Appendices

Appendix A

Assumptions

Appendix A: Key Assumptions

1. Customer growth is as per the extensive review conducted that incorporates results from the Melbourne @ 5 Million report developed by the Victorian Government's Growth Areas Authority (GAA). In particular this review focuses on the large exceptional growth occurring in the Sunbury, Melton and Toolern. The simple average growth over the 5 years is predicted to be in excess of 4.8% pa (initial average growth as low as 4.40% to a high of 5.10% by the end of the Water Plan 2013-18). Refer section 9 on Demand for further detail.

2. The Rising Block Tariffs structure was first introduced on 1st November 2004. Throughout the Water Plan 2013-18 period it is not proposed to make any structural changes to this. Pricing for the third tier is proposed to be frozen in real terms which will continue to provide an incentive to use less water however, align closer with Long Run Marginal Costs. It is proposed that both volumetric and fixed water tariffs increase by approximately CPI+8.86% p.a. throughout the period of Water Plan 3. Sewerage tariff increase is proposed to remain constant at CPI + 3.54% p.a. over the regulatory period.

Water Pricing Structure real January 2013 $ - All Districts

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Volume tariff for residential						
0-53kl	138.38c/kl	150.64c/kl	163.99c/kl	178.52c/kl	194.33c/kl	211.55c/kl
53-106kl	183.58c/kl	199.85c/kl	221.55c/kl	245.61c/kl	272.28c/kl	301.85c/kl
>106kl	367.17c/kl	399.70c/kl	399.70c/kl	399.70c/kl	399.70c/kl	399.70c/kl
Volume tariff for non-residential	183.58c/kl	199.85c/kl	221.55c/kl	245.61c/kl	272.28c/kl	301.85c/kl
Service access (residential)	$215.26	$234.33	$255.09	$277.70	$302.30	$329.08
Service access (non-residential)	$215.26	$234.33	$255.09	$277.70	$302.30	$329.08

Sewerage Pricing Structure – All Districts

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Service access (residential & non-residential)	$496.33	$513.92	$532.13	$550.99	$570.52	$590.74

3. Under Rising Block Tariffs the price elasticity of demand are assumed to be as follows giving rise to an average reduction in demand of 3.4%.

Consumption Blocks	% Price Change	Price Elasticity	% Change in Demand
0 to 53	-2.6	0	0
53 to 106	14.3	-0.1	-1.4
>106	68.8	-0.1	-6.9

4. Southern Rural Water charging regime is assumed to remain, whereby 100% is fixed. Preliminary real prices are included below; (Jan 2013 $ M)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Southern Rural Fixed Annual charge $ real	1.540	1.531	1.704	1.857	1.921	2.028

5. The Plan assumes Permanent Water Savings Rules (PWSR) will apply for the entire period of Water Plan 2013/18 and Water Plan 2018/23.

6. A total of 21,500ML will be supplied from Melbourne Water for Sunbury, Melton, Bacchus Marsh and the Gisborne area during Water Plan 2013/18.

7. All figures are presented in real January 13 dollars

8. Interest rates on surplus funds to be 3.25%.

9. Inflation is assumed to be 2.5% p.a. for the period of the Water Plan.

10. The Water Plan incorporates strategies incorporated into the demand forecasting as part of Western Water's WSDS, which include initiatives to reduce water use by 25% by 2015 and 30% by 2020.

11. Payments to Government, by way of TER or dividends are 65% of previous year's profit excluding developer's contributions. The tax rate is 30%.

12. Employee costs are assumed to rise in accordance with the EBA. In real terms this is equivalent to 2.5% inclusive of band increments. This increase is assumed to be offset by efficiency gains of equivalent value plus a 2% productivity factor has been applied to all controllable expenditure. In addition a staff freeze has been imposed for the period of Water Plan 2013/18 which places greater reliance on IT to provide efficiency and improved systems in addition to reliance on staff performance to cover business growth. Incremental increases for Superannuation Guarantee have also been incorporated.

13. Depreciation for new works and developer contributed assets to be included at an average straight line 1.5% per annum, in line with effective average accounting lives.

14. New fixed term loan commitments have been assumed to be at a rate of 4.15%, including a TCV settlement fee of 0.2%, with rates forecast to increasing by 25 basis points each year of the 5 year Water Plan. It is assumed the Financial

Accommodation Levy increases to 2.5% on new loans drawn after 1st July 2013. Total interest bearing debt is predicted to be $330million at the end of this regulatory period (nominal).

15. **New Customer Contributions (NCC) cash and non cash are based on current averages increased by predicted growth estimates (as per the Growth Strategy). NCC are assumed at $1,217 per lot per service as per the current ESC price determination increased by CPI thereafter. It is assumed these will change as a result of the modeling conducted by Western Water in line with the guidance released by ESC in August. All non-cash contributions are assumed to increase by CPI and are aligned with growth predictions and an average per lot asset value. An amendment to this plan will be submitted to ESC by 7 December 2012 incorporating revised NCC charges.**

16. **Bulk Entitlements (BE) – no additional bulk entitlements are required during Water Plan 2013/18.**

Appendix B

New Statement of Obligations October 2012 until revoked

Water Industry Act 1994

STATEMENT OF OBLIGATIONS

I, Peter Walsh, Minister for Water, as Minister administering the **Water Industry Act 1994**, pursuant to Section 4I(2) of the **Water Industry Act 1994**, make and issue the attached Statement of Obligations to the following water authorities:

- Barwon Region Water Corporation;
- Central Gippsland Region Water Corporation;
- Central Highlands Region Water Corporation;
- City West Water Corporation;
- Coliban Region Water Corporation;
- East Gippsland Region Water Corporation;
- Gippsland and Southern Rural Water Corporation;
- Goulburn-Murray Rural Water Corporation;
- Goulburn Valley Region Water Corporation;
- Grampians Wimmera Mallee Water Corporation;
- Lower Murray Urban and Rural Water Corporation;
- Melbourne Water Corporation;
- North East Region Water Corporation;
- South East Water Corporation;
- South Gippsland Region Water Corporation;
- Wannon Region Water Corporation;
- Western Region Water Corporation;
- Westernport Region Water Corporation;
- Yarra Valley Water Corporation.

PETER WALSH MLA

Minister for Water

Dated:

STATEMENT OF OBLIGATIONS

PART 1 PRELIMINARY

1-1 Authorising Provision

.1	The Minister responsible for administering the *Water Industry Act 1994* (the Act) makes and issues this Statement of Obligations to all regulated entities under section 4I of the Act.
.2	Effective from the date on which this Statement commences, the Minister revokes all previous Statements made and issued to a corporation under sections 4I and 8 of the Act with the exception of those System Management Statements made by the Minister on 1 July 2009 as amended.

1-2 Commencement and Term

.1	This Statement commences on the date it is made by the Minister and remains in effect until it is revoked.

1-3 Purpose

.1	The purpose of this Statement is to specify obligations of a Corporation in relation to performing its functions and exercising its powers and to revoke all previous Statements made and issued by the Minister with the exception of those System Management Statements made by the Minister on 1 July 2009 as amended.

1-4 Interpretation

.1	(a) The terms defined in Schedule A to this Statement apply in this Statement. (b) Unless defined in this Statement, terms defined in the *Water Act 1989* and the Act have the same meaning in this Statement.
.2	When this Statement provides at the end of a clause the words in column 1, that clause is an obligation that applies to the entities listed directly opposite in column 2, but only in relation to the powers and functions of those entities specified (if any) in column 2.

Column 1	**Column 2**
applicable all	All Corporations
rural only	The entities included in the definition of "rural", but only in relation to their powers and functions to supply water by agreement and under Part 11 of the *Water Act 1989.*
Melbourne Water only	Melbourne Water in relation to all of its statutory powers and functions.
urban only	The entities included in the definition of "urban", but only in relation to their

		powers and functions to supply water by agreement and under Part 8 or under Part 9 (as may be applicable) of the *Water Act 1989*.
	metropolitan and Melbourne Water only	The entities included in the definition of "metropolitan" and Melbourne Water
	applicable all except rural and Melbourne Water	All Corporations except – • Melbourne Water; and • the entities included in the definition of "rural", but only in relation to their powers and functions under Part 11 of the *Water Act 1989*.
	rural and water corporations that provide water for domestic and stock purposes	All Corporations with powers and functions to: • supply or deliver water by agreement, under Part 8 or Part 11 of the *Water Act 1989*; or • provide water for domestic and stock purposes.

.3

The following rules also apply in interpreting this Statement, except where the content makes it clear that a rule is not intended to apply.

(a) Whenever this Statement requires the Corporation to make something "available to the public", the Corporation must:

(i) publish that thing on the Corporation's website; and

(ii) make a copy of the thing available for inspection at the Corporation's registered office; and

(iii) provide a copy on request at no charge or, where providing the copy involves a significant cost to the Corporation, for a charge that covers the fair and reasonable costs of making the copy available.

(b) Whenever this Statement requires a Corporation to "develop" something, the Corporation must be taken to have complied with that obligation if it has already developed the thing before this Statement commenced.

(applicable all)

1-5 Availability of Statement

.1 The Corporation must make this Statement available to the public.

(applicable all)

1-6 Guiding Principles

.1 In performing its functions, exercising its powers and carrying out its duties, the Corporation must have regard to the sustainable management principles in section 93 of the *Water Act 1989*.

The Corporation must also have regard to the following principles:

(a) the need to undertake continuous review and improvement;

(b) the need to find innovative ways to:

	(i) optimise the operation of water and wastewater systems; (ii) deliver water services that enhance environmental outcomes and amenity in urban and rural landscapes; and (iii) be an efficient and cooperative provider of fit for purpose water products; (c) the need to: (i) engage with public authorities and government agencies to develop and implement integrated water cycle management; (ii) engage with other Corporations to drive business efficiencies, develop shared services and sustain and improve industry knowledge through targeted research programs; (iii) take a strategic approach to improving the productivity of the corporation having regard to emerging technology; and (iv) engage with its customers and the community to ensure that the services it provides reflects their needs; and (d) the need to reduce, where the benefits to the community exceed the costs, the detrimental impacts of its activities on the environment, having regard to best industry standards in this respect. In following the principles outlined above, the Corporation needs to manage its business operations to ensure that it continues to: (a) provide for and maintain the financial viability of the Corporation; (b) minimise the overall whole of life costs of assets; and (c) provide its services in an efficient and affordable manner. (applicable all)

PART 2 THE WATER PLAN

2-1 Preparation and Delivery of a Water Plan

.1	The Corporation must develop a Water Plan that complies with the requirements of this Statement for the purpose of enabling the Commission to make a decision with respect to Prices for Prescribed Goods and Services in respect of the Regulatory Period. (applicable all)
.2	The Corporation must deliver the Water Plan to the Commission by the date set by the Chair of the Commission following consultation with the Minister. (applicable all)
.3	The Corporation must include in the Water Plan: (a) outcomes to be delivered in the Regulatory Period with respect to: (i) Standards and Conditions of Service and Supply; (ii) meeting future demands on the Corporation's services; and (iii) complying with the obligations specified in this Statement, a Regulatory Obligation and other obligations imposed by or under legislation; (b) a description of how the Corporation proposes to deliver those outcomes; (c) the Corporation's revenue requirements in the Regulatory Period; and (d) the proposed price to be charged for each of the Corporation's Prescribed Goods and Services. In developing (a) to (d), the Corporation must also ensure that the contents of the

	Water Plan are in accordance with any guidelines issued by the Commission. (applicable all)

2-2 Procedural Requirements

.1	In developing the Water Plan the Corporation must undertake effective consultation with: (a) its customers and customer committees on matters of concern to its customers; (b) each Regulatory Agency on outcomes to be included in the Water Plan that relate to a Regulatory Obligation; and (c) the Commission on Standards and Conditions of Service and Supply. (applicable all)
.2	In developing the Water Plan the Corporation must consult with the Department on matters to be included in the Water Plan that relate to the performance of the Corporation's functions and the obligations included in this Statement. (applicable all)
.3	The Corporation must submit a draft of its Water Plan to the Minister, the Treasurer and each Regulatory Agency no less than three months prior to the submission of its final Water Plan to the Commission. (applicable all)
.4	The Corporation must make any variation to the Water Plan: (a) requested by the Minister in writing at least one month before the Submission Date, and in relation to which the Minister has consulted with the Treasurer; and (b) relating to the performance of the Corporation's functions and the obligations included in this Statement. (applicable all)
.5	In developing the Water Plan the Corporation must have regard to any comments relating to a Regulatory Obligation that are provided in writing by a Regulatory Agency at least one month before the Submission Date. (applicable all)

PART 3 GOVERNANCE

3-1 Board Role

.1	The Board of the Corporation is accountable to the Minister for ensuring the good governance of the Corporation. The Board is obliged to: (a) be responsible for the strategic planning of the Corporation and oversee the achievement of the strategic plan; (b) be responsible for the management of the affairs of the corporation; (c) exercise the powers of the corporation. (applicable all)

3-2 Board Performance

.1	In accordance with any guidelines issued by the Minister the Corporation must annually review and report by 31 March to the Minister (and for Melbourne Water and the Metropolitan Corporations also to the Treasurer) on the performance of the Board of the Corporation, including in relation to the Board's role and obligations in clause 3-1.1. The report is to include actions to improve the accountability of the Board with regards to its responsibilities as outlined in section 95(4) of the *Water Act 1994*. (applicable all)

PART 4 CUSTOMER AND COMMUNITY ENGAGEMENT

4-1 Customer Engagement

.1	The Corporation must develop and make available to the public: (a) terms of reference for the role of customer committees; and (b) open and transparent processes under which the Corporation will engage customers and the community in its planning processes to ensure that the services it provides reflect the needs and expectations of customers and the community. This includes having regard to any guidelines issued by the Minister for that purpose. (applicable all)

4-2 Customer Information

.1	The Corporation must make available to its customers information about its functions and: (a) the current availability of water, in each of the supply and/or delivery systems it manages; (b) expected changes in the seasonal determination for water; (c) its delivery of significant projects identified in the Water Plan; and (d) its performance with respect to regulatory requirements. (applicable all)

4-3 Information for Schools

.1	The Corporation must make available to schools in the area educational material about sustainable water resource management including information on: (a) water supply; (b) sewage and recycled water; (c) water conservation and the efficient and responsible use of water; and (d) integrated water cycle management. (urban only)
.2	The Corporation must make available to schools in the area educational material about sustainable water resource management including information on:

	(a) bulk sewage; (b) headworks; and (c) catchment management. (Melbourne Water only)

PART 5 RISK MANAGEMENT

5-1 Managing Risks

.1	The Corporation must develop and implement plans, systems and processes, having regard to ISO31000:2009: Risk Management (or as amended) to ensure that risks associated with functions performed and services provided by the Corporation are identified, assessed, prioritised and managed. The Corporation must also annually monitor and report to the Secretary on its risks. (applicable all)

5-2 Managing Incidents and Emergencies

.1	The Corporation must develop an emergency management plan for incidents and emergencies covering all hazards and measures, including: (a) the continuity of services; (b) incidents resulting in waste discharges to the environment; (c) a dam safety incident; (d) a major Information and Communications Technology (ICT) incident; (e) potential security risks, including but not limited to terrorist attacks; (f) risks to water quality; and (g) (for Melbourne Water only) flooding in any waterway in Melbourne Water's waterway management district or water which flows into or out of works operated by Melbourne Water. The emergency management plan must have regard to the Australian Inter-Service Incident Management System. (subject to paragraph (g), applicable all)
.2	In addition to the obligation at 7-2.4 the Corporation must make available to the public its policy on: (a) Pre-release of water from its dam; and (b) Surcharge of water level in its dams. (applicable all)
.3	The Corporation must undertake such periodic training and exercises as may be necessary to ensure that its emergency management plan and business continuity plan are tested and can be implemented effectively. (applicable all)

5-3 Dam Safety

.1	The Corporation must develop and implement processes to identify, assess, manage and prioritise improvements to, and periodically review the safety of, dams, including retarding basins and wastewater storages, operated by the Corporation. (applicable all)
.2	In developing processes under sub-clause 5-3.1, the Corporation must have regard to the ANCOLD Guidelines and have particular regard to: (a) prioritising risks posed by the Corporation's dams over all dams, components of dams and the types of failure; (b) giving priority to reducing risks to life above other risks; (c) basing the urgency of reducing the risk posed by a dam on the relativity of risks to the tolerability limits as defined in the ANCOLD Guidelines; (d) basing programs for reducing risk on the concept "As Low As Reasonably Practicable" as defined in the ANCOLD Guidelines; and (e) where feasible, progressively implementing risk reduction measures to achieve the best outcomes for the available resources. (applicable all)
.3	The Corporation must develop and implement a dam safety monitoring and surveillance program for each dam operated by the Corporation, consistent with the ANCOLD Guidelines. (applicable all)
.4	The Corporation must prepare and give to the Secretary by 30 June each year a report that contains: (a) a prioritised list of proposed dam safety works identified under sub-clause 5-3.1 and the dates by which the Corporation proposes to complete each of those works; (b) a summary of the risk profile of: (i) dams operated by the Corporation at the date of the report; and (ii) each dam on which the Corporation proposes to undertake safety works, after those works are complete; and (c) a summary of the overall risk reduction profile of the Corporation's dams. (applicable all)
.5	If for any reason the Corporation is unable to undertake any proposed dam safety works identified under sub-clause 5-3.1 within the time advised, it must promptly prepare and give to the Secretary a report which explains why the Corporation is unable to undertake those works and includes any other information requested by the Secretary. (applicable all)

5-4 Blue Green Algal Blooms

.1	The Corporation must report any blue green algal blooms impacting on water supply or delivery services to: (a) the Department of Health;

	(b) the Department; and (c) the relevant Regional Coordinator. (applicable all)
.2	If the Corporation is nominated as a Regional Coordinator by the Secretary, the Corporation must: (a) develop and maintain on an annual basis a contingency plan for regional blue-green algal blooms; and (b) undertake its duties as a Regional Coordinator in accordance with that contingency plan and the Blue Green Algae Circular. (applicable all)

PART 6 PLANNING

6-1 Metropolitan Integrated Water Cycle Strategy

.1	By 31 March 2017, and within each five yearly period thereafter, the Corporation must work with the Office of Living Victoria to develop, in accordance with any written guidelines issued by the Minister, a Metropolitan Integrated Water Cycle Strategy that identifies the best mix of measures to: (a) maintain a balance between the demand for water and the supply of water in cities and towns; (b) facilitate efficient investment in all water cycle services, including recycling sewage or trade waste, stormwater capture and re-use, and demand management; and (c) improve the resilience of water supply systems (including fit-for purpose) through scenario based planning and adaptive management having regard to risk and uncertainty. In identifying the best mix of measures, the Corporation should consider opportunities that support liveable and sustainable cities and towns through the delivery of benefits across the urban water cycle, including approaches to align the funding of benefits with the organisation responsible for their delivery. (Metropolitan corporations, Melbourne Water and Western Water only)
.2	In developing a Metropolitan Integrated Water Cycle Strategy, the Corporation must consult with the community and key stakeholders including: (a) Local Government; (b) the Growth Areas Authority; (c) the Department for Planning and Community Development; (d) relevant developers and builders; and (e) other water businesses in the region including Southern Rural Water. (Metropolitan corporations, Melbourne Water and Western Water only)

6-2 Metropolitan Integrated Water Cycle Planning

.1	The Corporation must work with the Office of Living Victoria to develop, in accordance with any written guidelines issued by the Minister, Integrated Water

	Cycle Plans and precinct structure plan submissions. (Metropolitan corporations, Western Water and Melbourne Water only)
.2	Integrated Water Cycle Plans and precinct structure plan submissions must be developed jointly where more than one Corporation provides services in the area. (Metropolitan corporations, Western Water and Melbourne Water only)
.3	In exercising its functions under this clause, the Corporation must consult with the community and key stakeholders including: (a) Local Government; (b) the Growth Areas Authority; (c) the Department for Planning and Community Development; and (d) relevant developers and builders. (Metropolitan corporations, Western Water and Melbourne Water only)

6-3 Waterways and Drainage Services

.1	The Corporation must develop, in accordance with any written guidelines issued by the Minister, a Strategy that sets out the responsibilities, goals, levels of service and programs of work for waterway management, flood management and drainage taking into consideration: (a) the efficient and effective delivery of services where: (i) benefits to the community exceed the costs; (ii) investment levels are prudent; (iii) opportunities for stormwater capture and fit-for-purpose re-use are facilitated; (iv) the principles of integrated water management are taken into account; (v) systematic and transparent processes are used to determine priorities; (vi) scenario planning is adaptive, having regard to risk and uncertainty; and (vii) progress in implementing the Waterways and Drainage Strategy is monitored and reported to the public and the Minister using key performance indicators; (b) any relevant Integrated Water Cycle Strategy; (c) any relevant Integrated Water Cycle Plan; (d) any relevant Victorian Waterway Management Strategy, Regional Catchment Management Strategy, or catchment sub-strategy; (e) and relevant Victorian flood strategy; and (f) any other matter which the Corporation considers necessary or desirable. (Melbourne Water only)
.2	The Corporation must review and amend the Waterways and Drainage Strategy:

	(a) at least once in every five years; and (b) whenever the Minister requests in writing. (Melbourne Water only)
.3	The Corporation must promptly provide a copy of any proposed amendments to the Waterways and Drainage Strategy to the Minister for comment prior to any amendments being made to the Waterways and Drainage Strategy. (Melbourne Water only)
.4	In developing a Waterways and Drainage Strategy, the Corporation must consult with the community and key stakeholders including: (a) the Office of Living Victoria; (b) other water corporations operating in the area; (c) the Department of Sustainability and Environment; (d) the Environment Protection Authority; (e) Local Government; (f) the Growth Areas Authority; (g) the Department for Planning and Community Development; and (h) relevant developers and builders. (Melbourne Water only)

6-4 Regional Integrated Water Cycle Strategies

.1	By 31 March 2017, and within each five yearly period thereafter, the Corporation must develop, in accordance with any written guidelines issued by the Minister, an Integrated Water Cycle Strategy that identifies the best mix of measures to: (a) maintain a balance between the demand for water and the supply of water in cities and towns; (b) facilitate efficient investment in all water sources, including recycling sewage or trade waste, stormwater capture and re-use, and demand management; and (c) improve the resilience of water supply systems (including fit-for purpose) through scenario based planning and adaptive management having regard to risk and uncertainty. In identifying the best mix of measures, the Corporation should consider opportunities that support liveable and sustainable cities and towns through the delivery of benefits across the urban water cycle, including approaches to align the funding of benefits with the organisation responsible for their delivery. (applicable all, except rural, Metropolitan corporations, Melbourne Water and Western Water)
.2	In developing an Integrated Water Cycle Strategy, the Corporation must consult with the community and key stakeholders including: (a) the Office of Living Victoria; (b) Local Government; (c) the Department for Planning and Community Development; and

	(d) relevant developers and builders. (applicable all, except rural, Metropolitan corporations, Melbourne Water and Western Water)

6-5 Drought Response Plans for Urban Systems

.1	The Corporation must: (a) develop a Drought Response Plan that governs the management of the supply of water by the Corporation in any period of drought or when the supply of water is limited; (b) not rely on the Minister declaring a water shortage and qualifying rights to water under the *Water Act 1989* as an option for maintaining supplies as part of a Drought Response Plan; (c) comply with any guidelines issued by the Minister for the purpose of drought response planning; and (d) make its Drought Response Plan available to the public, unless the Minister consents in writing to not making available a Plan or part of a Plan. (urban only)
.2	The Corporation must review, and if necessary amend, its Drought Response Plan: (a) at intervals of no more than five years; and (b) within twelve months of either: (i) the lifting of any period of water restriction imposed in accordance with the Corporation's Drought Response Plan; or (ii) any major change occurring to works or arrangements for conserving water for, or supplying water to, any water supply system that is relied upon for the supply of water by the Corporation. (urban only)
.3	The Corporations that share water supply systems must cooperate and coordinate with each other when developing, reviewing or implementing their Drought Response Plans. (applicable all)

6-6 Water Allocation and Reserve Rules for Rurals

.1	The Corporation must: (a) make and publish rules for allocating available water for the current year and setting aside reserves for subsequent years; (b) provide regular information to customers about current and forecast water allocations under certain scenarios; and (c) develop contingency plans for managing severe water shortages in consultation with the Corporations they supply. (rural corporations and water corporations that provide water for domestic and stock purposes, except Melbourne Water)
.2	The Corporation must review, and if necessary amend its allocation and reserve rules: (a) at intervals of no more than five years; (b) within twelve months of a final allocation to high reliability entitlements of less than 50%; and (c) consult with customers and the Minister prior to amending allocation and reserve rules.

	(rural corporations and water corporations that provide water for domestic and stock purposes, except Melbourne Water)

PART 7 WATER SERVICES

7-1 Managing Assets

.1	The Corporation must develop and implement plans, systems and processes to manage its assets in ways which: (a) maintain the standards and conditions of service: (i) specified by the Commission in a Code issued under section 4F of the Act; or (ii) included in a Water Plan and approved by the Commission; and (b) minimise the overall whole of life cost of providing the service. (applicable all)
.2	The Corporation must, in consultation with its customers, develop and implement plans, systems and processes to manage its assets providing irrigation services in ways which: (a) maintain agreed standards of service to customers; (b) deliver water efficiently; (c) adapt to the changing needs of customers; (d) minimise the overall whole of life cost of providing the service; and (e) enhance environmental outcomes and amenity where service standards to irrigation customers are not compromised. (Corporations with irrigation and drainage districts only)

7-2 Bulk Supply Systems

.1	The Corporation must assess the efficiency of bulk water supply systems and must develop and implement programs to improve efficiency where benefits exceed costs. (applicable all)
.2	The Corporation must report to the Secretary, as requested by the Secretary, on the efficiency of its bulk water delivery systems. (applicable all)
.3	The Corporation must, where waterways and wetlands are used for the supply of water, develop and implement plans and programs consistent with any guidelines issued by the Secretary, to: (a) seek to enhance ecological benefits where service standards to customers are not compromised; (b) work cooperatively with the Victorian Environmental Water Holder and relevant agencies; (c) have regard to any guidelines issued by the Minister for that purpose; and (d) make available to the public information on its activities to enhance ecological benefits. (applicable all)

.4	The Corporation in exercising its storage management functions must: (a) consult with relevant floodplain management authorities; and (b) have regard to s 122ZL(2) of the Water Act 1989. (applicable all)
.5	The Corporation must, when it renews or carries out major works on a dam or existing structure on a waterway, ensure that: (a) it is renewed or constructed so that: (i) native fish may move past the structure; (ii) water releases do not pose an environmental risk through variations of temperature, dissolved oxygen, sediment, nutrients or other substances; and (iii) adequate off takes are provided for environmental flows; or (b) if it is not practical to comply with paragraph (a), it is renewed or constructed in accordance with a plan of works approved by the Secretary. (applicable all)

7-3 Licensing Administration Functions

.1	A Corporation to which the Minister has delegated powers and functions for licence administration under the *Water Act 1989* must exercise those powers and perform those functions in accordance with the terms and conditions of the instrument of delegation and in an effective and efficient manner in accordance with any guidelines or policies issued by the Minister for that purpose. (applicable all)

7-4 Metering

.1	Corporations providing non-urban water supplies or delivery services must prepare and implement Metering Action Plans that comply with the Victorian Implementation Plan for the National Metering Standards for Non-Urban Water Meters. (applicable all)

7-5 Sewerage Services to Unsewered Urban Areas

.1	The Corporation needs to participate with municipal councils in the development of councils' Domestic wastewater management plans. (applicable all, except rural and Melbourne Water)
.2	When considering the types of sewerage services to be provided to unsewered urban areas, the Corporation must: (a) consider fit for purpose service options; and (b) identify the: (i) costs and benefits to the Corporation's customers and community; and (ii) risks to the Corporation.

	(applicable all, except rural and Melbourne Water)

7-6 Sewerage Services to New Urban Areas

.1	When considering the types of sewerage services to be provided to new developments, the Corporation must: (a) consider fit for purpose service options; (b) identify the: (i) costs and benefits to the Corporation's customers and community; and (ii) risks to the Corporation; and (c) not agree to service options that unreasonably transfer costs from the developer to the Corporation's customers. (applicable all, except rural and Melbourne Water)

7-7 Sewerage Connections to Properties

.1	The Corporation must not require a serviced property to be connected to the Corporation's sewerage works unless the sewerage service has been: (a) included in a sewerage management plan developed by the Corporation in conjunction with the Environment Protection Authority and relevant municipal council and in consultation with the local community; or (b) provided in the interests of health or the environment after consultation with and written advice from the Environment Protection Authority, municipal council or the Chief Health Officer within the meaning of the *Public Health and Wellbeing Act 2008*. (applicable all, except rural and Melbourne Water)
.2	The Corporation needs to take all reasonable steps to ensure that a property provided with a sewerage service: (a) included in a sewerage management plan developed in conjunction with the Environment Protection Authority and relevant municipal council, and in consultation with the local community; or (b) provided in the interests of health or the environment after consultation with the Environment Protection Authority, a municipal council or the Chief Health Officer within the meaning of the *Public Health and Wellbeing Act 2008*; is connected to the Corporation's sewerage works, unless the owner of a property can demonstrate that wastewater can be sustainably reused on site in accordance with guidelines issued by the Environment Protection Authority. (applicable all, except rural and Melbourne Water)

7-8 Trade Waste

.1	The Corporation must develop policies and practices to manage trade waste to: (a) protect its sewerage systems, including treatment works and processes,

	and the health and safety of the public and of people working in or operating those systems; (b) minimise environmental impacts consistent with any licence issued under the *Environment Protection Act 1970*; and (c) facilitate recycling by ensuring that trade waste accepted does not present barriers to recycling or reuse of wastewater or biosolids. (applicable all, except rural)
.2	In developing trade waste management policies and practices, the Corporation should be guided by the environmental protection principles set out in section 1 of the *Environment Protection Act 1970.* (applicable all, except rural)

7-9 Capital Contributions by Property Owners

.1	In this clause, the owner of a property does not include the owner of a property being subdivided, developed or used for commercial purposes. (applicable all, except rural and Melbourne Water)
.2	The Corporation must offer the owner of any property who is required to make a contribution the option (amongst other options) of paying that contribution in instalments over 20 years as an annuity calculated by reference to the 20-year market annuity rate, as determined by the Treasury Corporation of Victoria prevailing at the time the contribution is calculated. (applicable all, except rural and Melbourne Water)

PART 8 COMPLIANCE

8-1 Complying with Obligations

.1	The Corporation must monitor compliance with its obligations under Parts 1 to 7 inclusive of this Statement. (applicable all)
.2	If the Corporation becomes aware of a material failure to comply with its obligation under Parts 1 to 7 of this Statement, the Corporation must give the Minister a written report, within 30 days after becoming aware of the failure, that includes: (a) the nature of and reason for the failure; and (b) a proposed plan of action to prevent the failure re-occurring. (applicable all)
.3	The Corporation must make any variation to the plan of action referred to in sub-clause 8-1.2(b) requested in writing by the Minister. (applicable all)

.4	The Corporation must: (a) implement the plan of action referred to in sub-clause 8-1.2(b), as varied by the Minister; (b) report its progress in implementing the plan, whenever the Minister requests in writing; and (c) summarise the contents of any report made under sub-clause 8-1.2(b) and its progress in implementing the plan in its annual report. (applicable all)

8-2 Compliance Audits

.1	The Corporation must, when requested by the Commission not more frequently than once every twelve months, arrange for an audit of its compliance with: (a) clause 8-1 of this Statement; and (b) any other obligation under Parts 1 to 7 of this Statement that the Corporation has been requested by the Minister to audit. (applicable all)
.2	The Corporation must ensure that any audit under sub-clause 8-2.1 is conducted: (a) by an independent auditor nominated by the Corporation and approved by the Commission; and (b) in accordance with any guidelines issued by the Commission. (applicable all)
.3	The Corporation must ensure that a copy of the auditor's final report is provided to both the Commission and the Minister. (applicable all)
.4	The Minister may, at any time, require the Corporation to report to the Minister in writing on action taken by the Corporation in response to any matter: (a) contained in an auditor's report; and (b) specified by the Minister in writing. (applicable all)

8-3 Other Audits and Reviews

.1	The Corporation must, when requested by the Minister, arrange for an audit or review of any matter specified by the Minister in relation to the performance of its functions and the exercise of its powers. (applicable all)

SCHEDULE A
DEFINITIONS

The following definitions apply:

"Act" means the *Water Industry Act 1994*.

"ANCOLD Guidelines" means the Guidelines issued by the Australian National Committee on Large Dams Inc.

"Commission" means the Essential Services Commission.

"Corporation", except when used to define other words or terms in this Schedule A, means a regulated entity, which has the same meaning as provided in section 4A of the Act.

"Department" means the Department of Sustainability and Environment.

"Licence Administration" means the power or function of a Corporation as a delegate of the Minister under the *Water Act 1989*:

- of receiving, considering and determining an application for a licence or a water-use registration and an application to renew, amend, vary or transfer a licence or a water-use registration;
- to provide services to a licence holder;
- to supervise licensed activities;
- to sell a licence; and
- to fix or determine a fee for such an application, provision of service or supervision activity.

"Melbourne Water" means Melbourne Water Corporation.

"Metropolitan" means City West Water Corporation, South East Water Corporation and Yarra Valley Water Corporation.

"Minister" means the Minister responsible for administering the Act.

"Prescribed Goods and Services" means the goods and services specified in the Water Industry Regulatory Order as prescribed goods and services in respect of which the Commission has power to regulate prices.

*"***Regional Coordinator"** means a Corporation listed as a Regional Coordinator in the Department's annual Blue-Green Algae circular.

"Regulatory Agency" means the Environment Protection Authority, the Secretary to the Department of Health, and the Commission.

"Regulatory Obligation" means:

i. in relation to the Environment Protection Authority, an obligation imposed by or under the *Environment Protection Act 1970;*
ii. in relation to the Commission, an obligation imposed by or under a Code made under section 4F of the *Water Industry Act 1994*;
iii. in relation to the *Secretary* to the Department of Health, an obligation imposed by or under the *Safe Drinking Water Act 2003*, the *Food Act 1984* or the *Health (Fluoridation) Act 1973*.

"Regulatory Period" means the period determined by the Commission commencing on a date to be set by the Commission.

"Rural" means Goulburn-Murray Rural Water Corporation; Grampians Wimmera Mallee Water Corporation (but only in relation to its functions to supply water by agreement and under Part 11 of the *Water Act 1989*); Lower Murray Urban and Rural Water Corporation (but only in relation to its functions to supply water by agreement and under Part 11 of the *Water Act 1989*); and Gippsland and Southern Rural Water Corporation.

"Secretary" means the person occupying or acting in the position of Secretary to the Department.

"Standards and Conditions of Service and Supply" means Standards and Conditions of Service and Supply of declared goods and services regulated by the Commission under the Water Industry Regulatory Order and includes any requirements specified by the Commission in a Code made under section 4F of the Act.

"Statement" means this Statement of Obligations.

"**Submission Date**" means the date set under clause 2-1.2.

"Urban" means Metropolitan, Barwon Water Corporation, Central Highlands Water Corporation, Coliban Water Corporation, East Gippsland Water Corporation, Gippsland Water Corporation, Goulburn Valley Water Corporation, Grampians Wimmera Mallee Water Corporation (but only in relation to its powers and functions to supply water by agreement and under Parts 8 and 9 of the *Water Act 1989*), Lower Murray Water Corporation (but only in relation to its powers and functions to supply water by agreement and under Parts 8 and 9 of the *Water Act 1989*), North East Water Corporation, South Gippsland Water Corporation, Wannon Water Corporation, Western Water Corporation and Westernport Water Corporation.

"Urban water cycle" means the hydrological cycle within an urban environment, including water supply, wastewater management, waterway health, flood management, and protection of urban amenity. It encompasses the treatment, storage and circulation of water through built infrastructure, such as water supply, drainage and sewerage systems, as well as natural systems.

