3.4.5 Parameters for which there is no guideline value in the ADWG

If a provider monitors for and detects any parameter for which there is no guideline value (either health or aesthetic) available in the ADWG, this must be reported to the regulator within 24 hours (refer to guideline section 3.6.3). This will trigger an assessment by the provider of the parameter, noting the circumstances under which it was detected, and may require additional monitoring by the provider. If there is a potential health risk, the regulator will liaise with Queensland Health and the provider to undertake a health risk assessment and determine, where possible and appropriate, an acceptable value (or upper limit) for the parameter that is suitable for the particular instance and ensures public health is protected.

In some circumstances, Queensland Health or the regulator may consider it necessary to set the value as a water quality criteria applicable to all providers.

The regulator may decide to define a parameter with no guideline value in the ADWG as non-reportable; that parameter will be added to the list of non-reportable parameters<sup>18</sup>.

### 3.4.6 Any water quality criteria not health-related

All providers should monitor for aesthetic parameters to ensure the treatment systems are functioning appropriately. The aim of aesthetic monitoring is to ensure desired water quality is achieved and customer satisfaction is maintained. A provider should set its own performance criteria for aesthetic parameters. These should be consistent with either the recommendations in the ADWG, specified product water quality objectives or agreed customer service standards. These will form the provider's water quality criteria for aesthetic parameters. The regulator does not set these criteria.

The aesthetic parameters included in a current drinking water quality monitoring program and the frequency of sampling should be risk-based and should be appropriate and representative of the source water, relevant scheme, and the rationale for choosing the parameter and the performance criteria.

The ADWG provides aesthetic guideline values for many parameters. Providers may choose to achieve water of better quality than the values in the ADWG. Alternatively, some providers, in consultation with the community or customers, may choose to provide water of lesser quality than that recommended in the ADWG. The regulator encourages all providers to achieve and maintain best practice in terms of the operation of the service and each scheme associated with the service.

<sup>18</sup> The list of non-reportable parameters is available online at [www.dews.qld.gov.au/water/regulation/drinking/non\\_reportable.html](http://www.dews.qld.gov.au/water/regulation/drinking/non_reportable.html).

### 3.5 What to do if the criteria are not met

On occasion the criteria made by the regulator about drinking water quality or standards prescribed under the Public Health Regulation will not be met for a variety of reasons. It is the provider's responsibility to notify the regulator of such a situation as it is deemed as an incident (refer to guideline section 3.6.3).

### 3.6 Water quality criteria—reporting requirements

Under the notice providers are required to report to the regulator on the following:

- current drinking water quality monitoring program
- results of monitoring program
- incidents.

Further, the regulator may, at any time, re-issue the notice under section 630 of the Act to a provider varying reporting requirements.

Further information on the reporting requirements is outlined in the following guideline sections.

#### 3.6.1 Current monitoring program

All providers are required by the notice issued under section 630 of the Act to submit the current drinking water quality monitoring program to the regulator. The current drinking water quality monitoring program should apply to the source, treatment, transmission and reticulation components of a service and each scheme associated with the service.

Where a provider does not have a current drinking water quality monitoring program for the service, there is no requirement to implement one. However, the provider is still required to monitor for *E. coli* and fluoride (where added) in accordance with the Public Health Regulation. The regulator may, at any time, re-issue the notice under section 630 of the Act to a provider specifying additional or varied monitoring requirements.

Any monitoring undertaken should support the development of a drinking water quality monitoring program for when an approved plan is in place.

#### 3.6.2 Reporting on results of monitoring program

Under the notice in existence at 29 September 2010, providers are required to provide the regulator with a summary of the water quality monitoring results, according to their current drinking water quality monitoring program, for a defined list of parameters each quarter as part of a quarterly report. However, the regulator may, at any time, re-issue the notice under section 630 of the Act to a provider varying reporting requirements.

Quarterly reports should be made using the Drinking water quality: quarterly report form prepared by the regulator<sup>19</sup>. All quarterly reports must be lodged with the regulator within one month of the end of the monitoring period. Any analysis results not received by the due date may be reported in the following period. Due dates for quarterly reports in each year are listed in table 3 and are also provided on the notice.

**Table 3: Due dates for quarterly reports**

Period	Due Date
1 January to 31 March	30 April (same year)
1 April to 30 June	31 July (same year)
1 July to 30 September	31 October (same year)
1 October to 31 December	31 January (following year)

<sup>19</sup> The Drinking water quality: quarterly report form can be accessed online at [www.dews.qld.gov.au/water/regulation/drinking/guidance\\_materials.html#quarterly\\_form](http://www.dews.qld.gov.au/water/regulation/drinking/guidance_materials.html#quarterly_form).

## Results to be included in the quarterly reporting

A provider operating under the notice must report quarterly. The report must summarise the monitoring results of the previous quarter. The results provided in the report must include *E. coli* and fluoride (where added) and any parameter listed on the quarterly reporting defined list<sup>20</sup> that the provider monitors for under the current drinking water quality monitoring program submitted to the regulator.

In addition, the regulator can request information on any monitoring result(s) from a provider.

If a test sample fails to meet the water quality standards as specified in the Public Health Regulation or the water quality criteria set by the regulator, a follow-up sample from the same location must be taken immediately and tested. The initial and follow-up test results should be included in the quarterly reporting summary.

The results of verification monitoring, which allows providers to verify the performance of the treatment plants in the long term, should be used to compile the summary of the monitoring results.

The summary must include a calculation of the minimum (concentration or count), the maximum (concentration or count), the average (mean of concentration or count) and the total number of samples taken during the reporting period.

Laboratory results may include values for parameters that are less than the limit of reporting (<LOR). For the purposes of calculating the average (mean of concentration or count), it is acceptable to consider <LOR as equal to zero. This is only applicable to chemical parameters. For microbiological parameters, the calculation of an average is not required.

## Results not to be included

The following should not be included in the quarterly summary of the monitoring results:

- results of operational monitoring, that is continuous monitoring performed at each treatment plant that ensure the treatment processes are operating appropriately<sup>21</sup>
- parameters that are not on the defined list of parameters for quarterly reporting
- results from locations in the water treatment plant other than that representative of the final water quality.

## Where in the service test results should be reported on

The summary of monitoring results should be reflective of the following locations within the service.

### Source water

Results reported here should be representative of the untreated source water quality. The actual location of sampling points will depend on the individual conditions of the scheme (for example, samples may be taken at the off take from the water source or from the raw water entering the water treatment plant). For a scheme with more than one water source, each source, while in use, should be monitored individually and results from each individual source should be reported.

### Water treatment plant

Results reported here should be representative of the final treated water and be taken from a point following satisfactory completion of all treatment and contact with disinfectant. The Water Fluoridation Regulation requires sample collection for fluoride analysis at a point at which the water has achieved a consistent concentration of fluoride.

