

# Guidelines for the Preparation of a System Leakage Management Plan

## For Water Service Providers

May 2011

Prepared by:

Office of the Water Supply Regulator

Department of Environment and Resource Management

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# 1. Introduction

These guidelines are prepared pursuant to s. 80(2) of the *Water Supply (Safety and Reliability) Act 2008* (the Act) and issued by the regulator. The regulator is the Director-General of the Department of Environment and Resource Management (DERM). The Act can be accessed on the internet at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

Under the Act, each registered water service provider must prepare a system leakage management plan (SLMP) in accordance with any guidelines made by the regulator. The SLMP must be given to the regulator for approval.

The requirement to prepare and submit a SLMP does not apply to a water service provider who:

- supplies only drainage services (s. 78 of the Act)
- is only registered to provide a sewerage service.

The regulator may exempt water service providers from preparing a SLMP (s. 83). The exemption process is detailed in the Guidelines for Granting Exemptions for System Leakage Management Plans (SLMP Exemption Guidelines).

Chapter 2 of the Act (Infrastructure and service) requires each water service provider to have an approved SLMP in place to minimise the water leakage from their water supply distribution systems. The plan should document the level of system leakage, measures to be used to reduce leakage and a plan to implement cost effective measures.

A SLMP must be prepared in accordance with both the provisions of the Act and these guidelines and must be submitted for approval by the regulator (s. 82). A water service provider must comply with the approved SLMP when supplying services to customers (s. 91).

## 1.1 Aim of the guidelines

The aim of these guidelines is two-fold, namely:

- to set out the minimum requirements for a water service provider to consider in preparing a SLMP (water service providers may choose to go beyond these requirements)
- to provide service providers with general information about the SLMP provisions in the Act.

These guidelines do not attempt to outline best practice system leakage management for water services. While prescribing some reporting requirements, these guidelines do not prescribe the methodology that service providers should use in determining leakage from distribution systems or the measures that could be implemented to reduce leakage. These are issues for each service provider to determine. There may be significant differences between service providers depending on their size, nature of the service, complexity of their systems and whether they provide a water service to a single scheme or a number of schemes with infrastructure of differing ages and quality.

Numerous manuals and guides currently exist that describe best practice in relation to these issues—for example, *Managing and Reducing Losses from Water Distribution Systems* available for purchase from the Wide Bay Water Corporation at <[www.widebaywater.qld.gov.au](http://www.widebaywater.qld.gov.au)>.

These guidelines are structured to reflect the key components of the SLMP regulatory requirement:

SLMP Overview (Section 2)	<ul style="list-style-type: none"> <li>• components of a SLMP</li> </ul>
Preparation of the SLMP (Section 4)	<ul style="list-style-type: none"> <li>• an overview of the Act requirements—who must prepare one, what services does it relate to and the deadlines for submission for approval</li> <li>• the key components of a SLMP and the details of what must be documented</li> </ul>
Approval by the regulator (Section 5)	<ul style="list-style-type: none"> <li>• the process for approval, the grounds for rejection, changing the SLMP after approval</li> </ul>
Annual reports, regular reviews and audits (Sections 6, 7, 8 & 9)	<ul style="list-style-type: none"> <li>• the requirements for annual reports, reviews and audit, the regulator's powers to undertake a spot audit, the outcomes and actions following these processes</li> </ul>
Rights of appeal (Section 10)	<ul style="list-style-type: none"> <li>• the appeal rights of a service provider</li> </ul>

## 1.2 Application of the guidelines

These guidelines apply to water service providers registered under part 4, chapter 2 of the Act, but do not apply to a water service provider who supplies only drainage services (s. 78).

A distributor-retailer under the *South-East Queensland (Distribution and Retail Restructuring) Act 2009* is not required to prepare a SLMP if they have a water netserv plan in place.

By virtue of the definition of water service provider, a service provider registered to provide only a sewerage service does not require a system leakage management plan.

In preparing these guidelines, the regulator has given consideration to the practicability and feasibility of compliance, particularly in the short term.

**Note:** Some tailoring of the guidelines has been necessary for their application to irrigation services reflecting the fundamental difference in the nature of these distribution systems from those used for reticulating urban water supplies.

This guideline provides guidance on preparing a SLMP in the situation where a service provider has individual schemes which require a SLMP and other schemes that meet the exemption requirements as detailed in the Guidelines for Granting Exemptions for System Leakage Management Plans (see section 4.2.3 of these guidelines).

## 1.3 Linkages with other requirements

### 1.3.1 Strategic asset management plan/total management plan

Sections 2 and 4 outline the information that a service provider should include in its SLMP.

Many service providers will already have all or part of this information contained within existing documentation as part of another plan, for example, a total management plan. Where this is the case, the service provider is not required to extract or re-package the information into a new SLMP document. Such existing documentation may, as a whole, be forwarded directly to the regulator, provided:

- the documentation submitted, addresses all the issues required by the Act and these guidelines
- the existing documentation that addresses only part of the SLMP requirements, additional documentation will need to be submitted to fulfil outstanding requirements of a complete SLMP
- the SLMP submission clearly identifies the information in the existing documentation which is intended to address the SLMP requirements
- the registered professional engineer who certifies the SLMP certifies the relevant information contained in the existing documentation as part of the overall certification of the SLMP.

### 1.3.2 Multi-purpose total management plans

There may be instances where a service provider wishes to prepare and submit a total management plan (TMP) to DERM to obtain the regulator's approval for a strategic asset management plan (SAMP) and SLMP.