"Water Plan" means the Water Plan required by this Statement to be delivered to the Commission.

"Water Industry Regulatory Order" means the Water Industry Regulatory Order made by the Governor in Council under section 4D of the Act.

Appendix C

Hardship Policy

Appendix C: Hardship Policy

Purpose

To outline Western Water's commitment to respond appropriately to customers experiencing financial difficulty, while following up on outstanding accounts.

Policy

Western Water recognises that customers on low and fixed incomes, or in difficult personal circumstances, may be vulnerable to increasing costs for essential services, including water and sewerage services. Western Water also appreciates that the personal circumstances of customers experiencing financial difficulty are complex and therefore care will be taken not to generalise and categorise customers into groups based on a single characteristic.

Western Water recognises a customer in hardship as someone who is identified either by themselves, Western Water, or an independent accredited financial counsellor as having the intention but not the financial capacity to make the required payments within the timeframe set out in the business's payment terms.

Where a customer is identified as being hardship or potential hardship Western Water will take best endeavours to confirm the customer's position and offer appropriate customers access to the Customer Support Program.

Customers who can apply for assistance under this policy include:

- **Customers who have experienced a sudden unforeseen change in living circumstances, a single event or short term resources shortfall (such as ill health, unemployment, separation, or a death in the family).**
- **Customers who are on a low income and who do not expect improvement in their financial situation in the foreseeable future.**
- **Other eligibility criteria may also be considered at the discretion of Western Water.**

Customers in the Customer Support Program will:

- **Be treated respectfully, sensitively and non-judgementally.**
- **Have their cases individually considered and their circumstances kept confidential.**
- **Receive prompt information on alternative payment arrangements, Western Water's Hardship Policy and government assistance schemes.**
- **Nominate the amount they can afford and the frequency of instalments of their preferred payment plan.**
- **Choose from various payment methods available and receive written confirmation of the agreed payment plan within 10 working days.**
- **Re-negotiate the amount of their instalment if there is change in their circumstances.**
- **Receive information about free independent and accredited financial counselling services.**
- **Receive a language interpreter service free.**
- **Avoid water supply restriction as long as they establish and maintain an agreed payment arrangement.**
- **Be shielded from legal action and additional debt recovery costs, whilst they continue to make payments according to an agreed schedule, or an agreed altered schedule of payments.**

- **Where possible speak with a person at Western Water who is familiar with their situation in order to re-negotiate their payment arrangement if a payment has been missed or is likely to be missed.**
- **Be advised about how to reduce consumption to assist in reducing future water use.**
- **Be advised about their right to lodge a complaint with the independent dispute resolution scheme via the Energy and Water Ombudsman of Victoria (EWOV) if their affordability issue is not resolved with Western Water.**

Western Water's expectations of Customers in the Support Program:
- **Advise Western Water of their financial difficulties as soon as practicable.**
- **Be reasonable in their negotiations with Western Water staff in pursuit of a mutually acceptable outcome.**
- **Be honest and realistic in their assessment of their capacity to pay.**
- **Seek independent financial advice or representation where appropriate.**
- **Maintain any arranged payment plan and advise Western Water if they are unable to meet a scheduled payment.**
- **Advise Western Water if their circumstances change as soon as practicable.**
- **Maintain contact with Western Water.**

Programs available under the Customer Support Program include:
- **Pay and Save - Where a customer commits to making payments as agreed and on time Western Water may match agreed payment/s to assist customers with regular payment arrangements.**
- **Audit Bonus - A reduction of a customer's water usage where a customer agrees to and undergoes a water audit under Western Water's WaterTight program.**
- **Utility Relief Grant Scheme (URGS) Supplementary Bonus -Where a customer has been granted an URGS and the balance of the account is greater than $500, Western Water may grant an additional waiver on the account in return for the customer committing to a payment plan.**
- **Household Size Relief Plan - For high water usage residences with six or more people in the household, Western Water may consider altered tariff arrangements to mitigate the impacts of a rising block tariff.**
- **Waivers - Western Water will consider waivers on an individual basis for abandonments, owner onus leaks, vacated tenants, compassionate grounds and other cases that may be deemed necessary.**
- **Other Plans - may be considered on an individual basis to meet individual customer needs.**

Related Policies

Customer Service Charter
Information Privacy Act 2000
Personal Privacy Charter
Code of Conduct
Terms of Reference for the Customer Advisory and Community Reference Groups
Collections Policy
Corporate Social Responsibility

Responsible for Review

General Manager Customer and Community Relations

Appendix D

Customer Consultation

Appendix D: Community Consultation

August 2012

Executive Summary

Western Water undertook a multi-stage approach to consultation for Water Plan 2013-2018. The approach was specifically designed to inform, engage and reflect the most representative range of opinions from across the community.

There were three main stages to the Water Plan consultation program: (i) deliberative forums to inform the drafting of the Plan; (ii) online panel feedback on a detailed consultation paper; and (iii) community forums to discuss and refine feedback on the draft Plan.

Across the various stages of the consultation for Water Plan 2013-2018, well over 500 customers provided input to Western Water's direction.

Customer feedback was clear that customers are concerned about:

i. **rising costs, particularly those on lower and fixed incomes and ensuring Western Water does its best to help customers manage their bills;**
ii. **rewarding customers for reducing and continuing to use low levels of water, and conversely, retaining a penalty system for people who use large amounts of water;**
iii. **not paying for infrastructure that does not benefit them or, rather, having to pay infrastructure development costs again (as many paid up front connection fees for their own services many years ago; and**
iv. **ensuring that Western Water plans for secure, sustainable services for the long term and communicates effectively about its services, charges and decision making and educates the community regarding efficient water use.**

Customer input has meant that we have:

a. **reduced the size of the overall price by deferring some planned capital spending until the next Water Plan and freezing staff numbers;**
b. **shifted from an upfront increase of 20% to a smoothed price path of 6.2% per annum over the five years of the plan;**
c. **supported retention of the three tiered rising block tariff for water usage charges;**
d. **elected to maintain existing service standards and Guaranteed Service Levels;**
e. **committed to additional spending in the areas of community education and support, biodiversity, water efficiency, reducing greenhouse gas emissions, and investment in recycled water and biosolids.**

1. Background

Water authorities across Victoria must prepare a plan which sets out how they will manage their business in the upcoming five year period. This plan must meet customer expectations for service delivery, addressing affordability and delivering value for money.

For Water Plan 2013-2018, the ESC required water authorities to undertake broader and more in depth consultation with customers to develop and review the draft of their Water Plan.

As a result, Western Water established clear consultation objectives for Water Plan 2013-2018: to obtain in depth, informed feedback from a wide, representative community base.

Consultation approach

Western Water undertook a multi-stage approach to consultation for Water Plan 2013-2018. The approach was specifically designed to inform, engage and reflect the most representative range of opinions from across the community.

At all times, communications were written in simple, plain language in formats that were user friendly and delivered through channels that would encourage participation.

There were three main stages to the Water Plan consultation program:

Stage	Function	Method	Timing	Customer Participation
1	Input for drafting	Deliberative Forums	Jul-Dec 2011	110*
2	Draft Water Plan – General feedback	Online consultation paper, websites, newspapers and direct mail	Jun-Jul 2012	400
3	Draft Water Plan - Detailed consideration of options	Community forums	Jul-Aug 2012	56*
Total				540*

**** Customer advisory members included in this total but included only once in overall tally.***

Participation

As a result of our staged, innovative and customer oriented consultation approach, customer input into Western Water's third Water Plan has been significantly broader and more detailed than achieved ever before.

In addition to consulting the 27 members of Western Water's customer advisory network at each phase of the consultation approach, another 500 customers have provided input to Water Plan 2013-2018.

Consultation methods

Within our service area, Western Water has been reliant on two main forms of mass communication – local newspapers and direct mail of our customer newsletter. This is supported by our website.

However, customer research has found that traditional communication channels are becoming less effective at gaining an individual's attention and generating

feedback and that websites are useful for those seeking information as opposed to sending out messages.

As a result, Western Water explored new options for informing and engaging customers to ensure we obtained the best input possible for developing and reviewing the new Water Plan. These were enlisted alongside traditional methods to ensure the best level of consultation was achieved.

Consultation methods incorporated:

1. **Deliberative forums**
   An enhanced form of the traditional focus group, these forums consist of up to 30 participants for 3-4 hour sessions. The larger group size and time allocation provides better opportunities to explain and discuss complex topics in detail. Participants are involved in large group discussions as well as smaller table activities so all opinions are canvassed. The higher number of participants ensures a broader cross section of customer base is represented. Participants were recruited from across the service region.

2. **Online customer panel**
   Western Water's online customer panel was developed as an addendum to our market research program during 2011/12. Today, the panel has close to 1,000 members. The advantage of the panel is that customers can be provided with detailed information in visually appealing formats by email and that they can choose when they wish to participate, at a time suitable to their individual needs. The panel provided the opportunity to inform, engage and receive feedback from a very large number of customers within their homes. It had significantly higher participation rates than phone surveys and the format suited delivery of complicated information through both written and visual modes.

3. **Community forums**
   Despite high participation from the online panel, Western Water recognised that face to face discussion provided the best opportunity to fully understand opinions and attitudes on complex topics. Feedback from the online panel had identified specific areas requiring for further attention – these included the price path and tier system. Participants were only recruited from those customers who had completed the online consultation paper to ensure the most informed discussion possible. Forums were held in three regional centres across the service area to ensure representative input.

4. **Traditional communication channels**
   Western Water retained its traditional communication channels to support our communication approach, recognising that these channels work best for those customers who are not comfortable with electronic communication or who have existing strong relationships with Western Water.

   The main traditional channels used to support Water Plan consultation included promotion, links and factsheets on Western Water's website, advertising and stories in local newspapers and community newsletters, promotion in customer newsletter, *H2infO*, which is included with every bill, as well as direct mail issued to stakeholders including key customers, water suppliers, local and state government, consumer groups, community and education groups, environmental groups, developers, agricultural sector.

2. Deliberative forums

The main input for drafting Water Plan 2013-2018 came from a series of four deliberative forums which were held with customers in the second half of 2011. The forums were coordinated by Market Solutions with up to 30 participants at each forum. A full report on the forums is included as Appendix 1.

The forums aimed to provide customers with the opportunity to discuss in detail critical issues impacting decision making for the plan. These issues included how to provide a secure water supply in the context of uncertain climate and rapid population growth while keeping operational costs at a minimum.

An initial forum was held in July 2011 with Western Water's customer advisory network as part of their strategic planning day. This forum gathered initial input on topics and finetuned how the forums would be conducted with customers later in the year.

A further three forums took place in late November, early December 2011 with customers from across the service region. Each forum lasted 3 hours with up to 30 participants.

Western Water representatives were present at each forum to provide technical assistance, ensuring participants were provided with any relevant information required to make informed decisions. The forum facilitator, from Market Solutions, presented topics and posed key questions. Topics were addressed in table groups as well as in open floor forum.

2a. Key findings from deliberative forums

Pricing

Customers held a general understanding of the fixed service charges and variable usage charge but a poor understanding of how the charges are calculated.

Rising block tariff: the tier system was not well understood but, once explained, was considered reasonable "the more you use, the more you pay" and this was quickly linked to encouraging water conservation.

Single tier option: Despite recognising that it was easier to understand, there was very low level of support for the single tier option stating it isn't fair to low water users.

Increased variable split: There was support for this option but customers required more information to understand what it would mean when introduced.

Discretionary spending

Customers were asked to allocate funds from a proposed $100 price increase to various areas of required and discretionary spending with a $40 allocation for CPI, maintaining business as usual.

Customers allocated higher proportions of the proposed price rise to increasing water recycling and water conservation and education programs with lower spending allocated to capital works, reducing greenhouse gas emissions and improving service standards.

Customer value

Core customer values include a reliable, secure water supply that is fit for purpose, well managed and local. There is a strong requirement for Western

Water to clearly inform customers about all water matters and provide information on exactly what is involved in service delivery. Western Water is expected to focus on proactively planning for the future.

Water security and preferences

The top priority for customers was safe, fit for purpose water supplies and a sustainable, affordable and local water supply was clearly preferred.

Regardless of how highly treated a water source could be, customers clearly prioritised high quality drinking water over grey water, stormwater, bore water and recycled water. A lack of preference for desalinated water was clearly evident.

Future water usage

Most householders had undertaken steps to reduce their water use and it was clear that water saving attitudes were firmly entrenched. As water restrictions ease, there was some expectation that usage would increase but not significantly.

2b. Impact on draft Water Plan

The findings from the deliberative forums informed the draft Water Plan in the following ways:

Pricing

- **recognition that limited customer understanding of how charges are calculated would need to be addressed to generate informed feedback and that there was strong concern about the impact of rising prices on poorer members of the community**
- **awareness that support for existing three tier rising block tariff would be difficult to change because it is seen to "reward water conservation"**
- **understanding that while a hypothetical $100 increase was not out of the question, customers prioritised spending on areas like water recycling and education rather than addressing growth, service standards and greenhouse gas emissions.**

Water supply and security

- **awareness of strong customer support for local, sustainable solutions. Customers value proactive planning with affordability top of mind as well as good communications**
- **understanding that desalinated water would not be well supported with existing customer attitudes**
- **recognition that usage forecasts should incorporate lower average household use than pre-drought as water conservation attitudes and behaviours are now well entrenched.**

3. Online customer panel

During 2011/12, Western Water began recruiting for an online panel of customers from across the region. Customers were recruited as part of our market research program and by June 2012, close to 1,000 customers had joined the panel.

A detailed, interactive consultation paper on Water Plan 2013-2018 was issued to Western Water's online customer panel for feedback over a period of six weeks - from 16 June to 31 August. More details on the paper is contained below with a full report of findings in Appendix 2.

Close to 400 customers engaged in the feedback process with over 300 providing input on all four sections of Western Water's consultation paper. This sample size is statistically reliable for Western Water's service population and, due to higher participation rates from Macedon Ranges customers, results were reweighted to accurately reflect population distribution.

Online consultation paper

Western Water's goal was to obtain informed consultation from as many customers as possible.

For this reason, an interactive, detailed consultation paper on the draft Water Plan was delivered to Western Water's online panel in an visually appealing, plain language format supported by state of the art market research technology, through the assistance of Market Solutions.

The online paper was separated into four sections to encourage feedback in short spurts, at times convenient to customers. In general, the four sections addressed context; pricing; service standards and discretionary spending.

Before customers were asked to provide their feedback, they were given sufficient background information to inform their decision making. This background included issues affecting local water supplies, high population growth forecasts and town by town capital works.

Options were provided for future price increases including explanation of the key drivers of price rises and suggested changes to the tier structure as well as consideration of increasing the fixed/variable split for the water bill.

Consultation also explained in detail Western Water's existing service standards and current performance as well as Guaranteed Service Levels. Customers were given the opportunity to comment on every element and recommend changes if felt necessary.

Finally, customers were presented with a range of projects which could be classified as discretionary spending. These included biodiversity actions, water efficiency activities, education and community support activities. The project areas were described along with their impact on the average customer bill. Customers were asked to rate their support for funding these areas.

3a. Key findings from online panel

The main conclusions from the online consultation paper were:

1. **customers were highly ambiguous about the price paths offered indicating Western Water need to do more to understand the customer position about the best option for Water Plan 2013-2018;**

2. **2/3 customers prefer the existing three tier water usage charge; it is considered easy to understand, fair and simple;**
3. **customers find bills easy to understand but a quarter find them difficult to pay;**
4. **there was strong support for exploring alternate water sources as well as;**
5. **very low support for funding the cost of growth and of the 30% who were willing to contribute to the new infrastructure, the average amount they were willing to pay was $28/bill;**
6. **over 90% customers believe we should increase the New Customer Contributions charge and very few think doing so would decrease the level of development**
7. **the results on increasing the variable split of the water bill were also ambiguous, recognising that there would be a cost impact on usage;**
8. **over 90% customers believe regular payment plans would help customers pay their bills and over 2/3 recommend increasing billing frequency;**
9. **There was virtually no dissatisfaction with the current service standards and GSLs and very low support for customers funding any improvements to these;**
10. **Customers supported (score out of 10) funding:**
    a. **Water efficiency activities/programs (7.6);**
    b. **Education programs (7.6);**
    c. **100% beneficial reuse of recycled water (7.5);**
    d. **Environmental enhancement projects (7.4);**
    e. **Community support activities (7.4);**
    f. **Improvements to drinking water above baseline requirements (7.4);**
    g. **Stormwater projects (7.3);**
    h. **Recycled water projects (6.9);**
    i. **Biosolids projects (6.6);**
    j. **Greenhouse gas reduction initiatives (6.5).**

3b. Impact on draft Water Plan

The online consultation paper resulted in:

1. **development of a broader range of price paths to be discussed at the community forums with the understanding that at least one in four customers are already concerned about how they will pay their water bill;**
2. **decision to maintain three tier water usage charge with the view to discussing thresholds and price points of each tier at the forums;**
3. **conclusion that service standards, GSLs and discretionary spending projects were sufficiently supported by the community to not require any further consultation or change in Water Plan 2013-2018;**
4. **recognition that Western Water needed to explore opportunities to partially fund growth outside of water prices.**

4. Community forums

The next phase for consultation was to provide the opportunity for face to face discussion of key Water Plan topics with customers across the region. Invitations were extended to those who had completed the online paper to ensure a high level of awareness and understanding of the key topics being discussed ("informed input"). A full report on the community forums is contained in Appendix 4.

A preliminary forum with our customer advisory network was integrated into their Strategic Planning Day in late July and this was followed by community forums in each of main community segments: the Macedon Ranges, Sunbury and Melton.

Table x: Water Plan Community Forums by location, time & attendance

Customer Group	Date	Time	Participants
Customer advisory network (Sunbury)	Wed 25 July	2.00-4.00pm	22
Macedon Ranges	Tues 31 July	6.30-8.30pm	19
Sunbury	Thur 2 August	6.30-8.30pm	8
Melton	Sat 4 August	10am-noon	7
Total			56

Topics

Following a review of the feedback from the online panel, the key topics discussed at the forums were the proposed price path for Water Plan 2013-2018 as well as options to review the rising block tariff for water usage charges. Because of the significant growth forecast for the region, New Customer Contributions were also considered in these forums.

The purpose of the community forums was to provide detailed insights on key customer issues for the Water Plan and also provide feedback to members of the community on the findings we had received for the online consultation survey.

Each forum covered the following topics:

1. **Consultation paper feedback**
2. **Additional price path options**
3. **New customer contributions**
4. **Options for changing the inclining block tariff for water usage charges**
5. **Billing and account payment (optional if sufficient time)**

These topics were selected because of

a) **their high relevance to customers, and/or**
b) **the need for Western Water to better understand customer needs and preferences to ensure the best possible decision making for the Water Plan.**

4a. Key findings from community panels

The main conclusions from the community forums are:

11. **a price increase of 20% is considered extremely high – "double figure price increases are horrifying";**
12. **customers are strongly opposed to paying for new growth and believe developers should foot the entire cost of development – "it's a user pays society";**
13. **a smoothed price path is considered the best option as a major upfront price increase will be too difficult for fixed and low income households.**

However, there is some scope to consider higher rises in the first two years if that reduces long term cost to customers;

14. there is extremely strong support for the existing three tier water usage charge; if things have to change then reduce the threshold for tier 2 and/or 3;
15. customers are very supportive of alternate water sources and increasing billing frequency and payment options.

4b. Impact on draft Water Plan

The community forums resulted in:

5. efforts to reduce the size of the price increase forecast in Water Plan 2013-2018;
6. selection of a smoothed price path as the best option for the overall customer base;
7. commitment to support the retention of a three tiered water usage charge;
8. consideration for retaining a low price point and same threshold for Teir 1 charges and then exploring changing the threshold or pricing for Tier 2 and/or Tier 3 in the rising block tariff;
9. understanding of the strong customer position that Western Water must pass on costs of growth to developers and new customers, through New Customer Contributions charges as much as possible.

Appendix E

Environmental Initiatives

Appendix E: Environmental initiatives

In the second regulatory period, Western Water committed more than $49 million to meeting environmental obligations. Significant improvements were achieved in sewage treatment, recycled water use, biosolids management, biodiversity management, sewer spills management, water efficiency and greenhouse gas emissions. These initiatives are consistent with key environmental protection principles outlined in EPA publication 1406.1.

Western Water will comply with and seek to be an industry leader in environmental protection in both current and future projects through the active engagement of environmental protection principles including:

- **Integration of economic, social and environmental considerations in key decisions,**
- **The precautionary principle to manage discharge to waterways by upgrading RWPs and aiming for 100% beneficial reuse of recycled water,**
- **Improved valuation, pricing and incentive mechanisms for trade waste to ensure environmental factors through a "polluter pays" principle,**
- **Shared responsibility through progressively reducing ecological degradation and resource intensity,**
- **Waste hierarchy through water efficiency initiatives and internal targets for waste and energy reduction,**
- **Integrated environmental management through adoption of life cycle assessment on all key assets and projects,**
- **Influencing behaviour of customers using recycled water and biosolids to ensure no adverse environmental impacts,**
- **Accountability through provision of an open, transparent environment reporting process for customers with opportunity to participate in environmental program and policy development.**

Meeting environmental initiatives

The initiatives outlined demonstrate Western Water's intention to be a leader in sustainability.

Sewage management

The State Environmental Protection Policy (SEPP) (Waters of Victoria) stipulates that wastewater must be recycled in preference to the discharge to waterways wherever practical. When recycling is not practical there is a requirement to minimise the extent of mixing zones in the receiving water body.

During Water Plan 2008-2013, Western Water undertook an ecological risk assessment (ERA) to determine the impacts on the beneficial uses of the receiving waters - namely Jacksons Creek and Five Mile Creek. While Western Water has explored options for maximising recycling, there remains a need for discharging recycled water to the environment in the future.

The ERA concluded there are benefits in the continuous discharge of recycled water for maintaining environmental flow, providing there is a controlled discharge regime to ensure the extent of predetermined mixing zone is maintained.

EPA Water Plan 2013-2018 Guidance states that water authorities should continue to reduce mixing zones. Western Water will upgrade recycled water plants to meet the EPA's requirements.

There is also requirement for adopting the waste hierarchy. In line with this, Western Water will focus on source reduction. To further enhance the quality of recycled water and biosolids, Western Water will continue with its cleaner production initiatives with trade waste customers.

Western Water will also embark on catchment based sewer monitoring to determine salt inputs to sewer. To assist in water and biosolids recycling Western Water has developed a Trade Waste Management Strategy, By-Law and associated management system to minimise volumetric input and contaminant loadings to sewer by trade waste customers.

Sewage treatment and disposal

Population growth over the past decade has increased inflows and necessitated upgrades for a number of recycled water plants. In addition, those plants which discharge recycled water to water ways have required more advanced treatment processes to meet changes to regulatory requirements aimed at better protecting waterways.

The significant population growth forecast for the region will see further increases to many recycled water plants and the following plants will need upgrading to cater for growth, improve water quality and comply with environmental requirements.

Bacchus Marsh RWP

During WP 2, Bacchus Marsh RWP was upgraded to serve the population growth until 2021. During WP 2, it was determined that the existing winter storage is inadequate for beneficial re-use of recycled water and therefore it is planned to construct additional winter storage at the RWP.

Western Water will continue to monitor the groundwater to determine the risk of ground water contamination and will complete a risk assessment. Potential repairs to existing lagoons could not be undertaken until additional wet weather storage is constructed and therefore future repairs to the existing lagoons will be completed within the Water Plan 2018-2023.

Melton RWP

Under Water Plan 2008-2013, Melton RWP was upgraded to meet EPA obligations for effluent quality until 2014. Upgrade works must continue to expand the sludge processing capacity to ensure adequate sludge treatment. This will assist to maintain a consistent biosolids quality. Additional methane produced can be converted to heat and electricity to reduce Western Water's exposure to grid electricity.

Sunbury RWP

Part of the recycled water produced from Sunbury RWP is returned to Jacksons Creek and the expectation is that Western Water will reduce the mixing zone in Jacksons Creek provided by the discharge.

Despite optimisation, Sunbury RWP fails to comply with the nitrogen limit of the EPA licence during winter months. These failures are due to bottlenecks within the treatment plant as well as population growth and increased organic loading.

During Water Plan 2013-18, Western Water proposes to upgrade Sunbury RWP to achieve licence compliance and reduce or maintain the existing mixing zone within Jacksons Creek.

Replacement of the existing chlorine disinfection system with a UV system was anticipated for Water Plan 2008-2013 but it has been deferred to Water Plan 2013-18 to coincide with the proposed upgrade of the plant.

Gisborne RWP
Gisborne's recycled water plant was upgraded during Water Plan 2 to accommodate population growth until 2021. However, increased flows revealed the plant does not have capacity to provide necessary disinfection and cannot provide helminth reduction to enable supply of recycled water for stock watering.

Upgrades are proposed to comply with microbiological limits and to enhance recycling. A dewatering facility will also be established at Gisborne RWP during Water Plan. This was committed in the 2007 works approval for the plant's upgrade.

Riddells Creek RWP
Riddells Creek Recycled Water Plant is overloaded and has inadequate capacity for treatment as a result of population growth and connection to Macedon. An upgrade is proposed to achieve continuous compliance with recycled water quality and EPA licence limits.

Woodend RWP
Western Water is required to undertake an investigation of the treatment lagoons at Woodend RWP under a works approval application issued by EPA. During Water Plan 2008-2013, the Woodend RWP was modified to include a mechanical treatment plant.

However, the lagoons are still required to achieve disinfection with an investigation indicating a lack of liner due to the lagoons being constructed 30 years ago. In order to comply with SEPP (Groundwaters), Western Water has to provide a liner to the treatment lagoons.

Table 1: Capital costs associated with sewage treatment

	2013/14	2014/15	2015/16	2016/17	2017/18	Total
Bacchus Marsh RWP lining					338	338
Melton RWP	4,500	4,300				8,800
Sunbury RWP	1,500	1,500	10,100	20,000		33,100
Riddells Creek RWP	250				2,000	2,250
Woodend RWP					1,011	1,011
Gisborne RWP		397	1200	1400	1300	4,300

Licence compliance

Western Water will monitor inflows and outflows to the recycled water plants and continue monitoring groundwater quality to demonstrate that no seepage of waste is occurring - as per the EPA licence requirement.

Biosolids will be monitored for chemical and bacterial quality.

EPA guidance notes on Water Plan 2013-2018 have highlighted its concern in regard to emergency discharges during wet weather flows. Western Water will focus on mitigating the need for emergency discharges by upgrading wet weather storages for those plants which are not licensed to discharge to waterways.

Western Water will negotiate with EPA during Water Plan 2013-2018 period on realistic licence limits for discharges taking into consideration holistic environmental outcomes including the consequence of increased green house gas

emissions in meeting licence limits. This is likely to include obtaining a discharge licence at both Melton and Bacchus Marsh RWP's.

Water Plan costs for continuous EPA licence maintenance are outlined in the following table.

Table 2: Costs associated EPA Corporate Licence maintenance ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
EPA Licence fee	$96	$96	$96	$96	$96
Licence Monitoring	$120	$120	$120	$120	$120
Ground Water sampling	$35	$35	$35	$35	$35
Analysis Non-Routine	$50	$50	$50	$50	$50

Recycled Water

Western Water has an aspirational target of 100% beneficial use of all recycled water and is leading major urban water utilities in Australia in this important initiative.

Key drivers for adopting a 100% aspirational goal includes satisfying demand for high quality water supplies to meet growth (in all sectors including agribusiness, residential and recreational), responding to scarcity of supply due to periods of low rainfall, reducing peak drinking water demands, reducing discharges to the environment and the high costs of augmentation of existing drinking water supplies.

Western Water has been proactive in promoting recycled water as a valuable resource and as a reliable, good quality water supply solution for a range of approved uses. This commitment has resulted in substantial drinking water savings through substitution of recycled water for drinking water where appropriate and approved by the Environmental Protection Authority and endorsed by the Department of Health.

Increasing climate risk and variability, changing community attitudes and pressure on natural and built environment highlight the necessity for efficient and effective water supplies that are adaptable and suited for purpose.

Western Water recognises the role that water (including recycled water and stormwater) plays in a liveable, sustainable and productive communities as described by the Ministerial Advisory Councils', "Living Melbourne, Living Victoria" Roadmap.

Supply of recycled water has satisfied the demand for high quality water supplies to meet growth, reduce peak drinking water demands, responded to variable supply scenarios including drought, reduced discharges to the environment and offset or delayed the high costs of augmentation of existing drinking water supplies.

Dual water supplies (Class A recycled water for residential development) to service high residential growth areas are a key component of the WSDS if Western Water is to meet required water consumption targets.

The concept of a Water Atlas is being developed by Western Water which will promote tailored water supply solution on a catchment by catchment basis. The Water Atlas will investigate all possible water supply options and establish a methodology for assessment which considers economic efficiency, community attitudes and environmental outcomes.

For the year ended June 2012, 56% of all recycled water was beneficially reused. This was lower than target due to higher than average rainfall across the year reducing the demand for recycled water. All recycled water plants experienced high rainfall, resulting in inflows and winter storages levels being higher than planned. Work has been undertaken and will continue to investigate current and future supply, demand and capacity of each RWP to improve the reliability of planning.

Western Water will continue to;

- **Encourage and promote integrated water cycle management solutions when working with community stakeholders;**
- **Work with all levels of Government, Councils, developers and other stakeholders to implement smart water sensitive urban design solutions from subdivisional level to local, site specific initiatives;**
- **Adopt transparent, adaptive and flexible decision-making tools;**
- **Ensure that risks are made explicit, are understood, managed and accepted by the most appropriate stakeholders;**
- **Adopt the risk management framework from the Australian National Guidelines to assess all the health and environmental risks in new and existing projects;**
- **Educate and inform stakeholders of shared risks and responsibilities;**
- **Maintain and enforce our Trade Waste Policy to protect the quality of recycled water produced;**
- **Actively pursue HACCP accreditation for all Class A recycled water schemes;**
- **Work with our teams, community, customers, Government and regulators to ensure schemes are planned, constructed, operated, and recycled water is used, at all times, consistent with best practice guidelines; and**
- **Keep abreast of latest technologies, research and initiatives in recycled water.**

Class A Recycled Water Supply

With the announcement of Melbourne @ 5 Million, Western Water took the opportunity to influence the Precinct Structure Plan that for the Toolern, Rockbank and Diggers Rest areas. The result was the inclusion of a requirement to use 50% less water than traditionally serviced developments. This requirement supports the use of recycled water and it is expected all residences will be provided with Class A recycled water supply.

The number of residential customers continues to grow at Eynesbury, Western Water's first dual reticulation town. A total of 492 properties are now supplied with recycled water, at 51% reduction in drinking water use, the proportion of drinking substitution observed in the development exceeds the expected 50% drinking water savings compared to the central regional sustainable water strategy drinking water target of 210 litres per person per day.

To create a liveable, sustainable and productive region, Western Water will continue to assess the viability of class A recycled water schemes and assess alternative recycled water markets on a catchment by catchment basis throughout the growth areas, subject to cost effectiveness and customer support.

Communication

A variety of methods are employed to disseminate information to recycled water customers, the public and other stakeholders to ensure protection of the public and employees. The methods communicate positive messages on water recycling and include using purple coloured infrastructure, above and below ground as well as signage, fact sheets, newsletters, advertising and information sessions and meetings.

As a result, Western Water's has achieved considerable success in educating the market of the benefits of recycled water supplies. Research has found that an customers are supportive of Western Water's recycled water strategy.

Recycled Water Production and Demand – increasing climate variability

An important component of the Recycled Water Strategy is the planning of future recycling schemes and extension of existing schemes. This is undertaken with understanding of existing and future inflows to recycled water plants, and likely customer demand based on climate information such as rainfall and evaporation rates.

The community is becoming more aware of alternative water supplies and during periods of low rainfall (as observed during 2008/09) customers conserve water and redirect some water away from the sewer system onto gardens. This resulted in lower than expected volumes of recycled water available in a time of higher demands. On the contrary during periods of normal rainfall, higher flows to the sewerage system are experienced and more recycled water is available while less is required by customers.

Highly changeable weather patterns increase the unpredictability of recycled water demand and supply. A revision of recycled water plant production and associated customer demand will be undertaken on an annual basis to ensure that any significant changes or disparity between supply and demand for each recycled water scheme can be identified early and a managed approach developed.

Government Policy and Regulation

The Victorian Government released its Living Melbourne, Living Victoria Implementation Plan and associated Government Response which strongly supports the use of recycled water in an integrated manner. Western Water's current policy is highly aligned with the new Roadmap.

In keeping with the EPA's requirements, Western Water has an aspirational target achieving 100% beneficial use of all recycled water to up to a 90th percentile wet year. Recycled water scheme development will also be consistent with the EPA's requirement to reduce the mixing zones of recycled water discharges over this regulatory period. Western Water has an aspirational target of having no mixing zones in Water Plan 2018-2023, an expectation outlined by the EPA.

Economic Rational

Western Water has consistently applied the principle of economic efficiency whilst implementing recycled water schemes. All schemes are expected to recover costs over time as evidenced by the Recycled Water Policy. This claim has recently been proven by a cross-subsidy review.

Growth in population requires continual investment in recycled water schemes to maintain quality, reliable supplies and remain consistent with government expectations and regulation. A list of new specific programs for achieving the proposed recycled water targets are described in the following tables.

Table 3: Bacchus Marsh recycled water scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Bacchus Marsh Travelling Irrigator	69	0	50	0	0
Bacchus Marsh RW Scheme stage 1	300	0	0	0	0
Bacchus Marsh RW Scheme extension	149	53	53	0	300

The Bacchus Marsh recycled water scheme consists of a well established irrigated farm including winter storage located at the Bacchus Marsh RWP. Climate

variability has meant that additional flows are available from the plant and market development can be undertaken for additional supplies.

Scheme development is driven by the lack of available discharge to waterways. Emergency discharge will be likely in greater than average wet years.

Table 4: Gisborne Recycled Water Scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Gisborne RW Scheme Stage 2	50	50	50	50	50

The Gisborne recycled water scheme is a successful scheme consisting of a distribution network supplying 6 properties with recycled water throughout the year. The Recycled Water Plant also contributes flows to nearby Jacksons Creek under a discharge licence. Population growth enabled the expansion of the existing scheme to make recycled water available to a local food bowl providing climate safe irrigation supplies to agricultural and horticultural enterprises. Scheme extensions are planned to reduce the need for discharge the mixing zone of Jackson's Creek, consistent with EPA expectations. It is forecast, however, that the volume of recycled water returned to Jackson's Creek will increase over the Water Plan.

Table 5: Melton Recycled Water Scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Melton Surbiton Park Irrigation Augmentation	153	0	0	0	0
Melton RW Scheme Stage 1	0	250	750	750	750

The Melton recycled water scheme provides both Class A and Class C recycled water for uses including irrigation of agricultural crops and water for residential use. The scheme is the fastest growing for Western Water due to forecast growth which leads to the increased availability of recycled water. There are large rates of population growth predicted for Melton and Class A recycled water will be supplied to these new growth areas to substitute drinking water use and support a healthy community and environment. It is expected that a disdcharge licence will be required from Melton RWP to enable recycled water to be permanently returned to waterways over the Water Plan.

Table 6: Riddells Creek Recycled Water Scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Riddells Creek Scheme Stage 2	0	0	0	681	1000
Riddells Creek Scheme Extension	0	0	48	48	48
Riddells Creek irrigation at RWP	15	0	0	0	0

The Riddells Creek recycled water scheme provides treatment services for both Riddells Creek and Macedon. It is a newer scheme experiencing reasonable levels of growth resulting in capital investments to balance supply and demand scenarios. Class C recycled water supports local agricultural and recreational land use. Scheme development is driven by the lack of available discharge to waterways. Emergencydischarge will be likely in greater than average wet years.

