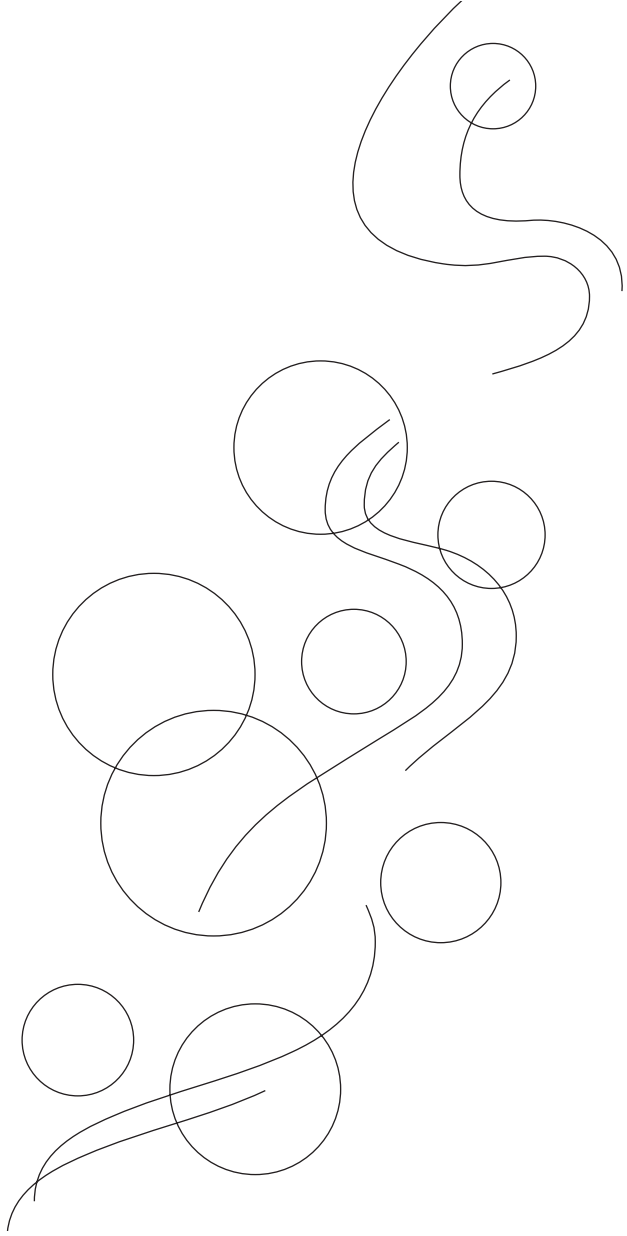


Guidelines for the preparation of a System Leakage Management Plan

April 2007



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April 2007

ISBN 9781741724448

#28206

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1 Introduction

These guidelines are prepared pursuant to s414B(3) of the *Water Act 2000* (the Act) and issued by chief executive (Director-General) of the Department of Natural Resources and Water (NRW). The Act can be accessed on the internet at <www.legislation.qld.gov.au>.

On 1 October 2005, amendments to the Act took effect requiring all registered water service providers to prepare a System Leakage Management Plan (SLMP) in accordance with any guidelines issued 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 (s414A of the Act).

A service provider who is only registered to provide a sewerage service is not required to have a SLMP.

The regulator may exempt water service providers from preparing a SLMP (s414E). The exemption process is detailed in the “*Guidelines for Granting Exemptions for System Leakage Management Plans*” (SLMP Exemption Guidelines).

Currently the “regulator” is the Director-General of NRW.

Chapter 3 of the Act (Service Provider Obligations) requires water service providers have SLMPs 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 (ss414D & 1136F). A water service provider must comply with the approved SLMP when supplying services to customers (s414M).

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* issued by the Environmental Protection Agency and Wide Bay Water Corporation.

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

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

1.2 Application of the guidelines

These guidelines apply to water service providers registered under Part 2, Chapter 3 of the Act, but do not apply to a water service provider who supplies only drainage services (s414A).