Where a multi-purpose TMP is proposed, a service provider may choose to submit the TMP in a single submission. This will be acceptable provided:

- the TMP has been prepared in accordance with the most recent version of the DERM Guidelines for Implementing Total Management Planning
- the submission states the TMP is submitted to satisfy the requirements of the Act, which requires that a SAMP or SLMP is submitted for approval by the regulator (the document could also include a drought management plan (DMP))
- the submission:
  - clearly identifies all parts of the TMP that constitute the service provider's SLMP and SAMP respectively
  - includes a certification by a registered professional engineer of those parts of the TMP that constitute the SLMP and SAMP
  - includes a certification by the service provider's chief executive officer for those parts of the TMP that constitute the DMP.

### **1.3.3 Requirements of Environmental Protection (Water) Policy 2009**

Local governments registered as water service providers may have already addressed a number of SLMP requirements in complying with the Environmental Protection (Water) Policy 2009 (EPP Water). Part 6 of the EPP Water requires that a local government that operates a water supply system must develop and implement an environmental plan, namely a total water cycle management plan, regarding water cycle management for its local government area.

## 2. SLMP Overview

In order to prepare a SLMP, a registered service provider must address the following components in relation to its entire water supply infrastructure system:

- service and system overview—provide a general description of the registered water service to which the plan applies and the infrastructure for supplying the service. This requirement will already have been met where a service provider has previously prepared an approved SAMP for its water service
- details of current system leakage—determine the volumetric amount of water lost (or percentage for irrigation or bulk services) due to leakage from the service provider’s distribution system. Service providers must outline the methodology used for determining the leakage volumes (see section 4.5)
- leakage reduction measures—determine cost-effective measures that will reduce leakage from the service provider’s distribution system. Service providers must outline the methodology used for determining which measures are cost-effective to implement (see section 4.8)
- leakage reduction program—develop a program to implement those reduction measures which were found to be cost-effective in reducing water lost due to leakage from the service provider’s distribution system (see section 4.9)
- financial arrangements—provide a general description of proposed arrangements for financing implementation of the SLMP including estimated and projected expenditure (see section 4.10).

The SLMP must be certified by a registered professional engineer (see section 4.11) and submitted to the regulator for approval.

### 3. Exemption from preparing a SLMP

Service providers are eligible to apply to the regulator for an exemption from preparing and implementing a SLMP if they demonstrate they meet the criteria nominated in the Act (ss. 83 and 84) and the SLMP exemption guideline.

The SLMP exemption guideline contains the criteria for exemption and describes how a service provider may apply for an exemption. The criteria for exemption as stated in s. 84 of the Act are as follows:

- the application complies with s. 83 and
- the water service provider's distribution system is considered relatively new under guidelines made by the regulator or
- the water service distributes underground water from the Great Artesian Basin primarily for stock and domestic purposes or
- the water service provider's distribution system is designed to operate as a groundwater recharge system or
- current water leakage from the distribution system is considered low under the guidelines or
- current water leakage from the distribution system is considered high under the guidelines but the water service provider does not have the financial capacity to undertake a cost-benefit analysis for the distribution system or
- current water leakage from the distribution system is considered high under the guidelines but the cost of undertaking a cost-benefit analysis for the distribution system is more than the cost of the water that could be recovered or
- a cost-benefit analysis for the distribution system shows that it is not cost-effective to implement any measures to reduce leakage.

For further information please refer to the SLMP exemption guidelines issued by the regulator.

The Act does not provide for partial exemptions in the situation where only some of the elements or schemes would be exempt and the others require a SLMP.

## 4. Preparing a SLMP

### 4.1 Who must prepare a SLMP?

A distributor-retailer under the *South-East Queensland (Distribution and Retail Restructuring) Act 2009* is not required to prepare a SLMP if they have a water netserv plan in place. Existing approved SLMPs for participating local governments are taken to be the distributor-retailer's approved SLMP until the day the distributor-retailer has a water netserv plan.

Unless exempted, each service provider (other than a distributor-retailer as mentioned above) registered under the Act as providing a water and/or sewerage service is required to have an approved SLMP in place.

A service provider is the legal owner of the infrastructure providing the service, not the operator of the infrastructure. It is therefore the owner of the infrastructure who is responsible for preparing a SLMP and submitting it for approval. This does not preclude collaboration between an owner and an operator in the preparation of the SLMP. In fact this is essential as the operator must operate the service in accordance with the SLMP.

### 4.2 To which services must a SLMP apply?

By the provisions of the Act (s. 80(2)), a registered water service provider must have a SLMP for its registered water service. Some service providers may be providing a water service comprised of more than one element, for example, the supply of bulk water or the supply of a retail water service. In these circumstances, a SLMP that addresses all elements of the water service should be prepared. The water service provider may choose to address each element of a service separately within the SLMP.

#### 4.2.1 Water services

The activities that constitute a water service are defined in schedule 3 of the Act. Service providers should note that the definition includes water recycling.

However a service provider involved in the provision of a water service that is a distribution system designed to act as a groundwater recharge system (that is, groundwater replenishment) can seek an exemption from preparing a SLMP (s. 84(1)(b)(iii)).