Table 7: Romsey Recycled Water Scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Romsey RW Scheme PS upgrade	0	0	0	192	247
Romsey RW Scheme	0	0	0	0	483

The Romsey Recycled Water Plant is located on the outskirts of town and provides treatment services for both Romsey and Lancefield. Class C recycled water is utilised on a large agricultural holding on site and also supplied to a number of additional properties under commercial contract arrangements. Population growth and climate variability necessitate the expansion of the offsite network and will result in a new opportunity to support local sporting facilities. Scheme

development is driven by the lack of available discharge to waterways. Emergency discharge will be likely in greater than average wet years.

Table 8: Sunbury Recycled Water Scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Sunbury RW Scheme extension	100	100	400	400	500

The Sunbury Recycled Water Scheme is Western Water's largest and supplies high quality recycled water to 60 customers between Sunbury and Melton. The scheme will be expanded and extended to cater for growth and provide additional landowners with the opportunity to utilise a reliable and high quality water supply. Scheme extensions are planned to reduce the need for recycled water to be returned to Jackson's Creek. It is forecast, however, that the volume of recycled water returned to Jackson's Creek will increase over the Water Plan.

Table 9: Woodend Recycled Water Scheme ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Woodend Scheme Extension	0	62	0	300	683

The Woodend Recycled Water Scheme provides a relatively climate independent source of high quality irrigation water to recreational facilities within and surrounding Woodend. As a result, the facilities provide year round green spaces which contribute to the health and wellbeing of locals. Scheme extensions are planned to reduce the need for recycled water to be returned to Five Mile Creek. It is forecast, however, that the volume of recycled water returned to Five Mile Creek will increase over the Water Plan.

Sludge and Biosolids Management

Western Water is committed to achieving 100% reuse of its biosolids for the 2013-2018 regulatory period. Population growth will increase the amount of biosolids available, presenting the opportunity to develop existing markets and seek new markets for this valuable, renewable resource.

Biosolids will continue to be handled in a way that considers and protects public and environmental aspects and is sympathetic to community attitudes. New facilities will be developed and existing facilities upgraded to ensure compliance with EPA expectation, allow for population growth and future inflows.

Western Water's Biosolids Strategy and Marketing Plan has resulted in great success including significant reduction in stockpiles of stored biosolids and the development of a market for biosolids amongst the local farming community.

Whilst ensuring environmental, public and stock health concerns are carefully protected, market uptake has become a cost effective means of managing the biosolids produced at each of the 7 recycled water plants. Public support is strong, evidenced by the growing demand for the product in recent years.

During Water Plan 2008-2013 period, Western Water achieved 100% recycling of biosolids and established two biosolids storage areas at Melton RWP and Romsey RWP.

Whilst Western Water was able to compost biosolids from Sunbury and Melton, the cost of third party composting operation has been steadily increasing and remained at $80.00/m3. It is forecast this cost would further increase during Water Plan 2013-2018.

Nonetheless, composting will remain most cost effective option for biosolids from Sunbury RWP as they do not meet EPA guidelines to be directly applied to farm. Recent investigations have indicated that solar drying of Sunbury Biosolids could be a more environmentally acceptable drying option compared to open composting.

For these reasons, Western Water proposes to establish a Biosolids management facility facility at Romsey RWP given that a storage facility has already been established there.

Western Water is committed to becoming cost neutral in managing biosolids over time and the proposed facility will enable Western Water to market the product for wide ranging beneficial use.

Due to increased biosolids production at Melton RWP, the existing storage facility also requires expansion. Melton biosolids are currently air dried using a windrow turner operated by a third party contractor. There is a high risk associated with this operation as the contractor is not willing to enter into a long term contract. Therefore it is proposed to purchase a windrow turner so that the biosolids can be dried to specific solid content and can be then applied to farms.

Western Water will amend the existing Biosolids Management Strategy (2008-2013) by 2013/2014 to enhance further beneficial use of biosolids with a view of becoming cost neutral.

Table 10: Biosolids program for 2013-2018 ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Composting of Sunbury biosolids	400	+CPI	+CPI	+CPI	+CPI
Biosolids storage and processing facility at Melton RWP*	150				
Biosolids storage and Treatment facility at Romsey RWP*			1000	1000	
Purchase of a windrow turner				$250*	
Off site application of Melton RWP biosolids**	200	+CPI	+CPI	+CPI	+CPI
Management of Gisborne RWP biosolids**	60	120*	120*	120*	120*
Lagoon de-sludging at various RWPs**	160		50	265	80
Woodend RWP Biosolids Management	40	+CPI	+CPI	+CPI	+CPI
R&D Biosolids**	50	50	50	50	50

*new requirement

EPA Guidance notes on Water Plan 2013-2018 requires 100% recycling of biosolids as per the waste hierarchy. Western Water has recognised that biosolids provide benefit as a soil conditioner and it is a valuable resource once it is made microbiologically safe. Pre-treatment of biosolids is an important step to ensure that when biosolids are used, it is a resource that is also safe to the public health.

Projects to continually improve the quality of biosolids and allow for growth in biosolid volumes will include an upgrade of the existing treatment facilities at Melton Recycled Water Plant, establishment of a centralised processing facility at the Romsey Recycled water Plant, improvement of the existing sludge treatment and installation of mechanical dewatering at the Gisborne Recycled Water Plant and an upgrade to the existing dewatering facility at the Woodend Recycled Water Plant. The capital costs associated with these projects are included in the table below;

Table 11: Biosolids reuse targets

	2013/14	2014/15	2015/16	2016/17	2017/18
Sunbury	100%	100%	100%	100%	100%
Gisborne	100%	100%	100%	100%	100%
Romsey (lagoon)	0%	0%	0%	100%	0%
Riddells Creek (lagoon)	0%	0%	0%	0%	100%
Woodend (lagoon)	100%	100%	100%	100%	100%
Melton	100%	100%	100%	100%	100%
Bacchus Marsh (lagoon)	0%	0%	0%	0%	0%

Lagoon based plants only harvest biosolids every 10 to 15 years, the table above indicates the approximate year of biosolids harvest for those plants.

Management of the Sewerage System

Western Water recognizes that uncontained spills during dry weather and also with the rain event of up to a 1 in 5 year storm event are unacceptable as it potentially compromises the beneficial use of surface water and adversely impacts public health. During Water Plan 2008-2013, Western Water developed various sewer asset management plans and undertook an independent expert review of these plans. The independent expert review provided a number of recommendations for improvement. All of the recommendations were accepted by Western Water and they will be implemented during Water Plan 3. In addition, Western Water also developed a comprehensive Sewer Spill Prevention Strategy based on risk assessment of various asset failures.

During Water Plan 2013-2018, Western Water will undertake replacing of aging assets, CCTV monitoring and identifying potential issues for repair, and providing emergency storages at pump stations. In 2011, Western Water was issued an enforceable undertaking as a consequence of a spill incident with a commitment to minimize sewer spills across its infrastructure base.

The enforceable undertaking also requires that any identified improvements which can't be completed within Water Plan 2008-2013 be identified and budgeted for in Water Plan 2013-2018. As such some projects carried over as part of the enforceable undertaking in Water Plan 2013-2018 shall be budgeted. Further to funding these enforceable actions, extra budget has been identified for improving the sewerage system.

Table 12: SSPS costs ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
SSPS - OPEX					
Reduction of Sewer Main Blockages caused by Tree Roots	358	278	358	278	358
Condition Assessment of Sewers by CCTV	750	710	30	30	30
Site Investigations to reduce Infiltration/Inflow	10	10	10	10	10
SSPS – CAPEX					
Program of works including rectification of pipes, manholes and other related assets	1,378	3,063	2,460	1,020	1,079
Master Asset Register and Rating Schedule (MARRS) - CAPEX					
Renewal of Sewage Pump Stations to Improve Asset Performance	1,020	1,020	1,020	1,020	1,020

Trade Waste Management

Essential Services Commission issued a Trade Waste Customer Service Code in September 2011. This Code introduced new guidance on Trade Waste Management during water plan 2008-2013. The Code also required the development of site specific Trade Waste Customer Service Charter and Western Waters charter came into effect in 1 July 2012. The code has introduced new requirements on Trade Waste Application turn over.

During Water Plan 2013-2018, Western Water will introduce system enhancements to reduce manual processing of trade waste applications and also in reviewing the customer pre-treatment maintenance requirements. Western Water will implement bar coding system to follow up compliance with grease trap cleaning.

During Water Plan 2013-2018, as stipulated in the EPA guidance document, Western Water will further increase its focus on cleaner production and build up on the positive outcomes obtained during Water Plan 2008-2013. Western Water will also implement a monitoring program to isolate the industrial catchments which contribute to significant salt loading to the sewer system.

Western water continue to employ external contractors for periodic inspection of Trade Waste Customers. Use of external contractors have been found to be effective in managing the trade waste customer compliance.

In the region, the number of trade waste customers has increased steadily. The anticipated numbers are as follows:

Table 13: Trade waste customers

	2013/14	2014/15	2015/16	2016/17	2017/18
Cat A (Minor)	352	365	378	391	400
Cat B	38	41	44	47	50
Cat C	109	113	117	121	125
Total	499	519	539	559	575

The following expenditure budget is allocated for trade waste management.

Table 14: Trade waste expenditure ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Trade Waste Monitoring	70	70	70	70	70
CP Audits & Model Projects Contribution	120	75	75	75	75
Catchment based on-line monitoring	60	60			
Administration	100	100	100	100	100
Total	290	245	245	245	245

Greenhouse Gas Emissions Reduction

In October 2010 Western Water developed its Climate Change Strategy which aims to best position Western Water for:

- **Climate change mitigation – our contribution to reducing the greenhouse gas emissions that are causing climate change as well as lowering the financial impact of the Carbon Price Mechanism, and**
- **Climate change adaptation – how we are preparing for the impacts on our business, and our customers, of changes in the climate that have already commenced.**

The Strategy recognises that climate change is not just an environmental issue – it is a business one as well. From a mitigation perspective, the Strategy sets Western Water on a pathway to achieve it's aspirational target of zero net

greenhouse gas emissions. The Strategy outlines steps that Western Water will take towards reducing its arbon exposure and outlines how it will meets its environmental obligations.

During 2011/12, Western Water achieved a 42% reduction in net emissions against the base line year of 2004/05, which enabled Western Water to meet the 2011/12 greenhouse gas reduction target. This outcome has been achieved despite the need to service a rapidly growing population. The targets ensure greenhouse gas emissions and energy are a key consideration in all business decisions and encourage investments that reduce our exposure to a long-term carbon price and increasing energy costs.

A program for monitoring, reporting and reducing Greenhouse Gas Emissions, which will be implemented across the business have been included in the Water Plan as outlined in the following table:

Table 15: Greenhouse Gas Reduction program ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Greenhouse Gas Strategy Implementation	100	100	100	100	100
Monitoring, Administration and Reporting	50	50	50	50	50

The impact of the above implementation strategy is less than $5 per customer per annum. This amount is well within customer surveys of willingness to pay for lower Greenhouse Gas Emissions (Appendix D).

Management of Odour

Due to urban growth, there is increased pressure for residential development in the vicinity of recycled water plants. Hence it has become necessary to ensure that potential odour emissions are minimised and therefore future upgrade of recycled water plants are provided with appropriate odour control systems.

Catchment Waterway and Groundwater Management

Management and Auditing of Irrigation Discharges

Western Water does not provide irrigation water discharges.
To manage land use and development in water supply catchments within the Moorabool Shire, Western Water implemented a Water Catchment Protection Policy in conjunction with Barwon Water, Central Highlands Water and Southern Rural Water. A similar policy has been developed for water catchments within Macedon Ranges Shire. These policies will continue to be implemented during this Water Plan.

Provisions and Auditing of Environmental Flows

Western Water owns a number of reservoirs and is licensed operate groundwater bores at Lancefield and Romsey for the supply of drinking water. Under established Bulk Entitlements, Western Water is required to meet extraction and environmental flow obligations.

Western Water has been working with DSE and the Bureau of Meteorology to improve available instrumentation and monitoring to ensure compliance with environmental flow requirements of its Bulk Entitlements. Western Water also publishes in its Annual Report information on volumes extracted, passing flows and environmental flow data. Western Water does not audit the environmental flows as DSE monitors the data under the Bulk Entitlement agreements.

Waterways Management Obligations

Waterways in Victoria are managed by Catchment Management Authorities or local councils. Western Water has no direct responsibility for managing waterways. However, Western Water manages a number of river frontages on its properties in conjunction with Melbourne Water and local community groups and is committed to maintaining these properties adjoining waterways through weed management, tree planting and general land care practices. This is discussed in more detail under biodiversity. Western Water meets the required conditions specified in each Bulk Entitlement in relation to managing water extraction points and storages.

Releases from Storages

Western Water releases water from its storages for maintaining required environmental flows. This occurs at Willimingongon, Djerriwarrh and Campaspe Reservoirs. Southern Rural Water is responsible for managing environmental flows from Merrimu, Pykes Creek and Rosslynne Reservoirs.

Groundwater Management Provisions

As part of compliance with EPA licence Western Water will continue monitoring groundwater at its licensed premises. There are 37 monitoring bores located around recycled water plants. Some of the bores are relatively old and they need to be renewed to ensure the bores truly reflect the surrounding ground water. As there are proposals for constructing additional wet weather storages at various recycled water plants, the upgrade will also include construction additional bores to monitor any potential leakage from these lagoons.

Western Water has been monitoring these bores and conducts a review of the data annually.

The following budgets are provided for bore renewals.

Table 16: Bore renewals ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Bore Renewals	-	60	-	60	-

Costs associated with monitoring the bores and reviewing the data are provided under Licence Compliance.

Biodiversity Management

Biodiversity includes all living things that inhabit the Earth, including plants, animals and micro-organisms. Western Water properties have significant biodiversity attributes and such attributes are managed through State and Federal legislations. Western Water, as a significant property owner within environmentally sensitive areas and as member of the community, has an obligation to protect biodiversity and lead by example.

Accordingly, the business will continue its biodiversity enhancement work across its properties to meet the Flora and Fauna Guarantee Act, Victorian Biodiversity Strategy, Wild Life Act and Catchment and Land Protection Act.

During Water Plan 2013-2018, through Western Water funding, various grants and contribution in kind by the community, Western Water achieved a number of enhanced biodiversity outcomes. Western Water embarked on a project to

rehabilitate a paddock previously used for controlled discharge sewage sludge and converted it a biodiversity link between two significant biodiversity assets. The rehabilitation work needed to continue to meet the aspirations of the local community namely Pinkerton Landcare and Environment Group. In addition, Western Water has a number of sites which have been set aside as biodiversity offsets as result of major projects and such sites also require long term maintenance. To maintain biodiversity across Western Water's properties, programs will be undertaken to control noxious weeds, tree planting, pest management, erosion control, flora and fauna assessments, fencing, stream frontage management and aquatic assessments.

Table 17: Biodiversity management ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
Biodiversity management	250	250	250	250	250

Assessment, Monitoring, Auditing and Reporting

Monitoring, Auditing and Risk Assessment

Three of Western Water's seven RWP's occasionally discharge recycled water to local creeks. As per the commitment provided in the 2005-2008 Water Plan, Western Water undertook a biological assessment of Jacksons Creek and Five Mile Creek through a protocol agreed with the EPA. The outcome of this assessment is that Western Water is required to undertake long-term monitoring of these waterways to gather reasonable data for an effective Ecological Risk Assessment (ERA). Western Water will undertake an ERA during the 2008-2013 period to complete this obligation.

Based on the results of the risk assessment, Western Water is committed to investigating any off-set projects that may be required and will report to the community any potentially affected waterways (mixing zones). The method of communication will be agreed with the EPA.

Table 18: ERA costs ($'000)

	2013/14	2014/15	2015/16	2016/17	2017/18
ERA			40	40	

Water Industry Reporting

In complying with the elements of an Environmental Management System, Western Water reports to the community and other stakeholders any impacts from activities including recycled water discharges to streams through its Annual Report. Western Water's Annual Report also includes information on RWP licence compliance, audit outcomes and water recycling. A separate Annual Recycled Water Report is also provided to the EPA and published on the website. Western Water will identify a mechanism to report to the community any environmental impacts on the beneficial uses of water ways, particularly from recycled water discharges and any sewer spills.

Continuous Improvement

There is a commitment under the EPA licence, that Western water will maintain an Environmental Management System (EMS). EMS is valuable tool in achieving continuous environmental improvements. Implementation of EMS requires resources for implementing corrective actions to prevent any environmental risks and therefore a modest budget is required.

Table 19: ERA costs ($'000)

EMS	2013/14	2014/15	2015/16	2016/17	2017/18
Corrective Actions	$30,000	$30,000	$30,000	$30,000	$30,000

Environment Management Policy, an environment committee has been established to facilitate the implementation of EMS principles.

The Environment Committee's (EC) purpose is to facilitate the adoption of environmentally sustainable practice by;

1. **Demonstrating leadership in environmental sustainability and 'walk the talk'.**
2. **Provide strategic advice on environmental sustainability issues**
3. **Provide an avenue for communication to assist behaviour change towards environmental sustainability.**
4. **Promote a culture of environmental sustainability at Western Water.**

The EC has made a commitment to oversee continuous improvement by Western Water in environmental management. The responsibilities of the EC are;

- **Oversee the implementation of the Environment Policy**
- **Assess and prioritise environmental opportunities and risks**
- **Review the performance and progress of Resource Efficiency, Generation, Recovery and Recycling projects – including internal water consumption, biosolids, energy & chemical use and develop measures for minimising solid wastes such as metals, organics and paper.**
- **Monitor the Reduction of Greenhouse Gas Emissions – Scope 1, 2 and 3**
- **Review impacts to determine objectives of Improving Biodiversity and Catchment Management**
- **Investigate Creating Cleaner Production Opportunities**
- **Monitor Implementation of the Green Travel Plan**

Appendix F

Water Supply Demand Strategy

Water Supply Demand Strategy 2011-2060

February 2012

This Water Supply Demand Strategy ("Report"):

1. *has been prepared by GHD Pty Ltd ("GHD") for Western Region Water Corporation ("Western Water");*
2. *may only be used and relied on by Western Water;*
3. *must not be copied to, used by, or relied on by any person other than Western Water without the prior written consent of GHD;*
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To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the Report are excluded unless they are expressly stated to apply in this Report.

GHD has prepared this Report on the basis of information provided by Western Water and Department of Sustainability and Environment, which GHD has not independently verified or checked ("Unverified Information") beyond the agreed scope of work.

GHD expressly disclaims responsibility in connection with the Unverified Information, including (but not limited to) errors in, or omissions from, the Report, which were caused or contributed to by errors in, or omissions from, the Unverified Information.

Climate change is an emerging issue and the effects are, at this stage, complex to quantify. The following assumptions about projected climate change conditions have been made during preparation of this report:

- *Climate change impacts on surface water availability have been adopted from the DSE WSDS Guidelines (DSE, 2011)*

The opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the date of preparation of the Report. GHD has not, and accepts no responsibility or obligation to update the Report to account for events or changes occurring subsequent to the date that the Report was prepared.

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1. Context

1.1 What is a Water Supply Demand Strategy

Government owned urban water corporations in Victoria are required to prepare a Water Supply Demand Strategy (WSDS) every five years under their Statement of Obligations, and in accordance with guidelines issued by the Victorian Government's Department of Sustainability and Environment (DSE). The current guidelines (DSE 2011) state that:

> *"The purpose of a Water Supply-Demand Strategy is to identify the best mix of measures to maintain a balance between the demand for water and available supply in our cities and towns now and into the future. This balance between supply and demand is to be achieved taking into consideration:*
>
> - *a long term outlook of 50 years;*
> - *the total water cycle, consistent with the principles of integrated urban water management;*
> - *social, environmental and economic costs and benefits; and*
> - *risks and uncertainty, such as that associated with population growth and climate change."*

The WSDS is a key input into strategic planning for water businesses and has a substantial impact on the forthcoming Water Plan. It is the long-term strategy to balance the supply of water to meet demand from Western Water's customers and therefore provides the basis for planning for expenditure on supply augmentation and demand management.

The guidelines also require that the community is consulted in the development of the WSDS. This occurred through deliberative forums in December 2011 as the strategy developed and, again, through quantitative online consultation in March 2012 to test reception to the strategy and options proposed in the WSDS.

1.2 Previous Water Supply Demand Strategy

Western Water's first WSDS was released in February 2007 (Western Water, 2007). This strategy identified a number of supply and demand measures required for 2007 – 2012.

Supply Measures

- improvements to the Romsey and Woodend supply systems required with immediate effect;
- the Rosslynne system would not meet level of service objectives from about 2015 to 2018 onwards, depending on the rate of demand growth;
- the Werribee system would not meet the level of service objectives from about 2015 to 2018 onwards, depending on the rate of demand growth.
- that changing the mode of operation to prioritise supplies drawn from the Yarra bulk water entitlement would extend those dates to 2020 and 2023 respectively;
- the Lancefield system had some spare capacity which should be sufficient to meet its water supply requirements until about 2030;

- new bulk water entitlements will need to be purchased for Myrniong's supply before 2008.

In contrast to the previous strategy, work undertaken for the current (2012) WSDS has identified that Lancefield has constrained water availability based on water quality objectives, while Myrniong has sufficient supply to meet its long term needs.

Demand Measures

A wide range of water demand management and supply substitution options were also investigated to meet the targets proposed in the Central Region Sustainable Water Strategy (CRSWS):

- 25% reduction in per capita residential water usage by 2015 compared to the 1990's average (280 L/p/d), to 210 L/p/d;
- 30% reduction in per capita water usage by 2020 compared to the 1990's average, to 196 L/p/d.

In order for Western Water to achieve the water consumption targets a program was recommended including:

- the mandatory water efficiency labelling scheme (WELS);
- permanent low-level restrictions on water use;
- inclining block tariff on residential customers indexed at CPI increase annually by an additional 1%;
- introduction of pricing incentives for non-residential customers (introduced in 2007);
- continuing and enhancing the community education program;
- non-residential water audits (program 2007 -2010);
- leakage management program (enhance program of district metering, leak detection and repair and establishment of pressure management areas in 2008);
- residential shower retrofit (program 2007-2009); and
- source substitution as follows:
  - recycled water for greenfield development (Eynesbury Station, Melton South and Sunbury);
  - incentives for installation of rain tanks for developments elsewhere;
- control on water efficient fixtures in new development areas; and
- incentives for home retrofit with water efficient fixtures and fittings at point of sale.

Western Water has implemented most of the demand measures put forward in the previous WSDS. The reductions in demand have however exceeded the targets proposed in the CRSWS, with a current per capita residential demand estimate of around 160 L/p/d.

1.3 2012 Strategy Development

This 2012 WSDS has used the 2007 WSDS as a starting point, and updated demand and supply forecasts based on current information. The Department of Sustainability and Environment (DSE) issued a set of guidelines to cover the development of the 2012 strategy (DSE, 2011), to ensure a suitable level of rigour was used. Western Water has adopted these

guidelines as the basis for the strategy development process.

The development of the strategy has involved:

- reviewing Western Water's strategic objectives , including the level of service provided to customers;
- updating water demand forecasts based on up to date water consumption trends and growth forecasts, including input from Western Water's 2011 Growth Strategy;
- updating water supply forecasts (system yield) based on current and upgraded Western Water supply infrastructure, and updated climate information; and
- consideration of demand management and additional supply options that will allow Western Water to meets its strategic objectives.

A draft strategy was submitted to DSE for review in November 2011 and key concepts were explored at deliberative forums with customers in December 2011. This final strategy incorporates both feedback from DSE as well as findings from online customer consultation which occurred in early March 2012[1].

Finalisation of the WSDS has been undertaken in accordance with DSE requirements, with the final strategy to be submitted to the Minister for Water by 31 March 2012.

This WSDS is supported by a technical supplement that details the assumptions, demand and supply modelling, and previous work that supported the development of this strategy. The conclusions and recommendations in this strategy are based on assumptions detailed in *'Western Water 2011-2060 Water Supply Demand Strategy, Supplementary Technical Report,'* February 2012.

1.4 Overview of Western Water

Western Water is one of Victoria's thirteen regional urban water corporations and provides water, sewerage and recycled water services to over 56,000 properties across an area of 3,000 square kilometres. The region serviced by Western Water is located to Melbourne's north west, extending from Rockbank in the south to Lancefield in the north and incorporates the major growth centres of Melton and Sunbury.

Western Water is subject to strong population growth - set to escalate in the coming years - and has access to a diversified local water supply(shown in Figure 1) as well as water from the Melbourne supply system.Historically, the majority of Western Water's drinking water supply has come from Rosslynne, Merrimu and Pykes Creek Reservoirs, operated by Southern Rural Water, as well as a number of small storages at Romsey, Riddells Creek, Mount Macedon, Macedon, Woodend & Lancefield .

Due to the extended period of low rainfall in the past decade, it became essential to supplement local water supplies with Western Water's bulk entitlement to the Melbourne Water supply system. This bulk entitlement provided 74% of the region's drinking water in 2010/11.

The region's population has grown by 3.9% in the past year to exceed 150,000. It is forecast to surpass 275,000 by 2021. During 2010/11, 10,251 ML of drinking water was consumed in the

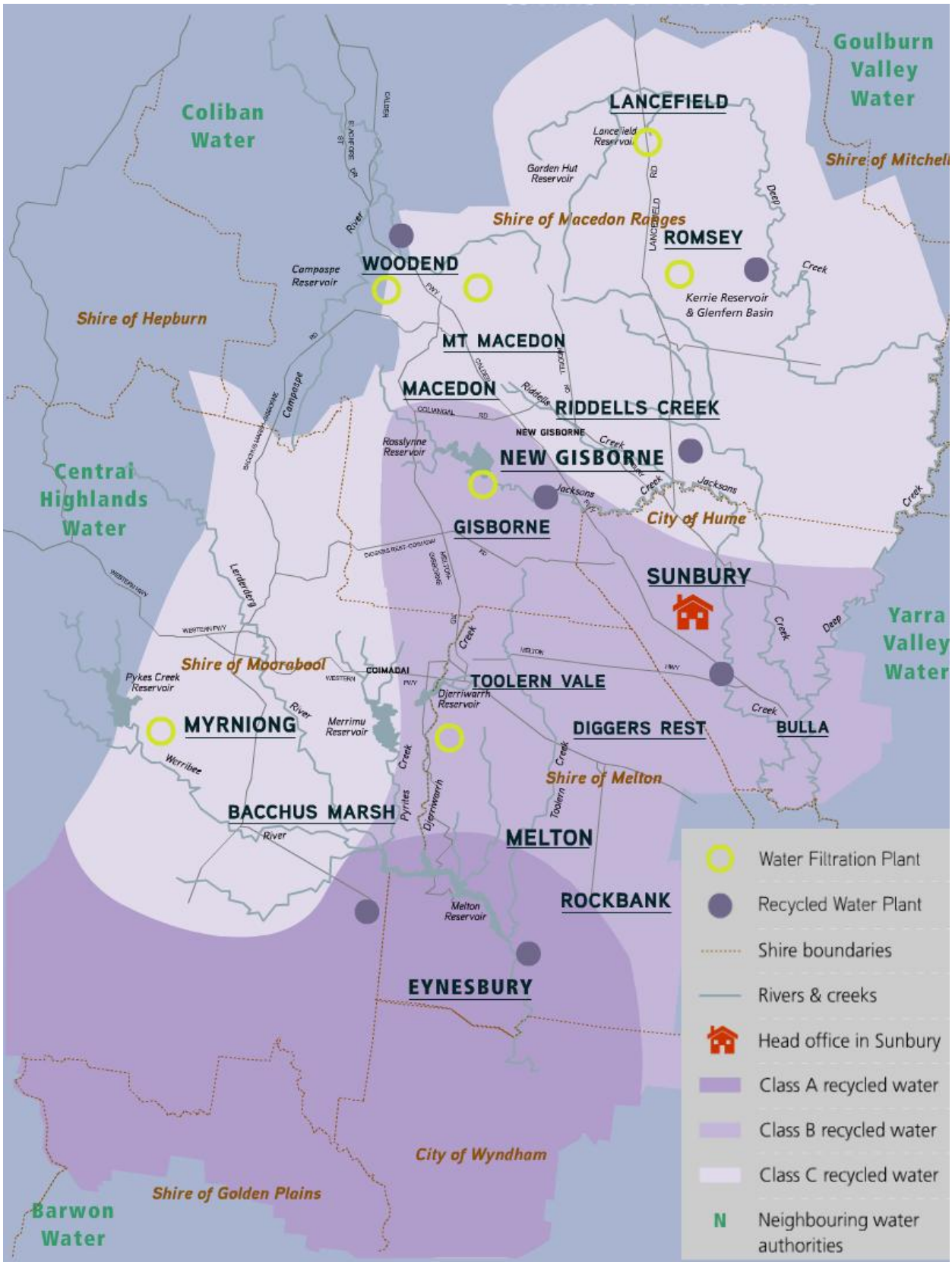
[1] WSDS Online Consultation occurred in early March 2012 with over 330 customers from across the region participating. Results from the survey are considered to be highly representative.

region. Treatment plants received 8,442 ML of sewage and produced 7,992 ML of recycled water, of which only 51% was reused due to high rainfall in the year.

Western Water invested $31.3 million in capital works in 2010/11, including completing Stage 2 of the major upgrade of the Surbiton Park Recycled Water Plant at Melton. Western Water is investigating greater storage options at the plant to ensure more supplies can be stored to meet increased demand in periods of low rainfall.

Future demand is also being catered for with funding secured for a new recycled water scheme to service a rapidly growing agribusiness precinct in South Gisborne. Another $239 million has been earmarked for capital works investment over the next five years focussing on meeting the needs of the growing population with sustainable supply solutions.

Figure 1 Western Water's water supply system (Western Water, 2011)



Western Water's 2011-2060 Water Supply Demand Strategy covers six main supply systems as follows:

Rosslynne System

The Rosslynne system comprises all the Western Water urban water supply systems in the Maribyrnong Basin supplied primarily from Rosslynne Reservoir and the Melbourne Headworks system (Melbourne system). The townships included in the Rosslynne system are Sunbury, Diggers Rest, Bulla, Gisborne, Riddells Creek, Macedon and Mt Macedon. Sunbury was connected to the Melbourne system in March 2000, with Gisborne, Riddells Creek, Macedon and Mt Macedon connected in May 2004.

Romsey System

The Romsey system is located in the Maribyrnong Basin, and receives most of its supply from Bolinda Creek (Kerrie Reservoir) and Main Creek (Forster and Wright Reservoirs). Romsey also receives a supplementary supply from Rosslynne Reservoir and the Melbourne system via Wright Reservoir.

Lancefield System

The Lancefield system is located within the Maribyrnong Basin, and receives supply from Garden Hut Reservoir and groundwater. Unlike other Western Water systems in the Maribyrnong Basin, Lancefield has no supplementary supply from Rosslynne Reservoir or the Melbourne system.

Woodend System

The Woodend system is located in the Campaspe Basin, and is supplied predominantly from Campaspe Reservoir and Reservoirs B and C on the north side of Mount Macedon. Woodend also receives a supplementary supply from transfers from the Macedon and Mt Macedon system (part of the Rosslynne system).

Werribee System

The Werribee system comprises all the Western Water urban water supply systems in the Werribee Basin supplied from Merrimu and Djerriwarrh Reservoirs and the Melbourne system. The townships included in the Werribee system are Melton, Bacchus Marsh, Rockbank and Toolern Vale. Melton and Bacchus Marsh were connected to the Melbourne system in April 2004.

Myrniong System

The Myrniong system is supplied from Pykes Creek Reservoir, located on Pykes Creek in the Werribee catchment. Water is supplied to Myrniong from a pumping station at Pykes Creek Reservoir.

1.5 Regional Climate

Western Water's service area is situated to the north-west of Melbourne. Average rainfall in the region is less than half that in Melbourne's water supply catchments to the east and north of Melbourne. This is illustrated in Figure 2, which shows mean annual rainfall in the Melbourne region. The dry climate to the north-west of Melbourne, represented as orange and red areas,

includes the region serviced by Western Water. In the greater Melbourne region, only parts of the Barwon Water service area has a drier climate than the Western Water region.

The dry climate of Western Water's region means that inflows to local water supply catchments are relatively low, while climatically-dependent demands such as garden watering have tended to be higher than they would have been under wetter climate conditions.

Western Water's region has a long history of drought. The lack of reliable inflows and the drought of 1967/68 led to the construction of the Rosslynne and Merrimu storages in the late 1960s and early 1970s to improve the reliability of supply from the Maribyrnong and Werribee catchments.

Dry conditions over the past ten years have resulted in significantly reduced inflows to Western Water's supply systems, to the extent where local water supplies were unable to meet demand from Western Water customers. This recent extended dry period led to the connection of Western Water's supply systems to the Melbourne system, with Sunbury connected in March 2000, Bacchus Marsh and Melton in April 2004, and Gisborne, Riddells Creek and Macedon and Mt Macedon in May 2004. Figure 3 shows estimated annual inflows to Western Water's share of Merrimu Reservoir up to 2010, clearly illustrating the reduction in average annual inflows to the system that occurred since 2001.

Figure 2 Regional Rainfall (Source: Melbourne Water)

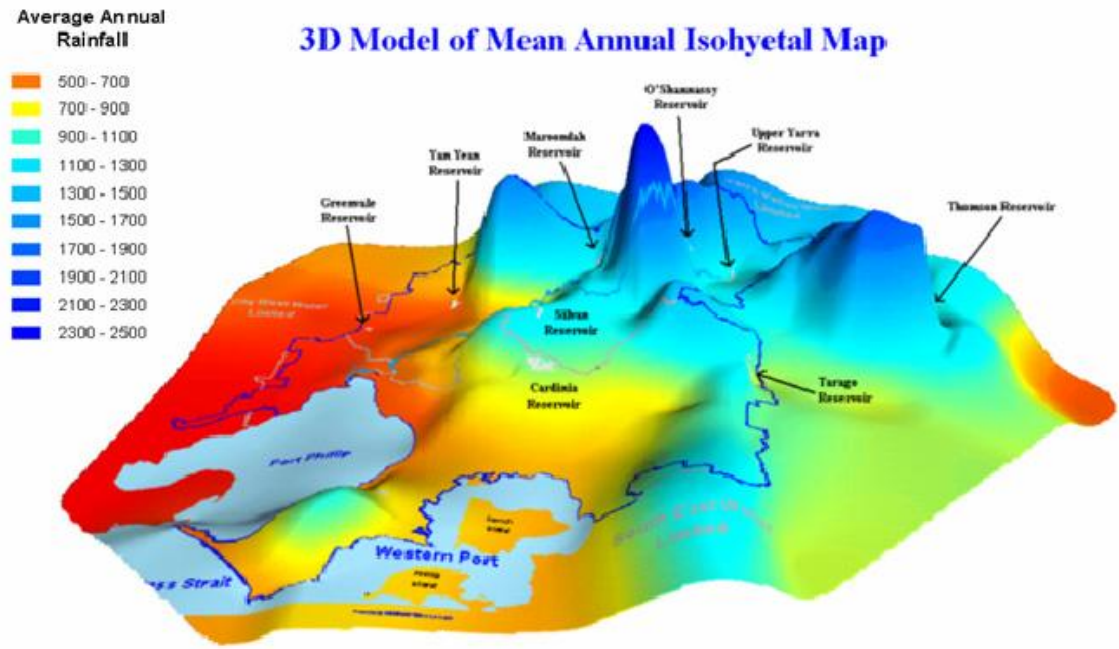
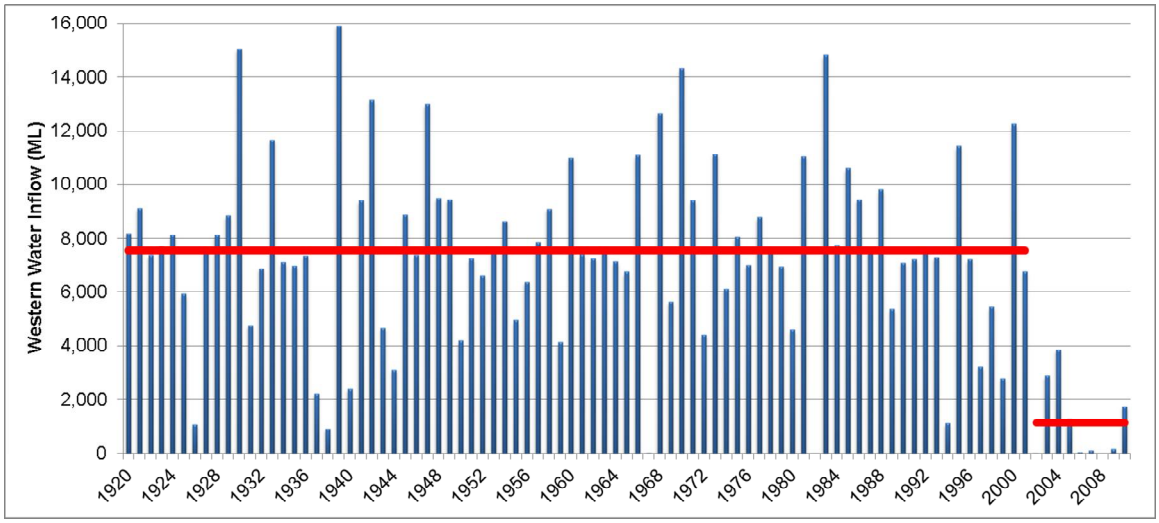


Figure 3 Annual Merrimu Reservoir Inflows (Western Water Share)



2. Key Water Supply and Demand Drivers for Western Water Region

2.1 Background

The region serviced by Western Water is one of the fastest growing in the State. Since the preparation of the last WSDS, the population serviced by Western Water has increased by over 20,000 people (an average of 3.7% p.a.), to just over 150,000. Growth is now set to escalate with a population of 275,000 forecast for 2021.