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. Please 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.
- These guidelines will be reviewed by October 2012 to reflect the experience gained in implementing the regulatory regime. The review will include:
 - consideration of outcomes from the first round of SLMPs
 - annual reports
 - reviews and audits
 - evolving industry developments.

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 SLMP Exemption Guidelines (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, eg. a Total Management Plan (TMP) or Strategic Asset Management Plan (SAMP). 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:

- Documentation submitted addresses all the issues required by the Act and these guidelines.
- Where existing documentation 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 NRW to obtain:

- the maximum capital works subsidies provided by the Department of Local Government, Planning, Sport and Recreation (DLGPS&R). Please note: TMPs must be submitted to, and approved by, NRW as a prerequisite to receiving the maximum subsidy from DLGPS&R under Local Government Grants and Subsidy Programs,
- the regulator’s approval for a Strategic Asset Management Plan (SAMP) and a SLMP.

The various approval processes are quite separate.

Submission of a:

- TMP for subsidy purposes is a voluntary undertaking and involves an administrative approval and a recommendation by NRW to DLGPS&R,
- SAMP and SLMP are mandatory requirements involving regulatory approval for both documents.

Where a multi-purpose document 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 NRW Guidelines for Total Management Planning (February 2002),
- the submission states the TMP is submitted for several purposes,
 - to satisfy DLGPS&R’s Local Government Grants and Subsidy Program guidelines requiring NRW approval of the TMP to obtain maximum subsidies
 - 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 SAMP and SLMP respectively
 - includes a certification by a registered professional engineer of those parts of the TMP that constitute the SAMP and the SLMP.

1.3.3 Requirements of Environmental Protection (Water) Policy 1997

Local governments, registered as a water service provider may have already addressed a number of SLMP requirements in complying with the Environmental Protection (Water) Policy 1997 (EPP Water). Section 43 of the EPP Water requires

1. A local government that operates a water supply system must develop and implement an environmental plan about water conservation that improves water use efficiency in the system.
2. In developing its plan, the local government must consider:
 - a. the water quality objectives for a water to which a release of waste water may occur; and,
 - b. the maintenance of acceptable health risks.
3. The local government must consider including the following measures in its plans:
 - a. water restrictions, including, for example, restricted garden watering)
 - b. use of rainwater tanks and waste water recycling
 - c. ways of reducing water usage in industrial processes and household appliances, including, for example, low flush toilets and water efficient appliances;
 - d. water pricing policies, tariff structures, water meters and financial incentives and concessions to reduce water usage
 - e. voluntary water reduction schemes and community education and involvement in water conservation
 - f. detection and control of leaks in its water supply system.

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 (s414E, s414F) and the SLMP Exemption Guidelines.

The SLMP Exemption Guidelines contain the criteria for exemption and describe how a service provider may apply for an exemption. The criteria for exemption as stated in s414F of the Act are as follows

- the water service distribution system is considered relatively new
- the water service distributes underground water from the Great Artesian Basin primarily for stock and domestic purposes
- the water service provider's distribution system is designed to operate as a groundwater recharge system
- the current water leakage from the distribution system is considered low
- the current water leakage from the distribution system is considered high but the water service provider does not have the financial capacity to undertake a cost/benefit analysis for the distribution system
- the current water leakage from the distribution system is considered high 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
- 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?

Unless exempted, each service provider registered under the Act as providing a water service is required to have a 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 because 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 (s414B(3)), a registered water service provider must have a SLMP for the service provider’s registered water service. Some service providers may be providing a water service comprised of more than one element, eg the supply of bulk water, the supply of a retail water service, etc. 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 4 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 which is a distribution system designed to act as a groundwater recharge system (i.e. groundwater replenishment) can seek an exemption from preparing a SLMP (s414F(1)(b)(iii) of the Act).