#### 4.2.2 Different elements of a water service

The registered water service could consist of one or more of the following elements:

- bulk water—the supply of large quantities of water other than as an irrigation service
- retail water—the supply of reticulated water in a defined service area (other than bulk water, irrigation, or recycled water)
- irrigation—the supply of water services for the irrigation of crops and pastures for commercial gain
- primarily stock and domestic—the supply of water for stock and/or domestic services.

A SLMP must separately address each of the discrete water service elements that collectively make up the service provider's registered water service.

Where a water service provider's registered service contains separate schemes with substantially different infrastructure in terms of leakage, each scheme must be addressed separately as sections of the one SLMP. If the water service provider is a water authority, a SLMP must be prepared for the authority area.

#### 4.2.3 Schemes which meet exemption requirements

Under the provisions of the Act, a SLMP is considered a single document which addresses the different elements of a water service and the schemes served by the service provider. Therefore there is no mechanism to provide for an exemption for any individual element of a service or scheme within a service provider's registered service.

If a particular element and/or scheme currently meets one of the exemption criteria, a service provider may choose to address that particular element and/or scheme to a lesser extent in its SLMP, but each component must be addressed.

For a scheme which is designed as a groundwater recharge system, or is a primarily stock and domestic scheme that distributes underground water from the Great Artesian Basin, a service provider need only address the service and system overview elements of the SLMP and will not be required to report annually on the scheme.

### 4.3 When must a SLMP be submitted

Unless exempted, service providers must, within two years after the day they are registered, prepare and submit a SLMP to the regulator for approval as required under s. 82 of the Act.

Under s. 1158 of the *Water Act 2000*, new or adjusted local governments formed as a result of the 2008 local government amalgamations are required to provide a SLMP within two years after 15 March 2008. The regulator may, under s. 1158(3)(c) of the Water Act, agree that the local government may give the SLMP to the regulator on a later day.

The April 2011 amendment to the transitional provisions in s. 1136F and s. 1158 extended the date for submission for approval by the regulator to 1 July 2013 in the situation where the service provider:

- is a service provider or a new or adjusted local government outside of South East Queensland; and
- provides an urban water service (a drinking water service or a retail water service under the Act).

### 4.4 Service and system overview

The service and system overview must include details as outlined below:

Registered services	Identify the registered water service to which the SLMP applies.
Nature of the service/s	Describe, in general terms: <ul style="list-style-type: none"> <li>• all of the separate schemes that make up the registered water service</li> <li>• all elements of the registered water service being provided to the separate schemes, that is, bulk water; retail water; irrigation; primarily stock and domestic</li> <li>• the nature of the service. Relevant considerations include whether the service is potable or non-potable, pressurised on-demand, a constant flow scheme; a dual reticulation scheme; a channel system, etc.</li> <li>• the extent of the service. This includes an estimate of the number of connections<sup>1</sup> and the total length of mains and/or channels for the service as a whole and for each scheme and element of water service, where relevant.</li> </ul>
Infrastructure details	Describe, the distribution infrastructure used to deliver the elements of the service that collectively make up the service provider's registered service.  This includes identifying the major infrastructure facilities and components, their purpose and capacity (capacity information is not required for pipelines). Major infrastructure facilities and components include: <ul style="list-style-type: none"> <li>• treatment plants</li> <li>• pump stations</li> <li>• reservoirs</li> <li>• channels</li> <li>• pipelines<sup>2</sup>.</li> </ul> This information should include a schematic layout clearly showing the linkages between each of the major infrastructure components.

The information required for service and system overview should reflect that previously provided for inclusion in a SAMP with the proviso that it contains sufficient detail on each scheme.

<sup>1</sup> Note: where the term connections is used in the Act, a different meaning applies (see schedule 3).

<sup>2</sup> For large complex systems, identification of pipelines may be limited to trunk delivery mains only rather than documenting extensive networks of reticulation pipe work or distribution mains.

For the purposes of these guidelines, the Water Services Association of Australia (WSAA) definition of connections has been adopted.

A water property, for the purposes of determining connections, is:

- connected to the service provider's water system
- subject to billing for water supply (fixed and/or consumption)
- a tenanted property, which is separately metered and, in respect of which the tenant is liable for water usage, counts as one property. The owner and tenant are not separately counted as water properties.

Connections are calculated by the addition of water properties that fit the above criteria as follows:

Single residential connections + multiple residential connections (no. of dwellings/ property\*properties or no. of dwellings) + industrial connections + commercial connections + other connections which don't fit into above categories.

This definition includes:

- a connected non-rateable property
- a connected but non-metered property.

It does not include:

- a body corporate or
- a rated but unconnected property.

## 4.5 Units for reporting system leakage

There are a number of ways in which leakage could be reported, namely:

- volumetric terms, litres/connection/day
- percentage terms
- infrastructure leakage index (ILI).

The diversity of the types of water services delivered to customers by water service providers means that it is impracticable for all providers to report leakage in one single manner. The regulator requires leakage to be reported as follows:

- retail water service—in volumetric terms (litres/connection/day)
- bulk water service—in percentage terms
- irrigation service—in percentage terms
- primarily stock and domestic—in volumetric terms (litres/connection/day).

This recognises the inherent difficulties in determining absolute leakage volumes in the cases of both bulk water services and irrigation services. Factors such as meter accuracy, evaporation and soakage have a major bearing with respect to calculating water leakage from channel systems.