### Transmission

Results reported here include any location at which water is sampled in the bulk transfer pipeline system which transmits water to the reticulation system. This may include pump stations and service reservoirs. Sampling from the transmission may not be applicable to all providers. It is not expected the provider would report on each individual sampling point unless that sampling point is the only sampling point within the transmission system.

---

<sup>20</sup> The defined list of parameters for quarterly reporting can be accessed online at <[www.dews.qld.gov.au/water/regulation/pdfs/dwqra\\_appendix\\_a.pdf](http://www.dews.qld.gov.au/water/regulation/pdfs/dwqra_appendix_a.pdf)>.

<sup>21</sup> In the case of water fluoridation, whatever samples the provider has taken to satisfy the requirements of the Public Health Regulation and Water Fluoridation Regulation are the results that should be included in the quarterly reports.

## Reticulation

Results reported here include any location at which water is sampled in the reticulation system. Providers should provide maximum, minimum and average results for all chemical samples taken from the reticulation.

*E. coli* or other microbiological re-samples taken as a result of an initial detection in the reticulation system need to be reported.

The Public Health Regulation stipulates the sampling frequency for *E. coli* in the reticulation system is based on population size. The sampling frequency requirement does not include re-samples for *E. coli* in the reticulation as a result of a detection.

### 3.6.3 Incident reporting

Providers must report any incident that will or is likely to adversely affect water quality. The requirement to report incidents to the regulator ensures action is taken by the provider to manage incidents to ensure there is no risk to public health. Providers are also required to report on actions taken to manage the incident.

The regulator may declare a particular parameter to be non-reportable as an incident. The declaration will be made in consultation with Queensland Health. Non-reportable parameters may be subject to specific conditions and may only be applicable in some circumstances. The non-reportable parameter list<sup>22</sup> will be subject to change based on advice from Queensland Health.

#### Incidents

As per attachment 1 of the notice, providers are required to report to the regulator on the incidents mentioned in table 4.

**Table 4: Incidents that must be reported to the regulator**

Incident	Detail	Timeframe for reporting to the regulator
Detection of <i>E. coli</i>	In reticulation system for the drinking water service	(i) reported by telephone within three hours of receipt of the test result (ii) written confirmation by fax or email within 24 hours (incident reporting form part A) (iii) written confirmation by fax or email upon resolution of the incident (incident reporting form part B)
Detection of pathogen	In treatment component of the drinking water service	
Failure to meet chemical health-related guideline values as specified in the Australian Drinking Water Guidelines (ADWG)	In transmission component of the drinking water service	
Fluoride: greater than 1.5 mg/L	In raw water or source water if parameter cannot be removed or reduced and will impact on final drinking water quality	

<sup>22</sup> The list of non-reportable parameters can be accessed online at [www.dews.qld.gov.au/water/regulation/drinking/non\\_reportable.html](http://www.dews.qld.gov.au/water/regulation/drinking/non_reportable.html).

Incident	Detail	Timeframe for reporting to the regulator
Radiological: Greater than 0.5 becquerels per litre for gross alpha activity Greater than 0.5 becquerels per litre (after subtraction of potassium – 40 activity) for gross beta activity	In raw water or source water or drinking water	(i) reported by telephone within three hours of receipt of the test result (ii) written confirmation by fax or email within 24 hours (incident reporting form part A) (iii) written confirmation by fax or email upon resolution of the incident (incident reporting form part B)
Parameter for which there is no guideline value in the ADWG	Any parameter for which a guideline value is not available under the ADWG	(i) written confirmation by fax or email within 24 hours of receipt of test result (incident reporting form part A) (ii) written confirmation by fax or email upon resolution of the incident (incident reporting form part B)
An event or a series of events likely to affect drinking water quality or will cause difficulty in ability to adequately treat or provide drinking water	Examples: Flood Bushfire Equipment failure Deviation from an operational critical limit for a critical control point Contamination of source water Contamination of treated water Mains break Terrorism Natural disaster	(i) reported by telephone as soon as practicable after the drinking water service provider becomes aware that the situation has escalated to the level where usual mitigation actions will not control the situation and the ability to provide safe drinking water is compromised (ii) written confirmation by fax or email within 24 hours or as soon as practicable (incident reporting form part A) (iii) written confirmation by fax or email upon resolution of the incident (incident reporting form part B)

The following examples illustrate possible incidents that are reportable to the regulator.

- Example 1:** A provider uses river water flowing from catchments with extensive agricultural activity and routinely tests for pesticides in the source and treated water. Atrazine is detected in the source water above the water quality criteria of 0.04mg/L (ADWG health guideline value). Where this is the only sampling point for the service, the provider must report the result to the regulator.  
 If the provider undertakes further sampling in the treated water for Atrazine, and the level is above 0.04mg/L, the provider must report the result to the regulator. If the level is below 0.04mg/L the provider does not have to report the result to the regulator.
- Example 2:** A provider tests for the disinfection by-product total trihalomethanes (TTHMs) in the reticulation system. The TTHMs found in the sample is greater than the water quality criterion of 0.25mg/L (ADWG health guideline value). TTHM concentrations of 0.251mg/L or above are reportable if the laboratory report has listed the concentration to this degree of accuracy regardless of the uncertainty value. The provider must report the result to the regulator.
- Example 3:** A provider tests for the protozoan pathogens *Cryptosporidium* and *Giardia* in response to an incident such as high turbidity, or routinely if the risk assessment determines the risk of protozoan contamination is high. The detection of *Cryptosporidium* and *Giardia* in a service must be reported to the regulator.
- Example 4:** Hardness (as CaCO<sub>3</sub>) does not pose a health risk but high levels may lead to customer dissatisfaction due to scaling and inability to lather. The ADWG recommends an aesthetic value of 200mg/L. If the concentration is above 200mg/L, problems with scaling may increase as hardness increases. Some providers aim to provide much lower concentrations of hardness in the treated drinking water. Other providers may not be able to reduce hardness to below the aesthetic guideline value due to high levels in source water and/or the cost of treatment. The provider is not required to report this to the regulator.

***E. coli***

If *E. coli* is detected in a sample it must be reported to the regulator within the timeframes stipulated on the notice. A follow-up sample from the same location must be taken immediately and tested for *E. coli*<sup>23</sup>. The follow-up sample is in addition to routine monitoring. All occasions in which *E. coli* are detected in a sample must be investigated and reported to the regulator.

**Fluoride**

Where a provider adds fluoride to a drinking water supply, the fluoride concentration in the drinking water must be less than 1.5mg/L as specified in schedule 3A of the Public Health Regulation. Any failure to meet this standard must be reported to the regulator. It should be noted the ADWG also includes a guideline level of 1.5mg/L for fluoride from any source.

In addition, where a provider adds fluoride to the drinking water supply, they must report in accordance with the requirements in the Water Fluoridation Act and the Water Fluoridation Regulation.