This period of strong population growth has coincided with a 10 year extended dry period that ranks as the region's worst drought in recorded history, certainly in terms of its duration.

Western Water is currently able to provide most of its customers with a relatively secure water supply due to interconnections to the Melbourne system between 2000 and 2004 and the granting of Bulk Entitlements from the Melbourne system (most recently increasing the annual volume that can be taken by Western Water to 18,250 ML). This has been assisted by a large reduction in customer individual water use over the past ten years, due in part to Western Water's range of water efficiency programs. Western Water customers have become highly water-conscious and water-literate, with water efficiency behaviour embedded in normal water use.

2.2 Key Challenges

Western Water's key challenge is how best to service the water needs of its rapidly growing customer base from a supply system that is vulnerable to extended periods of low rainfall. While connection to the Melbourne system has secured the Western Water supply in the short to medium term, the cost of the Melbourne supply is relatively high and is likely to increase significantly. Western Water needs to ensure that the water supply it provides is cost effective, to minimise unnecessary price increases to customers.

The relatively wet conditions that occurred in 2010/11 marked the end of the extended dry period that commenced in 1997, proving Western Water's supply systems will be able to meet most water needs from local sources in average to wet years. In planning for customers' future water needs, Western Water is seeking to maximise the use of local water sources in average to wet years, while still ensuring that supply systems have the capacity to withstand a return to an extended dry period.

2.3 Planning Focus

While Western Water's WSDS encompasses a 50 year planning period, from 2010/11 to 2059/60, the focus of this WSDS update is the first 10 years of this period - in particular the Water Plan 3 period (2013/14 – 2017/18). The combination of local water resources, the connection to the Melbourne system and the amended Melbourne Headworks Bulk Entitlement should provide Western Water with sufficient bulk water to meet demand over the 10 year period. However, systems such as Lancefield, Romsey and Woodend require action to address supply-demand imbalances, both now and into the Water Plan 3 period.

3. Water Supply Demand Strategy Objectives

3.1 WSDS Strategic Objective

The parent organisational objective for water corporations is that supply and demand are matched over time. Such a balance implies the most efficient investment in supply infrastructure. This is fundamental to the financial performance of a water corporation, in that over-investment in supply infrastructure will impact on customer tariff affordability, while demand under forecast will create a shortfall in forecast revenue. Conversely, under-investment in supply infrastructure and/or demand higher than forecast is likely to mean either failure to meet the agreed level of service and/or higher than forecast costs due to having to take unplanned actions to source water (such as having to undertake emergency supply infrastructure upgrades).

To align with Western Water's Balanced Scorecard this may be stated as a customer objective:

- to provide a reliable and cost efficient water supply that meets the needs of Western Water customers (while complying with all health, environmental, and social obligations).

The measures for reporting against the objective are:

- for reliability:
  - the agreed level of service requirements (i.e. not exceeding the agreed frequency and or duration of water restrictions); and
- for cost efficiency:
  - that supply and demand are balanced as forecast.

The measures for reporting against these targets are discussed in Section 5.3.3.

3.2 Western Water's Water Supply Demand Approach

Western Water has adopted three priorities in the development of our WSDS:

1. Local Water Supply First

Our overall strategy is to make the most of local water supplies. Local water is far less costly than sourcing and transporting water from the Melbourne supply system, and this will keep costs down for customers.

2. Water from Melbourne as our back up supply

Even with all the rain in the past two years, Melbourne water still supplied 74% of the region's drinking water last financial year. We will continue to rely on our connection to the Melbourne supply system to back up the local supply. This will become increasingly important as the population grows and also during extended periods of low rainfall.

3. Alternative Water Sources are being investigated

It is critical to preserve our local drinking water supplies as much as possible, particularly from uses that do not require water of this high quality. Western Water is investigating alternative water supplies for both drinking and non-drinking water consumption. These include ground water, recycled water, storm water and at home solutions like tank water and grey water.

This approach was well supported by customers with an approval rating of 8.5 out of 10 (WSDS Online Consultation, 2012).

3.3 Adopted Level of Service Standards

The Melbourne System Bulk Entitlement provides Western Water the option of aligning restrictions with Melbourne or accepting a restricted supply in some years. Western Water will adopt the same level of service standards as the metropolitan water retailers because Western Water's reliability of supply is integrally linked to the Melbourne System and it is easier to communicate and implement restriction levels that align with Melbourne.

For this WSDS, a new standard of service is proposed for each of Western Water's water supply systems. This standard of service is aligned with the service levels proposed in Melbourne's WSDS:

Restrictions will only be implemented in Western Water systems:

- ***once in 20 years***
- ***for a maximum of 12 months duration***
- ***at a maximum level of Stage 2***
- ***except in extreme circumstances***

This standard of service was not well supported by customers who remain strongly aligned to water conservation messages of recent years. Many customers believe restrictions should be a matter of common sense, imposed whenever necessary.

4. Current Demand – Supply Balance

4.1 Demand Forecasting

4.1.1 Uncertainty associated with demand forecasting

As part of the development of this WSDS, Western Water reviewed its water demand forecast to 2060. Demand for water is not easy to forecast. It is influenced by various factors - many of which are outside of Western Water's control. The major determinants of demand are population growth, climate and customer behaviour. In general, water use will be higher in hot, dry years than it is in cool, wet years.

In recognition of the uncertainty in forecast demand, Western Water has developed a baseline demand forecast with both an upper and lower bound to reflect the probable range of demand growth.

The demand forecasts (for each supply area) have been based on data from Western Water covering historical and forecast population growth; water consumption and restrictions; and also using evaporation (as a measure for climate). The baseline demand forecast is based upon historical residential consumption rates (adjusted for behaviour change and the implementation of water efficient technologies), non-residential consumption rates, and system losses (non-revenue demand). It is noted that there is some uncertainty inherent in the demand forecast, particularly for unrestricted consumption rates and population growth.

Sensitivity testing shows that the demand forecasts are most sensitive to the assumed residential connection growth and consumption rates, and relatively insensitive to the non-residential demand and non-revenue demand assumptions. Residential demand was forecast with growth rates based on a study[2] commissioned by Western Water.

Actual demand growth will be monitored and compared to forecast demand to best manage future implementation of initiatives to balance supply and demand.

4.1.2 Basis for demand forecast

The demand forecast is based on Western Water's demand and connection data as well as connection forecasts from Western Water's Growth Strategy (2011) . The effects of prior investment in and community education programs for water conservation are accounted for implicitly, by basing the demand estimates on recorded demand data.

Baseline residential demand is calculated and validated using two separate methods.

The first method for determining baseline demand is based on:

- an estimate of consumption rates for existing connections based on 2005/06 demand, because this was the last year with normal climatic conditions when there were no water restrictions; and
- an estimate of consumption rates for new connections which are approximately 15% lower than existing connection consumption, based on comparing actual data for new connections and existing connections in 2010/11.

[2] Western Water Growth Strategy (Osborne Management, Marsden Jacob & Associates)

The method for validating the residential demand forecast is to adjust the 2010/11 demand:

- upwards by 7% to account for the cool and wet conditions in 2010/11, based on monthly evaporation (which is a measure of climate conditions that impact water use); and
- upwards by 6.6% to account for the impact of local water restrictions in 2010/11. The value of 6.6% was chosen from the VicWater *Review of Water Restrictions and PWSRs - Position Paper,* which estimated savings of between 6.6% and 14.1% under Stage 3 restrictions. The lower end of this range has been used as there is evidence of water efficiency behaviour becoming embedded into normal water use.

The difference between to the two methods is accounted for by demand reduction due to behavioural change by the community and amounts to a 23% reduction. The result is that assumed consumption rates for new connections are around 35% less than in 2005/06.

Demand growth is then forecast based on:

- Growth Strategy connection forecasts for each town, updated for reported 2010/11 connection and population figures;
- non-residential demand based on Western Water demand and connection data, and assuming a growth rate of 50% of residential connection growth;
- distribution losses based on the reported 2010/11 losses, applied as a proportion of residential and non-residential demand (average 9.6%); and
- treatment plant losses based on Western Water bulk meter data, applied as a proportion of treated water produced;

The Growth Strategy provided household growth rates up to 2030. Other assumptions were made for connections post 2030. For areas of high growth (new growth areas in the study), the growth rate was set at 1.5% per year after 2030, consistent with the approach previously used by Western Water. For other systems, where a constant annual growth rate had been assumed in the study, this trend was continued to 2060.

Uncertainty analysis was undertaken for demand, which indicated uncertainty of around +/- 15% for the demand forecast.

Western Water, its customers, and the Victorian Government have made significant investments in water conservation measures over recent years, and these have undoubtedly reduced residential and non-residential consumption rates, as well as system losses. These water conservation measures include:

- Significant investment in recycled water schemes, in particular the Sunbury/Melton Scheme which delivers around 1,000 ML/year of recycled water to over 50 customers;
- Investment to reduce losses from both the distribution system and WFP;
- Victorian Government programs to replace inefficient water fittings, such as shower roses and toilet cisterns with water efficient fittings;
- Victorian Government programs, such as the 5 star and 6 star energy ratings for new homes, to increase the uptake of water tanks; and
- Communication and education programs to promote water conservation and improve the water literacy of Western Water customers.

For the baseline demand forecast, the effects of the water conservation measures have generally been accounted for implicitly, by basing the demand estimates on recorded demand volumes. Therefore, there has been no need to account for these water conservation measures in the current or future demand estimates. The exceptions to this are consumption rates for new residential connections and behavioural change, for which specific adjustments were made in the demand forecast.

Demand-side measures to reduce future potable water consumption (such as through the development of new recycled water schemes) are not included in the baseline demand forecast. Instead, these options will be considered as a demand scenario in the WSDS options analysis.

4.2 Supply Forecasting

4.2.1 Uncertainty associated with supply forecasting

There is also uncertainty associated with forecasting the available water supply. The major influence on water availability is climate. The Western Water region, like all of Victoria, has experienced the impact of extremes in climate on its water supply. During the recent drought (1997 – 2009) Western Water imposed Stage 4 water restrictions in 2003/04. Implementation of the pipeline connection to the Melbourne System was critical in securing supply for communities in the region. Other factors including water infrastructure capacity and system operating rules, for example the provision of environmental flows in rivers, can also impact the availability of water.

4.2.2 Basis for supply forecast

System supply (or yield) was estimated using the Maribyrnong and Werribee REALM models (as per the DSE Guidelines), with yields estimated for the Rosslynne, Werribee, Woodend and Lancefield systems.

Yield is a function of system inflows, storage capacity and demand. Demand is an important factor because it does not match the timing of inflows. For example most inflows occur in winter while demand is highest in summer.

Yield is estimated as the annual demand that can be supplied by each system without supply shortfalls occurring (shortfalls generally occur when storages draw down to a level where demand cannot be met).

System yield is usually calculated as the highest volume of water that can be extracted annually over the long term from the system without the imposition of restriction more frequently or for longer than agreed, and without draining dams below an agreed level.

The baseline yield was estimated based on median climate change (assuming a gradual reduction in stream flow over the next 50 years). The upper bound of the yield estimates was based on historical inflows (no climate change), with the lower bound based on the more severe ‘dry climate change.’ An additional ‘return to dry’ yield was also estimated based on the dry period 1997 to 2009.

Yield was previously estimated based on system reliability (e.g. no restrictions 9 years out of 10), although Western Water has now decided to align its restrictions with Melbourne, meaning

that restrictions are effectively independent of demand.

Yield is effectively a measure of the average volume that can be supplied in dry years, because the calculation is based on conditions that lead to restrictions or shortfalls. In average and wet years, more water will be available, while in very dry years less water will be available.

For Western Water's systems, the yield is effectively constrained by the extended dry period, from 1999 to 2009 – the system yield therefore represents the average annual volume that could be supplied by Western Water's systems under a similar extended dry period;

For the Rosslynne and Werribee systems, yield was estimated for the local systems, and added to the Melbourne Headworks yield (which was constrained by the Bulk Entitlement volume);

Because Western Water's system yields are effectively a measure of the average volume that can be supplied in an extended dry period, most supply augmentation options provide minimal increase in yield (due to extremely low inflows). These options will bemore effective under average to wet conditions.

4.3 Current Demand and Supply Balance

The forecast demand and supply balance for Western Water systems are shown in Figure 4 to Figure 9. For the next Water Plan period (2013/14–2017/18), water resource availability is unlikely to be constrained for the Melbourne-connected Rosslynne and Werribee systems, as shown in Figure 4 and Figure 8. System yield has been estimated based on historical conditions and median and dry climate change forecasts, representing the uncertainty associated with supply. Action is required in the Romsey, Lancefield and Woodend systems within the next Water Plan period to address imbalances in supply and demand, or water quality objectives in the case of Lancefield.

At the current level of unrestricted demand[3], there should be sufficient capacity in the transfer infrastructure in both the Rosslynne and Werribee systems to supply peak demands by using both the local storages and the Melbourne System.

[3] Unrestricted demand is equivalent to the current demand adjusted for the effect of climate and current restrictions.

Figure 4 Rosslynne System Supply and Demand (Including Melbourne Headworks Bulk Entitlement)

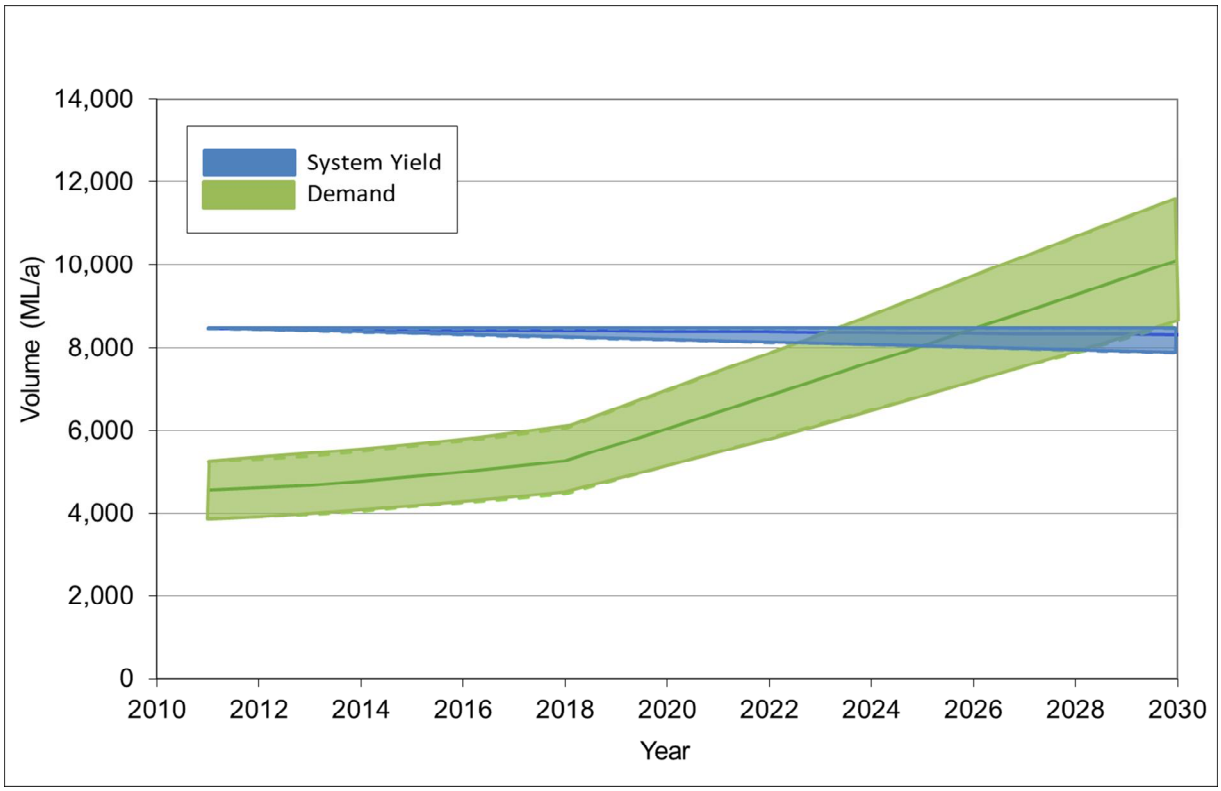


Figure 5 Romsey System Supply and Demand

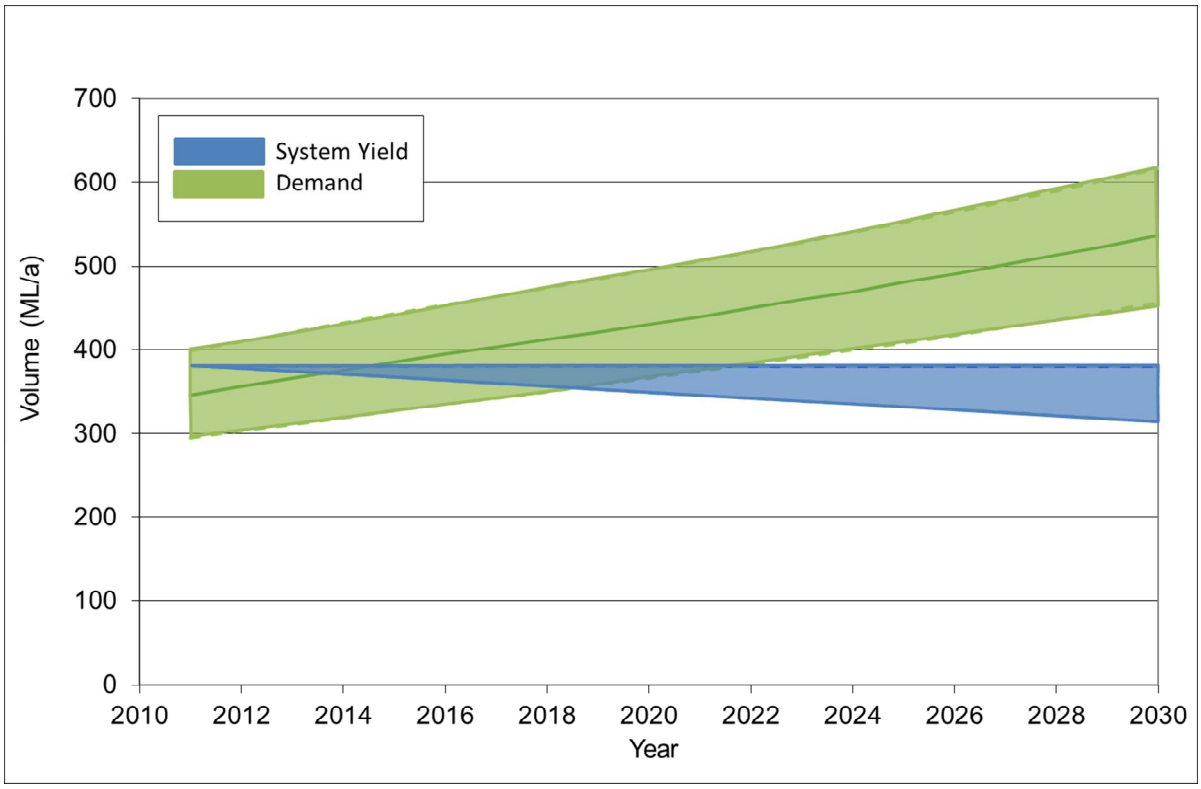


Figure 6 Lancefield System Supply and Demand

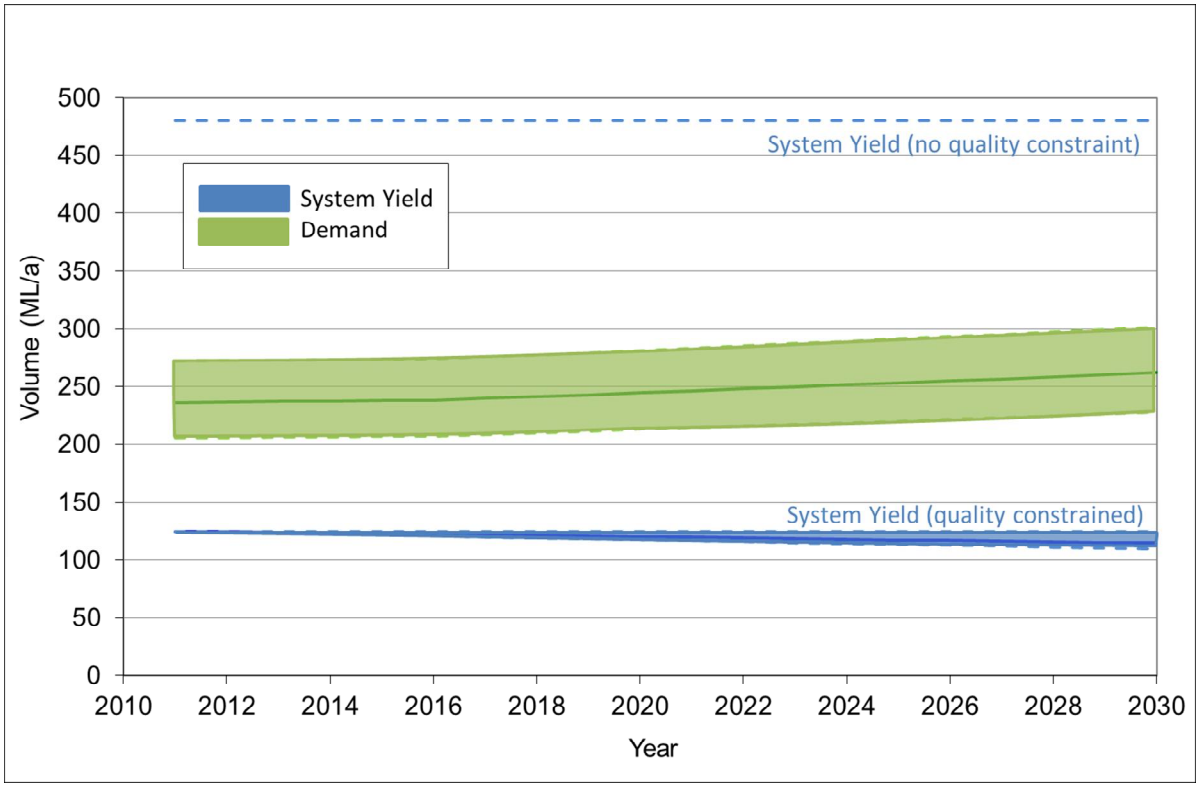


Figure 7 Woodend System Supply and Demand

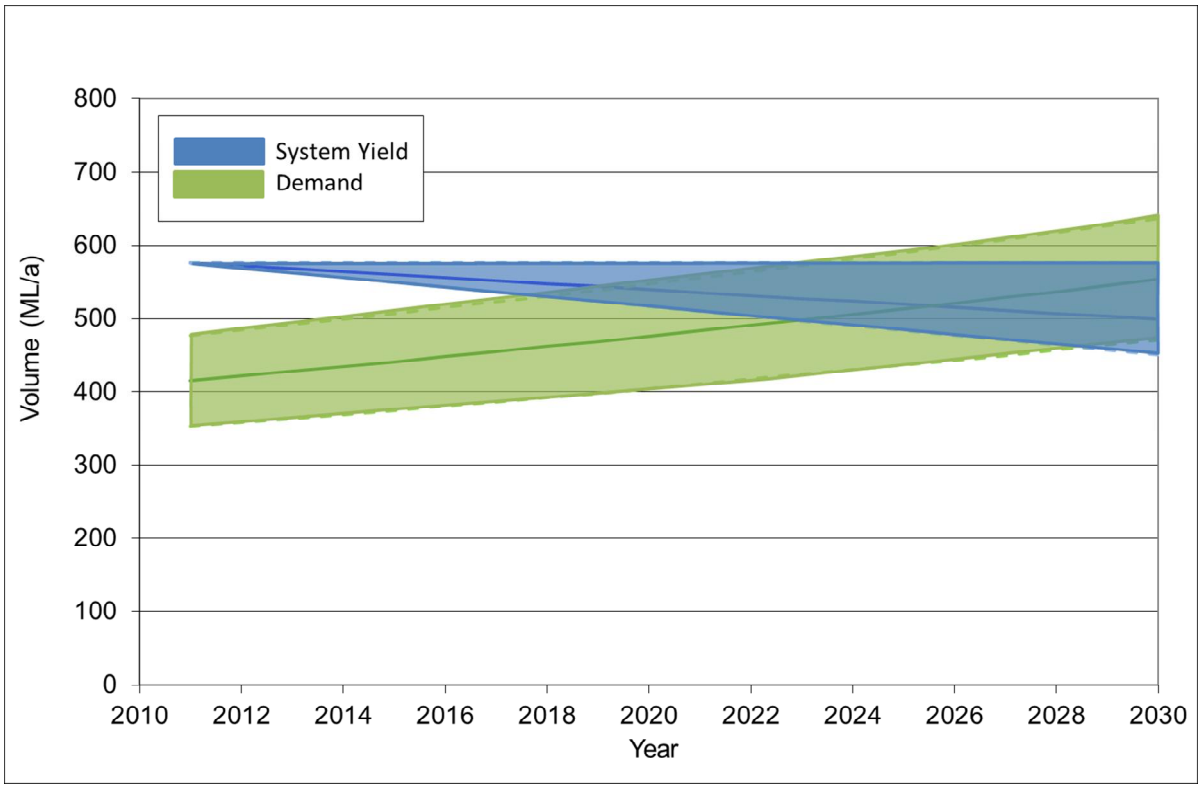


Figure 8 Werribee System Supply and Demand (Including Melbourne Headworks Bulk Entitlement)

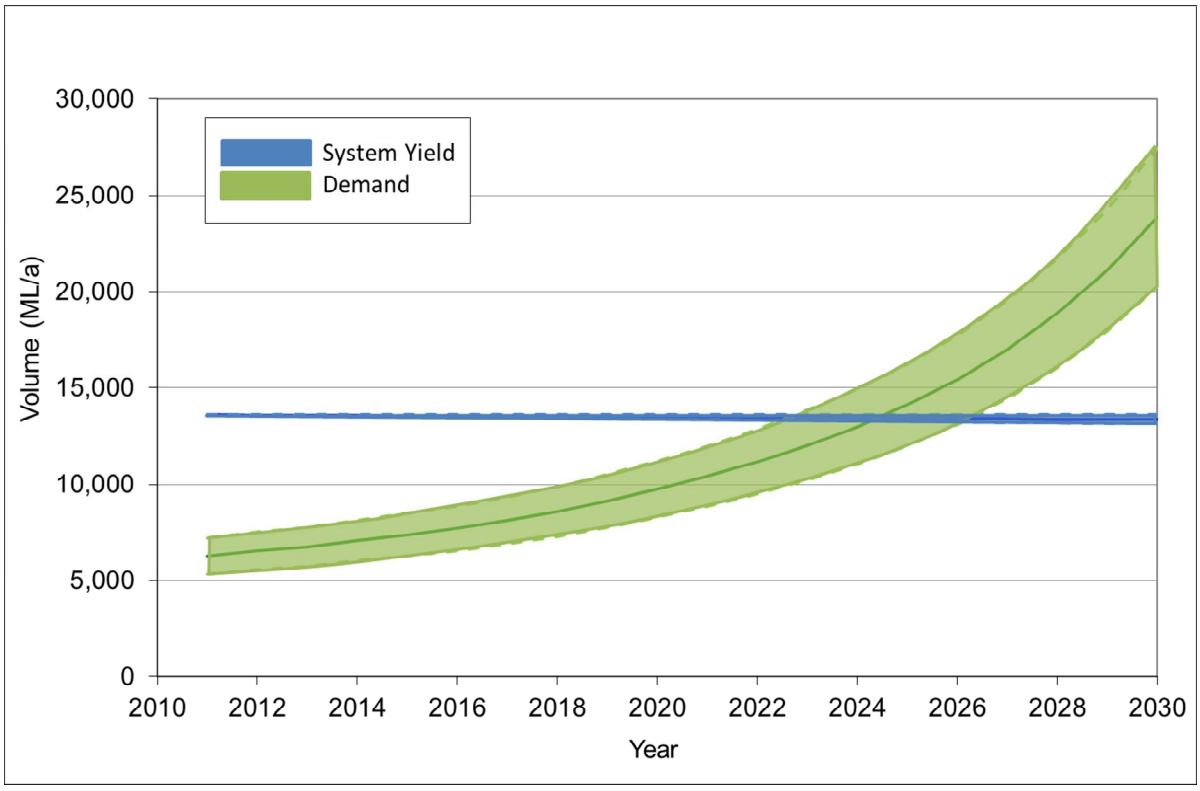
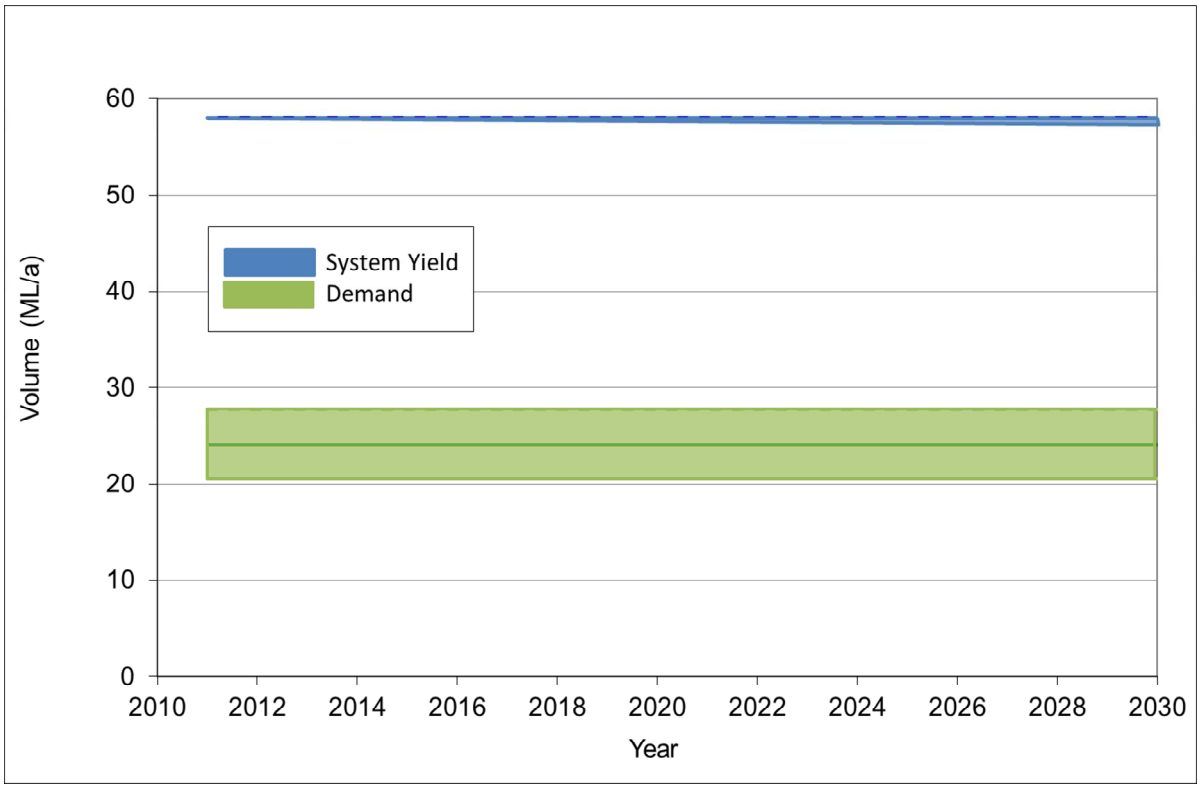


Figure 9 Myrniong System Supply and Demand



5. Actions to Maintain the Supply and Demand Balance

5.1 Why Action is Required

Rosslynne and Werribee systems

The demand and supply balances presented in the previous section show that Western Water has sufficient water to meet demand in the Rosslynne and Werribee systems for the short to medium term, including the next Water Plan period (2013/14–2017/18). However the balance presented above is a forecast only, and the actual supply and demand balance will shift every year depending on climate, population growth and water consumption habits. Therefore Western Water will need to ensure it is continually monitoring the supply and demand balance, and undertaking actions to help reduce the uncertainty around these forecasts.

A return to an extended dry period is the biggest risk for Western Water. Most supply augmentation options for the Rosslynne and Werribee systems provide minimal increase in yield, because Western Water's system yields are effectively a measure of the average volume that can be supplied in an extended dry period. All of the options evaluated for supply augmentation are more effective under average to wet conditions. The demand management initiatives, particularly potable substitution, help reduce demand and therefore defer the time at which action will be required to secure more water. In the absence of extreme drought, and if the population in the region grows as forecast, more water will need to be sourced for the Rosslynne and Werribee systems beyond 2025 (or 2022 at the earliest).

A peak demand assessment undertaken by Western Water in 2011 indicates that the existing Werribee and Rosslynne systems, together with the Melbourne supply, have capacity to meet peak demand through the next Water Plan period, subject to specific operating requirements (such as maintaining storage reserves in the local reservoirs). However, if peak demands bounce-back to pre-drought levels or growth is higher than forecast, it may be necessary to bring forward an increase to the Melbourne Headworks Bulk Entitlement and major upgrades of transfer infrastructure.

In the long term, it is inevitable that transfer capacity from Melbourne will need to be upgraded, together with an increase to the Melbourne Headworks Bulk Entitlement, if demand in the Melbourne-connected Werribee and Rosslynne systems increases as forecast..

The key issue for Western Water is the timing of investment in major supply upgrades, because of the uncertainty surrounding forecast demand for the Western Water region. Customers are highly supportive of solutions that use local water wherever possible but recognise the necessity of the connection to the Melbourne system. Recycled water and at home solutions ranked highly as customers choices for alternate supply solutions.

Romsey, Lancefield, Woodend and Myrniong systems

The demand and supply balances presented in the previous section show that the Romsey, Lancefield and Woodend systems require action in the short term. In all cases, options are available to augment these systems using local water sources.

The Lancefield system is supplied from both surface water and groundwater systems, but supply is constrained by the quality of the local groundwater supply (rather than the available resource). Addressing water quality issues for Lancefield's supply will be a key initiative under

this WSDS.

The Romsey system has immediate supply-demand concerns that will need to be addressed within the next Water Plan period. The major constraint on the Romsey system yield is the transfer capacity from Wright Reservoir, which supplies water from the former Riddells Creek system, as well as Rosslynne Reservoir and the Melbourne system.