In the case of retail water services, the requirement for volumetric measurement rather than percentage was adopted to avoid any confusion in interpreting and reporting on leakage levels. For example, in the case of a service provider with two separate water supply schemes:

<b>Scheme No 1</b>		
	Number of connections	250
	Total consumption (ML/annum)	85
	Total leakage as a percentage	10
	Total leakage volume (L/day)	23 288
	Volumetric leakage (L/connection/day)	93
<b>Scheme No 2</b>		
	Number of connections	200
	Total consumption (ML/annum)	50
	Total leakage as a percentage	10
	Total leakage volume (L/day)	13 699
	Volumetric leakage (L/connection/day)	68.5

It can be seen from the examples that although the two schemes supposedly have the same level of leakage, that is, 10 percent, the actual volumetric level of leakage from scheme two is far less, that is, 68.5 litres/connection/day versus 93 litres/connection/day. Therefore, quoting leakage in percentage terms can be misleading.

ILI, although recognised internationally through the International Water Association (IWA), is not considered appropriate because it may give unreliable results when calculated for:

- systems with average pressures below 25 m where the percentages of metallic pipes is either very high or very low thereby invalidating the assumption of a linear pressure – leakage rate relationship
- systems with less than 5000 service connections because the assumptions used in the equation for the calculation of unavoidable annual real losses (UARL) for average numbers and average flow rates for small numbers of reported and unreported bursts may be invalid
- systems with a density of service connections of less than 20 service connections per kilometre due to the lack of testing in this situation.

A service provider may choose to calculate the ILI for its own purposes.

## 4.6 Actual system leakage volumes

The service provider must determine and document the volume of water currently lost from the distribution system through leakage. This should be reported in volumetric terms, for example, litres/connection/day (L/conn/day) or as a percentage for bulk water and irrigation services.

System leakage	<p>For piped systems, determine and document the volume of water leaking from the system, up to the point of customer connection. Water leakage<sup>3</sup> includes:</p> <ul style="list-style-type: none"> <li>• leakage and bursts from transmission mains</li> <li>• leakage and bursts from the distribution system—from the service provider’s mains, service connections, and fittings</li> <li>• leakage from reservoirs</li> <li>• overflows from reservoirs.</li> </ul> <p>Water leakage must be reported in terms of litres/connection/day for retail water services and for stock and domestic services.</p> <p>These service providers must document the methodology used for determining system leakage in their SLMP.</p> <p>For a bulk water service comprising of an individual or several large diameter pipeline(s), determine and document the volume of water leaking from the system, up to the point of customer connection. Water leakage includes:</p> <ul style="list-style-type: none"> <li>• leakage and bursts from transmission mains</li> <li>• leakage and bursts from the distribution system—from the service provider’s mains, service connections and fittings</li> <li>• leakage from reservoirs or balancing storages</li> <li>• overflows from reservoirs or balancing storages.</li> </ul> <p>Water leakage must be reported in terms of percentage<sup>4</sup> lost.</p> $\text{Percentage lost} = \frac{(\text{total input volume} - \text{volume delivered}) \times 100}{\text{total input volume}}$ <p>These service providers must document the methodology used for determining system leakage in their SLMP.</p> <p>For constructed channel systems or irrigation systems, determine and document the volume of water leaking from the system, up to the point of connection. Water leakage includes:</p> <ul style="list-style-type: none"> <li>• leakage from lined and unlined channels</li> <li>• leakage from balancing storages and tanks</li> <li>• overflows from balancing storages and tanks.</li> </ul> <p>Water leakage must be reported in terms of percentage lost.</p> $\text{Percentage lost} = \frac{(\text{total input volume} - \text{volume delivered}) \times 100}{\text{total input volume}}$ <p>These service providers must also document the methodology used for determining system leakage in their SLMP.</p> <p>If other more accurate methods of determining leakage for a bulk water service or for constructed channels can be utilised these should be adopted and the methodology stated in the SLMP.</p> <p>Water leakage does not include (where applicable):</p> <ul style="list-style-type: none"> <li>• inaccuracies associated with production and customer metering</li> <li>• unauthorised consumption (theft or illegal use)</li> <li>• evaporation from channels, balancing storages and tanks</li> <li>• losses attributable to maintenance activities, such as scouring, cleaning, etc.</li> <li>• leakage losses from natural (as opposed to constructed) water courses</li> <li>• unmetered water use of various types, such as for fire fighting and training, mains flushing, parks and gardens.</li> </ul>
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<sup>3</sup> This definition of water leakage from a piped system is consistent with the standard definitions developed by the IWA as components of annual water audit processes for water supply and distribution systems. This system is recommended for use by Australian water utilities by WSAA. The appendix in this document briefly summarises the IWA system. (Note: Water leakage defined in this guideline is equivalent to real losses as defined in the IWA system.)

<sup>4</sup> Methods other than percentage lost may be used if the service provider has more appropriate methods for measuring the actual volume of leakage. Percentage lost has been adopted as many systems do not have sufficient metering locations to accurately determine volumetric losses. In adopting the value of the percentages lost, consideration has been given to reflecting the level of accuracy of the meters used in the bulk water supply systems and/or irrigation schemes.

## 4.7 Customer connection point

Leakage from the distribution system must be determined up to the point of customer connection. This means the point for connection to the service provider’s water supply system of:

- a supply pipe or premises main for premises
- a premises group main for a premises group
- for an irrigation channel, at the meter or the termination of the service providers’ infrastructure
- for a bulk water supply pipeline, at the meter or the termination of the service provider’s infrastructure

If not expressly covered by the above, it shall be taken to be the last point in the infrastructure owned by the service provider.