**What is an “event”**

An event, for the purpose of this guideline, refers to any sudden or extreme change in water quality, flow or environmental conditions, for example, excessive rainfall or flood, or equipment failure. An event should raise concerns that drinking water might be, or could become, contaminated. Disease outbreaks from drinking water may result when the treatment process fails to cope with major fluctuations in source water quality or flow. Therefore, it is essential that operators and managers of a service are aware of the implications of such events.

Only events that have the potential to affect the drinking water quality are required to be reported.

In some cases a provider may believe the impacts on the drinking water quality arising from an event can be managed using normal mitigation actions or treatment processes, yet find the situation has not been resolved several days later. In this case, the provider must report this to the regulator regardless of when the event occurred. The regulator will not penalise the provider for not reporting the event in the first instance if they reasonably believed the event was able to be managed.

However, it is recommended that if an event occurs, and a provider is unsure about whether to report it to the regulator, the provider should contact the regulator who will advise whether the event must be formally reported or not.

Possible events that may impact on drinking water quality are illustrated in the examples below.

**Example 1:** A situation arises comparable to the bushfires that occurred in catchment areas during the Canberra bushfires. The fires affect the drinking water quality, and the situation escalates to the level where usual mitigation actions such as treatment cannot control the situation and the ability to provide safe drinking water is compromised. This event must be reported to the regulator.

**Example 2:** Turbidity is a useful indicator for monitoring the effectiveness of treatment processes. Turbidity levels provide an indication of the effectiveness of filtration processes, and while a deviation from operational (or other) limits set for turbidity does not necessarily constitute a risk to public health, it may indicate potential impacts on the effectiveness of chlorine disinfection processes. Often, in times of heavy rainfall or flooding, turbidity levels in source water increase substantially. Where this occurs and the treatment processes are unable to effectively reduce the turbidity levels to ensure effective disinfection, the provider must notify this as an event.

**Example 3:** A one-in-one-hundred-year flood event occurs in South West Queensland. The flooded rivers affect the catchment area, and hence the source water, through increased turbidity. This increases the chance of *Cryptosporidium*. Usual mitigation actions, such as flocculation, are able to control the situation as the water treatment plant is not impacted by the flooding event and the effectiveness of the chlorination is also maintained. Additional monitoring is undertaken to ensure the water quality is not compromised. As such, the provider is able to continue to supply safe drinking water. This is not considered an event that must be reported to the regulator.

<sup>23</sup> Further information on *E. coli* is provided in the *Escherichia coli (E. coli)* monitoring guidance notes which can be accessed online at <[www.dews.qld.gov.au/water/regulation/pdfs/ecoli\\_guidance\\_notes.pdf](http://www.dews.qld.gov.au/water/regulation/pdfs/ecoli_guidance_notes.pdf)>.

**Example 4:** An operator notices on a periodic site inspection that the chlorine-dosing pump had encountered a gas lock, indicating that non-disinfected water may have been reticulated for some time since the previous inspection. The operator rectifies the fault immediately. This must be reported to the regulator as an event at the time of failure. Routine *E. coli* sampling is performed a few days later as per the normal scheduled frequency.

### 3.6.4 Who can do the water quality testing

Providers can use their own organisation's laboratory to analyse the water quality in the samples taken or send samples to any laboratory. Using a National Association of Testing Authorities (NATA) accredited laboratory<sup>24</sup> for the analysis is not required, although it is recommended if one is available. It is also recommended that where in-house laboratories are used, occasional verification samples are sent to an outside laboratory to confirm in-house laboratory analysis results.

Queensland Health Forensic Scientific Services (QHSS) laboratory<sup>25</sup> provides *E. coli* testing at no charge for small and medium providers, while large providers will be charged at a cost recovery rate. Please note providers will need to meet their own collection and transport costs.

If a provider does not have access to laboratory facilities, they have the option of using an in-house testing package for the detection of *E. coli*.

If a provider is having difficulty meeting the monitoring requirements, they should contact the regulator as a matter of priority.

Whether the provider decides to use in-house laboratory or send samples to an outside laboratory to analyse water quality samples, it is the provider's responsibility to ensure the test results of the water quality samples comply with the relevant standards as specified in accordance with the Public Health Regulation, the Water Fluoridation Act, the Water Fluoridation Regulation, the water quality criteria set by the regulator or the guideline value in the ADWG.

### 3.6.5 Interpretation of test results

The reporting of incidents is based on test results for the water quality samples that have been taken across the service and each scheme associated with the service. Many laboratories, depending on the accuracy of their testing methodologies, will report final test results with more significant figures than the guideline values specified in the ADWG. No rounding of laboratory results should be carried out by the provider prior to comparison with the criteria or standard. This is important as the laboratory analysis would have already taken into account the confidence limits and measurements of uncertainty in determining the result (that is, in effect rounding up the original analysis result). Any further rounding up by the provider would result in an inaccurate result being considered.

For example, a sample test result of 0.51mg/L of formaldehyde is greater than the criteria of 0.5mg/L, which is the health guideline value of the ADWG, and thus is considered an incident and must be reported to the regulator.

The presence of health-related contaminants in concentrations below, but close to, the ADWG guideline values should be addressed and investigated appropriately, but are not reportable as incidents to the regulator.

---

<sup>24</sup> Information on the NATA accredited laboratories can be accessed at <[www.nata.asn.au](http://www.nata.asn.au)>.

<sup>25</sup> Information on the Queensland Health Forensic Scientific Services labs can be accessed at <[www.health.qld.gov.au/qhcss/qhss/](http://www.health.qld.gov.au/qhcss/qhss/)>.

## 4. Monitoring and reporting requirements—an approved plan (stage two—under the plan)

### 4.1 Operating under an approved plan

In accordance with section 94 of the Act, the purpose of the plan is to protect public health. This is achieved through the adoption of a risk management approach to drinking water quality.

Providers that store, treat, transmit and reticulate water for drinking are required to have a plan that has been approved by the regulator.

Under section 95(3) of the Act, the plan:

- (a) must be prepared in accordance with the guideline, if any, made by the regulator about preparing the plan<sup>26</sup>
  - (i) state the registered services to which the plan applies
  - (ii) include details of the infrastructure for providing the services
  - (iii) identify the hazards and hazardous events the drinking water service provider considers may affect the quality of water to which the services relate
  - (iv) include an assessment of the risks posed by the hazard and hazardous events
  - (v) demonstrate how the drinking water service provider intends to manage the risks posed by the hazard and hazardous events

and

- (vi) include details of the operational and verification monitoring programs under the plan, including the parameters to be used for indicating compliance with the plan and the water quality criteria for drinking water.