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:

- “New”¹ service providers must prepare and submit a SLMP for approval within two years of being registered as a service provider;
- “Existing”² service providers must prepare and submit a SLMP for approval in accordance with the prescribed transitional arrangements (s1136F):

Large³ and medium service providers 1 October 2007

Small service providers 1 October 2008

4.4 Service and system overview

The service and system overview must include:

<i>Registered services</i>	Identify the registered water service to which the SLMP applies
<i>Nature of the service/s</i>	Describe , in general terms: <ul style="list-style-type: none">• All of the separate schemes that make up the registered water service• All elements of the registered water service being provided to the separate schemes i.e. bulk water; retail water; irrigation; primarily stock and domestic;• 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;• The extent of the service. This includes an estimate of the number of connections⁴ 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.

¹ A service provider who commenced operation after the commencement of s414D – 19 May 2005.

² A service provider registered at the time of commencement of the relevant provisions (s1136F) – 1 October 2005.

³ Schedule 4 of the *Water Act 2000* defines large, medium and small service providers.

⁴ Note, where the term “connections” is used in the Act, a different meaning applies (see Schedule 4 of the Act).

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:

- treatment plants
- pump stations
- reservoirs
- channels
- pipelines⁵.

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.

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.

⁵ 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.

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, and
- 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:

Scheme No. 1		
	Number of connections	250
	Total consumption (ML/annum)	85
	Total leakage as a %	10
	Total leakage volume (L/day)	23,288
	Volumetric leakage (L/conn/day)	93
Scheme No. 2		
	Number of connections	200
	Total consumption (ML/annum)	50
	Total leakage as a %	10
	Total leakage volume (L/day)	13,699
	Volumetric leakage (L/conn/day)	68.5

It can be seen from the examples that although the two schemes supposedly have the same level of leakage, ie 10%, the actual volumetric level of leakage from scheme two is far less, i.e. 68.5 L/connection/day versus 93 L/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 25m 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, eg litres/connection/day (L/conn/day) or as a percentage for bulk water and irrigation services.

System Leakage

For **pipéd systems**, determine and document the volume of water leaking from the system, up to the point of customer connection. Water leakage⁶ includes:

- Leakage and bursts from transmission mains
- Leakage and bursts from the distribution system – from the service provider’s mains, service connections, and fittings
- Leakage from reservoirs
- Overflows from reservoirs.

Water leakage must be reported in terms of L/conn/day for retail water services and for stock and domestic services.

These service providers **must** document the methodology used for determining system leakage in their SLMP.

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:

- Leakage and bursts from transmission mains
- Leakage and bursts from the distribution system – from the service provider’s mains, service connections, and fittings
- Leakage from reservoirs or balancing storages
- Overflows from reservoirs or balancing storages.

⁶ This definition of water leakage from a pipéd system is consistent with the standard definitions developed by the International Water Association (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 the Water Services Association of Australia (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.)

Water leakage must be reported in terms of percentage⁷ lost.

$$\text{Percentage lost} = \frac{(\text{total input volume} - \text{volume delivered}) \times 100}{\text{total input volume}}$$

These service providers must document the methodology used for determining system leakage in their SLMP.

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:

- Leakage from lined and unlined channels
- Leakage from balancing storages and tanks
- Overflows from balancing storages and tanks.

Water leakage must be reported in terms of percentage lost.

$$\text{Percentage lost} = \frac{(\text{total input volume} - \text{volume delivered}) \times 100}{\text{total input volume}}$$

These service providers must also document the methodology used for determining system leakage in their SLMP.

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.

Water leakage does not include (where applicable):

- Inaccuracies associated with production and customer metering
- Unauthorised consumption (theft or illegal use)
- Evaporation from channels, balancing storages and tanks
- Losses attributable to maintenance activities, such as scouring, cleaning, etc
- Leakage losses from natural (as opposed to constructed) water courses
- Unmetered water use of various types, such as for fire fighting and training, mains flushing, parks and gardens, etc

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; or
- a premises group main for a premises group;

⁷ 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 since 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.