## 4.8 Leakage reduction measures

The service provider must identify and document the leakage reduction measures to be implemented to reduce leakage:

Leakage reduction measures	<p>Identify and document measures that will reduce leakage from the distribution system. For each measure:</p> <ul style="list-style-type: none"> <li>• describe the nature of the measure; such as, pressure reduction</li> <li>• state whether the measure is either a one-off or an on-going activity</li> <li>• state the timeframe over which the measure would be implemented</li> <li>• state the expected reduction in water leakage for the measure</li> <li>• estimate the lowest leakage level technically achievable for the service provider’s distribution system.</li> </ul>
Cost-effective measures to reduce water leakage	<p>Determine and document which of the leakage reduction measures are cost-effective for the service provider to implement. Service providers must document the methodology used for determining which measures are cost-effective by considering:</p> <ul style="list-style-type: none"> <li>• The cost of water (calculated at retail price) currently lost from the system due to leakage that can be reduced by the documented measures. Where step tariffs apply or excess water charges apply, the retail price shall be the highest price applicable to the step tariff or the excess water charge.</li> <li>• The cost of developing and implementing a system leakage reduction program.</li> <li>• The estimated reduction in operation and maintenance costs; for example, energy for pumping water, chemicals for treating water, reduced incidents of burst pipes, reduced costs for bulk water purchases.</li> <li>• The estimated costs saved by deferral of, and possibly avoiding, the construction of new water infrastructure such as treatment plants and the augmentation of water sources such as dams, weirs and bores.</li> <li>• The cost effectiveness is to be assessed for a period appropriate for the leakage reduction measure (minimum of five year period to be used).</li> </ul>

## 4.9 Leakage reduction program

The service provider must document a leakage reduction program of works and activities that will reduce system leakage:

Leakage reduction program	<p>Document a program of measures that are cost-effective to implement and will be implemented to reduce water lost due to leakage from the system. For each measure:</p> <ul style="list-style-type: none"> <li>• describe the nature of the measure; for example, pressure reduction</li> <li>• state the timeframe over which the measure will be implemented</li> <li>• state the total reduction in water leakage expected to be achieved by the system leakage reduction program.</li> </ul>
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## 4.10 Financial arrangements

The proposed financial arrangements for implementing the SLMP must be outlined in a financial statement that shows:

- total planned expenditure for the SLMP (detailed planned expenditure for each of the measures proposed to be implemented is not required)
- the anticipated funding source for the proposed expenditure (the funding source may include infrastructure charges, revenue, and community service obligations. A break-up between the different types of funding sources is not required).

Some providers may have all or part of the required financial information in existing documentation or as part of another plan (for example, a financial sub-plan of a TMP or SAMP). In this case, the service provider may include this existing financial information as part of the SLMP.

## 4.11 Certification by a registered professional engineer<sup>5</sup>

The registered professional engineer is expected to take into account the following matters prior to certifying the SLMP:

- Does the plan comply with, and address all the requirements of the Act and these guidelines?
- Can the measures outlined in the leakage reduction program be reasonably expected to achieve the stated overall reduction in water leakage from the system?
- Do the proposed financial arrangements appear to be sufficient/adequate to implement the SLMP?

A registered professional engineer must certify the system leakage management plan.

The engineer may be:

- an employee of the service provider
- the engineer who prepared the service provider's strategic asset management plan
- an engineer employed to operate the service provider's infrastructure
- an engineer independent of the service provider.

The engineer must provide a written certification to accompany a system leakage management plan stating:

- the plan is appropriate for the service provider's infrastructure and registered services
- their name and registration details.

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<sup>5</sup> The registered professional engineer must be a registered professional engineer as defined by the *Professional Engineers Act 2002*.

## 5. Having a SLMP approved

### 5.1 Submission of a SLMP

Unless a service provider has obtained an exemption (s. 83), a service provider must prepare and submit a SLMP to the regulator for approval (s. 82). The deadlines for submission are outlined in section 4.3.

### 5.2 Approval criteria

Within three months of receiving a SLMP, the regulator must approve the SLMP and give the water service provider a notice of approval (s. 87) if the regulator is satisfied that:

- the plan meets the requirements of the Act and these guidelines
- the plan was certified by a registered professional engineer
- the plan is adequate in all material particulars.

Before approving a SLMP, the regulator may, but is not obliged to, obtain advice from an advisory council established under s. 570 of the Act. At the time of publication of this guideline, no advisory council has been established.

The notice of approval must also tell the service provider:

- the intervals, of not less than one year, at which regular reviews of the approved SLMP must be conducted
- if the regulator requires regular audits of the approved SLMP under s. 108—the intervals, of not less than two years, at which the audits must be conducted.

### 5.3 Four possible outcomes upon submission

There are four possible formal outcomes upon submission of a SLMP for approval to the regulator.