As part of complying with section 95(3)(vi) above, providers will need to implement a drinking water quality monitoring program relevant to the service and each scheme associated with the service. The parameters for inclusion in a drinking water quality monitoring program should be based on the risks for the service and each scheme associated with the service. The drinking water quality monitoring program must include both operational and verification monitoring and should have a whole of scheme focus including each of the components (treatment, transmission and reticulation).

In terms of water quality criteria for drinking water, the provider will be required to undertake the following once an approved plan is in place:

- implement the drinking water quality monitoring program(s) specified in the plan. The drinking water quality monitoring program(s) must indicate compliance with the plan and the water quality criteria for drinking water as stated under (vi) above
- immediately inform the regulator of any noncompliance with the water quality criteria relating to the service<sup>27</sup>.

The regulator can, in accordance with section 99(2)(a) of the Act, approve the plan with conditions. The types of conditions that may be placed on the plan include:

- reporting drinking water quality incidents that will or are likely to adversely affect drinking water quality
- specific water quality monitoring and reporting requirements
- conditions as deemed necessary by the regulator to ensure the protection of public health.

The water quality criteria stated in this section of the guideline apply to the drinking water quality monitoring program that forms part of an approved plan or any conditions set by the regulator relating to water quality. When

---

<sup>26</sup> Refer to the Drinking Water Quality Management Plan Guideline for further information on the preparation of a plan and is available online at <[www.dews.qld.gov.au](http://www.dews.qld.gov.au)>.

<sup>27</sup> In accordance with section 102 of the Act.

operating under an approved plan, a provider must:

- monitor for *E. coli*<sup>28</sup> in the reticulation system of a service
- monitor for fluoride<sup>29</sup> (where added at the point where the fluoridated water has a consistent concentration of fluoride)
- monitor for other water quality parameters that form the operational and verification monitoring program for the service and each scheme associated with the service
- immediately inform the regulator of the noncompliance with the water quality criteria relating to the verification monitoring for the service and each scheme associated with the service<sup>30</sup>.

Information on the standards prescribed in the Public Health Regulation and criteria made by the regulator about drinking water quality is discussed in guideline sections 4.2 and 4.3.

## 4.2 Standards prescribed in the Public Health Regulation

Guideline sections 4.2.1 and 4.2.2 relate to the standards prescribed under the Public Health Regulation and follow a standard format, including a section or sub-section number and title, introductory paragraphs and standards. The standards describe the specific requirements the provider must meet. These requirements are mandatory as they are legislative requirements under the Public Health Regulation and use the word must. Information required as a must is considered the minimum amount of information needed to address the standard.

The standards prescribed in the Public Health Regulation are the minimum water quality criteria all providers must meet. These are described below in guideline sections 4.2.1 and 4.2.2. It is the responsibility of the provider to ensure these requirements are met and ensure they are aware of any changes to the legislation. Currently the Public Health Regulation prescribes *E. coli* and fluoride (where added) as standards for the quality of drinking water. In the case of fluoride (where added), three pieces of legislation apply—the Water Fluoridation Act, the Water Fluoridation Regulation and the Public Health Regulation. Where a provider is legislated to add fluoride to the drinking water supply, the specific monitoring and reporting requirements are stipulated under the Water Fluoridation Act and Water Fluoridation Regulation. While the Water Fluoridation Act and Water Fluoridation Regulation are referenced throughout this guideline, they are administered by Queensland Health. The relationship between the Public Health Regulation, the Water Fluoridation Act and Water Fluoridation Regulation is a result of fluoride being prescribed as a standard in the Public Health Regulation. As such, reference to fluoride will be made using the Public Health Regulation unless stated otherwise.

### 4.2.1 *E. coli* (in the reticulation system)

*E. coli* is a thermotolerant coliform present in faeces and is regarded as the most specific indicator of recent faecal contamination. The presence of *E. coli* in the reticulation system therefore suggests inadequate treatment and disinfection, regrowth, or infiltration in a distribution system.

*E. coli* is occasionally detected in reticulation of systems that are operating effectively. The presence of *E. coli* in a sample does not necessarily indicate drinking water is unsafe. However, detection should prompt an investigation to ensure the source water, treatment, transmission or reticulation components of a service have not been compromised.

---

<sup>28</sup> A standard prescribed under the Public Health Regulation.

<sup>29</sup> A standard prescribed under the Public Health Regulation, Water Fluoridation Act and Water Fluoridation Regulation.

<sup>30</sup> In accordance with section 102 of the Act.

**Standards**

The provider must meet the standards prescribed under the Public Health Regulation for *E. coli* in the reticulation system of the service.

To achieve these standards the provider must:

- monitor for *E. coli*
- monitor at the frequency of sampling relevant to the service
- achieve a nil colony forming units per 100mL (nil cfu/100mL) value per sample
- achieve a 98 per cent annual value of samples (i.e. 98 per cent of samples for a 12-month period must be nil cfu/100mL).

Information for achieving these standards is provided below.

**Monitor for *E. coli***

If a provider does not currently monitor for *E. coli* they must commence monitoring for this parameter and ensure sample analysis results meet the requirements as defined in the Public Health Regulation. If providers are currently monitoring for *E. coli* they must continue this monitoring and ensure the results meet the requirements as defined in the Public Health Regulation.

**Monitor at the frequency of sampling relevant to the service**

The minimum number of *E. coli* samples for each service is dependent upon the total population supplied by the reticulation system as described in Schedule 3A of the Public Health Regulation<sup>31</sup> (refer to Appendix A for the Public Health Regulation requirements and Appendix B for information on determining the minimum frequency of sampling).

**Achieve a nil colony forming units per 100mL (nil cfu/100mL) value per sample**

The value for *E. coli* in a reticulation system of a service is nil cfu/100mL for each sample. If *E. coli* is detected in a sample, a follow-up sample from the same location must be taken immediately and tested for *E. coli*. The follow-up sample is in addition to the minimum total number of samples required, as detailed above, and does not form part of routine monitoring for assessment against the annual value.

**Achieve a 98 per cent annual value of samples (i.e. 98 per cent of samples must be nil cfu/100mL)**

The Public Health Regulation gives allowance for occasional detection of *E. coli* in the reticulation system of a service. Over a 12-month period 98 per cent<sup>32</sup> of all samples must be nil cfu/100mL for *E. coli*. However, all occasions in which *E. coli* are detected in a sample must be investigated and reported to the regulator.

The Public Health Regulation sets the standards for *E. coli* in the reticulation system only. Further details for *E. coli* reporting requirements for the treatment and transmission components of a service, as per the water quality criteria set by the regulator, are detailed in guideline section 4.3.1.

**4.2.2 Fluoride (where added to the water supply)**

Schedule 1 of the Water Fluoridation Regulation lists the providers that are legislated to add fluoride to the drinking water supplies and the date this must be completed by. Section 13 of the Water Fluoridation Regulation also stipulates the monitoring requirements for providers that add fluoride to the drinking water supply by requiring providers analyse fluoridated water. It is the responsibility of the provider to meet these legislative requirements<sup>33</sup>. The Water Fluoridation Act and Water Fluoridation Regulation are administered by Queensland Health.