The Woodend system has sufficient supply to meet demand for the next ten year period, including the next Water Plan period. However, if water consumption is higher than forecast, demand could exceed available supply towards the end of the next Water Plan period. Planning for a supply augmentation of the Woodend system will be a key initiative under this WSDS.

Myrniong has a highly reliable supply from Pykes Creek Reservoir, with relatively low rates of demand growth forecast, and does not require action to augment its supply within the WSDS planning period.

Customers have a strong preference for local surface water solutions – and this is more prevalent in smaller towns with strong support in particular for enhancing the capacity at local reservoirs. There is some concern around the use of local groundwater regarding its quality as well as the impact on aquifer depletion. Customers in Romsey and Lancefield are not clear on the value of connecting their systems and noted concerns about “their water” being used elsewhere.

5.2 Supply and Demand Options

For this WSDS, a range of options have been identified by Western Water to address current and projected supply shortfalls, and work towards achieving the WSDS objective of balancing supply and demand at the lowest possible cost.

Importantly, only one of the options considered in this options assessment addresses the significant supply shortfalls that are likely to be experienced in the Rosslynne and Werribee systems. Because of the rapid population growth in the areas serviced by these systems, the step change in demand is likely to require a new Bulk Entitlement from the Melbourne system (together with infrastructure upgrades) or a measure such as indirect potable re-use (which currently does not have Government support).

For the Rosslynne and Werribee systems, the system yield is effectively limited to what the systems could have supplied on average over the recent extended dry period, using the current infrastructure and Bulk Entitlement conditions. While options to increase storage capacity (eg: lake Merrimu) and better utilise available local water sources will be reasonably effective in providing a cost effective water supply in normal years, they provide little benefit under an extended dry period. An increase in the Melbourne Headworks Bulk Entitlement is therefore considered the only viable option for meeting the forecast step change in demand.

Options Considered

As part of the development of this WSDS, a suite of supply and demand options was identified for each of the systems with identified supply shortfalls in the short to medium term. The focus of this options review was for systems where planning or implementation of options is likely to be required in the next Water Plan period (2013/14 – 2017/18).

Demand-side options that are currently being implemented by Western Water were not considered as part of this review. This includes the "Water Tight" program; community education and behaviour change, including the Victorian Government's Living Victoria Water Rebate program; ongoing implementation of the Permanent Water Saving Rules; and the non-revenue water (leakage) reduction program.

Supply and demand options identified for each system are summarised in Table 1 below.

Table 1 Identified Supply and Demand Options for Western Water Systems

System	Option Type	Description	Option
Rosslynne	Supply: BE / transfer	Increased Bulk Entitlement from Melbourne system, together with transfer infrastructure upgrade	1a
	Supply: Lot-scale supply	Investment in lot-scale supply (rainwater tanks, etc.)	N/A(1)
	Demand: Dual supply / ASR	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas, with potential augmentation of this option using Aquifer Storage & Recovery (ASR)	6a/6b(2)
Romsey	Supply: groundwater / treatment	Develop borefield for Romsey under Romsey's 600 ML groundwater licence, together with an upgrade of the Romsey WTP	2a
	Supply: storage	Increase storage capacity of Kerrie Reservoir in Romsey system	2b
	Supply: transfer	Upgrade transfer capacity from Wright Reservoir, by duplication of existing main	2c
	Demand: Dual supply / ASR	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas, with potential augmentation of this option using Aquifer Storage & Recovery (ASR)	6a/6b(2)
Lancefield	Supply: treatment	Upgrade of the Lancefield WTP to address poor groundwater quality	3a
	Supply: storage / transfer	Increase storage capacity of Garden Hut Reservoir and upgrade transfer capacity to Lancefield, to enable increased surface water blending with poorer quality groundwater	3b
	Demand: Dual supply / ASR	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas, with potential augmentation of this option using Aquifer Storage & Recovery (ASR)	6a/6b(2)
Romsey-Lancefield	Supply: Interconn. / groundwater / treatment	Interconnection of the Romsey and Lancefield systems, together with development of the Romsey groundwater borefield and upgrade of the Romsey WTP (increased supply from groundwater)	4a
	Supply: Interconn. / transfer	Interconnection of the Romsey and Lancefield systems, together with upgraded transfer capacity from Wright Reservoir, by duplication of existing main (increased supply from Melbourne)	4b
Woodend	Supply: storage	Increase storage capacity of Campaspe Reservoir in Woodend system	5a
	Supply: transfer	Upgrade transfer capacity from Macedon and Mt Macedon system, by duplication of existing main	5b
	Demand: Dual supply / ASR	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas, with potential augmentation of this option using Aquifer Storage & Recovery (ASR)	6a/6b(2)

System	Option Type	Description	Option
Werribee	Supply: BE / transfer	Increased Bulk Entitlement from Melbourne system, together with transfer infrastructure upgrade	1a
	Supply: BE	Increased Bulk Entitlement from Merrimu Reservoir, from unallocated share	1b
	Supply: Lot-scale supply	Investment in lot-scale supply (rainwater tanks, etc.)	N/A(1)
	Supply: BE	Increase Werribee BE by purchasing entitlements from irrigators in Bacchus Marsh and Werribee Irrigation Districts, and provide recycled water to irrigators	N/A(3)
	Demand: Dual supply / ASR	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas, with potential augmentation of this option using Aquifer Storage & Recovery (ASR)	6a/6b(2)
Myrniong	N/A	No supply or demand options considered	N/A(4)

Notes: (1) Lot-scale supply has limited yield benefits for the Rosslynne and Werribee systems, and is not considered appropriate for investment by Western Water. Western Water will however continue to promote and support lot-scale supply through its existing programs.

(2) Case study assessment for Melton, in Werribee system

(3) Known community concerns and technical issues mean this option is unlikely to proceed in the short to medium term

(4) System supply likely to meet demand over the next 50 year period

Option Assessment

Based on the suite of supply and demand options presented in Table 1 above, a short list of options was prepared as part of the development of this WSDS. The initial list of options was consolidated to a short list based upon an initial screening process. For some options that apply to multiple systems, such as the provision of a dual water supply, a case study was identified for the option short list to demonstrate the potential application of the option. Other options that were not considered practical to implement in the short to medium term, or where there is uncertainty due to known community concerns or technical issues, were not carried forward for further evaluation.

For the dual water supply and Aquifer Storage and Recovery (ASR) options, which potentially apply to a number of systems, case study options have been developed for Melton, in the Werribee system.

Lot-scale supply has limited yield benefits for the Rosslynne and Werribee systems, and is not considered appropriate for investment by Western Water. Western Water will however continue to promote and support lot-scale supply through its existing programs.

The option to supply irrigators in the Bacchus Marsh and Werribee Irrigation Districts with recycled water, and transfer their Werribee entitlements to Western Water, is known to have some community concerns and technical issues, and is not considered viable in the short to medium term.

A preliminary Triple Bottom Line (TBL) assessment was performed on the 14 short-listed supply and demand options. The TBL assessment considered the cost-benefit, additional supply, social acceptance,

amenity, land use & acquisition, environmental & cultural heritage, capability and approvals.

Summary results for the assessment of each of the short-listed options are presented in Table 2, while detailed results are presented in *Western Water 2011-2060 Water Supply Demand Strategy, Supplementary Technical Report*,' February 2012.

Table 2 Supply and Demand Option Assessment Summary

Option	System	Description	Preliminary Appraisal	Feasibility
1a	Rosslynne / Werribee	Increased Bulk Entitlement from Melbourne system, together with transfer infrastructure upgrade	Only viable option to address steep change in demand forecast for Sunbury and Melton	High
1b	Werribee	Increased Bulk Entitlement from Merrimu Reservoir, from unallocated share (10% storage increase)	Low cost option with operational and cost benefits under average to wet conditions, but limited yield benefit	High
1c	Werribee	Increased Bulk Entitlement from Merrimu Reservoir, from unallocated share (10% storage increase + purchase of 50% of water shares)	Low cost option with operational and cost benefits under average to wet conditions, but limited yield benefit	High
2a	Romsey	Develop borefield for Romsey, together with an upgrade of the Romsey WTP	Cost effective option with acceptable risk that utilises local water sources, but does not address Lancefield requirements	Medium
2b	Romsey	Increase storage capacity of Kerrie Reservoir in Romsey system	Worth considering as part of dam safety works. Relatively low cost benefit and limited yield benefit. Does not address Lancefield requirements	Medium
2c	Romsey	Upgrade transfer capacity from Wright Reservoir, by duplication of existing main	Improves yield and operational flexibility, but with a relatively low cost benefit. Does not address Lancefield requirements	Low
3a	Lancefield	Upgrade of the Lancefield WTP to address poor groundwater quality	Low risk option with a relatively high cost benefit that improves yield and operational flexibility, but does not address Romsey requirements	Medium
3b	Lancefield	Increase storage capacity of Garden Hut Reservoir and upgrade transfer capacity to Lancefield	High risk option with low cost benefit. Improves yield, but does not address Romsey requirements	Low
4a	Romsey-Lancefield	Interconnection of the Romsey and Lancefield systems, together with development of the Romsey groundwater borefield and upgrade of the Romsey WTP (increased supply from groundwater)	Attractive option with a relatively high cost benefit that improves yield and operational flexibility. Utilises local water sources and address Lancefield and Romsey requirements	High
4b	Romsey-Lancefield	Interconnection of the Romsey and Lancefield systems, together with upgraded transfer capacity from Wright Reservoir, by duplication of existing main (increased supply from Melbourne)	Relatively low risk option that improves yield and operational flexibility, but with a relatively low cost benefit. Addresses both Lancefield and Romsey requirements	Medium

Option	System	Description	Preliminary Appraisal	Feasibility
5a	Woodend	Increase storage capacity of Campaspe Reservoir in Woodend system	Low risk option with a relatively high cost benefit that improves yield and operational flexibility	Medium
5b	Woodend	Upgrade transfer capacity from Macedon and Mt Macedon system, by duplication of existing main	Low risk option with a relatively high cost benefit that improves yield and operational flexibility	High
6a	Werribee	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas in Melton, Eynesbury & Toolern	Relatively low cost benefit, but risk is low. Offers good potential to defer or offset new Melbourne BE volume. Aligns with Western Water recycling strategy, utilising local water sources	High
6b	Werribee	Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas in Melton, Eynesbury & Toolern, with augmentation using ASR	Acceptable risk, but difficult to progress on cost grounds. Offers good potential to defer or offset new Melbourne BE volume. Aligns with Western Water recycling strategy, utilising local water sources	Medium

5.3 Actions

5.3.1 Demand-side actions

Efficient use of water is continually being pursued by Western Water through WaterTight, community education, the promotion of permanent water savings rules and leakage reduction. Western Water is also pursuing greater uptake of recycled water as a way of reducing demand for potable water.

Given the approach advocated by the Essential Services Commission guidelines for 2013 Water Plans (Essential Services Commission, 2011), the development of new water conservation measures over and above current measures is not considered necessary at this time.

Western Water will continue current water conservation programs to reduce demand, being:

1. Ongoing implementation of *WaterTight* program;
2. Community education and behaviour change, including the Victorian Government's Living Victoria Water Rebate Program;
3. Ongoing implementation of Permanent Water Saving Rules; and
4. Non-revenue water (leakage) reduction program.

Western Water will also:

5. Continue to expand the availability of recycled water from Surbiton Park to new developments, particularly the rapidly growing areas of Melton, Toolern and Rockbank (while this can also be considered a supply-side action, the approach taken for this WSDS has been to consider recycled water supply as an offset to potable water demand); and
6. Investigate the use of Aquifer Storage and Recovery (ASR) to improve the availability of recycled water.

It is important to note the scale of demand reduction possible under some of these initiatives. For example, in new developments identified for 3rd pipe connection, Western Water believes each connected property saves 30-50% of its potable water consumption by substituting recycled water where appropriate.

5.3.2 Supply-side actions

The demand and supply balances presented in Section 4.3 indicate that the Rosslynne and Werribee supply systems require no augmentation until 2022. Immediate action is required for the Romsey and Lancefield systems to address infrastructure constraints in the case of Romsey and water quality constraints in the case of Lancefield. While the Woodend system has sufficient supply to meet demand for the next ten year period, if water consumption is higher than forecast, demand could exceed available supply towards the end of the next Water Plan period. Planning for a supply augmentation of the Woodend system is therefore required for the next Water Plan.

To allow Western Water to supply its customers with the most cost effective water supply, the corporation is aiming to maximise its use of locally managed resources. This is consistent with customer preferences identified in detailed community consultation which Western Water

undertook in early March 2012. A summary of these findings is attached to the WSDS Technical Paper. For the next Water Plan period, Western Water will implement the following supply-side actions:

Rosslynne and Werribee systems

1. Negotiate with DSE and Melbourne Water to increase the Melbourne Headworks Bulk Entitlement, together with planning for a major upgrade of the transfer infrastructure to accommodate increased average and peak transfer volumes from the Melbourne system. The capital works for the infrastructure upgrade to increase supply volumes are not likely to occur until Water Plan 4;
2. Negotiate with DSE and SRW to increase the Merrimu Reservoir Bulk Entitlement, from the allocated share;

Romsey and Lancefield systems

3. Interconnect the Romsey and Lancefield systems, together with full development of the Romsey groundwater borefield and upgrade of the Romsey WTP;

Woodend system

4. Complete planning for an augmentation of the Woodend system, by either increasing storage capacity of Campaspe Reservoir or upgrading the transfer capacity from the Macedon and Mt Macedon system, by duplication of the existing main.

5.3.3 WSDS monitoring and reporting

Western Water will actively monitor the supply demand balance as part of the implementation of this strategy. This monitoring will focus on comparing elements of supply and demand that may indicate if action is required to maintain the supply – demand balance.

Table 3 Measures for monitoring the supply and demand balance

Measure	What this may indicate
Actual demand compared to the forecast demand.	If demand is exceeding forecast and action is required to secure supply reliability, then unplanned supply augmentation will incur additional costs.
Actual Rosslynne, Werribee, Lancefield and Woodend system inflows compared to inflow scenario used for yield calculation.	If actual inflows are less than those used for modelling then the available supply may be less than required, therefore necessitating greater use of Melbourne System water than forecast.
Annual use of water from Melbourne System.	Increasing use of these resources indicate that the supply from local sources is not sufficient to meet demand, and that supply cost will higher than forecast.
Volume of water stored in Rosslyn, Merrimu, Pykes Creek reservoirs and the smaller storages at Romsey, Riddells Creek, Mount Macedon, Macedon, Woodend, and Lancefield.	Indication of the volume of water currently available to meet supply in the short term (1 – 2 years).

Western Water will prepare a water security outlook on an annual basis for communicating supply security and level of service to its customers. This water security outlook will be aligned with Western Water's Balanced Scorecard process and will be informed by the Melbourne water security outlook, as well as local demand and supply measures. This will enable deviations from the demand and supply balance presented in this strategy to be monitored.

5.4 Action Plan

Based on the supply and demand options assessment, an action plan has been prepared for the next Water Plan period (2013/14 – 2017/18). The action plan, presented in Table 4, includes demand-side and supply-side actions, together with an indication of their benefit, capital cost (where relevant), and stakeholder agencies.

5.5 Updating this strategy

Western Water will update this WSDS within five years of the submission of this strategy.

Table 4 Supply and Demand Actions for Water Plan 3 Period (2013/14 – 2017/18)

Action	Benefit	Capital Cost	Stakeholder Agencies
Ongoing implementation of *WaterTight* program	Reduced demand across all systems, but savings will be less than those observed in last 5 years	N/A	Western Water
Ongoing implementation of community education and behaviour change, including the Victorian Government's Living Victoria Water Rebate program	Reduced demand across all systems, but savings will be less than those observed in last 5 years	N/A	Western Water, DSE
Ongoing implementation of the Permanent Water Saving Rules	Reduced demand across all systems, but savings will be less than those observed in last 5 years	N/A	Western Water, DSE
Ongoing implementation of non-revenue water (leakage) reduction program	Reduced demand across all systems, but savings will be less than those observed in last 5 years	N/A	Western Water
Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas in Melton, Eynesbury & Toolern	Potential to defer major supply augmentation by around 1 year	> $10m	Western Water
Provision of dual supply / 3rd pipe scheme using recycled water to new growth areas in Melton, Eynesbury & Toolern, with augmentation using ASR	Potential to defer major supply augmentation by around 1 year	> $10m	Western Water, SRW
Increased Bulk Entitlement from Melbourne system, together with transfer infrastructure upgrade	Only viable option to meet step-change in demand in the Rosslynne and Werribee systems	> $10m	DSE, Melbourne Water, Western Water
Increased Bulk Entitlement from Merrimu Reservoir, from unallocated share (10% storage increase + purchase of water shares)	Minimal yield benefit, but could deliver an additional 500 ML/year on average	< $1m	DSE, SRW, Western Water
Interconnection of the Romsey and Lancefield systems, together with development of the Romsey groundwater borefield and upgrade of the Romsey WTP	Should meet forecast Romsey and Lancefield demands over 50 year WSDS period	$5m - $10m	Western Water, SRW
Planning for supply augmentation of Woodend system (increase storage capacity of Campaspe Reservoir or upgrade transfer capacity from Macedon and Mt Macedon system	Should meet forecast Woodend demands for a further 10 years, compared to the baseline	< $1m	DSE, Western Water

6. References

DSE (2011) *Guidelines for the Development of a Water Supply Demand Strategy Version 2*, Department of Sustainability and Environment, August 2011

Essential Services Commission (2011), *2013 Water Price Review – Guidance on Water Plans*, October 2011.

GHD (2012) *Draft Water Supply Demand Strategy 2012 Technical Supplement (GHD Document Number: 203426)*, prepared for Western Water Corporation, February 2012

Western Water (2007) *Water Supply Demand Strategy - 2006 to 2055*, Prepared by SKM for Western Water, February 2007

Western Water (2011a), *Western Water 2010 Annual Report*

Western Water (2011b) *Western Water Growth Strategy*, Prepared by Osborne Management and Marsden Jacob & Associates

Western Water (2012), WSDS Community Consultation Summary Report

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Appendix G

Growth Strategy

Appendix G: Growth Strategy

Confidential item provided under separate cover.

Appendix H

Business Cases – Top 10 Capital Projects

Water Plan 2013-2018

Preliminary Business Case

Sunbury Recycled Water Plant (RWP)

Upgrade

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the proposed upgrade of the Sunbury RWP. The plant treats wastewater generated from Sunbury including Diggers Rest and Bulla.

Wastewater generated within the Sunbury and Diggers Rest Townships are treated at Western Water's Sunbury Recycled Water Plant (RWP). The treatment plant is located on the outskirts of the Sunbury Township.

The treatment plant currently treats wastewater using a Modified Ludzak Ettinger (MLE) process to a standard that is suitable for either agricultural/commercial re-use, through Western Water's Class B recycled water network, or discharge to Jacksons Creek under an EPA discharge license. The treatment plant also produces biosolids from the treatment process which are disposed of offsite.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

Sunbury and Diggers Rest are expected to experience significant land development and resulting population growth over the next 20 year period as a result of Urban Growth Boundary (UGB) alterations as part of the Victorian State Governments Melbourne @ 5 Million initiatives.

The growth within the catchment of the Sunbury RWP is expected to more than double the current population (approximately 43,000 people) over the next 20 years, commencing in 2013 with a new 4,000 lot development in Diggers Rest.

This will result in an increased amount of wastewater to be treated within the Sunbury RWP catchment. The forecast growth will see ultimate flows to the plant exceed 20 ML/day.

The existing treatment plant is currently operating at treatment capacity and requires a plant upgrade to cater for future growth. The treatment capacity of the existing plant is approximately 6 ML/day.

2.2 Evidence of the problem

The Treatment Plant at Sunbury, based on recorded data at the plant, is currently receiving average dry weather flows in the order of 5.9 ML/day. The average dry weather flow refers to the average flow that enters the plant on non-rain affected days. Rainfall and wet weather events ultimately increase the flows within the wastewater systems by a factor of 6, and in some rainfall events and under certain circumstances up to 10.

The capacity of the existing plant is estimated to be in the order of 6 ML/day, with flows above this range producing less than the required treatment standard.

The growth in the region has been forecast based on the available information from involved stakeholders including the Melton Shire and Hume City Council's, the Growth Areas Authority (GAA) as well as the known developers in the region. Based on the available information, the number of residential lots within Sunbury is expected to increase from approximately 13,500 connected lots, up to ultimately more than 45,000 lots. By the end of the next regulatory Water Plan period, the number of connected sewer lots is expected to increase to approximately 16,000 lots.

Analysis of the current plant capacity as well as the current inflows indicates that the existing Sunbury RWP is at, or at the very least nearing its capacity. The flows to the plant are variable and dependent on a number of factors, including rainfall, climate conditions etc. For example through the recent drought period from 2006 through to 2010, the average dry weather flows were somewhat lower than what has been observed more recently through 2012 and also pre drought in 2004/05.

During the drought period prior to 2010, there was a conscious effort by Water Authorities and other Government organisations to promote efficient re-use of water and reduction in potable demands, as well as high level water restrictions. Initiatives encouraged through communities included grey water re-use, reducing shower time etc, which can reduce the amount of water use, and in turn the wastewater flows at the treatment plant.

Based on the most recently observed flows to the plant, and on the basis that conditions experienced during this time (ie. minimal water restrictions and average rainfall conditions), the current flows have been adopted as the basis for the forecast flows to the plant.

The forecast average dry weather flow (ADWF) to the plant is shown in Figure 1.

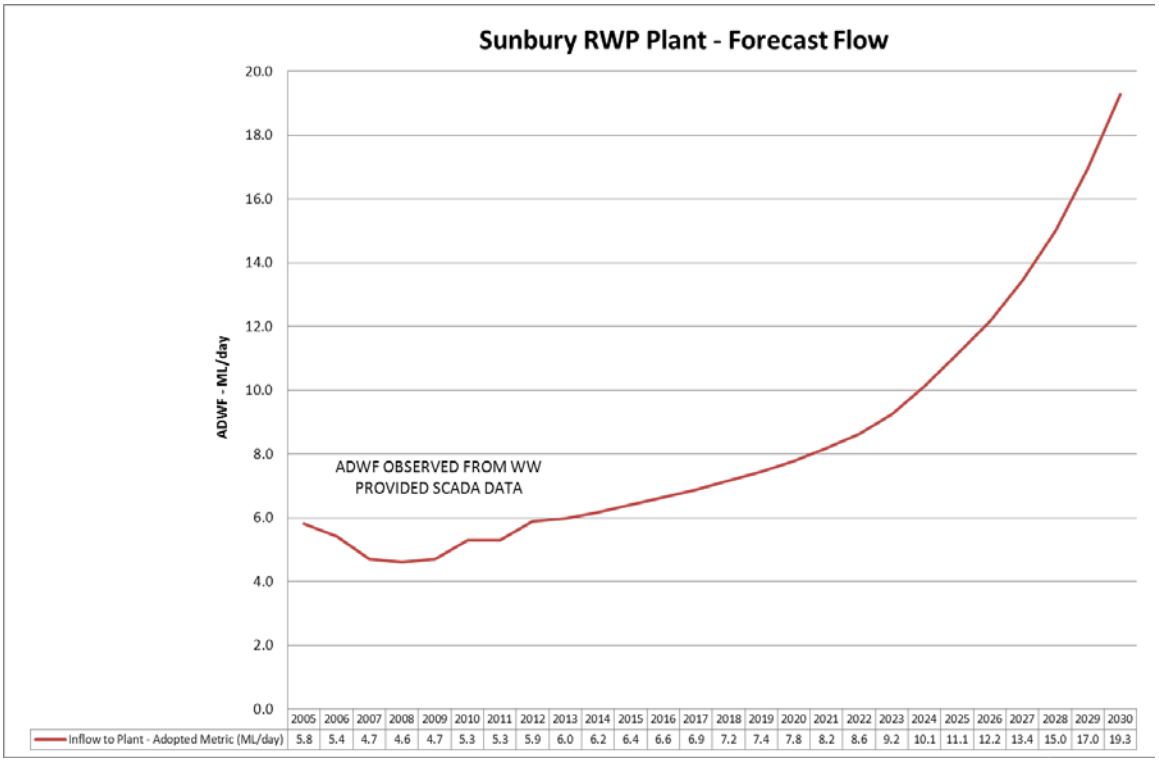


Figure 1 - Forecast Peak Demand vs Storage

2.3 Risks to the business introduced by the problem

Figure 1 indicates that the treatment (or process) capacity of the plant will be exceeded in 2013/14. The plant has a hydraulic capacity that is higher than the treatment capacity, to allow for flows generated from rainfall or wet weather events. In such events, the flows can be significantly greater than average; however the biological load is similar to the average flows. Although similar in biological loading, the higher flows experienced during wet weather events can affect the process capacity of the plant.

Without upgrade to the process capacity of the plant, the plant is likely to produce a lower quality of effluent. This lower quality of effluent may reduce the availability of recycled water to the Class B system and/or have an impact on the environment through discharge to Jacksons Creek. The likelihood that less than required quality is produced increases as the plant flows increase above the treatment capacity of 6 ML/day. The forecast indicates that the flow to the plant will exceed 6 ML/day in 2013/14.

The higher flows to the plant will effectively overload the plant and will result in a significant risk to Western Water. The risks relate to the regulatory compliance associated with the EPA license for the site as well as potential for pollution to the environment. The risk and assessment of the risk is outlined further in Section 4.6.

The option to do nothing at this treatment plant through the next regulatory period (ie. Water Plan 2013-2018) is not considered viable due to the risk of environmental damage and associated prosecution by EPA.

Western Water Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water. The event considered for the Sunbury RWP is not undertaking the project during the Water Plan 2013-2018 regulatory period. The associated risk is outlined below.

Consequence

Deferring the Sunbury RWP project through Water Plan 2013-2018 would result in the following consequences to Western Water:

- Regulatory/compliance criteria
    - Should the project not proceed, this will result in a lower quality of water being produced.
    - The lower quality effluent will result in reduced potential to re-use or recycle the effluent, which will result in discharge to environment.
    - The quantity and quality of this discharge to the environment could result in a major breach of the EPA's regulatory requirement.
- Environmental
    - Ongoing discharging of lower quality effluent will impact significantly to the local environment, resulting in an increase to the mixing zone within Jacksons Creek.
    - Such an environmental incident could take an extended recovery period
- Reputation
    - Western Water's reputation could be severely impacted by discharging lower quality effluent to the Jacksons Creek.
    - The impact would likely be an issue of regional significance, however could become an issue of State significance if continual breach of EPA license, or removal of license occurs.
    - The consequence rating for these areas generally all lie within a Major Consequence.

Likelihood

Based on Western Water Enterprise Risk Framework Likelihood Table, the likelihood of the consequence could be considered "Likely" or even "Almost Certain". The capacity of the plant is at, or at the very least approaching its treatment capacity. Based on forecast flow to the plant, the treatment capacity of 6 ML/day will be exceeded in 2014, at which point it would be considered at least "Likely" that the consequence will occur.

Risk Ranking

As per Western Water Enterprise Risk Framework, the risk ranking assigned to the Sunbury RWP project is Extreme.

2.4 Timing

The staging of the upgrade to the Sunbury RWP is currently being investigated as part of the Concept Design. The Concept Design will determine an efficient staging option to cater for the initial upgrade

works (nominally to meet flows to 2023) and the lay the footprint for the ultimate capacity of the plant (+20ML/day at 2030).

3 The upgrade will involve a number of phases, the first of which (concept design/process selection) has commencedBenefits

3.1 Benefits to be delivered

Wastewater treatment and management is part of Western Water's core business. The effective management and treatment of wastewater forms a key component of the Customer Charter, as well as a number of regulatory requirements. The regulatory requirements relate to environmental aspects of wastewater management in containment within the system and treatment to a certain standard and quality.

Through upgrade of the treatment plant, Western Water will be able to meet its obligations both in terms of customer service as well as regulatory compliance. The project will increase the treatment plants capacity, resulting in a lower risk of spill both at the treatment plant and within the distribution system as a result of sewer back up due to inability of the plant to treat the flows.

Currently with the plant near capacity, there is little scope to further optimise the current plant due to operational constraints. The plant upgrade is also expected to allow for improved operation of the treatment plant to enable the quality of effluent produced to be optimised.

3.2 Evidence of the benefits delivered

The benefits of upgrading the Sunbury RWP will contribute to:

- Improving the quality of effluent discharged to Jacksons Creek.
- The improved quality will contribute to reducing the mixing zone within Jacksons Creek, meeting EPA guidelines.
- Reducing spill occurrence within the sewer network.

4 Options

4.1 Options Considered

Reduce Flows?

As described above, there can be large variation in flows to the treatment plant. Water restrictions and water efficient usage at a household level can influence the wastewater flows generated and significantly alter organic load. Public perception around the availability of water appears to affect the willingness to conserve water and/or re-use wastewater.

Water restrictions were introduced in 2006 as a result of reduction in available water supply from local reservoirs, as well as Melbourne Water's supply reservoirs. In late 2011, these water restrictions were reduced back to Stage 1 restrictions as a result of above average rainfall that replenished water supply reservoirs. Figure 2below shows the average dry weather flows observed

at the Sunbury RWP over this period. Flows to the plant have steadily increased as water restrictions have progressively been eased.

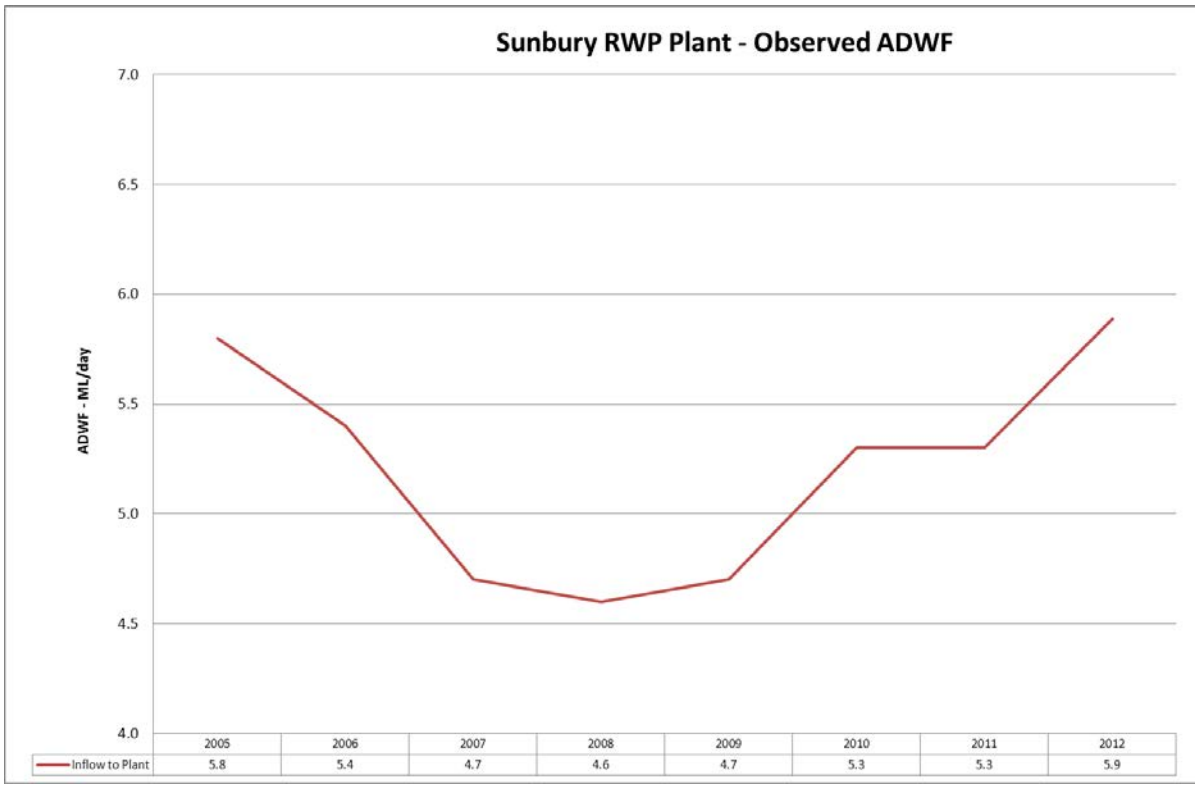


Figure 2 – Inflows to Sunbury RWP

With the pending completion of Victoria's Desalination Plant, and recent above average rainfall replenishing local water supplies, the perception could be that water supply is "secure" at least for the short term future. In the foreseeable future, it is unlikely that water restrictions will be re-implemented, and hence it is unlikely that flows observed during heavy restricted periods will return.

Based on the most recently observed flows to the plant, and on the basis that conditions experienced during this time (ie. minimal water restrictions and average rainfall conditions), the current flows have been adopted as the basis for the forecast flows to the plant.

Alternative Treatment to Reduce Flow to existing Plant?

Options for reducing the flow to Sunbury RWP were considering during preliminary analysis of the upgrade requirement. Options included:

- Diverting flows to Melton RWP.
- New plant at alternate treatment plant site.

Either of these options provided little benefit to Western Water, as they were both much higher capital investment options.

Assessment around the future location of the treatment facility has seen a number of alternate sites being investigated including completely relocating the site.

Western Water's Capital Works Committee resolved at their meeting in November 2011, that the sewerage treatment strategy for Sunbury would involve augmenting the existing plant over time to meet forecast growth within the current site.

Alter existing Plant to increase capacity?

As part of the Concept Design and Process Selection phase of the project currently underway, the existing plant capacity is being investigated. The plant has been modified several times over the past decade to maximise the capacity, with all options to increase capacity seemingly exhausted. Any options to increase the plants capacity further are anticipated to be at a high cost (capital and operational) for little benefit (minimal additional capacity) but will be considered throughout the project.

Adjacent Plant (at existing site)

Within the current treatment plant site, there is space available for a new plant that could operate in parallel with the existing plant. The adjacent plant alternative provides a number of benefits to Western Water, including not limiting the selection of the latest treatment technologies, and that distribution systems already deliver flows to the site.

The adjacent plant alternative will also enable further optimisation of the existing plant and process. This option will allow for flexibility in plant operation in that flows and loads on the existing plant could be altered to enable a higher quality effluent to be produced, providing added benefit to the upgrade option.

This alternative option will be considered as part of the Concept Design.

4.2 Options Comparison

Due to the high capital cost associated with options surrounding transferring flows to an alternative site, option associated with relocating the plant and/or redirecting flows were discarded.

4.3 Recommended Option

Western Water's Board resolved in November 2011 that increasing the capacity at the existing treatment plant site was the preferred option.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

The proposed solution will be developed in detail as part of the design process, but at this preliminary stage is proposed to include a new Modified Ludzack-Ettinger (MLE) process train added to the existing plant including:

- A new inlet works,

- A new MLE process reactor,
- A new secondary sedimentation tanks,
- New additional filtration units and chemical dosing
- New UV dosing
- New waste activated sludge thickening plant
- Additional aerobic digestion capacity
- Upgraded blower capacity,
- Electrical and power upgrade, and
- Ancillary services.

5.2 Timelines/Schedule/Project Plan

The following outlines the proposed program and lead times for key phases within the project:

Phase	Duration	Completed
1 – Concept Design/Process Selection	6 months	December 2012
2 – Procurement Analysis	2 months	February 2013
3 – Detailed Design	24 months	December 2014
4 – Works Approval	8 months	December 2013
5 – Construction	24 months	June 2017
6 – Commission	1 month	July 2017

5.3 Cost Estimate

A concept level cost estimate has been developed for this project. The cost estimate will be further developed as more information is understood about the selected process. The estimate below reflects a P50 cost estimate – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Sunbury RWP Upgrade	1.45M	1.5M	1.5M	10.1M	20M	-

Water Plan 2013-2018

Preliminary Business Case

Toolern Stormwater Harvesting

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the Toolern Stormwater Harvesting in Melton South.

A decade ago, local water supplies provided 100% of Western Water's drinking water needs. In 2008/09, they could provide only 6%.

The Toolern UGA, on the south eastern edge of Melton (45km to the west of Melbourne) is located in the designated area for urban development and will accommodate approximately 50,000 people. Development in Toolern will increase potable water demand through the next regulatory period and as a result require augmentation of the potable water supply.