Approve the SLMP	The regulator must give written notice of approval (s. 87).
Refuse to approve the SLMP because it was not certified by a registered professional engineer	<p>The SLMP is returned to the service provider with a notice stating:</p> <ul style="list-style-type: none"> <li>• certification is required</li> <li>• the time by which the certified document must be returned.</li> </ul> <p>The regulator must ensure that the time allowed for the plan to be certified and returned to the regulator is reasonable.</p>
Refuse to approve the SLMP because the regulator is satisfied that it is inadequate in a material particular	<p>The SLMP is returned to the service provider with an information notice<sup>6</sup> stating:</p> <ul style="list-style-type: none"> <li>• how the plan is inadequate and requiring that:                             <ul style="list-style-type: none"> <li>○ it be revised and returned for approval within a stated time or</li> <li>○ a new SLMP be prepared, certified and returned for approval within a stated time</li> </ul> </li> <li>• the time by which the revised or new document must be submitted.</li> </ul> <p>The regulator must ensure that the time allowed for the revised or new certified plan to be returned is reasonable.</p>
Seek further information	Section 89 of the Act allows the regulator to require further information from a service provider about the SLMP.

<sup>6</sup> Schedule 3 of the Act defines an information notice.

In deciding whether a SLMP is inadequate in a material particular, the regulator will consider the following:

- whether the requirements of the Act and these guidelines have been addressed
- whether these requirements are addressed in sufficient detail given the nature, size and complexity of the infrastructure and the existing level of leakage from the system
- whether the SLMP:
  - is appropriate for the registered service and infrastructure
  - if implemented appropriately, is likely to deliver the nominated reduction in water lost due to leakage from the system
- the cost to the service provider and its customers in addressing any inadequacies.

## **5.4 Can a SLMP be changed once it is approved?**

A service provider may change a SLMP after it has been approved. However, the service provider must submit the proposed changes to the regulator seeking the regulator's agreement to the changes (s. 90).

If, as a result of a regular review, the SLMP needs to be changed to reflect best practice industry standards for the types of services provided, the new SLMP must be submitted to the regulator for approval.

It is also recognised that the planned expenditure to implement a SLMP is based on a set of assumptions that may change due to a variety of circumstances. If such circumstances force a change in planned expenditure prior to a review of the SLMP or adversely affect the service provider's ability to implement the SLMP, the service provider may either:

- obtain the agreement of the regulator to change the SLMP in accordance with s. 90 of the Act, or
- submit a new SLMP for approval.

## 6. Annual reports

Service providers are required to submit an annual report for each financial year after a financial year in which a SLMP has been approved (s. 141(a)). The report must be given to the regulator within 120 business days after the end of the financial year<sup>7</sup> (s. 141(3)).

The annual report for the SLMP may be combined with the annual report for strategic asset management plan, customer service standards, drinking water quality management plan, system operating plan and/or water advice (s. 141(2)).

Service providers are required to keep their annual report(s) available for inspection and purchase (s. 141(5)). This means the service provider must keep a copy of its annual report(s) available for inspection by the public during office hours on business days at the office of the service provider (s. 575(1)). The service provider may also keep a copy of the annual report(s) available for inspection by the public at other places the service provider considers appropriate (s. 575(2)).

### 6.1 Contents of annual reports

The annual report must:

Measure the service provider's performance for the financial year against the SLMP	<p>The information reported should include:</p> <ul style="list-style-type: none"> <li>the volumetric leakage level of the current and previous year (if available)—or as a percentage, depending on the elements of the water infrastructure system</li> <li>the overall volumetric reduction in water leakage from the system</li> <li>any statements qualifying the data reported—this is not a mandatory requirement, but may be appropriate in circumstances where certain events or activities have affected data for a particular year.</li> </ul>
Document actions taken by the service provider to implement the SLMP (including application of funds)	<p>This information reported should include:</p> <ul style="list-style-type: none"> <li>progress on implementing the SLMP</li> <li>actions that have been undertaken in accordance with the approved leakage reduction program</li> <li>reasons for failing to undertake a particular action nominated by the service provider for this reporting period</li> <li>the application of funds in accordance with the proposed financial arrangements for implementing the SLMP.</li> </ul>
Document outcomes of any regular reviews or audits	<p>This information reported should include:</p> <ul style="list-style-type: none"> <li>the outcomes of any regular reviews, including how the service provider has addressed issues raised by the review</li> <li>a summary of the findings and any recommendations of audit reports (regular and spot audit reports) given to the regulator in this reporting period.</li> </ul>

### 6.2 Annual reports for local governments

A different time frame applies to a service provider that is a local government, if the provider (s. 141(4)):

- includes the information required for the SLMP annual report in a report required under s. 531 (Annual report to be prepared and adopted) of the *Local Government Act 1993*
- gives a copy of the s. 531 report to the regulator within 30 business days after the report is adopted by the local government.

<sup>7</sup> Unless section 6.2 Annual reports for local governments applies to the report.

## 7. Regular reviews

Service providers must regularly review a SLMP in accordance with the notice given under s. 87(2)(a). Regular reviews must be undertaken in accordance with s. 106 of the Act.

Service providers may conduct these reviews internally.

The outcomes of a regular review and the manner in which the matters raised in the review have been addressed must be reported in the annual report (see section 6.1).

Within 30 business days of completion of the review (s. 107), the service provider must:

- if the review indicates the plan needs to be changed to reflect best practice industry standards for the types of services provided by the service provider—give the regulator a copy of a new plan indicating the actions taken or planned to be taken and improvements made or planned to be made since the plan being reviewed was approved or
- otherwise—give the regulator a further copy of the existing plan.

The same formal approval process applies for the revised SLMP or the new copy of the existing unchanged SLMP (s. 107(5)) as for the initial SLMP (section 5.2).

### 7.1 Purpose of review

The SLMP must be regularly reviewed to ensure that it remains relevant having regard to industry best practice as it relates to the particular service being provided by the service provider (s. 106(3)).