<sup>31</sup> The Public Health Regulation can be accessed online at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

<sup>32</sup> A guidance note on how to calculate the annual value can be found at <[www.dews.qld.gov.au/water/regulation/pdfs/dw\\_quarterly\\_ecoli\\_explanatory\\_notes.pdf](http://www.dews.qld.gov.au/water/regulation/pdfs/dw_quarterly_ecoli_explanatory_notes.pdf)>.

<sup>33</sup> For more information on fluoridation requirements refer to the Water Fluoridation Act. It can be accessed online at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

Where a provider is legislated to add fluoride to the drinking water supply, they must monitor for this parameter and ensure the results are within the levels specified in the Water Fluoridation Regulation. In all instances where fluoride is added, the fluoride level must be below the standard prescribed in the Public Health Regulation. In the case where there are multiple providers involved in supplying drinking water, it is the responsibility of the provider that adds the fluoride to the drinking water supply to monitor and report the results to the regulator.

### Standards

Where fluoride is added to a drinking water supply, the provider must meet the standards prescribed in the Public Health Regulation.

In addressing these standards the provider must:

- monitor for fluoride at the frequency of sampling as prescribed
- ensure that the fluoride concentration level does not exceed 1.5mg/L per sample.

### Standards

Where fluoride is added to a drinking water supply, the provider must meet the standards prescribed in the Water Fluoridation Act and Water Fluoridation Regulation.

In addressing these standards, the provider must:

- monitor for fluoride at the frequency of sampling as prescribed
- achieve a concentration level between 0.6mg/L and 0.8mg/L, dependent on the location of water supply.

Information for addressing these standards is provided below.

### **Monitor for fluoride (where added) at the frequency of sampling as prescribed**

The provider must collect at least one sample of the fluoridated water from the water supply at a point where the fluoridated water has a consistent concentration of fluoride each day. The provider must carry out an analysis of the fluoridated water to measure the concentration of fluoride of the fluoridated water each day.

### **Ensure the concentration level does not exceed 1.5mg/L per sample**

Schedule 3A of the Public Health Regulation specifies the maximum concentration level for fluoride at a point where the fluoridated water has been mixed to a consistent fluoride concentration as 1.5mg/L. Instances where fluoride is detected at a level greater than 1.5mg/L in a sample must be investigated and reported to the regulator.

### **Achieve a concentration level between 0.6mg/L and 0.8mg/L**

Section 6 of the Water Fluoridation Regulation defines the level of concentration each provider must achieve.

## **4.3 Water quality criteria as set by the regulator**

Guideline sections 4.3.1 to 4.3.6 relate to the drinking water criteria made by the regulator about drinking water quality and follow a standard format, including a section or sub-section number and title, introductory paragraphs and criteria. The criteria describe the specific requirements the provider must meet. These requirements are mandatory as they are legislative requirements under the Act and use the word must. Information required as a must is considered the minimum amount of information needed to address the criteria.

The criteria set by the regulator apply to the parameters that form part of the drinking water quality monitoring program<sup>34</sup> under an approved plan or any conditions set by the regulator. Under an approved plan, providers must continue to monitor according to the operational and verification monitoring program for the service, and each scheme associated with the service, and ensure parameters meet the criteria (that is, level of detection) as outlined below.

It is recognised that on occasion, samples that do not comply with the water quality criteria will be detected. This is not an offence; however, the failure to report the detection to the regulator and failure to take action to protect public health is an offence under the Act.

---

<sup>34</sup> Drinking water quality monitoring program for the service and each scheme associated with the service.

### 4.3.1 *E. coli* within the treatment and transmission components

The Public Health Regulation sets the standard for *E. coli* only in the reticulation component of a service. The regulator has set the following criteria for the treatment and transmission components of a service.

If *E. coli* is detected in a sample, a follow-up sample from the same location must be taken immediately and tested for *E. coli*. The follow-up sample is in addition to routine monitoring. All occasions in which *E. coli* is detected in a sample must be investigated and reported to the regulator.

The frequency of sampling, and the sampling locations for *E. coli* in both treatment and transmission components of a service, are not set by the regulator. The frequency of sampling should be determined by the provider using a risk assessment process and included in verification monitoring program under the plan.

If a provider is required to monitor for *E. coli* in the treatment and transmission components through the verification monitoring program under the plan, or through a condition set as part of a plan, the criteria below apply.

#### Criteria

Where *E. coli* is monitored in the treatment and/or transmission component of a service, the provider must:

- achieve a nil cfu/100mL value per sample
- achieve a 98 per cent annual value of samples (i.e. 98 per cent of samples for a 12-month period must be nil cfu/100mL)
- undertake a follow-up sample immediately where *E. coli* is detected in a sample<sup>35</sup>.

### 4.3.2 Pathogens

Infection is the main, but not only, problem associated with microorganisms in drinking water. For instance, certain algae and bacteria can produce toxins that affect humans which may remain in the water even when the organisms responsible have been removed. Human enteric viruses occur in water largely as a result of contamination with sewage and human excreta. As sewage mixes with receiving water, viruses are carried downstream. The length of time they remain detectable depends on temperature, their degree of absorption to particulate matter, penetration of sunlight into the water and other factors. Consequently, enteric viruses can be found at the intakes to water treatment plants if the water is polluted by sewage.

Monitoring should be undertaken for specific pathogens if water contamination is suspected or a risk assessment of the service recommends it. Pathogens (for example, viruses, bacteria, protozoa and helminths) should not be detected in treated water in the transmission and reticulation components of a service, as established in the ADWG. As such, the criteria made by the regulator for pathogens are based on the ADWG that state no pathogens should be present in any water sample taken.

If a provider is required to monitor for pathogens in the treatment, transmission and reticulation components, through the verification monitoring program under the plan or through a condition set as part of a plan, the criteria below apply to the service.

The detection of pathogens in any sample must be reported to the regulator. A contamination investigation should be carried out by the provider where a pathogen is detected. The results of the investigation must be reported to the regulator.

#### Criteria

Where a provider monitors in the treatment and/or transmission and/or reticulation component of a service for pathogens, there must be no pathogens present in any water sample taken.

<sup>35</sup> The follow-up sample is in addition to routine monitoring.

### 4.3.3 Chemical health-related water quality criteria

Health-related chemical parameters, for example, pesticides, disinfection by-products and metals, should be monitored across source, treatment, transmission and reticulation components of a service. The criteria set by the regulator, for chemical water quality parameters, are those stated in the ADWG in the tables relating to chemical parameters. The values stated in the ADWG, and set by the regulator, apply at any point beyond the final treatment step that affects the concentration of the particular chemical.