- 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:

<i>Leakage reduction measures</i>	<p>Identify and document measures that will reduce leakage from the distribution system. For each measure:</p> <ul style="list-style-type: none"> • Describe the nature of the measure, eg pressure reduction • State whether the measure is either a “one-off” or an on-going activity • State the time-frame over which the measure would be implemented • State the expected reduction in water leakage for the measure • Estimate the lowest leakage level technically achievable for the service providers’ distribution system.
<i>Cost-effective measures to reduce water leakage</i>	<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"> • 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. • The cost of developing and implementing a system leakage reduction program • The estimated reduction in operation and maintenance costs e.g. energy for pumping water, chemicals for treating water, reduced incidents of burst pipes, reduced costs for bulk water purchases • 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. • The cost effectiveness is to be assessed for a period appropriate for the leakage reduction measure (minimum of five year period to be used).

4.9 Leakage reduction program

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

<i>Leakage reduction program</i>	<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">• Describe the nature of the measure, eg pressure reduction• State the timeframe over which the measure will be implemented• State the total reduction in water leakage expected to be achieved by the system leakage reduction program
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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); and
- 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 (eg 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 engineer⁸

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.

⁸ The Registered Professional Engineer must be a registered professional engineer as defined by the *Professional Engineers Act 2002*.

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; or
- 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; and
- his or her name and registration details;

5 SLMP approval

5.1 Submission of a SLMP

Unless a service provider has obtained an exemption (s414E), a service provider must prepare and submit a SLMP to the regulator for approval (ss414D and 1136F). 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 (s414I) if the regulator is satisfied that:

- the plan satisfies the requirements of the Act and these guidelines;
- the plan was certified by a registered professional engineer, and
- 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 s1005 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, and
- if the regulator requires regular audits of the approved SLMP under s417 – 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.

<i>Approve the SLMP</i>	The regulator must give written notice of approval (s414I).
<i>NOT approve it because it was not certified by a registered professional engineer</i>	<p>The SLMP is returned to the service provider with a notice stating:</p> <ul style="list-style-type: none">• certification is required;• the time by which the certified document must be returned. <p>The regulator must ensure that the time allowed for the plan to be certified and returned to the regulator is reasonable.</p>
<i>NOT approve it because the regulator is satisfied that it is inadequate in a material particular</i>	<p>The SLMP is returned to the service provider with an information notice⁹ stating:</p> <ul style="list-style-type: none">• how the plan is inadequate and requiring that:<ul style="list-style-type: none">○ it be revised and returned for approval within a stated time; OR

⁹ Schedule 4 of *Water Act 2000* defines an information notice.

- a new SLMP be prepared, certified and returned for approval within a stated time.

- the time by which the revised or new document must be submitted.

The regulator must ensure that the time allowed for the revised or new certified plan to be returned is reasonable.

Seek further information Section 414K of the Act allows the regulator to require further information from a service provider about the SLMP

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 (s414L), however, the service provider must submit the proposed changes to the regulator seeking the regulator’s agreement to the changes (s414L).

A SLMP may need to be changed following a regular review (s416). A SLMP changed in this manner 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 s414L of the Act; or
- submit a new SLMP for approval.

6 Annual reports

Service providers will be required to submit an annual report for each financial year after a SLMP has been approved. The report must be given to the regulator within 120 business days after the end of the financial year¹⁰ (s430). An annual report is required for the remainder of the financial year in which the SLMP is approved.

The annual report for the SLMP may be combined with the annual reports for the Strategic Asset Management Plan (SAMP) and the Customer Service Standards (CSS).

Copies of the annual report must be available for inspection and purchase by the public (s430(7)).