In order to determine whether the SLMP remains relevant having regard to best practise industry standards for the type of service provided by the service provider, the service provider should consider the following matters when undertaking a regular review:

- Does the SLMP continue to meet the requirements of the Act and these guidelines?
- Are these requirements addressed in sufficient detail given the nature, size and complexity of the infrastructure and services provided and the existing level of leakage from the system?
- Is the SLMP appropriate for the registered services and infrastructure?
- Does it reduce the leakage from the system to the level nominated in the leakage reduction program?

### 7.2 Review interval

Reviews must take place at the time intervals stipulated by the regulator in the approval notice (see section 5.2). In accordance with s. 87 of the Act, regular reviews must be conducted at intervals of not less than one year. Generally, reviews will be required to be undertaken at intervals ranging from two to five years.

The regulator will, when setting these time intervals, take into account:

- the complexity and timing of the leakage reduction program that the service provider is committed to undertaking
- the current system losses and planned reduction in system water loss
- the nature and complexity of the system
- the timing for review of a service provider's SAMP.

## 8. Regular audit reports

A service provider may be required to arrange for regular audits of its SLMP. Such audits, if required by the regulator, must be undertaken in accordance with s. 108 of the Act.

A service provider must summarise the findings and any recommendations contained in a regular audit report in the annual report (see section 6.1).

The regular audit report must be prepared by a registered professional engineer (the auditor) who is not:

- an employee of the service provider
- the engineer who prepared or certified the SLMP
- an engineer employed to operate the service provider's infrastructure.

The regular audit report must be given to the regulator within 30 business days after its completion and be made available for inspection and purchase.

### 8.1 Purpose of the regular audit report

The purpose of the audit report is to:

- assess a service provider's compliance with the SLMP
- verify the accuracy of any performance data included in the SLMP annual report
- assess the service provider's technical ability to meet the standards identified in the SLMP.

### 8.2 Statutory declaration

The audit report must be accompanied by statutory declarations by the service provider and the auditor.

The service provider's declaration must be made by:

- the service provider—if the service provider is an individual
- by an executive officer of the corporation—if the service provider is a corporation.

The service provider's declaration must state:

- that no false or misleading information was knowingly given to the auditor
- that all relevant information was given to the auditor.

The auditor's declaration must state:

- the auditor's qualifications and relevant experience
- that the auditor has not knowingly included any false, misleading or incomplete information in the report
- that the auditor has not knowingly failed to reveal any relevant information or document to the regulator
- that the regular audit report addresses the relevant matters for the evaluation and is factually correct
- that the opinions expressed in the report are honestly and reasonably held.

### 8.3 Regular audit report interval

Regular audits must take place at the time intervals stipulated by the regulator in the SLMP approval notice (see section 5.2). In accordance with s. 87 of the Act the audits must be conducted at intervals of not less than two years. Generally, audit reports will be required at intervals ranging from two to five years. The regulator will, when setting these time intervals, take into account:

- the complexity and timing of the leakage reduction program that the service provider is committed to undertaking
- the current system losses and planned reduction in system water loss
- the nature and complexity of the system
- the timing for the auditing of a service provider's SAMP.

## 9. Spot audits

### 9.1 When can a spot audit be arranged?

The regulator can arrange for spot audits (s. 110) of a service provider's SLMP if the regulator is satisfied, or reasonably believes that:

- a service provider is not complying with the SLMP
- the SLMP is no longer adequate for the service provider's registered services
- the service provider does not have a regular audit report prepared under s. 108
- the service provider has not given the regulator a copy of a regular audit report prepared under s. 108.

Before arranging a spot audit, the regulator must issue a show cause notice (s. 464). The notice must state:

- that a spot audit is proposed
- the grounds for the spot audit
- the facts and circumstances forming the basis for the grounds
- that a submission from the service provider may be made about the show cause notice
- how the submission may be made
- where the submission may be made or sent
- a day and time within which the submission must be made.

### 9.2 Spot audit report

A spot audit report must be prepared by a registered professional engineer (the auditor) and be undertaken in accordance with s. 110 of the Act.

The spot audit report must be accompanied by a statutory declaration from the auditor. The declaration must address the same matters stated for the regular audit report (see section 8.2).

The regulator is required to give the service provider a copy of the report within 30 business days after its completion (s. 110(5)).

Spot audits do not have to be made available for inspection and purchase, but the findings of the spot audit and any recommendations must be included in the SLMP annual report.

### 9.3 Consequences of a spot audit

The regulator must give the service provider an information notice if the spot audit report concludes that the SLMP:

- is inadequate in a material particular
- was not properly implemented by the service provider.

The information notice will require that, within a reasonable time as stated in the notice:

- the inadequacy be rectified; or
- the SLMP be implemented properly by the service provider.

The service provider must comply with the notice, unless the service provider has a reasonable excuse.

The service provider can apply to the regulator for an internal review of this decision and obtain a review decision. If the service provider is not satisfied with the review decision, arbitration can be sought from the Queensland Competition Authority<sup>8</sup>.

The regulator may recover from the service provider an amount equal to the cost of completing the spot audit report (s. 110(9)).

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<sup>8</sup> See chapter 7 of the Act for details relating to appeal provisions.

## **9.4 Obligation to allow access for audits**

During regular or spot audits a service provider must give the auditor, and any person employed or authorised by the auditor to participate in conducting the audit, free and uninterrupted access to its infrastructure and any related records. However, these people must not enter a customer's premises unless the customer agrees to the entry (s. 112(2)).