If a provider is required to monitor for chemical health-related water quality criteria in the treatment, transmission and reticulation components through the verification monitoring program under the plan or through a condition set as part of a plan, and the concentration of a chemical is detected above the health guideline value stipulated in the ADWG, leaving the treatment system or in the transmission or reticulation, it must be reported to the regulator.

#### Criteria

Where a provider monitors in the treatment and/or transmission and/or reticulation component of a service for health-related chemical parameters, the provider must achieve the values as per the ADWG for health-related chemical parameters.

### 4.3.4 Radiological water quality criteria

The criteria for radionuclides apply to the initial screening level of the raw or source water or drinking water where applicable. The radiological screening levels are:

- for gross alpha activity: 0.5 Becquerels per litre (Bq/L)
- for gross beta activity, after the subtraction of the contribution from potassium-40: 0.5Bq/L.

If a provider is required to monitor for radiological water quality criteria in the treatment, transmission and reticulation components through the verification monitoring program under the plan or through a condition set as part of a plan, levels greater than the screening levels must be reported to the regulator. This is a trigger for further investigation and if required, an assessment to identify specific radionuclides and determine their activity concentrations. The total estimated dose per year from all the radionuclides in the drinking water, excluding the dose from potassium-40, must be calculated and the risk assessed in consultation with the regulator.

#### Criteria

Where radiological screening is undertaken in the treatment and/or transmission and/or reticulation component of the service, a provider must:

- achieve for gross alpha activity <0.5Bq/L
- achieve for gross beta activity <0.5Bq/L (after the subtraction of the contribution from potassium-40).

### 4.3.5 Parameters for which there is no guideline value in the ADWG

If a provider monitors for and detects any parameter for which there is no guideline value (either health or aesthetic) available in the ADWG, it must be reported to the regulator. This will trigger an assessment by the provider of the parameter, noting the circumstances under which it was detected and may require additional monitoring to be done by the provider. If there is a potential health risk, the regulator will liaise with Queensland Health and the provider to undertake a health risk assessment and determine, where possible and appropriate, an acceptable value (or upper limit) for the parameter that is suitable for the particular instance and ensures public health is protected.

In some circumstances, Queensland Health or the regulator may consider it necessary to set the value as a water quality criteria applicable to all providers, or set as a condition of a plan on a case-by-case basis

The regulator may decide to define a parameter with no guideline value in the ADWG as non-reportable resulting in that parameter being added to the list of non-reportable parameters<sup>36</sup>.

<sup>36</sup> The list of non-reportable parameters is available online at [www.dews.qld.gov.au/water/regulation/drinking/reporting\\_incidents.html](http://www.dews.qld.gov.au/water/regulation/drinking/reporting_incidents.html).

### 4.3.6 Any water quality criteria not health-related

All providers should monitor for aesthetic parameters as part of the operational and verification monitoring programs of the approved plan to ensure the treatment systems are functioning appropriately. The aim of aesthetic monitoring is to ensure desired water quality is achieved and customer satisfaction is maintained. A provider should set its own performance criteria for aesthetic parameters. These should be consistent with either the recommendations in the ADWG, specified product water quality objectives or agreed customer service standards. These will form the provider's water quality criteria for aesthetic parameters. The regulator does not set these criteria.

The aesthetic parameters included in a monitoring program, and the frequency of sampling, should be risk-based and appropriate and representative of the source water, relevant scheme and the rationale for choosing the parameter and performance criteria.

The ADWG provides aesthetic guideline values for many parameters. Providers may choose to achieve water of better quality than the values in the ADWG. Alternatively, some providers, in consultation with the community or customers, may choose to provide water of lesser quality than that recommended in the ADWG. The regulator encourages all providers to achieve and maintain best practice in terms of the operation of the service and each scheme associated with the service.

## 4.4 What to do if the criteria are not met

On occasion the criteria made by the regulator about drinking water quality or standards prescribed under the Public Health Regulation will not be met for a variety of reasons. It is the provider's responsibility to notify the regulator of such a situation.

## 4.5 Reporting requirements—noncompliance with water quality criteria

The following section outlines a provider's requirements in relation to reporting water quality criteria noncompliance relating to the verification monitoring program for the service and each scheme associated with the service.

Section 102 of the Act outlines the noncompliance reporting requirements as follows:

- (1) This section applies if the drinking water service provider becomes aware that the quality of water supplied from the provider's drinking water service does not comply with the water quality criteria relating to the service.
- (2) The drinking water service provider must, unless the provider has a reasonable excuse, immediately inform the regulator of the noncompliance and the circumstances that gave rise to the noncompliance.

Maximum penalty – 1665 penalty units.

- (3) The drinking water service provider must, unless the provider has a reasonable excuse, give the regulator notice of the following in the approved form as soon as practicable:
  - (a) the noncompliance and the circumstances that gave rise to the noncompliance;
  - (b) any action taken, or to be taken, by the provider to correct the noncompliance;
  - (c) the measures the provider will take to prevent the noncompliance in the future.

Maximum penalty – 1665 penalty units.

Additional reporting requirements may be set by the regulator as a condition of an approved plan.

## 4.6 Who can do the water quality testing

Providers can use their own organisation's laboratory to analyse the water quality in the samples taken or send samples to any laboratory. Using a National Association of Testing Authorities (NATA) accredited laboratory<sup>37</sup> is not required for the analysis, although it is recommended if one is available. It is also recommended where in-

---

<sup>37</sup> Information on National Association of Testing Authorities accredited laboratories can be accessed at <[www.nata.asn.au](http://www.nata.asn.au)>.

house laboratories are utilised, occasional verification samples are sent to an outside laboratory to confirm in-house laboratory analysis results.

Queensland Health Forensic Scientific Services (QHSS) laboratory<sup>38</sup> provides *E. coli* testing at no charge for small and medium providers, while large providers will be charged at a cost recovery rate. Please note providers will need to meet their own collection and transport costs.

If a provider does not have access to laboratory facilities, they have the option of using an in-house testing package for the detection of *E. coli*.

Whether the provider decides to use an in-house laboratory or outside laboratory to analyse water quality samples, it is the provider's responsibility to ensure the test results of the water quality samples must comply with the relevant standards as specified in accordance with the Public Health Regulation, the Water Fluoridation Act, the Water Fluoridation Regulation, the water quality criteria set by the regulator, or the guideline value in the ADWG.

## 4.7 Interpretation of test results

The reporting of noncompliance with water quality criteria under section 102 of the Act is based on test results for the water quality samples that have been taken across the service and each scheme associated with the service. Many laboratories, depending on the accuracy of their testing methodologies, will report final test results with more significant figures than the guideline values specified in the ADWG. No rounding of laboratory results should be carried out by the provider prior to comparison with the criteria or standard. This is important as the laboratory analysis would have already taken into account the confidence limits and measurements of uncertainty in determining the result (that is, in effect rounding up the original analysis result). Any further rounding up by the provider would result in an inaccurate result being considered.