Figure 1 – Merrimu Reservoir

In January 2011 the Minister for Water the Hon Peter Walsh appointed a Ministerial Advisory Council (MAC) to provide recommendations on strategic priorities for reform in the water sector to support the Living Melbourne, Living Victoria Policy.

Objectives of the Government's Living Melbourne, Living Victoria Policy include:

- Drive generational change in how Melbourne uses rainwater, stormwater and recycled water;

and

- Drive integration projects and developments in Melbourne and regional cities to use stormwater, rainwater and recycled water to provide Victoria's next major water augmentation.

This project involves the creation of a stormwater network and associated infrastructure to transfer 2.76GL of stormwater from wetlands within the proposed residential development in Toolern, to the Melton Reservoir.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

The Toolern development in Melton is a major future urban growth area, one of the biggest growth precincts across metropolitan Melbourne. At around 2,300ha it is predicted to provide additional 22,000 dwellings for 50,000 new residents over the next 20 years.

The greenfield site sits in a rain shadow and will be reliant on water imported from Melbourne. The potable supplies from Merrimu Reservoir cannot be counted upon to supply potable water on a reliable and continuing basis.

The sustainable management of water is one of the key challenges facing Western Water. Conventional management of separate systems for water supply, wastewater and stormwater disposal is no longer appropriate to service the growing populations and to simultaneously provide adequate environmental protection.

The harvesting of the stormwater within the Toolern Development provides an opportunity to Western Water to augment its supplies and provide increased security of supply by optimising local water resources to reduce the Melton area's dependence on Melbourne Water supply.

Evidence of the problem

The area where Toolern is located, shown in Figure 2, is situated in a rainfall shadow and is historically an area of low rainfall. In the ten years leading up to 2009, the average yearly rainfall was only 400- 500mm, with local storages going into decline from 2002. In 2008 the total rainfall was only 295mm. The Melton area, which was originally supplied with water via a gravity fed system from regional supplies, was in 2009 over 95% reliant on water pumped from the Melbourne Water metropolitan supply network.

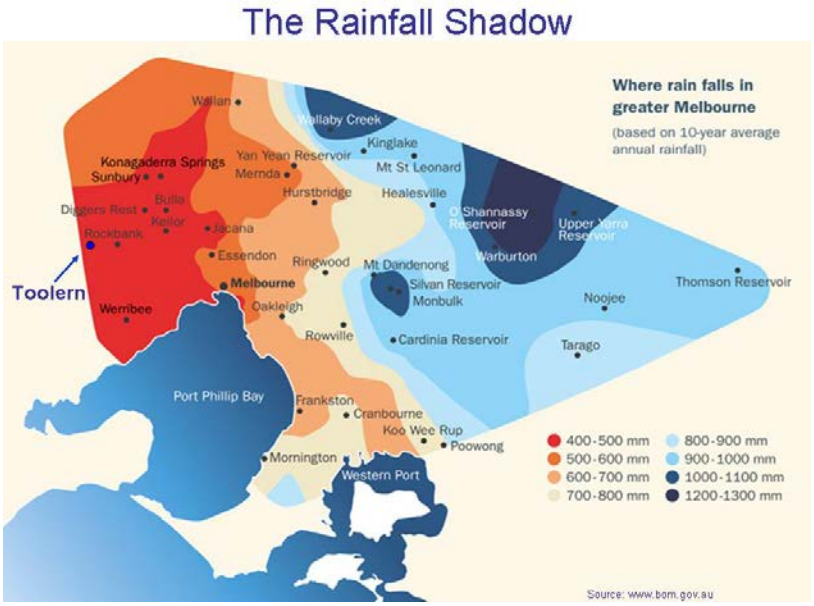


Figure 2 - The Rainfall Shadow

There is an opportunity to harvest on average 2.76 GL/yr of stormwater from the Toolern development.

2.2 Risks to the business introduced by the problem

Western Water has an opportunity to embrace the future of managing urban water in a cost effective, sustainable manner by matching different water sources such as stormwater and recycled wastewater to 'fit for purpose' uses.

The risk to Western Water of not managing urban water is missing the opportunity of alternate water sources. Climate change and drought will maintain Western Water's reliance on Melbourne Water. The impacts of this are exacerbated by the rising cost of desalinated water coupled with growth that requires more water infrastructure to service growth. There is existing demand for the stormwater captured, it is important that Western Water manage these potential customers vigilantly.

The project has been ranked through Western Water's Enterprise Risk Framework as a High Risk to Western Water, with a moderate consequence and likely to occur without undertaking the project during the Water Plan 2013-2018 regulatory period. Without the harvesting scheme, the system relies heavily on the Melbourne Water system and capacity of transfer systems to supply peak demands.

2.3 Timing

The opportunity to do this holistically must occur at the planning phase for new communities to ensure development is linked to local catchments characteristics, site master planning and communities.

The majority of stormwater harvesting infrastructure alignments coincide with alignments of sewers and other infrastructure currently identified within the Toolern Precinct Structure Plan. The most opportune timing for this project is to construct the stormwater infrastructure at the same time as the development services are constructed, this will alleviate the additional expenses associated with planning approvals and reinstatement. Therefore the project needs to occur progressively as the PSP develops.

3 Benefits

3.1 Benefits to be delivered

The new source of water supports a shift away from expanding Melbourne Water's metropolitan scale infrastructure to service the Toolern area, the project drivers include:

- Meeting the recoomendations of the MAC
- Minimising potable water consumption
- Conservation, reuse and recycling of water through innovative solutions involving alternative water supplies, as well as water use and its management
- Managing the quality of stormwater run-off to protect and enhance the quality of receiving waters

Among other policy drivers, Western Water has internal policy that sets out objectives for reductions in potable water use that have been derived from the Central Region Sustainable Water Strategy (2006)

Existing Western Water infrastructure together with current planned precinct scale infrastructure makes the use of alternative water sources for Toolern economically appealing: The existence of this infrastructure reduces the additional capital cost associated with these alternate sources whilst minimising the capital cost associated with extending Melbourne's supply network to service the area. The alternative sources also have good potential for lower supply charges in the future. The existing infrastructure includes:

- Supply reservoirs. Recent climatic conditions have resulted in reduced stream flow and the storage available in local supply reservoirs becoming less utilised in supplying rural and local potable demands. This has resulted in greater dependence on connections to the external metropolitan supply system. The underutilised storage is therefore potentially available for stormwater harvesting where 'fit for purpose' risks can be addressed.
- The configuration of infrastructure planned within Melbourne Water's Waterways management Scheme compliments the harvesting of stormwater at a precinct scale.

3.2 Evidence of the benefits delivered

Stormwater transfer volumes will be monitored through smart metering to ensure systems perform as expected and delver the anticipated water savings and environmental outcomes. The transfer system will be connected to our web-based SCADA systems for near real time feedback on harvested volumes, wetland levels and pump operation.

4 Options

4.1 Options Considered

In 2009 Western Water, produced the Toolern Integrated Water Management Strategy.

The strategy was prepared in consultation stakeholder reference group and considered a range of water management and sustainability related issues. The strategy is now referred to as the Toolern Integrated Water Management (IWM) Plan and is referred to in this report as such.

The conceptual design of key elements used within a set of infrastructure portfolios has been undertaken in sufficient detail to inform high level financial, environmental and social outcomes to be determined for the comparative assessment of seven portfolios. Approaches used within the portfolios include:

- Centralised option improvements using demand management strategies
- Decentralised in-house options for harvesting of roof runoff and reuse of greywater
- Precinct and/or catchment infrastructure options that involve wastewater recycling treated to non-potable standards and/or stormwater harvesting options treated to non-potable and potable standards.

A multi-criteria assessment was used to rank the seven infrastructure portfolios based on consideration of their financial, environmental and social costs and benefits. These costs and benefits were expressed as seven themes derived from a list of stakeholder wants and needs. A

stakeholder reference group identified indicators of success for each of the themes. Rating each of the portfolio's performance in terms of the indicators of success enabled the portfolios to be ranked against each other.

Case studies were undertaken at allotment scale and precinct scale to help inform the water cycle benefits and environmental outcomes associated with the infrastructure portfolios. Findings showed that:

- Precinct scale initiatives provided superior feasibility in terms of cost and performance; with low rainfall being a primary influencing factor
- Wastewater recycling alone will not achieve the desired reduction in mains water supply specified by Western Water's residential water saving target of 98 litres per person per day.

4.2 Options Comparison

The precinct scale case study highlights that this 'policy based' potable savings target is attained if stormwater harvesting is also included; where it is provided as a resource fit for uses that would otherwise require the import of potable water from outside the local region. The preferred infrastructure portfolio servicing Toolern should therefore include:

- Second supply pipe providing 'Class A' wastewater for the provision of supply for -
    - non potable residential demands including toilet and outdoor use
    - irrigation for sports fields
    - non potable industrial demands (which represents 25% of overall industrial demand).
- Harvesting and storing runoff from the UGA that has been treated in accordance with stormwater 'best practice' for uses that would otherwise require import of potable water from outside the local region. Two uses identified in the infrastructure portfolios are -
    - further treatment to potable standard and supplied to the potable reticulation network
    - irrigation supply for agricultural purposes without further treatment.

The two top ranking infrastructure portfolios differ only in these two uses of stormwater.
The two preferred infrastructure portfolios result in potable water savings of around 70% compared to meeting the UGA demands entirely through an import of potable water through Melbourne's Metropolitan supply infrastructure.

4.3 Recommended Option

The preferred infrastructure demonstrates a role for stormwater harvesting in greenfield development where Class A recycled water supplies non potable demands. The optimal combination incorporates water demands and 'seasonal scale' stormwater storage solutions.

This solution involves the creation of a stormwater network and associated infrastructure to transfer from wetlands within the proposed residential development in Toolern, to the Melton Reservoir. The staged construction of capture, treatment (via wetlands) and transfer of urban stormwater from the Toolern development to Melton Reservoir.

Redirecting the stormwater from Toolern Ck & Kororoit Ck catchments to minimise excessive runoff due to increased imperviousness from the development. Maintaining and enhancing pre-development flows to the creeks (quality and hydrology).

The water balance and stormwater quality treatment performance (MUSIC) models of the 2300ha catchment use subcatchment and % impervious data provided by Melbourne Water. The annual volume of stormwater available for harvesting is presented as a time series and an exceedance curve.

Figure 3 - Annual time series of stormwater from proposed Toolern urban development

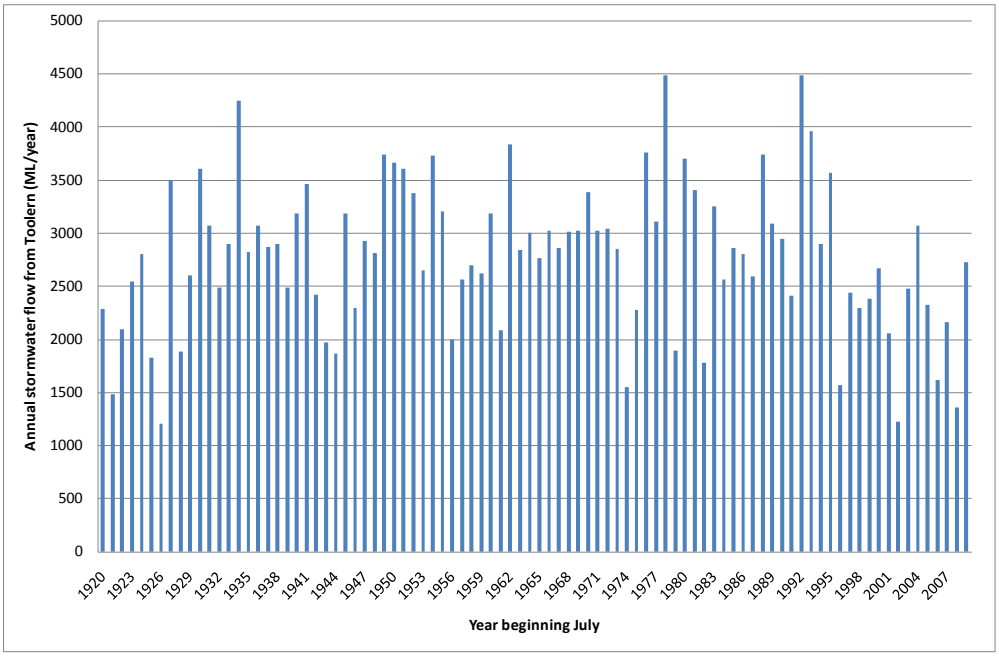
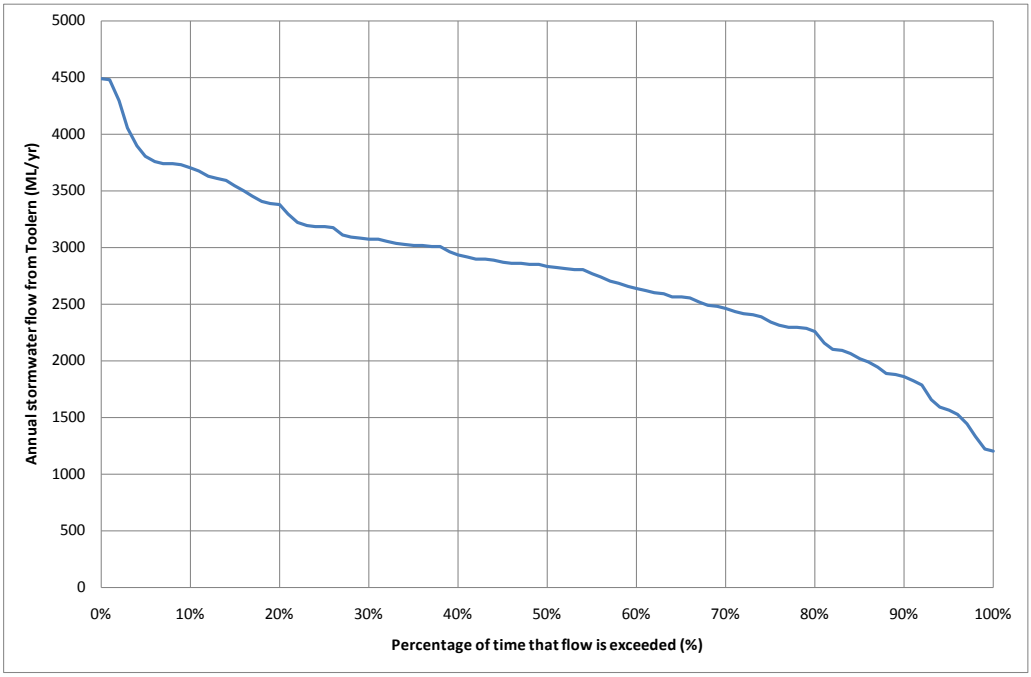


Figure 4 - Annual exceedance curve of stormwater from proposed Toolern urban development



These graphs show that the annual volume of stormwater ranges from 1200 ML/yr to 4500 ML/yr. Importantly, the annual volume available is never zero, which means that despite high variability on

a daily or monthly time step, the annual volume available for harvesting is reliably above 1200 ML/yr. The average annual volume available is 2780 ML/yr.

WW is to maximise the BE of stormwater harvested at Melton Reservoir for use as drinking water to substitute for bulk water supplies from Melbourne Water. Building flexibility and diversity in water supply infrastructure for Toolern will provide resilience against climate change whilst accommodating growth in population.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

It is proposed to construct approximately 23km of stormwater mains from proposed wetlands within the development of Toolern and using an optimal mix of gravity and pumping it across to Melton Reservoir or future upgrades to Western Water's regional supply network where 'seasonal storage' buffers against the difference in pattern of supply and demand.

5.2 Timelines/Schedule/Project Plan

The staging of the Toolern stormwater harvesting project is currently being investigated as part of the Preliminary Detailed Design. The project will involve a number of construction phases, efficient delivery will be based on stage of development within the Toolern Precinct.

The following outlines the proposed program and lead times for key phases within the project:

Phase	Duration	Completed	Description
1 – Detailed Design Stage 1	6 months	May 2013	
2 – Construction Stage 1	12 months	May 2014	Award contract for Stage 1 Construct stormwater pipes and pumps in Lend Lease development
3 – Detailed Design Stage 2	6 months	April 2014	
4 – Construction Stage 2	12 months	April 2015	Award contract for Stage 2 Connect the Delfin / Lend Lease development with Melton Reservoir across Toolern Ck via the Waterford development
5 – Detailed Design Stage 3	4 month	February 2015	
6 – Construction Stage 3	12 month	February 2016	Award contract for Stage 3 Connect wetlands "Greybox, Parklea and RB8" to the Delfin Lend Lease system.
7 – Detailed Design Stage 4	4 month	February 2016	
8 – Construction Stage 4	12 month	February 2017	Award contract for Stage 4 Connect "RB5, RB6 & RB7" with the stormwater harvesting network.

Due to the current unstable financial climate there is the potential for inadequate progression of development in the area reducing the overall scale of the project. It is important that Western Water continue to maintain continuous communication with the developers to establish a program for the Stormwater Project that is inline with precinct growth.

5.3 Cost Estimate

The total project cost estimate for the Toolern Stormwater Harvesting project is $18,694,933.02. Of which Western Water has been advised that a funding application under the Federal Governments "Water for the Future" National Urban Water and Desalination Plan has been successful for funding up to $9,235,782.75.

The Western Water contribution to the project is the balance of $9,459,150.27.

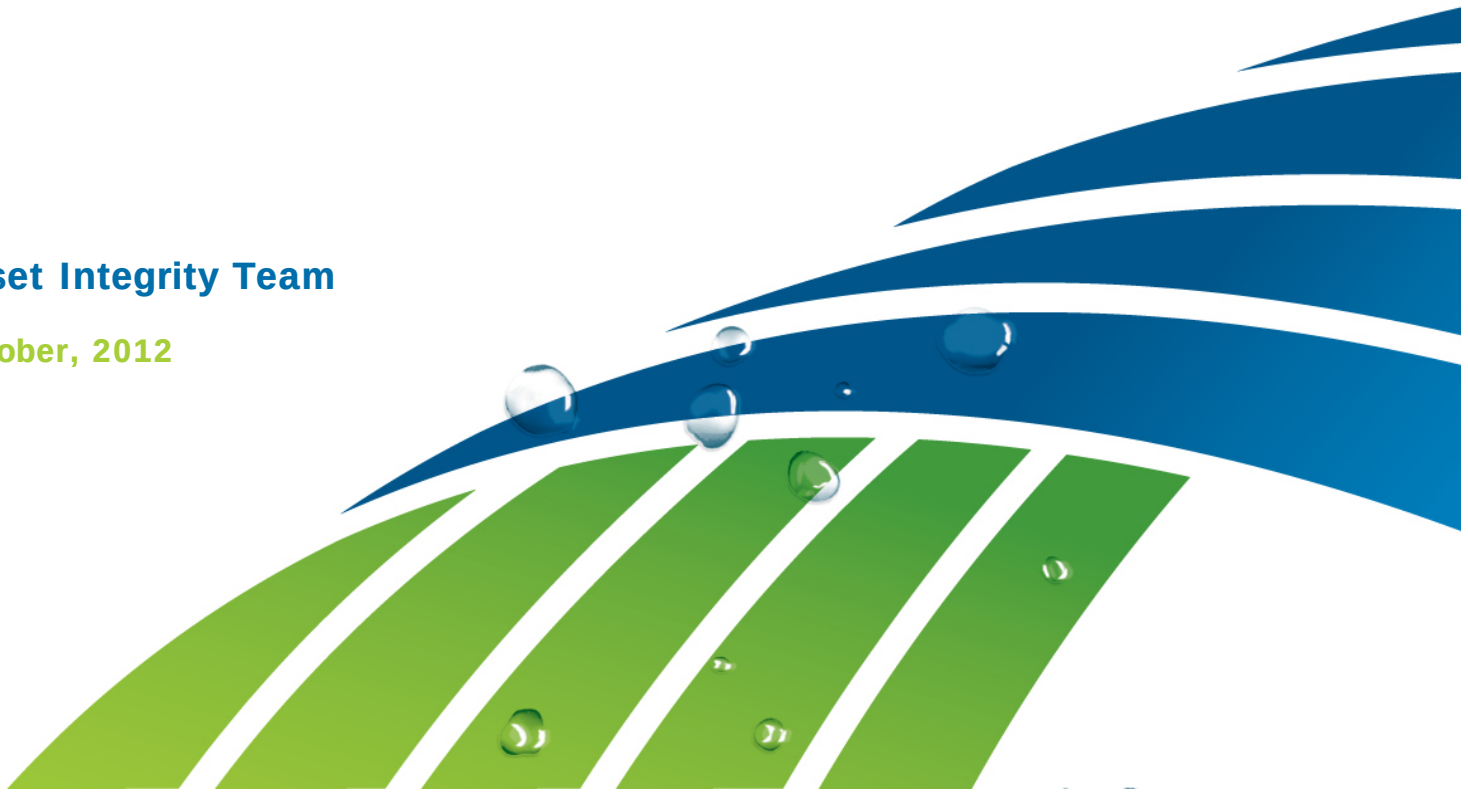
The estimate below reflects a P50 cost estimate – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
TOOLERN STORMWATER HARVESTING		$3,180k	$7,135k	$7,880k	$500k	

Water Plan 2013-2018

Preliminary Business Case

Sewage Spill Prevention Strategy



Asset Integrity Team

October, 2012

1 Introduction

This preliminary business case relates to Western Water's Sewage Spill Prevention Strategy (SSPS). Western Water has developed a program of works to reduce the occurrence of sewer spills across the region, namely the Sewage Spill Prevention Strategy (SSPS). This program targets actions to prevent all known causes of sewage spills to minimise their unacceptable effects to the environment irrespective of cause.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

Western Water's sewerage system comprises approximately 1,100km of sewer mains, 53 pump stations and 88km of rising mains. As of 30th June 2012, Western Water serviced 45,687 residential customers and 2,451 non-residential customers.

Since 2009, three significant uncontained sewage spills (sewage lost to the environment) have occurred at Western Water. Two of these sewage spills have attracted Pollution Infringement Notices (PIN) by the EPA and associated fines. The third sewage spill, which occurred at Tullidge Street Sewage Pump Station in March 2010, has resulted in an Enforceable Undertaking under the Environmental Protection Act 1970. The Enforceable Undertaking requires Western Water to undertake various tasks including the delivery of a strategy to minimise sewage spills.

In response to the issue of sewage spills from Western Water's system, a project team was established to carry out a thorough review of all available information and develop a strategy to reduce the risk, and number, of sewage spills and establish Western Water as a "Top 5" water business for this category.

The objective of the project team was to:

- Identify all causes of sewage spills; and
- Develop a strategy for proactively managing the sewerage system to minimise such spills and the associated detrimental effects to the community and the environment.

The need to ensure that any strategy assessed all likely causes of sewage spill is highlighted by the fact that, although the vast majority of sewage spills are caused by sewer blockages, there are numerous other causes of spills. An example of this is the electrical activity associated with a severe storm event that resulted in an undetected failure of a high level alarm at the Tullidge Street sewage pumping station. This alarm failure, which had previously not been experienced before, led to a subsequent serious sewage spill to an urban waterway and an Enforceable Undertaking requirement on Western Water.

The KPI for which Western Water's Board has set to achieve to become "Top 5"amongst all Victorian water businesses is for the number of sewer blockages per 100km of sewer. This KPI was chosen as the indicator to measure the effectiveness of the implementation of the strategy, as the vast majority of sewage spills at Western Water are caused by sewer blockages.

At the July 2010 meeting, Western Water's Board approved Western Water's Sewage Spill Prevention Strategy (SSPS). The strategy aims to reduce the occurrence of sewage spills within Western Water's sewerage system through proactively determining all known causes of sewage spill and determining actions to minimise future spills.

The SSPS has been subject to an independent expert review as a requirement of the EPA Enforceable Undertaking.

SSPS

The key tool developed for the SSPS was a Failure Mode Analysis of sewage spills. The diagram, shown in Figure 1, represents a summary of a detailed review of all aspects of sewage spills, the causes, categorisation of failure, and also the type of spill and response required. This analysis includes all categories of causes for sewage spill, and can therefore be confidently used and relied upon to assess and review mitigation and action plans to achieve the goals of the SSPS.

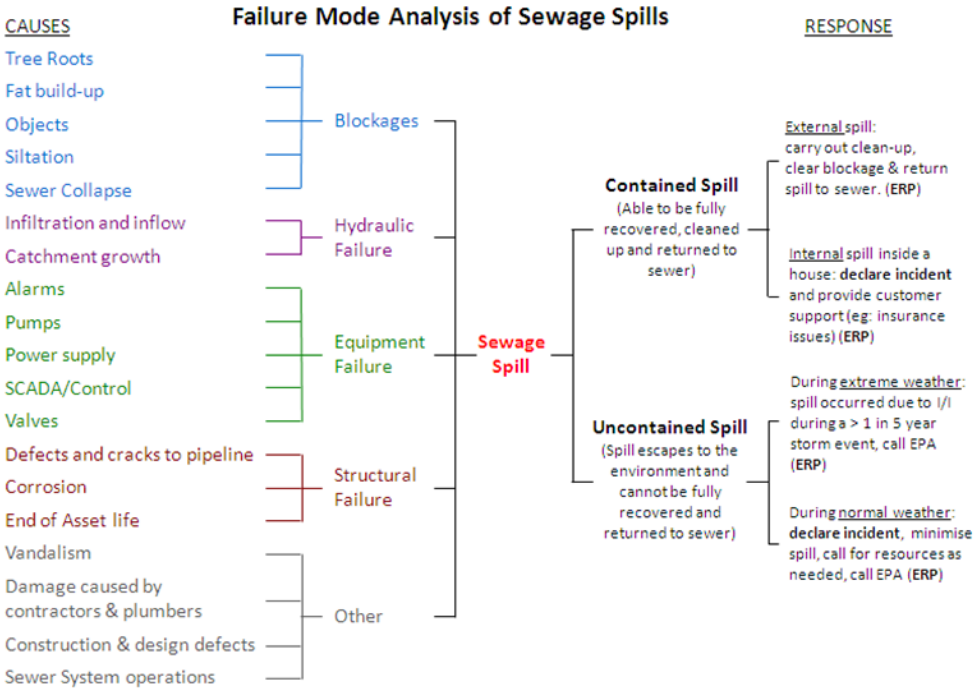


Figure 1 – Failure Modes Analysis used to create the SSPS

Key Activities under the SSPS are:

- Increased targeting of tree root affected sewers via application of root foaming agents.
- Region wide CCTV of critical sewers (main sewers) as well as known and arising repeat blockage areas (reticulation sewers or main sewers).

- Appointment and execution of a term contract with a sewer rehabilitation contractor to respond to defects as they are identified.
- Targeted inspection of sewer manholes in sensitive spill areas such as near waterways.
- Development of a backup Fail Safe alarm for use at sewer pumping stations, and key sewer manholes which present a greater risk of spill.
- Development of an improved sewerage system monitoring program, especially at key locations that will indicate the systems performance (e.g. real-time monitoring to identify and forecast spills).
- Monitoring of key assets, which are typically difficult to detect failure on, e.g. sewer rising mains, by logging flows at the outlet end of the rising main and accumulating the volume each day for comparison with the previous days using a "saw tooth chart".
- A review of all Sewage Pumping Station electrical and alarm controls, with works as identified.
- Development and upgrade of Sewer Asset Management Plans (AMP's) for each sewer asset class, e.g. Pumping Stations, Gravity Sewer Mains, Sewer Rising Mains, Manholes, Siphons, House Connection Branches, etc. which outline the asset management requirements.
- A review of Sewerage System design and construction standards.

2.2 Evidence of the problem

Prior to Commencement of SSPS (before FY10/11)

Prior to commencing the implementation of the SSPS in August 2010, in addition to the three significant uncontained sewage spills mentioned in Section 2.1, there had been a steady increase in the number of sewer blockages per 100km of sewer since FY05/06. As described previously, the vast majority of sewage spills at Western Water are caused by sewer blockages; therefore the increase in blockage numbers showed an increased risk of spill at Western Water. Figure 2 presents a graph showing the trend of the increasing number of sewer blockages from FY05/06 to FY09/10.

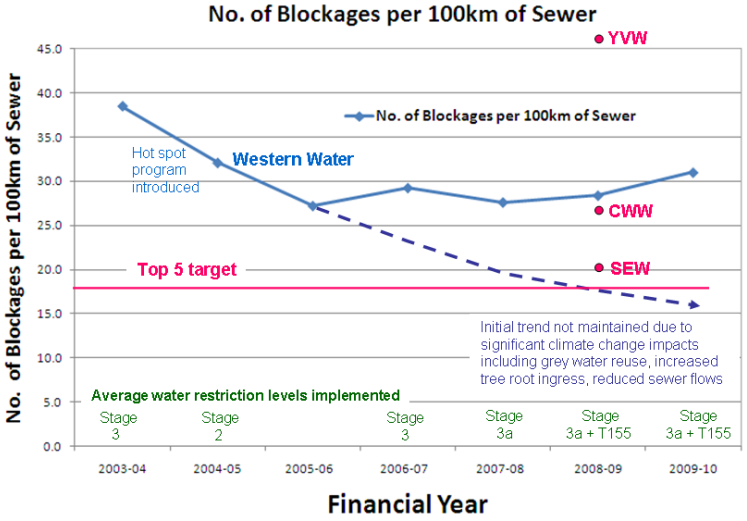


Figure 2 - Trend of the increasing number of sewer blockages from FY05/06 to FY09/10

Figure 3 presents how Western Water has performed against all other Victorian water businesses in respect to the number of blockages per 100km of from FY05/06 to 08/09.

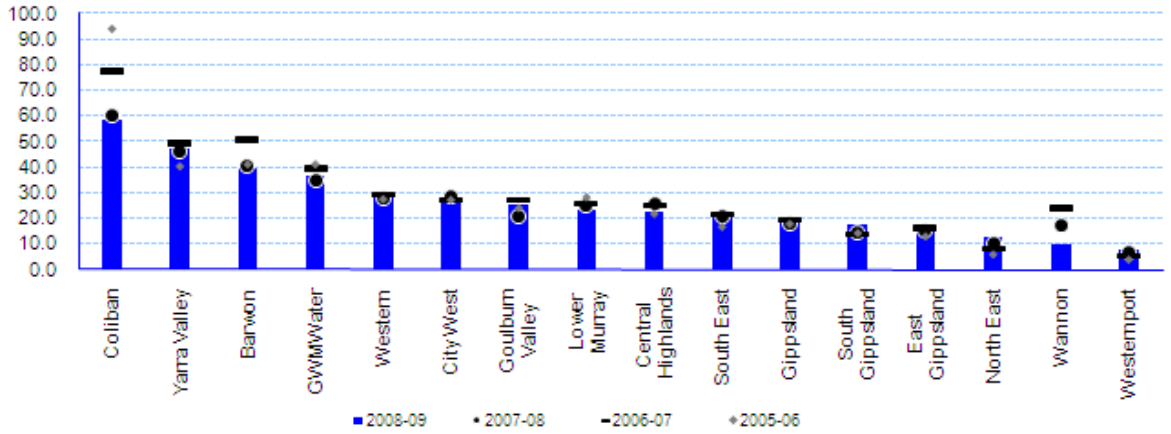


Figure 3 - Performance of Western Water in relation to Number of Sewer Blockages per 100km of Sewer against all Victorian Water Businesses

As can be seen from the 3, Western Water has had the fifth highest number of blockages when compared to other water businesses in FY08/09.

Additional Evidence observed following SSPS (FY10/11 to FY11/12)

A key part of the works undertaken under the SSPS is to CCTV inspect all main sewers (defined as sewers of 300mm in diameter and greater) and all problematic reticulation sewers (225mm in diameter and below).

In FY10/11 and FY11/12 CCTV inspection was carried out on approximately 40km of sewer in Melton, Bacchus Marsh and Lancefield which identified the following:

- Approximately 23% of all 150mm diameter and 225mm diameter sewers inspected are confirmed to be of Structural Grade 4 or 5 (requiring rehabilitation).
- Approximately 15km of main sewers up to 900mm in diameter (previously thought to be of another material) have been confirmed by CCTV to be concrete pipes with varying degrees of corrosion. Further non-destructive testing has confirmed the findings of the CCTV to suggest that those heavily corroded sewers will require rehabilitation. A main sewer collapse, presents an unacceptable risk to Western Water.
- Based on the extent of CCTV carried out to-date under SSPS in FY10/11 to FY11/12, Table 1 presents the lengths of structural grades 4 and 5 for various pipe diameters:

Table 1 - Lengths of Pipe with Structural Grades 4 and 5 from CCTV in Water Plan 2

Pipe Diameter	Length CCTV under SSPS (m) from FY10/11 to FY11/12	Length of Structural Confirmed to be Grade 4 or 5 (m) Or requiring Further Field Investigation as Concrete Sewers	% of Pipes found to be Structural Grade 4 or 5 Or requiring Further Field Investigation as Concrete Sewers (%)
150	13,707	3,597	26%
225	2,120	224	11%
300	5,844	2,064	35%
375	6,701	6,630	99%
450	1,060	769	73%
600	4,850	2,456	51%
675	549	468	85%
900	2,115	2,115	100%
1200	3.2	3.2	100%

- Based on the above, and pending further investigations on the concrete pipes, to-date there is an additional (worst case) $5.4million of sewer main relining to be carried out. It should be noted that the condition of the concrete sewers needs to be confirmed with further investigations (pipe cut-outs) on site to establish the extent of corrosion.
- It should be noted that the extent of rehabilitation does not take into account the condition of sewers in other towns (Sunbury, Gisborne, Woodend etc.) which are currently planned to be CCTV surveyed in Water Plan 3, nor any other repairs within pipes with a structural rating of 3 and below where patches may be required to resolve isolated defects.
- In Water Plan 3, budgets have been included for CCTV surveys of main sewers and problematic reticulation sewers all remaining towns, including the key towns of Sunbury and Gisborne.

2.3 Risks to the business introduced by the problem

SSPS is a risk based program that identifies Western Water's greatest risk areas in terms of sewage spills to the environment. The SSPS is expected to prevent spills, but is not an elimination strategy, as such a target is unrealistic and cost prohibitive.

Using Western Water's Enterprise Risk Framework, not implementing the SSPS would result in a High Risk to Western Water (Likelihood being "Possible", and Consequence being "Major"). Without the SSPS program the following risks would likely increase:

- Increase number of spills caused by blockages and associated costs of response, clean-up, compensation etc.
- Unacceptable damage to the environment.
- Likely prosecution due to greater focus by EPA on enforcement activities associated with sewage spills.
- Loss of reputation and damage to Western Water's brand as a result of sewage spills and the higher potential for public exposure.

2.4 Timing

It is proposed to continue the SSPS through Water Plan 3, with key focus on the following areas:

- Tree Root Foaming
- CCTV Inspections
- Sewer Main Renewals
- Establishing Critical Spill Points and Installing Fail Safe Alarms
- Monitoring all High Risk Rising Mains
- Identifying the source of, and implementing options to control, infiltration and inflow.

3 Benefits

3.1 Benefits to be delivered

The proactive approach to sewage spill prevention by the implementation of the SSPS will minimise the occurrence of sewage spills. This will reduce the impacts to the environment and customers.

3.2 Evidence of the benefits delivered

Since the implementation of SSPS in August 2010, the following benefits have already been achieved:

- Reduction in approximately 200 number blockages.
- Reduction in labour, plant, equipment, materials and management costs associated with sewer operations effort to respond to sewer blockages and spills.
- More than 300 customers free of the unpleasant impacts of blockages in their sewerage system, and many avoiding an even more offensive spill to their property or the nearby environment.
- Established processes, plans and procedures for management of all sewer asset types, including inspections and monitoring of the sewerage system, CCTV, SCADA etc.
- Effective contract with sewer rehabilitation contractors that allow prompt response to the identification of infrastructure defects.
- Independent Fail Safe alarms, providing an extra line of backup to prevent spills and their undesirable consequences.
- Reduced number of Blockages per 100km of sewer by almost 50% (as shown in Figure 4 below).