## 10. Rights of appeal

Any decision made by the regulator in regard to a SLMP may be the subject of appeal (chapter 7 of the Act).

In the first instance, the service provider may apply to the regulator for an internal review of a decision.

An application for internal review must be made within 30 business days after the day the service provider is given an information notice advising of the decision. However the Act allows the reviewer to extend the time for applying for an internal review. The application for internal review must be:

- in the approved form WSR004 Internal review of decision application—a copy of which can be obtained:
  - from Office of the Water Supply Regulator, Department of Environment and Resource Management, GPO Box 2454, Brisbane, Qld, 4001 or
  - by downloading it from the DERM website <[www.derm.qld.gov.au](http://www.derm.qld.gov.au)>
- accompanied by a statement of the grounds on which the service provider seeks the review of the decision
- supported by enough information to enable the reviewer to decide the application.

The reviewer must, within 10 business days after making a review decision, give the service provider and any person who was given notice of the original decision, a notice of the review decision.

If the service provider is not satisfied with the review decision, arbitration can be sought from the Queensland Competition Authority (chapter 7, sections 524–529 of the Act).

The service provider may give the Queensland Competition Authority (QCA) a dispute notice applying for arbitration on the review decision. This notice must be given within 30 business days after the day that the service provider receives notice of the review decision. The dispute notice must state the name and address of the service provider, details of the review decision and the grounds on which arbitration is sought. The service provider is also required to give a copy of the dispute notice to the regulator.

An application for arbitration from the service provider does not stay the review decision. However, the service provider may immediately apply for a stay of the review decision to a court with jurisdiction to hear the proceeding.

The QCA must give the service provider and the regulator a notice acknowledging receipt of the dispute notice. The service provider may withdraw the dispute notice at any time before the QCA makes its determination.

The QCA must make a written determination on the dispute and must provide reasons for its determination. However, the QCA is not required to make a determination if it is satisfied that the dispute notice was vexatious or the subject matter of the dispute is trivial, misconceived or lacking in substance.

## Appendix 1—Annual water audit

(Based on standard definitions developed by the International Water Association)

The International Water Association (IWA) has produced an international best practice standard approach for water balance calculations as shown in the table below, complete with definitions of all of the terms involved.

This water balance diagram and definitions have been adapted (with minor variations) by the Water Services Association of Australia (WSAA) for use by Australian water utilities and forms the basis of the BENCHLOSS software available from WSAA. WSAA has adopted this new water balance approach in its annual publication *WSAA Facts* and commends this methodology to other water service providers in Australia.

**Table: IWA water balance diagram**

System input volume (including water imported)	Authorised consumption	Billed authorised consumption	Billed metered consumption (including water exported)	Revenue water
			Billed unmetered consumption	
		Unbilled authorised consumption	Unbilled metered consumption	Non-revenue water
			Unbilled unmetered consumption	
	Water losses	Apparent losses	Unauthorised consumption	
			Metering inaccuracies	
		Real losses	Leakage on transmission and/or distribution mains	
			Leakage and overflows at storage tanks	
Leakage on service connections up to metering point.				

Brief definitions of the various components of the water balance diagram follow. For more complete definitions and detailed discussions refer to the following references:

- Losses from water supply systems—International Water Association
- Benchmarking of water losses in Australia—WSAA BENCHLOSS software and user manual
- Managing and reducing losses from water distribution systems—Manuals 1 to 10, Wide Bay Water Corporation and Department of Environment and Resource Management (formerly Environmental Protection Agency) <[www.widebaywater.qld.gov.au](http://www.widebaywater.qld.gov.au)>.

Based on IWA definitions, the water losses from a system are calculated as follows:

$$\text{Water losses} = \text{System input volume} - \text{authorised consumption}$$

System input volume is the water input to a transmission system or a distribution system.

Authorised consumption is the annual volume of metered and/or unmetered water taken by registered customers, the service provider and others who are implicitly or explicitly authorised to do so by the service provider, for domestic, commercial or industrial purposes. It should be noted that authorised consumption includes items such as fire fighting and training, flushing of mains and sewers, street cleaning, watering of municipal gardens, public fountains, frost protection and water for construction. These may be billed or unbilled, metered or unmetered according to local practice.

The calculated water losses are defined by the IWA to consist of both real and apparent losses.

Real losses are the physical water losses from the system up to the point of the customer metering. It is water that does not reach the customer and is not paid for by customers. If real losses are reduced, more water is available for distribution to customers. Real losses include background leakage in joints and fittings, reported and unreported bursts in pipes, and leakage and overflows from reservoirs.

Apparent losses consist of water that is not physically lost from the system but that which is never measured or accounted for and, more importantly, not paid for. If apparent losses are reduced, more revenue will be generated by and for the service provider. Apparent losses include errors in source, production and customer meters, theft or illegal use, unmetered public use (council parks and gardens, cleaning), fire fighting and training, water used in processing (filter back-washing) and water used in infrastructure maintenance (pipe scouring and reservoir cleaning).

**Important notes for service providers:**

1. Water leakage as defined in these guidelines is equivalent to the real losses as defined above in the IWA system—refer section 3.6.
2. Water leakage as defined in these guidelines does **not** include apparent losses as defined above in the IWA system—refer section 3.6.
3. Service providers are not required to determine, report on or reduce apparent losses in their SLMP.