For example, a sample test result of 0.51mg/L of formaldehyde is greater than the criteria of 0.5mg/L, which is the health guideline value of the ADWG, and thus is considered an incident and must be reported to the regulator.

The presence of health-related contaminants in concentrations below, but close to, the ADWG guideline values should be addressed and investigated appropriately, but are not reportable as incidents to the regulator.

## 4.8 Further information on an approved plan

The department has prepared a Drinking Water Quality Management Plan Guideline to provide information to providers about preparing a plan. It also provides information on compliance with the legislative requirements of the Act when an approved plan is in place.

For further information refer to the Drinking Water Quality Management Plan Guideline which can be accessed online at <[www.dews.qld.gov.au](http://www.dews.qld.gov.au)>.

---

<sup>38</sup> Information on the Queensland Health Forensic Scientific Services labs can be accessed at <[www.health.qld.gov.au/qhcss/qhss/](http://www.health.qld.gov.au/qhcss/qhss/)>.

## 5. Glossary

Note: The provider should refer to the *Water Supply (Safety and Reliability) Act 2008* (the Act) for the meaning of the terms. However, terms referred to in this guideline are provided below for your convenience.

Term	Definition
ADWG	The Australian Drinking Water Guidelines incorporate the Framework for the Management of Drinking Water Quality based on the 12 elements and provides guidance on what constitutes good quality drinking.
Critical control point (CCP)	A point, step or procedure at which control can be applied and which is essential to prevent or eliminate a hazard or reduce it to an acceptable level.
Critical limit	A prescribed tolerance that must be met to ensure that a critical control point effectively controls a potential health hazard; a criterion that separates acceptability from unacceptability (from the ADWG).
Department	Department of Energy and Water Supply.
Distribution System	Means the infrastructure for: <ul style="list-style-type: none"> <li>(a) the transmission of water</li> <li>or</li> <li>(b) the reticulation of water</li> <li>or</li> <li>(c) water treatment or recycling.*</li> </ul>
Drinking water	Means water, for human consumption, intended primarily as water for drinking, whether or not the water is used for other purposes. Drinking water does not include: <ul style="list-style-type: none"> <li>(a) water that is food as defined under the <i>Food Act 2006</i></li> <li>or</li> <li>(b) water taken or supplied for domestic purposes under the <i>Water Act 2000</i>.*</li> </ul>
Drinking water quality management plan (the plan)	Means a plan about the storage, treatment, transmission or reticulation of water for drinking by a drinking water service provider, under Chapter 4 of the Act.
Drinking water scheme	Infrastructure owned by a provider for single or multiple combinations of the individual components of treatment, transmission, or reticulation of a drinking water supply, or the storage of recycled water to augment a drinking water supply.

---

\* See Schedule 3 of the Act.

Term	Definition
Drinking water service	<p>Means a water service that is:</p> <ul style="list-style-type: none"> <li>(a) the treatment, transmission or reticulation of water for supply as drinking water</li> <li>or</li> <li>(b) water collection in a water storage, if the water in the storage: <ul style="list-style-type: none"> <li>(i) includes recycled water and</li> <li>(ii) is used to augment a drinking water supply*.</li> </ul> </li> </ul>
Drinking water service provider (provider)	Means a water service provider for a drinking water service*.
Event	Any sudden or extreme change in water quality, flow or environmental conditions (for example, excessive rainfall or flood, or equipment failure).
Incident	<p>An incident is:</p> <ol style="list-style-type: none"> <li>1. the failure to meet a water quality criterion</li> <li>2. the detection of a parameter for which there is no guideline value in the ADWG</li> </ol> <p>or</p> <ol style="list-style-type: none"> <li>3. an event or a series of events likely to affect drinking water quality or cause difficulty in adequately treating drinking water.</li> </ol>
Large service provider	<p>A large service provider is:</p> <ul style="list-style-type: none"> <li>(a) a service provider primarily providing bulk water services</li> <li>or</li> <li>(b) for a retail water service or sewerage service—a service provider with more than 25 000 connections to a registered service</li> <li>or</li> <li>(c) for a drinking water service that is the reticulation of water and is not a retail water service—a service provider with more than 25 000 connections to a registered service</li> <li>or</li> <li>(d) for an irrigation service—a service provider with: <ul style="list-style-type: none"> <li>(i) more than 500 users</li> <li>and</li> <li>(ii) a volume throughput, in any of the last 5 financial years, of more than 10 000ML*.</li> </ul> </li> </ul>

---

\* See Schedule 3 of the Act.

Term	Definition
Medium service provider	<p>A medium service provider is:</p> <ul style="list-style-type: none"> <li>(a) for a retail water service or sewerage service—a service provider with more than 1000 but not more than 25 000 connections to a registered service</li> <li>or</li> <li>(b) for a drinking water service that is the reticulation of water and is not a retail water service—a service provider with more than 1000 but not more than 25 000 connections to a registered service</li> <li>or</li> <li>(c) for an irrigation service—a service provider with: <ul style="list-style-type: none"> <li>(i) more than 100 but not more than 500 users</li> <li>and</li> <li>(ii) a volume throughput, in any of the last 5 financial years, of more than 10 000ML.*</li> </ul> </li> </ul>
Notice	The notice about monitoring and reporting issued by the regulator under section 630 of the Act.
Operational monitoring	The act of conducting a planned sequence of observations of measurements of control parameters to assess whether a critical control point (CCP) is performing within its operational range.
Performance criteria	A water quality criterion set for an aesthetic parameter, which is determined by the provider.
Raw water	Means untreated source water.
Recycled water	In relation to the augmentation of a drinking water supply, sewage or effluent sourced from a service provider’s sewerage that is intended to be reused.
Regulator	The chief executive is the regulator under the Act. The chief executive of the department, as the regulator, has delegated certain powers under the Act to officers of the Queensland Water Supply Regulator.
Small service provider	<p>A small service provider is:</p> <ul style="list-style-type: none"> <li>(a) for a retail water service or sewerage service—a service provider with 1000 or less connections to a registered service</li> <li>or</li> <li>(b) for a drinking water service that is the reticulation of water and is not a retail water service—a service provider with 1000 or less connections to a registered service</li> <li>or</li> <li>(c) for an irrigation service—a service provider with: <ul style="list-style-type: none"> <li>(i) 100 or less users</li> <li>or</li> <li>(ii) a volume throughput, in any of the last 5 financial years, of 10 000ML or less</li> <li>or</li> </ul> </li> <li>(d) for a water service other than a water service mentioned in paragraph</li> </ul>

\* See Schedule 3 of the Act.