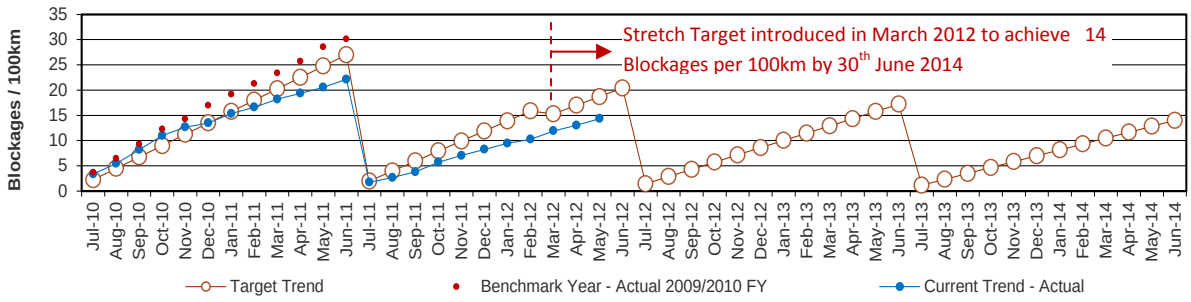


Figure 4 – Actual Performance against Target Number of Blockages per 100km of Sewer

4 Options

4.1 Options Considered

As stated previously a detailed Failure Mode Analysis of sewage spills was carried out to assess the causes of spill together with management options. During the implementation of the SSPS, significant discussion has been had with all other Victorian Water Authorities as well as specialist engineers and contractors at Australia wide industry conferences such as OzWater 2012 (where a paper on SSPS was presented) and Trenchless Technology Conference 2011.

4.2 Options Comparison

All activities carried out under the SSPS are prioritised on the reduction of residual risk to Western Water and the available budget. This ensures the greatest reduction of total risk at the lowest cost.

4.3 Recommended Option

It is recommended to proceed with the SSPS as stated for Water Plan 3.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

The program shows a need for continued focus on the following areas:

- Tree Root Foaming
- CCTV Inspections and Sewer Main Renewals
- Establishing Critical Spill Points and Installing Fail Safe Alarms
- Monitoring all High Risk Rising Mains
- Identifying the source of, and implementing options to control, infiltration and inflow.

Tree Root Foaming (Operational Expenditure):

Region wide foaming treatment to control root infestation within sewers, as well as liaison with Councils to remove (and prevent future) trees planted above sewerage assets. Root foaming has been found to be effective in targeted areas within the region where root ingress into sewers is high. Chemical foaming into the sewerage system must be done in a controlled and targeted way so as to

minimise adverse impact on customers, and also on the downstream Recycled Water Plant and its processes. Given that tree root blockages are the key cause of most blockages, this effort needs to be maintained at similar levels to Water Plan 3.

CCTV Inspections and Sewer Main Renewals

Carry out region wide CCTV inspection to assess which sewers have significant structural and/or serviceability defects which could cause future blockage. The annual program to replace sewers in poor condition (similar to the Water Mains renewals program) is planned to be increased based on evidence from CCTV inspections (from inspections carried out under Water Plan 2 and proposed under Water Plan 3) as well as non-destructive field tests as required.

Critical Spill Points and Installing Fail Safe Alarms

Independent "Fail Safe" alarms and monitoring at key points in the sewerage system and at all sewage pumping stations and rising mains will provide early detection of system blockages, equipment failure or hydraulic overloading that if left unreported have the potential to result in a sewage spill.

Monitoring High Risk Rising Mains

Continue with installation of flow meters at the downstream end of all high risk rising mains, to ensure that the flow profile through these is monitored with appropriate alarms to provide early warning of a failure of these critical assets.

Minimise Stormwater Infiltration and Inflow:

Deployment of flow monitoring and field inspections to determine the source of, and implement options to control or arrest, infiltration and inflow.

5.2 Timelines/Schedule/Project Plan

The SSPS program has been developed with prioritised work schedules for each activity. This schedule undergoes continual refinement based on new data (such as CCTV). The implementation of term contracts for Root Foaming, CCTV Inspections and Sewer Rehabilitation in Water Plan 3, will allow greatest flexibility for efficient delivery.

5.3 Cost Estimate

A concept level cost estimate has been developed for this project. The estimate has been developed based on tendered rates from similar works undertaken under the SSPS in Water Plan 2, together with projected works required under Water Plan 3 based on asset data (including CCTV data). The estimate below reflects a P50 cost estimate – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Sewage Spill Prevention Strategy (SSPS)	860k	2,274.9k	2,200K	1,510k	1,510k	1,510k

There is a significant increase in the proposed capital expenditure for Water Plan 3. This increase in capital expenditure is primarily driven by two key factors:

- CCTV inspections budgets being reported as Capital Expenditure, and not Operational Expenditure as done for Water Plan 2. CCTV inspections provide the justification to carry out sewer rehabilitation works or not. Therefore, consistent to the approach adopted by other Water Authorities, the CCTV inspections has been included as Capital Expenditure in Water Plan 3.
- Appropriate budget to carry out sewer rehabilitation works for the high risk sewers with poor structural condition as inspected by CCTV in Water Plan 2.

Water Plan 2013-2018

Preliminary Business Case

Surbiton Park Recycled Water Plant Upgrade

Stage 3

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the upgrade of the Surbiton Park Recycled Water Plant (RWP) in Melton. The Surbiton Park RWP treats the wastewater generated from Melton, Rockbank and Eynesbury.

Melton and the surrounding area is forecast to be one of the fastest growing regions within Victoria, with development forecast in more than one location through the next regulatory period. Development in Rockbank North and Toolern will increase wastewater loads generated through the next regulatory period and as a result will require upgrade of the RWP.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

The Surbiton Park RWP has a treatment capacity of approximately 12 ML/day. Wastewater currently generated by the existing population equates to approximately 11 ML/day. Forecast growth in the region will lead to increased inflows to the treatment plant, which will require upgrade to the capacity of components of the treatment plant.

Without upgrade to the treatment capacity, the existing treatment facility will not be able to treat flows to the standards set by the EPA. Failure to meet the EPA obligations for treatment standards may result in fines.

2.2 Evidence of the problem

Western Water is expecting significant growth in the Melton region. Melton has been one of Western Water's fastest growing towns in recent years, with up to 4% growth being realised per annum within the existing township.

Both the Rockbank North and Toolern developments have approved Precinct Structure Plans by the Growth Areas Authority, and have commenced development. These two areas alone are expected to increase the population in Melton by some 70,000 people over the next 20 years. Wastewater generated by these developments will be treated at the Surbiton Park facility.

Flows in excess of 15 ML/day are expected by 2018, exceeding the current capacity of the plant. Ultimate flows to the plant are forecast to be in excess of 40ML/day.

2.3 Risks to the business introduced by the problem

Without upgrade to the plant, the plant will not be able to treat incoming wastewater volume and is likely to produce a lower quality of effluent. This lower quality of effluent may reduce the availability of recycled water to the Class B system and impact on the Class A plant operation.

The higher flows generated due to growth will effectively overload the plant and will result in a significant risk to Western Water. The risks relate to the regulatory compliance associated with the EPA license for the site as well as potential for pollution to the environment and non-compliance of the Class A quality requirements.

The option to do nothing at this treatment plant through the next regulatory period (ie. Water Plan 2013-2018) is not considered viable due to the risk of environmental damage and associated prosecution by EPA.

Western Water Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water. The event considered for the Surbiton Park RWP is not undertaking the project during the Water Plan 2013-2018 regulatory period. The associated risk is outlined below.

Consequence

Defering the Sunbury RWP project through Water Plan 2013-2018 would result in the following consequences to Western Water:

- Regulatory/compliance criteria
    - Should the project not proceed, due to overloading of the plant, will result in a lower quality of water being produced.
    - The lower quality effluent will result in reduced potential to re-use or recycle the effluent, and could cause issues with the Class A scheme.
    - The quantity and quality of this discharge to the environment could result in a major breach of the EPA's regulatory requirement.
- Reputation
    - Western Water's reputation could be severly impacted by producing lower quality which could impact on the Class A and Class B recycled water schemes.
    - The impact would likely be an issue of regional significance, however could become an issue of State significance if continual breach of EPA license, or removal of license occurs.
    - The consequence rating for these areas generally all lie within a Major Consequence.

Likelihood

Based on Western Water Enterprise Risk Framework Likelihood Table, the likelihood of the consequence could be considered "Likely". The growth forecast within Toolern and Rockbank North has commenced, with developments commenced. The capacity of the plant is likely to be exceeded during the next regulatory period, based on the forecast growth.

Risk Ranking

As per Western Water Enterprise Risk Framework, the risk ranking assigned to the Surbiton Park RWP project is Extreme.

2.4 Timing

The current treatment plant capacity is expected to be exceeded in 2014, and hence the timing of this project is for construction and commissioning of the plant upgrade to occur in the first two years of the next regulatory period.

3 Benefits

3.1 Benefits to be delivered

Wastewater treatment and management is part of Western Water's core business. The effective management and treatment of wastewater forms a key component of the Customer Charter, as well as a number of regulatory requirements. The regulatory requirements relate to environmental aspects of wastewater management in containment within the system and treatment to a certain standard and quality.

Through upgrade of the treatment plant, Western Water will be able to meet its obligations both in terms of customer service as well as regulatory compliance. The project will increase the treatment plants capacity, resulting in a lower risk of spill both at the treatment plant and within the distribution system as a result of sewer back up due to inability of the plant to treat the flows.

3.2 Evidence of the benefits delivered

The benefits of upgrading the Surbiton Park RWP will contribute to:

- Ensuring that incoming wastewater flows can be treated to the required standard.
- Reducing spill occurrence within the sewer network.

4 Options

4.1 Options Considered

This project forms part of the overall upgrade strategy for the Surbiton Park RWP. This particular upgrade is Stage 3 of a four stage approach to upgrading the plant, started in Water Plan 2008-2013, to achieve an overall plant capacity of 18.6ML/day. The first two stages of the plant upgrade have included:

Stage 1:

- Construction of a new inlet works,
- Construction of a new Secondary Sedimentation Tank,

Stage 2:

- Construction of a new Aeration Tank
- Construction of new Effluent Pumping Stations (No.3 and No.4),
- Construction of new Return Activated Sludge and Waste Activated Sludge Pumping Stations,
- Refurbishment of an existing Primary Sedimentation Tank

Stage 3 incorporates a sludge thickening upgrade as well as construction of additional digestion capacity. Stage 4 is scheduled for early in Water Plan 2018-2023 and will include increase in aeration capacity as well as construction of an emergency storage/relief to deal with storm flows.

4.2 Options Comparison

As this is part of a staged strategy, additional options have not been considered. These were considered at the earlier stage of the project.

4.3 Recommended Option

The next regulatory period will continue the staging Strategy commenced in Water Plan 2008-2013. Stage 3 will be constructed in the next regulatory period (Water Plan 2013-2018), with Stage 4 to be completed in Water Plan 2018-2023.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

Stage 3 incorporates a sludge thickening upgrade as well as construction of additional digestion capacity. This will enable the solids process stream for flows up to 18.6 ML/day to be treated to the required standard (although it is noted that full treatment capacity to 18.6 ML/d will not be available until the completion of Stage 4).

5.2 Timelines/Schedule/Project Plan

The design of Stage 3 was completed as part of the original design package during Water Plan 2008-2013. The design package is planned to be tendered for construction by mid 2013, with construction to commence in the first year of the next regulatory period. The construction of Stage 3 is expected to take up to 18 months to complete to commissioning.

5.3 Cost Estimate

A cost estimate was developed for this project as part of the design phase. The estimate below reflects a P50 cost estimate – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
PROJECT NAME	$2.9M	$4.5M	$4.3M	-	-	-

Water Plan 2013-2018

Preliminary Business Case

Bacchus Marsh Winter Storage

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the Bacchus Marsh Winter Storage Lagoon at the Bacchus Marsh Recycled Water Plant (RWP).

A water balance calculation for the Bacchus Marsh sewer catchment indicated a need for additional winter storage at the Bacchus Marsh Recycled Water Plant.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

The Bacchus Marsh Recycled Water Plant produces Class C recycled water. Historically all available recycled water is used on the adjoining farm under a third party Lease which is due to expire in 2016. In October 2011, a recycled water pipeline was constructed which connected the adjacent property south of the plant to recycled water. This provided one additional customer who is currently supplied under a temporary contract. No recycled water discharge other than to land is available.

The investment strategy is based on maintaining 100% beneficial water recycling in accordance with the principles outlined in the Western Water's Recycled Water Strategy. This strategy together with forecast growth in the region will increase both the availability of recycled water and the storage required to contain recycled water.

Western Water's investment strategy is to maintain 100% beneficial water recycling in accordance with the principles outlined in the Western Water's Recycled Water Strategy.

The winter storage at the Parwan RWP requires augmentation in the next regulatory period.

Augmentation of the existing winter storage should coincide and will be triggered by the re-lining of existing storages. It is expected that this augmentation will occur at the existing RWP property.

2.2 Evidence of the problem

As part of Western Water's obligations to the EPA, there is a requirement that recycled water schemes to be designed to have sufficient winter storage and irrigation area for a 90th%ile wet year. To meet EPA requirements, the Bacchus Marsh recycled water scheme currently requires an additional 85 Ha to be under irrigation and up to 259 Ha by 2020. The winter storage for the scheme will reach capacity, according to EPA requirements/guidelines, during the next regulatory period.

2.3 Risks to the business introduced by the problem

During 2011/12, Western Water experienced a >90th%ile wet year and without a designated emergency discharge point, remained an operational incident mode for over 12 months (incorporating significant human and financial resources).

Without upgrade to the winter storage capacity of the plant, there is a risk that the Class C will be discharged to the environment.

The option to "do nothing" at the winter storage throughout the next regulatory period (ie. Water Plan 2013-2018) is not considered viable due to the risk of environmental damage and associated prosecution by EPA.

Western Water Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water. The event considered for the Bacchus Marsh RWP is not undertaking the project during the Water Plan 2013-2018 regulatory period. The associated risk is outlined below.

Consequence

Deferring or not implementing the Winter Storage upgrade through Water Plan 2013-2018 would result in the following consequences to Western Water:

- Regulatory/compliance criteria
    - The quantity and quality of recycled water produces may spill to the environment, which could result in a breach of the EPA's regulatory requirement.
- Environmental
    - Insufficient storage, resulting in an increase in effluent discharge to the local environment.
- Reputation
    - Western Water's reputation could be locally impacted by .
    - The impact would likely be an issue of regional significance, with those surrounding the plant most impacted.

The consequence rating for these areas generally all lie within a Major Consequence.

Likelihood

Based on Western Water Enterprise Risk Framework Likelihood Table, the likelihood of the consequence could be considered "Possible". The capacity of the existing storage, and the variability in climate together with the lack of alternate disposal at the site all contribute to this ranking.

Risk Ranking

As per Western Water Enterprise Risk Framework, the risk ranking assigned to the Sunbury RWP project is High.

2.4 Timing

The project is required during the next regulatory period, coinciding with the renewal of the farm lease in 2016.

3 Benefits

3.1 Benefits to be delivered

Regional growth and improved lining of RWP storages will increase the availability of recycled water. EPA requires recycled water schemes to be designed to have enough winter storage and irrigation area for a 90th%ile wet year. To meet EPA requirements, the Bacchus Marsh recycled water scheme currently requires an additional 85 Ha to be under irrigation and up to 259 Ha by 2020. The winter storage for the scheme will reach capacity, according to EPA requirements, once the RWP storages are relined, needing an additional 262 ML by the end of Water Plan 3.

3.2 Evidence of the benefits delivered

The benefits will include the extension of the recycled water network providing a cost effective mechanism to beneficially reuse recycled water.

4 Options

4.1 Options Considered

Options considered alleviating the issues surrounding the water balance issues relating to winter storage include:

- Business as usual option – involving increase storage volume
- Increasing on-site irrigation
- Providing off-site schemes, including off-site sewer mining to provide recycled water to the Bacchus Marsh Irrigation District or similar large customer.
- Purchase additional land for irrigation purposes
- Beneficial reuse of treated wastewater to waterway.

4.2 Options Comparison

Options were assessed based on the following review steps:

- Feasibility review – a qualitative review of the likely option impacts under the heading of stakeholder, sustainability, customer impact and business cost/benefit.
- Risk review.
- Cost review

4.3 Recommended Option

All of the above solutions to alleviate the water balance issues at the site, considered the need for an increase to the winter storage for recycled water as part of the option.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

The proposed solution is to continue to store the treated waste water through the wet years and sell this water off site during irrigation periods. The new storage will be necessary to deal with the increasing flows to the plant.

5.2 Timelines/Schedule/Project Plan

Cost Estimate

The estimate below reflects a P50 cost estimate for design and construction of additional winter storage – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Bacchus Marsh RWP – Winter Storage Lagoon	-	-	-	-	$1.26M	$4.0M

Water Plan 2013-2018

Preliminary Business Case

Melton Class A

Recycled Water Plant Upgrade

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the upgrade of the Class A recycled water plant in Melton.

The Class A recycled water plant located at the Surbiton Park RWP in Melton, currently supplies Class A recycled water to residential and commercial customers in Eynesbury and Melton South . Western Water has forecast extensive growth in the Melton region and plans to supply Class A recycled water as a third pipe alternate water source into the growth areas of Toolern and Rockbank North.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

Western Water has committed to supplying Class A recycled water into the new growth areas of Toolern and Rockbank North as part of an overall water supply strategy to reduce the potable water demand on local water resources.

The existing Class A treatment plant, located at Surbiton Park RWP, has a capacity of 5 ML/day. The expansion of the customer base into new growth areas as well as continued residential growth within Eynesbury, will increase the forecast demand on the Class A system beyond the capacity of the plant during the next regulatory period.

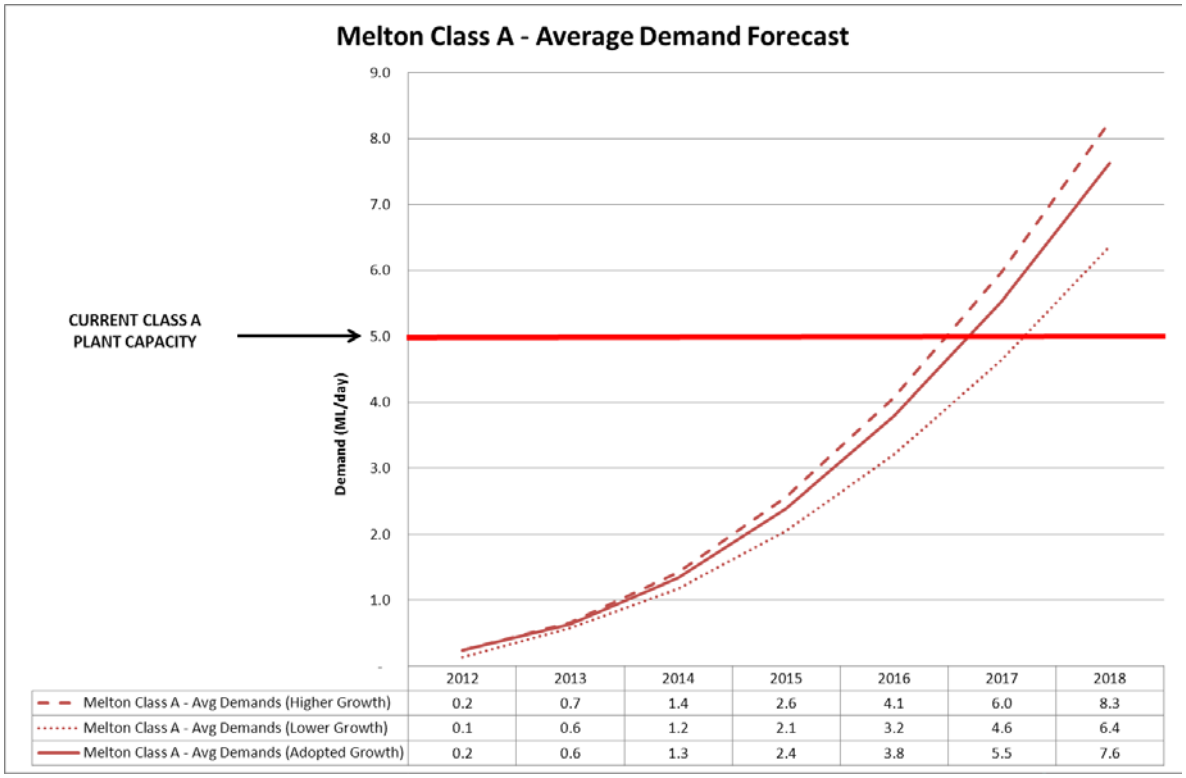
2.2 Evidence of the problem

The current Class A scheme consists of approximately 400 residential customers within Eynesbury together with the Eyensbury Golf and Polo clubs as well as Harness Racing Victoria's Tabcorp Park. During summer peak periods, the plant is supplying close to 0.2 ML/d on average but up to 4 ML/day as a peak demand.

With expansion of the Class A network into Rockbank North and Toolern, the domestic Class A customer base is expected to increase by more than 5,000 customers during the next regulatory period.

The forecast demands indicate that the average daily demand for Class A will exceed the 5 ML/day capacity of the existing plant by 2016. The average demand is forecast to be as high as 7.6ML/day by the end of the next regulatory period.

The forecast demand is highly dependent on the rate of growth within the two development areas of Rockbank North and Toolern, as well as the continual growth in Eynesbury. As a means of sensitivity against the growth, the rates of development were altered to gain upper (10% higher) and lower (20% lower) bound demand forecasts for Class A within the region. These sensitivities are shown in Figure 1. In all growth scenarios, the forecast average demand exceeds the existing plants capacity in the next regulatory period.



	2012	2013	2014	2015	2016	2017	2018
Melton Class A - Avg Demands (Higher Growth)	0.2	0.7	1.4	2.6	4.1	6.0	8.3
Melton Class A - Avg Demands (Lower Growth)	0.1	0.6	1.2	2.1	3.2	4.6	6.4
Melton Class A - Avg Demands (Adopted Growth)	0.2	0.6	1.3	2.4	3.8	5.5	7.6

Figure 1 - Forecast Class A Demand Melton

The peak demands on the Class A network are forecast to be more than 15ML/day by the end of the next regulatory period. The peak demands are expected to be supplied by network components, including two storages, one located at the treatment plant, the other in Eynesbury.

2.3 Risks to the business introduced by the problem

Western Water has committed to supplying growth areas of Toolern and Rockbank with third pipe Class A recycled water. The risks associated with not doing the upgrade to the treatment plant, would mean that Western Water would not be able to supply demands into the new areas. Although Class A is an alternative water source, it is being supplied to customers for toilet flushing and Western Water are currently undertaking trials on use in washing machines.

This being the case, if customers are not able to be supplied Class A, this could result in an inability to flush toilets, which could lead to lengthy customer disruptions, public health concerns and Western Water's reputation being tarnished with customers actively expressing dissatisfaction.

Western Water Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water. Using this framework as a guide the risk to Western Water is classified as high, with moderate consequences and likely that those consequences will be realised should the upgrade not go ahead.

2.4 Timing

Based on forecast average demands and the current plants capacity, the upgrade is required in 2016.

3 Benefits

3.1 Benefits to be delivered

Western Water has aspirational targets to achieve 100% recycling of all treated effluent at their treatment plants.

Provision of alternative water supplies, including Class A, is incorporated in the Governments Living Melbourne, Living Victoria Policy. Specifically the Policy includes the objectives of "driving generational change in how Melbourne uses rainwater, stormwater and recycled water".

Western Water's Growth Strategy identified that Class A "third pipe" reticulated supply, based on total community costs, was higher than conventional water supply. Despite the higher overall cost, there are a number of benefits that Class A networks provide to communities and the environment alike.

Supplying Class A recycled water to customers, is expected to reduce potable demand by up to 50%. This provides significant benefit to Western Water, particularly with the price of water from Melbourne Water increasing as a result of the desalination plant, and unpredictability of local water storages.

3.2 Evidence of the benefits delivered

One of the major benefits in Class A third pipe systems is reduction of potable water usage. Western Water's existing Class A network in Eynesbury records the potable and recycled water comparative usage and reports on a monthly basis to the Board.

This will continue with the expanding Class A network, and will report to Western Water's Board on the beneficial reuse of Class A to reduce the potable water demand.

4 Options

4.1 Options Considered

As this project is related to capacity of the treatment plant to supply demand, there are few options that are available in terms of upgrade to the treatment capacity. Alternatives for decentralised treatment plant options within the development areas to treat and supply Class A, was not considered feasible. A new treatment plant at a new location was not considered viable due to the high capital cost associated with the purchase of a new site and the need for large storages in order to meet the demand forecast.

The options for this project were staging options to stage the capital investment at the Class A plant to match forecast demands.

4.2 Options Comparison

Forecast demands are expected to far exceed the current capacity of the plant, should the full potential of Class A supply be realised through the growth areas of Melton. The demands could be as high as 100ML/day ultimately, supplying over 35,000 new customers.

The Melbourne @ 5 Million preliminary infrastructure strategy suggested an upgrade to the Class A plant of 10ML/day taking the overall plant capacity to 15 ML/day by the end of the next regulatory period. This would provide for average demands to be supplied out to approximately 2020, depending on the actual rate of growth realised.

Forecast demands to the end of the next regulatory period, are in the order of 7.6ML/day.

4.3 Recommended Option

The existing treatment plant was originally designed to enable modular upgrade of the plant to 7.5 ML/day through additional UV disinfection and micro filtration membranes. This is considered the most practical option for upgrading the treatment plant, rather than upgrading to 10 ML/day which would require additional plant modifications, at a much greater capital cost.

Additional upgrades to the capacity of the plant will be required in the following regulatory period, should the forecast demand and growth be realised.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

The Class A plant will be upgraded from 5 ML/day to 7.5 ML/day through addition of UV filtration and MF membranes. The original plant was designed to allow for these additions to be added to the plant to increase capacity.

5.2 Timelines/Schedule/Project Plan

The project is forecast to be constructed in 2016, to meet the projected Class A average demands. As the increase in capacity is somewhat a modular design to the existing plant, the design component is not expected to be extensive, and will rely more on specification of the equipment required to achieve the original design outcomes. The project is likely to be tendered in 2015 as a design and construct tender, to enable commissioning in 2016.

5.3 Cost Estimate

The forecast budget for this project below reflects a P50 cost estimate – refer to Attachment for details of P50. The cost estimate has been based on costs associated with the original plant construction and estimates to increase the capacity of the plant to 7.5 ML/day.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
PROJECT NAME	-	-	-	$2.6M	$2.6M	

Water Plan 2013-2018

Preliminary Business Case

Sunbury Additional Water Storage

Bald Hill Tank

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the proposed Bald Hill water storage tank in Sunbury. The water storage forms part of the water supply system for Sunbury, supporting growth within South Sunbury as well as Diggers Rest.

The future growth in Sunbury is forecast to add an additional 25,000 new lots to the Sunbury area. Up to 30ML of additional water storage will be required over the next 20 years to supply the Sunbury system.

The proposed storage tank at Bald Hill in South Sunbury will provide multiple benefits to the water supply network. The tank will provide supply to a proposed new zone in the development areas of South Sunbury and Diggers Rest, as well as satisfying the overall network storage requirements, and improving system operational efficiencies.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

Western Water's design criteria for water supply systems require 16 hours peak day storage. The design criteria is designed to maintain supply of peak day demands, based on providing both emergency as well as operational storage during peak days.

Sunbury currently has two water storages within the existing supply system at Western Tank and Riddell Rd Tank sites, totalling 20ML effective storage. The Riddell Rd tank also provides storage for transfer of water into the Gisborne/Rosslynne water supply network to supplement local water storages.

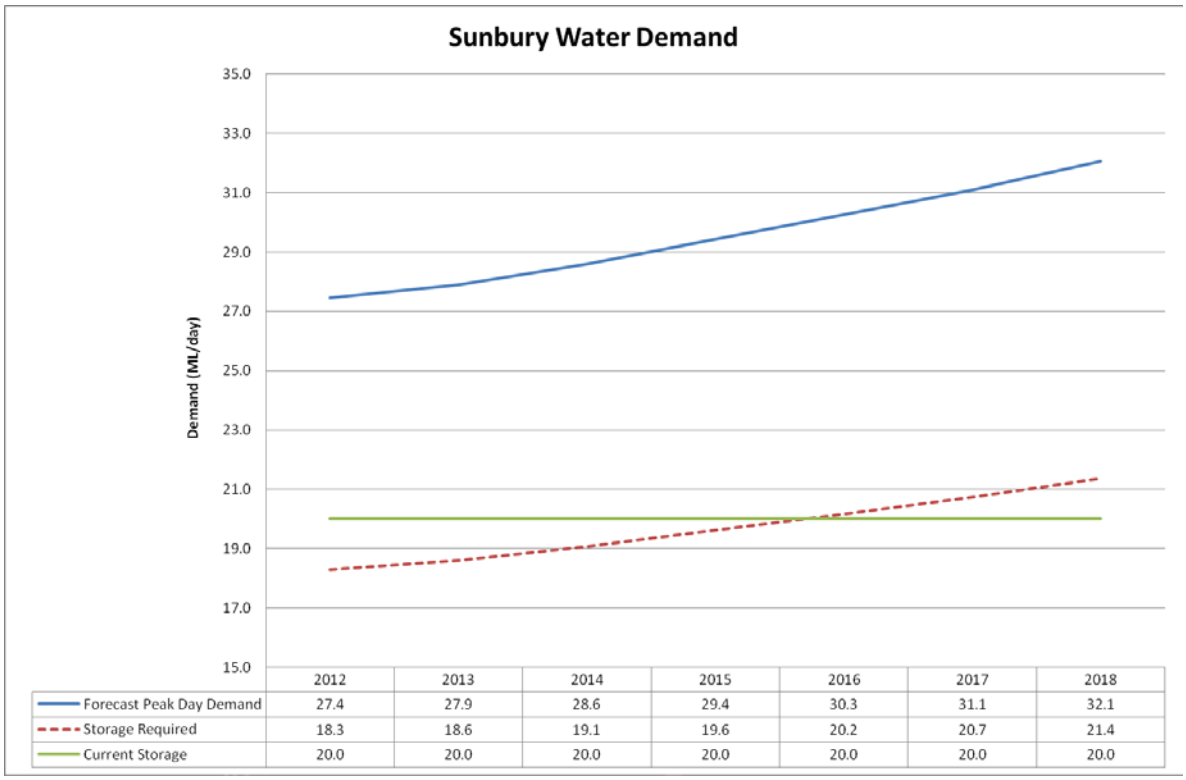
Riddell Road storage provides the majority of the 20ML of effective storage to the system, and relies on three pump stations to fill, one of which pumps out of the Western Tank. Therefore, although there is 20 ML of storage within the system, the storage available for the Sunbury system for operational and emergency purposes could be argued to be much less. Currently the system, although supplied from both storages, is effectively balanced off the Western Storage Tank, which receives flow from the Melbourne Water transfer system.

2.2 Evidence of the problem

Demand forecasts suggest that the current storage will exceed Western Water's design criteria within the Water Plan 2013-2018 period. The peak day demands are based on metrics for peak water consumption during an unrestricted water demand period. The adopted demand metric is consistent with Western Water's Growth Strategy as follows:

- Peak Day Demand – 1,920 L/lot/day

It should be noted that the adopted peak day demand is less than the historical peak day demand, and reflective of latest water saving technology as well as education around efficient water usage. Western Water plan to supply Class A water to the growth area of Diggers Rest through 3rd pipe systems, however Board has resolved that the Class A network will not be constructed until Water Plan 2019-2023. Although a reduction in potable demand is anticipated when the Class A network is implemented, this is not reflected in the forecasts in demand through Water Plan 2013-2018 as only potable water will be supplied through that period.



	2012	2013	2014	2015	2016	2017	2018
Forecast Peak Day Demand	27.4	27.9	28.6	29.4	30.3	31.1	32.1
Storage Required	18.3	18.6	19.1	19.6	20.2	20.7	21.4
Current Storage	20.0	20.0	20.0	20.0	20.0	20.0	20.0

Figure 1 - Forecast Peak Demand vs Storage

2.3 Risks to the business introduced by the problem

Not having the required storage within the supply system will increase the reliance on water pump stations during peak demand periods, and put Western Water at risk of not supplying customers. Hydraulic modelling indicates that under peak day conditions, without additional storage, those

customers in the southern area of Sunbury, including Diggers Rest will not be supplied to Western Water's customer standards.

The project has been ranked through Western Water's Enterprise Risk Framework as a High Risk to Western Water, with a moderate consequence and likely to occur without the project. Without the storage tank, the system relies heavily on pumping stations and capacity of transfer systems to supply peak demands.

Without the additional storage, the hydraulic modelling has indicated that the system will not be able to supply the forecast peak day demands. Not meeting peak demands would result in customers not being supplied, and hence customer dissatisfaction. The extent of the issue will be through the south areas of Sunbury, including Diggers Rest and the associated growth areas – which is estimated to be in excess of 1,500 customers.

2.4 Timing

As can be seen from Figure 1 the forecast peak day demands exceed the current storage within the Water Plan period. This is based on peak day demand and growth forecasts consistent with Western Water's Growth Strategy.

3 Benefits

3.1 Benefits to be delivered

The tank will provide a security of supply to the Sunbury and Diggers Rest water supply network. The tank provides additional storage to the system, and being at an alternate site, where significant growth is forecast, will provide system efficiencies through operation.

Additional storage within the system will enable more efficient operation of the system pump stations which transfer water from Melbourne into the Sunbury system.

Western Water's core business is supplying water and sewerage services to customers. For water supply the customer charter is to provide minimum 20m pressure at all times, which requires peak day demand, and peak hour demand, to be supplied. The installation of this tank will form part of the water network that enables supply of these peak demands to customers.

3.2 Evidence of the benefits delivered

Currently as described in Section 2.1, the Western Tank effectively acts as a balancing storage for the Sunbury system, however only provides just over 10% of the total storage within the system. Providing additional storage effectively prior to the Western Tank, will enable a new zone to be supplied from this tank, reducing the reliance on the Western Tank and allowing more efficient transfer of water into the system.

Detailed analysis of the operational efficiencies have not been undertaken, however the efficient pumping as a result of additional storage will result in lower power consumption and hence carbon emissions.

4 Options

4.1 Options Considered

The Bald Hill tank was one of a number of alternate sites considered for the location of additional storage required in Sunbury. Other sites considered included the existing Western Storage Tank and Riddell Road Tank sites.

4.2 Options Comparison

The Western Storage tank site was not considered viable due to land restrictions, and encroaching development around the site. Riddell Rd storage is still considered a viable option for future storage, however requires additional pumping of water.

4.3 Recommended Option

The Bald Hill tank site was preferred and is the recommended option due to the double benefits of supplying the proposed new water supply zone in Diggers Rest and South Sunbury, whilst providing the additional required storage. The Bald Hill tank will also reduce the peak demand load on the existing transfer pipeline into the system, and hence defer the augmentation of bulk transfer systems, which other options (alternate sites) do not provide.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

It is proposed to construct a new storage tank on Bald Hill in the south of Sunbury. This tank will enable the creation of a new water supply zone in the south of Sunbury to supply the Diggers Rest and surrounding development areas.

5.2 Timelines/Schedule/Project Plan

There are a number of phases of this project which are planned over the next regulatory period. The first of which is securing a site for the new tank. Preliminary investigations and community consultation process has commenced. The process for securing a new tank site can be quite lengthy and is expected to take up to 2 years complete.

Recent tank construction by Western Water has involved a concept design and general layout outlining the requirements of the tank, with a Design and Construction type contract being let for construction. This has worked well for Western Water on previous projects, including the Merrimu and Rosslynne 10 ML storage tanks as well as Loch Rd tank in Mt Macedon.