6.1 Contents of annual reports

The annual report must:

<i>Measure the service provider's performance for the financial year against the SLMP</i>	<p>The information reported should include:</p> <ul style="list-style-type: none">• the current and previous year's (if available) volumetric leakage level or as a percentage, depending on the elements of the water infrastructure system;• the overall volumetric reduction in water leakage from the system;• 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.
<i>Document actions taken by the service provider to implement the SLMP (including application of funds)</i>	<p>This information reported should include:</p> <ul style="list-style-type: none">• progress on implementing the SLMP;• actions that have been undertaken in accordance with the approved leakage reduction program;• reasons for failing to undertake a particular action nominated by the service provider for this reporting period;• the application of funds in accordance with the proposed financial arrangements for implementing the SLMP.
<i>Document outcomes of any regular reviews or audits</i>	<p>This information reported should include:</p> <ul style="list-style-type: none">• the outcomes of any regular reviews, including how the service provider has addressed issues raised by the review;• a summary of the findings and any recommendations of audit reports (regular and spot audit reports) given to the regulator in this reporting period.

¹⁰ Unless Section 6.2 Annual Reports for Local Governments applies to the report.

6.2 Annual reports for local governments

Local government service providers will not be required to prepare a separate SLMP annual report provided that:

- the information required for the SLMP annual report is included in a report under s531 of the *Local Government Act 1993*; AND
- a copy of the report under section 531 of the *Local Government Act 1993* is given to the regulator within 30 business days of its adoption by the local government.

7 Regular reviews

Service providers must regularly review a SLMP in accordance with the notice given under s414I(2)(a). Regular reviews must be undertaken in accordance with s415 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 (s416), 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 (s416(5) of the Act) 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 (s415(3) of the Act).

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)¹¹. Generally speaking, 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.

¹¹ Note: S414I of the Act states that regular reviews are not to be required more than once a year.

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 s417 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; or
- 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
- 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 auditor.

The service provider's declaration must be made by:

- the service provider – if the service provider is an individual; or
- 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)¹². Generally, audit reports will be required at intervals ranging from 2 to 5 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.

¹² Note the Act states that regular audits must not be required more than once every two years.

9 Spot Audits

9.1 When can a spot audit be arranged?

The regulator can arrange for spot audits (s419) of a service provider's SLMP if the regulator is satisfied, or reasonably believes that:

- a service provider is not complying with the SLMP; or
- the SLMP is no longer adequate for the service provider's registered services; or
- the service provider does not have a regular audit report prepared under s417; or
- the service provider has not given the regulator a copy of a regular audit report prepared under s417.

Before arranging a spot audit, the regulator must issue a show cause notice (s778). The notice must state:

- that a spot audit is proposed;
- the grounds for this action;
- 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, and
- 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 s419 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 (s419(4)).

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 there is a reasonable basis for not complying.

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 Authority¹³.

The regulator may recover from the service provider an amount equal to the cost of completing the spot audit report (s419(8)).

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 (s421).

¹³ See Chapter 6 of *Water Act 2000* for details relating to appeal provisions.

10 Rights of appeal

Any decision made by the regulator in regard to a SLMP may be the subject of appeal (Chapter 6 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 usually be made within 30 business days of the day the service provider is given the 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 NRMIR01 – Application for Internal Review of an Original Decision – a copy of which can be obtained from
 - Water Industry Regulation, GPO Box 2454, Brisbane, Qld, 4001; or
 - by downloading it from the NRW website; and
- Supported by enough information to enable the reviewer to decide the application.

If the service provider is not satisfied with the review decision, arbitration can be sought from the Queensland Competition Authority (Chapter 6, Sections 891 – 896 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.

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. The QCA is not required to make a determination if it considers that the dispute notice was vexatious or the subject matter of the dispute is trivial, misconceived or lacking in substance.

Only the service provider to which the decision applies can request an internal review and arbitration for the decision. For example, a service provider's customer cannot undertake these actions.

11 Appendix

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.

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.	

Table: IWA water balance diagram

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
- Benchmarking of Water Losses in Australia – WSAA BENCHLOSS software and User Manual
- Managing and Reducing Losses from Water Distribution Systems – Manuals 1 to 10, Environmental Protection Agency and Wide Bay Water.

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 SLMPs.**