Term	Definition
	<p>(a), (b) or (c), a service provider:</p> <ul style="list-style-type: none"> <li>(i) with not more than 500 customers and</li> <li>(ii) that mainly provides drainage services or water for domestic purposes or for watering stock*.</li> </ul>
Source water	Means the source of water for a drinking water scheme and may include raw water abstracted directly by the service provider from various sources (for example, dams, weirs, rivers, creeks, underground, the ocean) or water obtained from another service provider or other entity such as bulk raw water or bulk treated water.
Standards	Standards as specified under the Public Health Regulation 2005.
Transitional arrangements	<p>Section 628 (6) of the Act:</p> <p>existing drinking water service means a drinking water service the drinking water service provider was carrying out immediately before 1 July 2008.</p> <p>large drinking water service provider means a drinking water service provider that is a large service provider.</p> <p>medium drinking water service provider means a drinking water service provider that is a medium service provider.</p> <p>small drinking water service provider means a drinking water service provider that is a small service provider.</p>
Verification monitoring	An assessment of the performance of the scheme.
Water quality criteria	<p>Water quality criteria-</p> <ul style="list-style-type: none"> <li>(a) for drinking water means all of the following- <ul style="list-style-type: none"> <li>(i) the standards for the quality of drinking water prescribed in a regulation under the Public Health Act</li> <li>(ii) the criteria stated in a guideline, if any, made by the regulator about the quality of drinking water</li> <li>(iii) the criteria for the quality of drinking water stated in a condition applying to a drinking water quality management plan*.</li> </ul> </li> </ul>

---

\* See Schedule 3 of the Act.

## Appendix A

The following table is an extract of schedule 3A of the Public Health Regulation. It sets the standards for the frequency of sampling dependant on the size of the provider, the value that must be met per sample as well as the annual value.

Note: Appendix A is an example only. It is the responsibility of the provider to ensure all legislative requirements are met.

### Schedule 3A of the Public Health Regulation—Standards for quality of drinking water

Column 1 Factor	Column 2 Frequency of sampling	Column 3 Value	Column 4 Annual Value
<i>Escherichia coli</i> – in the reticulation system for the drinking water service	(a) if the drinking water service supplies drinking water to more than 100 000 people: (i) 6 samples a week; and (ii) 1 additional sample a month for each 10 000 people by which the number of people supplies exceeds 100 000; or	nil cfu/100mL	nil cfu/100mL found in 98% of the samples taken for a 12-month period
	(b) if the drinking water service supplies drinking water to more than 5000 but not more than 100 000 people: (i) 1 sample a week; and (ii) 1 additional sample a month for each 5000 people by which the number of people supplies exceeds 5000; or	nil cfu/100mL	nil cfu/100mL found in 98% of the samples taken for a 12-month period
	(c) if the drinking water service supplies drinking water to more than 1000 but not more than 5000 people—1 sample a week; or	nil cfu/100mL	nil cfu/100mL found in 98% of the samples taken for a 12-month period
	(d) if the drinking water service supplies drinking water to 1000 people or less—1 sample a month	nil cfu/100mL	nil cfu/100mL found in 98% of the samples taken for a 12-month period
Fluoride concentration of fluoridated water at a point where the fluoridated water has mixed to a consistent fluoride concentration	Daily	1.5mg/L	1.5mg/L

## Appendix B

The following table had been taken from the Drinking Water Quality Monitoring and Reporting Manual that was sent to providers with the notice. It explains the minimum requirements for routine testing for *E. coli* in a reticulation system of a drinking water service (based on requirements of schedule 3A of the Public Health Regulation).

Note: Appendix B is an example only. It is the responsibility of the provider to ensure all legislative requirements are met.

Reticulation drinking water system population <sup>1</sup>	Minimum monitoring frequency as per the Public Health Regulation	Minimum number of routine samples required per year	Suggested minimum number of samples per week to evenly distribute the minimum number of samples over the year <sup>2</sup>	Maximum number of failures allowed in a 12-month period to meet the 98% annual value (based on minimum number of routine samples) <sup>3</sup>
1 000 or less	1 sample per month	12	1 sample per month	0
1 000 to 5 000	1 sample per week	52	1	1
5 001 to 10 000	1 sample per week plus additional 1 sample per month	64	1	1
10 001 to 15 000	1 sample per week plus additional 2 samples per month	76	1	1
15 001 to 20 000	1 sample per week plus additional 3 samples per month	88	1	1
20 001 to 25 000	1 sample per week plus additional 4 samples per month	100	1	2
25 001 to 30 000	1 sample per week plus additional 5 samples per month	112	2	2
30 001 to 35 000	1 sample per week plus additional 6 samples per month	124	2	2
35 001 to 40 000	1 sample per week plus additional 7 samples per month	136	2	2
40 001 to 45 000	1 sample per week plus additional 8 samples per month	148	2	3
45 001 to 50 000	1 sample per week plus additional 9 samples per month	160	3	3
50 001 to 55 000	1 sample per week plus additional 10 samples per month	172	3	3
55 001 to 60 000	1 sample per week plus additional 11 samples per month	184	3	3

Water Quality and Reporting Guideline for a Drinking Water Service

Reticulation drinking water system population <sup>1</sup>	Minimum monitoring frequency as per the Public Health Regulation	Minimum number of routine samples required per year	Suggested minimum number of samples per week to evenly distribute the minimum number of samples over the year <sup>2</sup>	Maximum number of failures allowed in a 12-month period to meet the 98% annual value (based on minimum number of routine samples) <sup>3</sup>
60 001 to 65 000	1 sample per week plus additional 12 samples per month	196	3	4
65 001 to 70 000	1 sample per week plus additional 13 samples per month	208	4	4
70 001 to 75 000	1 sample per week plus additional 14 samples per month	220	4	4
75 001 to 80 000	1 sample per week plus additional 15 samples per month	232	4	4
80 001 to 85 000	1 sample per week plus additional 16 samples per month	244	4	5
85 001 to 90 000	1 sample per week plus additional 17 samples per month	256	4	5
90 001 to 95 000	1 sample per week plus additional 18 samples per month	268	5	5
95 001 to 100 000	1 sample per week plus additional 19 samples per month	280	5	5
100 001 to 110 000	6 samples per week plus additional 1 sample per month	324	6	6
110 001 to 120 000	6 samples per week plus additional 2 samples per month	336	6	6
120 001 to 130 000	6 samples per week plus additional 3 samples per month	348	6	7
130 001 to 140 000	6 samples per week plus additional 4 samples per month	360	7	7
Above 140 001	6 samples per week plus additional 1 sample per month for each additional 10 000 population increment above 100 000			

1. Requirements apply to individual reticulation systems.
2. Some additional samples will be required to meet the total yearly number for most population groups.
3. A failure in the detection of *E. coli* in a sample. Annual compliance is based on routine samples only, not follow up samples when *E. coli* is detected.



**Call: 13 QGOV (13 74 68)**

**Visit: [www.dews.qld.gov.au](http://www.dews.qld.gov.au)**