5.3 Cost Estimate

A concept level cost estimate has been developed for this project. The cost estimate will be further developed as more information is understood about the actual site and any issues around construction. The estimate has been based on previous projects involving tank construction recently undertaken by Western Water. The estimate below reflects a P50 cost estimate – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Sunbury Additional Water Storage – Bald Hill Tank	100k	185k	-	-	4,600k	-

Water Plan 2013-2018

Preliminary Business Case

Avenue of Honour Rising Main Duplication

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the Avenue of Honour Rising Main duplication in Bacchus Marsh from Woolpack Road (Rd) to the Parwan Recycled Water Plant (RWP).

The Avenue of Honour Outfall Sewer Pump Station (SPS) currently transfers wastewater generated from the entire Bacchus Marsh sewer catchment to the Parwan RWP via the existing rising main.

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

The Avenue of Honour Outfall SPS currently receives wastewater generated from the entire Bacchus Marsh sewer catchment and pumps flows via an existing rising main to Parwan RWP. The rising main is one of the most critical assets in the Bacchus Marsh systems, as in the event of failure, all of the sewer generated would need to be contained at the Avenue of Honour Outfall SPS, or risk uncontrolled spilling to the environment.

In combination with the risk posed by the failure of existing pipeline, the Parwan RWP has received significant inflows over the last two years with the high rainfall experienced and has struggled to manage the volumes of waste water involved. With no emergency discharge pipeline in place from the Parwan RWP the onsite lagoons have come close to overflowing.

2.2 Evidence of the problem

The existing Avenue of Honour Rising Main to the Parwan RWP is currently the sole discharge source for the entire Bacchus Marsh sewer network. If there is any major failure in the approximately 7.5 km pipeline and an inability to pump flows from the Avenue of Honour Outfall SPS for an extended period of time, sewage will back up and eventually overflow into the Lerderderg River adjacent to the pump station.

2.3 Risks to the business introduced by the problem

Western Water's Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water.

As described above, the rising main delivers all of the Bacchus Marsh sewer flows to the Parwan RWP. There is no redundancy with regards to the operation of this rising main, which in the event that the rising main burst or failed, there would be major spill from the pump station to the environment. Duplicating the rising main will enable some redundancy within the system and also provide for operational efficiencies and improved maintenance of the rising main to reduce the risk of failure.

Using Western Water's Enterprise Risk Framework as a guide, the consequences of not doing this project could result in the following consequences:

- Environmental criteria.

    - Should the project not proceed, and in the event of failure of the rising main, major environmental impacts could be expected.
- Regulatory compliance.
    - Western Water is required to contain flows up to a 1 in 5 year ARI wet weather event.
    - In the event of failure of the rising main, this could result in breach of these obligations in that dry weather flows could be spilled to the environment
- Assets.
    - Major damage to an asset that would have significant impacts on the systems performance and efficiency.

Without the project, it is considered "possible" that the consequences will be realised, resulting in a high risk to Western Water.

2.4 Timing

The rate of growth within the Bacchus Marsh system places increasing pressure and reliance on the appropriate operation of the Avenue of Honour Outfall Pump Station and Rising Main to contain and transfer sewage flows to the Parwan WRP. The rate of growth occurring (and resulting increase in flows) will need to be monitored during the next Water Plan and the timing of the delivery of the project adjusted to suit. At present funds are allocated to undertake works in the final year of Water Plan 3.

3 Benefits

3.1 Benefits to be delivered

The duplication of the Avenue of Honour rising main will enable some redundancy within the system and enable flows to be contained and transferred from the pump station in the event of failure of the existing rising main.

The existing rising main also does not operate efficiently at high flows. The head losses are high through the main and the pumps at the Avenue of Honour SPS are required to operate at a higher head to transfer the required flows. Duplicating the main will enable for more efficient operation, as the duplicated main will enable flows to potentially be split between to two mains, increasing the transfer capacity and enabling more efficient pump operation.

3.2 Evidence of the benefits delivered

The construction of a duplicate rising main will all but eliminate the risk of uncontrolled spill to the environment as a result of main failure.

4 Options

4.1 Options Considered

The options considered are as follows:

Option 1: Do nothing.

Option 2: Duplicate the entire length of the rising main.

Option 3: Duplicate a section of the rising main.

4.2 Options Comparison

Option 1 does not reduce the risk of a major environmental impact from a failure of the existing rising main. Nor does it improve operational efficiency or flexibility of the system.

Option 2 provides the highest mitigation against a major environmental impact from a failure of the existing rising main. It does so, however, at significant cost to the business require the duplication of the entire approximately 7.5 km of DN450 pipeline. It also provides significant excess flow capacity in the system not anticipated to be required for the next 20 year timeframe.

Option 3 involves duplicating approximately 4 km of the rising main between Woolpack Rd and the Parwan WRP. This option reduces the level of environmental risk by duplicating over half the length of rising main. In doing so it reduces the hydraulic losses in the system and increases the flow rate able to be delivered through this final section of pipeline to the Parwan RWP. It also enables the pipeline to be used in emergency conditions as a discharge pipeline to release excess waste water from the Parwan RWP to Werribee River.

4.3 Recommended Option

The recommended option is Option 3 as it:

- Reduces the risk of uncontrolled spills to the environment from the failure of the existing rising main.
- Avoids the need to bring forward the cost involved with duplicating the entire length of the rising main and the excess capacity that it would provide.
- Reduces the frictional head losses in the existing system enabling greater flows to be pumped with the existing upstream infrastructure.
- Provides operational flexibility with the combination and choice of rising mains that the Avenue of Honour and Grant St SPSs pump through.
- Enables (if required) the emergency discharge of waste water from the Parwan RWP back north to the Werribee River under high rainfall years.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

The proposed solution (Option 3) is to duplicate approximately 4 km of the DN450 Avenue of Honour Rising Main between Woolpack Rd and the Parwan WRP. The duplicated section of rising main will be cross-connected with the existing rising main and also the Geelong Rd Rising Main such that there will be operational flexibility between which pipelines the Avenue of Honour and Grant Street SPSs discharge into (singularly or in combination).

5.2 Timelines/Schedule

The project is currently scheduled to be delivered in the final year of Water Plan 3. Growth and increased flows within the Bacchus Marsh will be monitored and the timing of the project adjusted to suit. Investigations for the project will be completed within the 2012/2013 year.

5.3 Cost Estimate

The forecast budget for this project below reflects a P50 cost estimate – refer to Attachment for details of P50.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Avenue of Honour Rising Main, Bacchus Marsh	$0.05M	-	-	-	-	$4.4M

Water Plan 2013-2018

Preliminary Business Case

Rockbank Sewer Rising Main

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the proposed Rockbank Sewer Rising Main. The proposed rising main (nominal 375mm diameter) forms part of the sewerage servicing strategy for Rockbank and the surrounding growth areas east of Melton and west of the future outer metropolitan ring road (OMR).

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

Rockbank and the surrounding region is forecast to experience significant growth over the next 20 year period with areas north and south of existing Rockbank, (referred to as Areas 1 and 5 within Western Water's Melbourne @ 5 Million Servicing Strategy), expected to contain an additional 20,000 (approx.) residential lots by 2030. Refer Figure 1 below.

Currently the Rockbank township, consisting of approximately 100 lots, is serviced by the Rockbank Sewerage Pumping Station which discharges to the Surbiton Park Recycled Water Plant via a 150mm rising main. The rising main servicing this pump station is currently operating at its full capacity. The pump station itself is also currently operating at full capacity and has limited scope to increase its capacity through future upgrades. Therefore the existing infrastructure is insufficient to service any future growth within the region.

2.2 Evidence of the problem

Growth forecasts have identified that new infrastructure will be required within Water Plan 2013-2018 period in order to service growth surrounding the Rockbank township. Refer Table 1 and 2 below which detail the expected growth within this catchment. Lots are currently projected to be occupied in Area 1 by around mid 2014. The area south of Rockbank is not expected to be developed until the back end of the next regulatory period. Growth projections for Area 1 and 2 are provided below for reference. The projected rate of growth is based on the most recent advice from developers and the Growth Areas Authority.

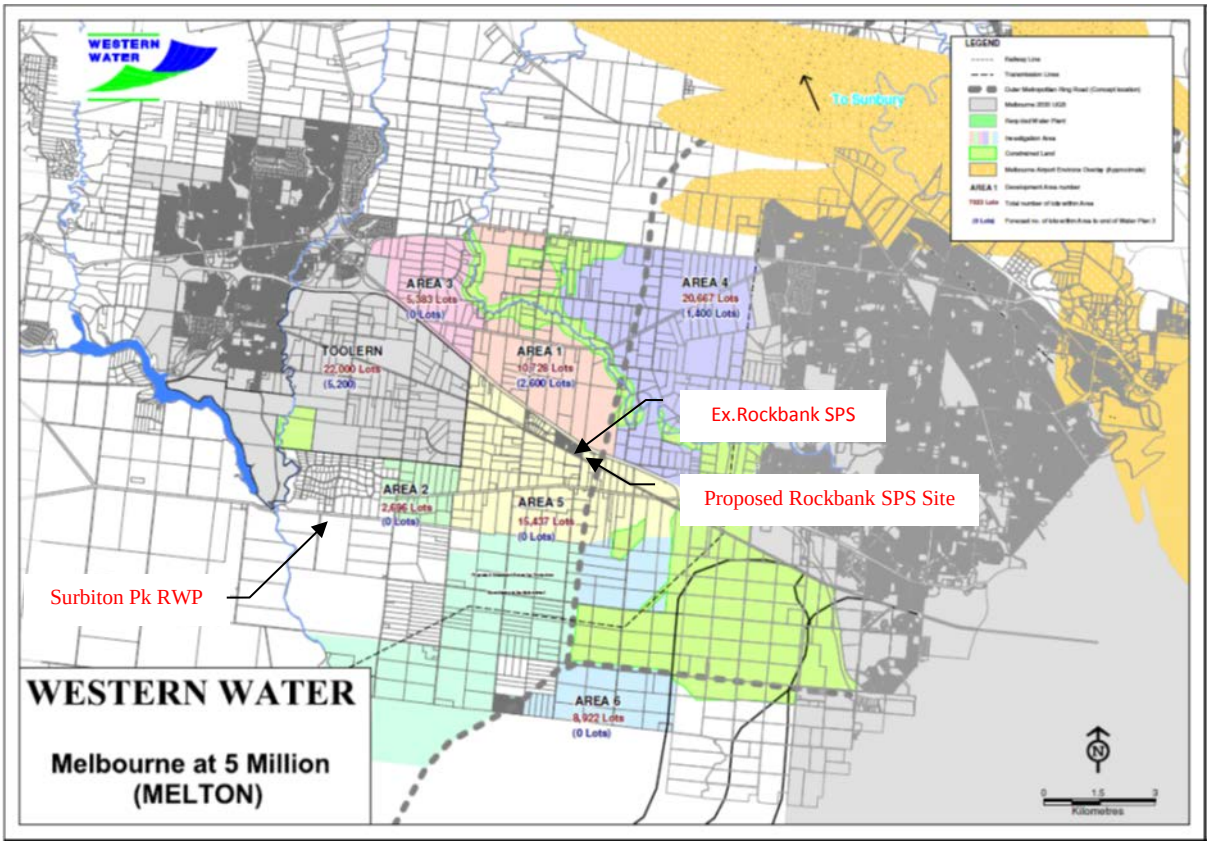


Figure 1 – Melton Growth Areas

Table 1 – Area 1: Projected timing of growth and flows

YEAR	CUMULATIVE LOTS	ADWF (L/SEC)	PWWF (L/SEC)
2014	160	1	3
2015	480	2	10
2016	800	4	16
2017	1,120	6	23
2018	1,440	7	29
2019	1,920	10	39
2020	2,420	12	49
2021	2,920	15	59
2022	3,620	18	74
2023	4,520	23	92
2024	5,670	29	115
2025	7,170	36	146
2026	8,670	44	176
2027	10,170	52	207
2028	10,728	55	218

2029	10,728	55	218
2030	10,728	55	218

Table 2 – Area 5: Projected timing of growth and flows

YEAR	CUMULATIVE LOTS	ADWF (L/SEC)	PWWF (L/SEC)
2016	320	2	7
2017	640	3	13
2018	960	5	20
2019	1,460	7	30
2020	2,160	11	44
2021	2,860	15	58
2022	3,560	18	72
2023	4,360	22	89
2024	5,160	26	105
2025	5,960	30	121
2026	6,760	34	137
2027	7,560	38	154
2028	8,606	44	175
2029	9,706	49	197
2030	10,806	55	220

2.3 Risks to the business introduced by the problem

Not addressing this capacity issue will increase the risk of Western Water not being able to service forecast growth adjacent to Rockbank . Without upgraded infrastructure, to service the growth, Western Water will need to employ labour and cost intensive solutions such as continual eduction from the sewerage system and transport via tanker truck to the treatment plant for disposal. As flows increase, eduction of the sewerage system becomes increasingly costly and impractical.

Western Water Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water. The event considered for the Rockbank rising main is not undertaking the project during the Water Plan 2013-2018 regulatory period. The associated risk is outlined below.

The consequences of not constructing the Rockbank rising main would result in consequences of Western Water not being able to supply the forecast growth in the region. This could have the following consequences:

- Environmental

    - Without augmenting the sewer infrastructure, this could result in major environmental impact with continual uncontrolled spill to the environment.
- Reputation
    - Western Water's reputation as a water and wastewater service provider could be severely impacted regionally without providing sewer infrastructure for the forecast growth.
    - Stakeholders, namely developers as well as new customers, could actively express dissatisfaction.
- Financial
    - Without augmenting the sewer infrastructure, the alternative of educting sewerage and transferring wastewater to the treatment plant via eduction trucks would result in increased operational costs, also being labour intensive.
    - Operating costs could be estimated to increase to be between $250,000 - $2,000,000.

Using Wester Water's Enterprise Risk Framework as a guide, the majority of the consequences are considered to have a moderate impact to the business. Due to their being minimal if any spare capacity within the existing sewerage system to cope with additional flows generated by forecast growth, the consequences are considered "likely" to occur. The resultant risk to Western Water is high.

2.4 Timing

As detailed above, the rising main will be required as soon as additional development occurs north or south of the Rockbank Township. Lots are currently projected to be occupied in Rockbank North by mid 2014. Tables 1 and 2 detail the projected increase in lot numbers within the immediate area up until 2030.

3 Benefits

3.1 Benefits to be delivered

Construction of the rising main will enable future growth in the Rockbank area to be efficiently serviced by means of a sewerage pump station. Construction of the rising main will also enable the existing Rockbank Pump Station to be replaced, with a larger capacity pump station to cope with future growth. The existing pump station is operating at capacity and does not comply with Western Water's operational standards, in particular it does not have an emergency storage. Sewerage spills to the environment have occurred at this pump station site as a result of the inadequate time to spill capacity of this facility.

3.2 Evidence of the benefits delivered

Construction of the rising man will enable sewage flows to be conveyed to the Surbiton Park Recycled Water Plant via pumped flow and avoid the need to undertake eduction of the sewerage system. Replacement of the existing Rockbank Pump Station that will be enabled by the construction of the new rising main will also result in reduced number of sewerage spills to the environment.

4 Options

4.1 Options Considered

Options considered to address this problem include –

- Construction of a new rising main from the site of the proposed ultimate Rockbank Pump Station (located east of the existing Rockbank Township) to the Surbiton Park Recycled Water Plant.
- Construction of a gravity sewer system to convey flows from Rockbank to the Surbiton Park Treatment Plant.

4.2 Options Comparison

A review of contour information determined that it is not feasible to convey flows from the Rockbank area to the Surbiton Park Plant via conventional gravity system. Review of contour information and projected flows determined that the use of a pressurised rising main was a hydraulically feasible and practically constructible option.

4.3 Recommended Option

Western Water investigations have determined that ultimately, a new pump station will be required to service the forecast growth. This pump station is currently planned to be located in an area of land to the east of the existing Rockbank Pump Station. The proposed pump station is part of a separate capital project within the Water Plan 2013-2018 budget.

As the existing rising main is at full capacity, a replacement main will be required prior to any additional development occurring immediately north or south of the Rockbank township. The rising main is proposed to be staged; with the first stage (this project) being a 375mm diameter rising main required to be operational by 2014. The rising main will need to be duplicated with a 700mm main beyond 2018, when growth in the region is expected to exceed the capacity of the 375mm main.

It is recommended that a pressurised sewerage main from the Rockbank township to the Surbiton Park Recycled Water Plant be adopted as the preferred option for servicing future sewerage flows from the Rockbank area. Alternative options such as a conventional gravity system were determined to not be hydraulically feasible.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

A new DN375 rising main is proposed to run from the new staged pump station south of the Western Freeway, south along Troups Road, west along Greigs Road and Mount Cottrell Road and connect into manhole MH5 on the Melton Outfall Sewer on the south side of Greigs Road at Surbiton Park.

5.2 Timelines/Schedule/Project Plan

There are a number of phases of this project which are planned over the next regulatory period. The design investigation, stakeholder consultation, environmental/cultural heritage and planning approval process has commenced and is expected to be completed by June 2013. It is proposed that

the detailed design of the pipeline be completed and the project tendered for construction under AS2124 Standard Conditions of Contract.

5.3 Cost Estimate

A concept level cost estimate has been developed for this project. The cost estimate will be further developed as detailed investigations are progressed. The estimate has been based on previous projects involving pipeline construction undertaken by Western Water within the area. The estimate below reflects a P50 cost estimate.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Rockbank SPS Rising Main	$150K	$5.2M	-	-	-	-

Water Plan 2013-2018

Preliminary Business Case

Geelong Rd Rising Main

Capital Investments Team

September, 2012

1 Introduction

This preliminary business case relates to the Geelong Rd Rising Main project in Bacchus Marsh. The Geelong Rd rising main will form part of the revised operation of the Grant Street Sewer Pump Station that currently pumps flow into the Bacchus Marsh sewer system which then gravitates to the Avenue of Honour Outfall Sewer Pump Station.

The construction of the rising main, together with operational changes to the pump station, will enable flows to be pumped directly to the Parwan Recycled Water Plant (RWP).

This preliminary business case outlines the problem, the benefits to be realised, the options considered and the proposed solution to the problem.

2 Problem Statement

2.1 Definition of the problem

The Grant Street Sewer Pump Station currently receives flows from a sewerage catchment with approximately 1,000 existing residential and commercial customers. The pump station then pumps into the Bacchus Marsh sewer network which gravitates to the Avenue of Honour Outfall Sewer pump station which pumps all flows from the Bacchus Marsh to the Parwan Recycled Water Plant (RWP).

The Grant Street sewer catchment (referred to in the Bacchus Marsh Sewer Master Plan as Catchment A – Southern Bacchus Marsh – Maddingley) is expected to experience significant growth over the next 20 years with up to 4,000 customers significantly increasing the flows generated within the catchment. The pump station is nearing capacity and requires upgrading to cater for additional flows generated by the growth.

As well as the Grant Street sewer catchment experiencing new growth, the Bacchus Marsh catchment is expected to experience constant growth over the next regulatory period placing increasing the reliance on the Avenue of Honour Outfall Sewer Pump Station which is already suffering capacity issues during wet weather events.

2.2 Evidence of the problem

The Grant Street sewer pump station has an existing nominal capacity of 28 L/s. Based on the capacity of the existing sewer system downstream of the pump station, the pump station is constrained to a maximum flow of 55 L/s. Current peak wet weather flows to the pump station are estimated at 38.5 L/s, with ultimate peak wet weather flow expected to be in the order of 180 L/s depending on the rate and density of future growth in the area.

At present two new housing developments are underway in the Maddingley catchment with an expected yield of 1,500 new houses.

2.3 Risks to the business introduced by the problem

Western Water Enterprise Risk Framework outlines the approach for risk ranking and management for Western Water. The framework is based on the likelihood and consequence of an event occurring, resulting in a level of risk to Western Water.

Without the project Western Water will be exposed to a high level of risk. Without the rising main allowing reconfiguration of the Grant Street SPS the pump station will not be able to keep up with incoming flows due to development within its catchment. It also will not reduce the reliance on the Avenue of Honour Outfall SPS. The consequences would be non-compliance with obligations to contain and treat sewer flows resulting in uncontrolled sewer spills to the environment. Using Western Water's Enterprise Risk Framework as a guide, this would correlate to a major consequence.

Without the project, it is considered "possible" that the consequences will be realised, resulting in a high risk to Western Water.

2.4 Timing

Development and flows within the Maddingley catchment will need to be monitored and the timing for final delivery of the project adjusted to suit the rate of development occurring. The project is currently forecast to be delivered in the final year of Water Plan 3.

3 Benefits

3.1 Benefits to be delivered

The project will cater or future growth as well as providing operational efficiencies for the Bacchus Marsh sewer network. The alteration of the pump station, which will be facilitated by the construction of the rising main, will result in flows from the Bacchus Marsh network being transferred via two separate pump stations to the Parwan WRP, rather than just the one pump station. By diverting flows away from the existing Avenue of Honour Outfall SPS it will also defer upgrading of this pump station and extend it life.

The Grant Street pump station requires upgrading to cater for future growth within its catchment. An upgrade of the pump station in its current configuration, with the pump station pumping into the Bacchus Marsh sewer system to the Avenue of Honour Outfall Pump Station, has limitations in its hydraulic capacity. This restriction means that the pump station would need to be upgraded in small stages, including significant upgrades of downstream sewers through the centre of Bacchus Marsh, and would still result in a high reliance on the Avenue of Honour Outfall Sewer Pump Station.

The project will:

- Cater for growth within the Maddingly catchment of Bacchus Marsh and reduce the risk of sewer overflows at the pump station site and negate the need to upgrade downstream sewers through the centre of town.
- Reduce the reliance on the Avenue of Honour Outfall Pump Station to discharge all sewer flows from town.
- Reduce flows to the existing Avenue of Honour Outfall Sewer Pump Station thereby extending its life and defer it upgrade.

3.2 Evidence of the benefits delivered

Evidence of the benefits to be delivered by the project will include:

- Ability of the Grant St SPS to cater for the expected growth in sewage flows in the Maddingly catchment until 2025 and therefore avoid sewer overflows at site.
- A reduction in flows to the Avenue of Honour Outfall Sewer SPS providing for capacity growth in other parts of Bacchus Marsh and therefore delaying the upgrade of the pump station.

4 Options

4.1 Options Considered

The options considered are as follows:

Option 1: Do Nothing.

Option 2: Upgrade the Grant St SPS augmenting the existing downstream gravity sewers discharging into the Bacchus Marsh system

Option 3: Upgrade and reconfigure the Grant St SPS and construct a new rising main (along the Ballarat Rd) to the Parwan RWP.

Option 4: Construct an overflow storage to hold back flows at the Grant Street SPS.

4.2 Options Comparison

Option 1 does not cater for the expected growth within the Maddingly catchment and will result over time in increasing occurrences of sewage overflows at the Grant St SPS.

Option 2 would require approximately 1000 m of downstream sewer within the Bacchus Marsh system to be augmented to cater for the increased flows from the upgraded Grant St SPS. The increased flows from the Grant St SPS will then in turn require the downstream Avenue of Honour Outfall Sewer SPS and rising main to be upgraded themselves to cater for the increased flows involved.

Option 3 involves the upgrading of the Grant St SPS and the construction of approximately 3 km of DN375 Rising Main along the Geelong Rd which would enable flows to be ultimately discharged to the Parwan RWP independently of the Avenue of Honour Outfall SPS thereby negating the need to upgrade it.

Option 4 involves the construction of an overflow storage at the Grant St SPS to contain flows from the existing SPS when incoming flows exceed the pump station capacity. Whilst this option may contain flows in the short term, the Grant St SPS site is constrained for room and unlikely to be able to cater for ultimate wet weather flows expected. The site is also abutted by residential development, the Werribee River and Grant St being a thoroughfare through town.

4.3 Recommended Option

The recommended option is Option 3 as it enables flows from the Maddingley Catchment to be directly pumped to the Parwan RWP thereby:

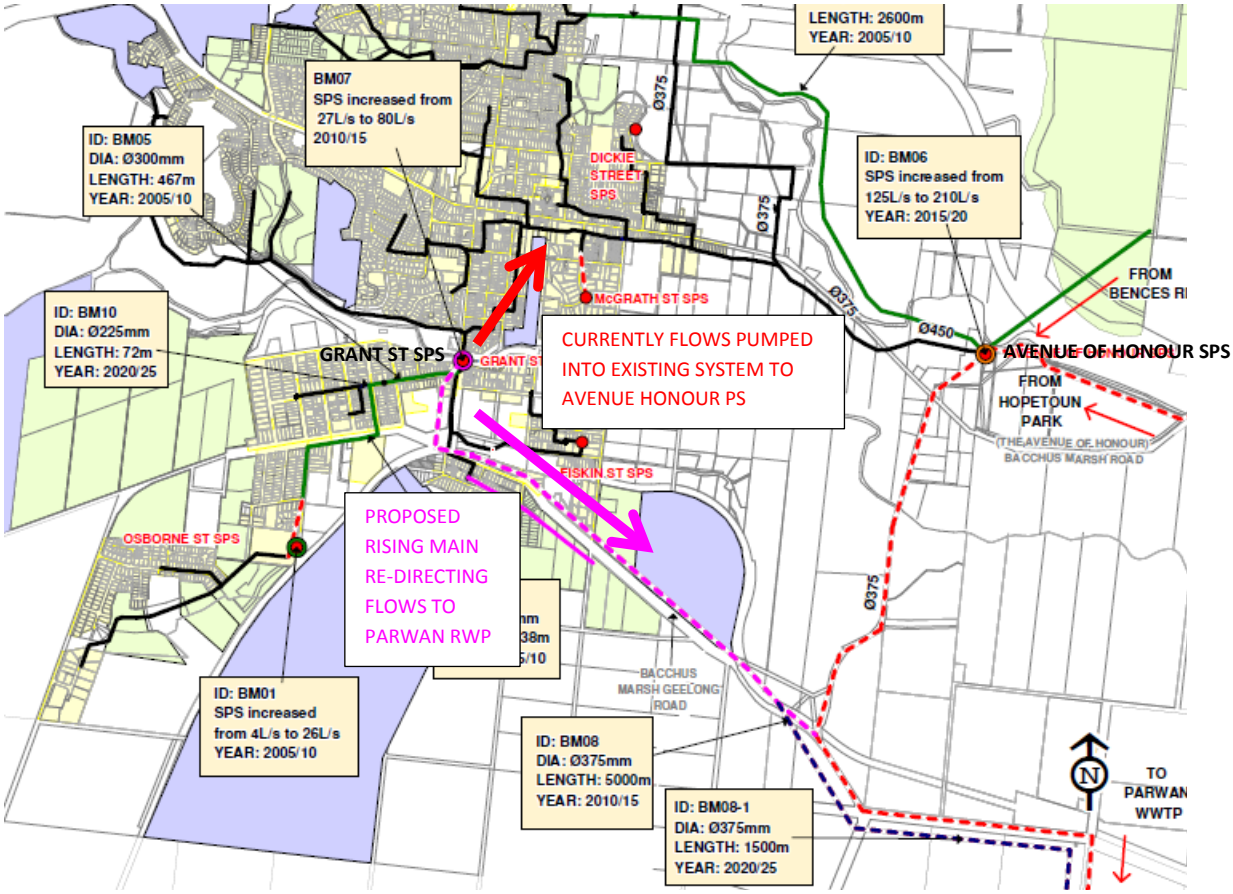
- Negating the need to upgrade significant downstream sewers through the centre of Bacchus Marsh.
- Reducing existing demands (flows) on the Avenue of Honour Outfall SPS and Rising Main therefore deferring their upgrade.

- Reducing the risk and reliance on the Avenue of Honour Outfall SPS as the sole means of pumping sewer flows from Bacchus Marsh to the Parwan WRP.

5 Solution & Implementation Strategy

5.1 Details of Proposed Solution

The proposed solution (Option 3) is to construct approximately 3 km of DN375 rising main along the Geelong Rd from the upgraded Grant SPS to Woolpack Rd at which it will then connect into the existing Avenue of Honour Rising Main along with the Avenue of Honour Rising Main Duplication to also be built.



5.2 Timelines/Schedule

The project is currently proposed to be delivered (constructed) within the final year of Water Plan 3. Development and flows within the Maddingley catchment will be monitored and the program adjusted to suit depending on the rate of development occurring. Investigations for the project will be completed within the 2012/13 financial year.

5.3 Cost Estimate

The forecast budget for this project below reflects a P50 cost estimate – refer to Attachment for details of P50 analysis.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Geelong Road Sewer Rising Main	$0.05M	-	-	-	$0.2M	$3.9M

The pump upgrade at Grant Street Sewer Pump Station is intrinsically linked with the rising main project. The forecast budget for this project is as per the below table.

	FY12/13	WATER PLAN 2013-2018				
		FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
Grant Street Sewer Pump Station upgrade	$0.3M	-	-	-	-	$2.1M

Appendix I

Risk Management Framework

WESTERN WATER
ENTERPRISE RISK MANAGEMENT FRAMEWORK

TABLE OF CONTENTS

Appendices

1. Purpose and Scope

Western Water has a vision to be a leading service provider working with the community towards a sustainable future. The Board considers that risk management is an important aspect of corporate governance.

Risk management is about identifying potential variations from what is planned or desired and managing these to maximise opportunity, minimise loss, and improve decisions and outcomes. Risk management will be an integral part of all business operations within Western Water.

The purpose of this Enterprise Risk Management Framework and embedded procedure is to outline the principles and processes by which Western Water can manage the risks facing the organization, in particular significant or strategic risks, in line with organisational risk appetite.

This Framework encompasses the following scope:

- **provides the context for organisational risk management at Western Water**
- **outlines the overarching documentation structure and review requirements**
- **describes the governance structure and accountabilities**
- **provides the procedure for identifying and assessing enterprise risks, and response requirements and approaches.**

Other subsidiary documents will translate the requirements of this framework into the procedures used throughout the organisation.

2. Background

This section of the Framework provides information on the organisational context for Western Water, the key principles that the organisation will adhere to in the management of risk, along with factors that the organisation has identified as critical for success.

2.1 Organisational Context

Established under the Water Act 1989, Western Region Water Corporation (trading as Western Water) is one of Victoria's thirteen regional urban water corporations. Western Water provides water, recycled water and sewerage services to almost 56,000 properties over an area of 3,000 square kilometres and a population of 145,000. Services are provided to the western regions of Melbourne including the Sunbury, Lancefield, Bacchus Marsh and Melton regions. This area is one of the fastest growing regions in Victoria. Rapid housing development is contributing to population growth of 3.7% per annum (2011 rate) with associated increasing demand for all services. In response, Western Water has invested, and will continue to invest, in a number of significant initiatives designed to improve organisational capability and capacity.

Western Water provides its services in line with the following vision, purpose and pathways.

Our Vision

"To be a leading service provider working with our community towards a sustainable future"

Our Purpose

"To contribute to healthy communities by meeting their current and future water service needs"

Pathways

Three strategic pathways have been developed:

- **To drive an environmentally sustainable future**
- **To actively manage growth**
- **To be a valued and innovative service provider as judged by our customers and the wider community**

The Pathways above are represented in the Balanced Score Card, a key instrument used by Western Water to map and measure the strategic objectives identified towards achieving the organisation's vision.

2.2 Risk Management Obligations

Western Water has a number of obligations relating to risk management.

This includes the activity of risk management, consistent with the requirements of the Statement of Obligations for Western Water issued by the Minister for Water as per below.

Statement of Obligations Clause 11: Risk Management

The *Authority* must develop and implement plans, systems and processes, having regard to the Australian/New Zealand Standard AS/NZS 4360 – Risk Management to ensure that risks to the *Authority*'s assets or services are identified, assessed, prioritised and managed.

As required under the Minister for Finance Standing Directions 4.5.5, the Chair of the Board and Chair of Audit committee are required to provide a risk management attestation annually in Western Water's annual report.

Risk Management Attestation example

I, [Chair of Board] certify that Western Water has risk management processes in place consistent with the *Australian/New Zealand Risk Management Standard (AS/NZS ISO 31000:2009* or its successor) and an internal control system is in place that enables the executive to understand, manage and satisfactorily control risk exposures.

I, [Chair of Audit Committee] verifies this assurance and that the risk profile of Western Water has been critically reviewed within the last 12 months.

The Board considers that risk management is an important aspect of corporate governance. Western Water's Risk Management Policy provides the organisations commitment to risk management which is attached in Appendix 4.

2.3 Risk principles

Risk Management and performance

Definition of Risk

"The effect of uncertainty on objectives" (ISO31000:2009 Risk Management – Principles and guidelines)

Definition of Risk Management:

"the processes, systems and culture applied in order to manage both the upside and downside effects of uncertainty on Western Water's objectives."

Risk is inherent in all business activities.

Risk management comprises the future focussed activities and actions taken by Western Water to ensure that it identifies and understands the risks that it faces and makes informed decisions in managing these risks. Managing risk well requires careful consideration of the key concepts of minimising loss, maximising opportunity and preparing for uncertainty. The objective of risk management is to enable performance by managing risks within the organisations appetite.

The principles for risk management from ISO31000:2009 Risk Management – Principles and guidelines are outlines below. This Enterprise Risk Framework outlines how Western Water will apply these principles in managing risks.

Risk Principles from ISO31000

a) **Risk Management creates and protects value**
b) **Risk Management is an integral part of organizational processes**
c) **Risk Management part of decision making**
d) **Risk Management explicitly addresses uncertainty**
e) **Risk Management is systematic, structured and timely**
f) **Risk Management is based on best available information**
g) **Risk Management is tailored**
h) **Risk Management takes human and cultural factors in account**
i) **Risk Management transparent and inclusive**
j) **Risk Management dynamic, iterative and responds to change**
k) **Risk Management facilitates continuous improvement of the organisation**

Organisations that successfully manage risk are characterised by:

- **a focus on both "unrewarded" and "rewarded" risks, with "rewarded" risks representing the creation of business value through the pursuit of opportunities**
- **the integration of performance and risk management as a fundamental part of organizational process**
- **that risks are not solely managed in their "silo", but also at an enterprise or aggregated level**
- **that risks are managed by line management, as well as by supporting functions like OHS, quality, legal, technology, HR and Internal Audit, with each aspect of the organisation having its own roles and responsibilities**
- **that risk management is an enabler of results instead of an objective on its own.**

Risk management is a valuable management activity that assists all staff, management and the Board to make informed decisions with the confidence that risks have been given due consideration. The risks and the rewards need to be assessed and balanced as a part of business decision making.

Leadership authorisation and commitment

Risk Management is part of Western Water's culture through authorisation and commitment of the Board and executive management. The Board and Executive management must provide actively leadership by:

- **reinforcing the importance of risk management and associated accountabilities**
- **articulating the organisation's risk appetite**
- **providing opportunities for personnel at all levels and all parts of the organisation to participate in the identification of risks to achieving strategic objectives and the development and implementation of appropriate treatment plans to manage those risks**
- **promoting a clear message to all staff that risk management is "everyone's responsibility".**

An informed and capable organisation

Communication is important to ensure that every individual in the organisation is aware of the Enterprise Risk Management Framework and to understand how the risk management process intersects with their role. Training on the Framework can be used to generate conversations and a common language about risk, and to secure consistent support across the organisation. Open communication about the risks facing the organisation will help build transparency and trust, important aspects of a mature organisational risk management culture.

A systematic approach

A formal approach to the management of business risk is regarded as sound business practice. The identification and assessment of strategic, operational and emerging risk, together with the assessment of the adequacy of existing controls are central principles of the company's risk approach. Assessment is in accordance with predefined criteria which reflect the risk tolerance acceptable to the business. Allocation of responsibility, implementation of adequate control measures and ongoing reporting of risks at the appropriate level are fundamental activities incorporated into Western Water's systematic approach to risk management. This systematic approach ensures a shared understanding of risk and a consistent response to unacceptable levels of risk.

A Resilient and Learning Organisation

Western Water is committed to continuous improvement and implementation of best prevailing practice, including updating and refining this Enterprise Risk Management Framework to ensure key concepts and processes meet organisational needs.

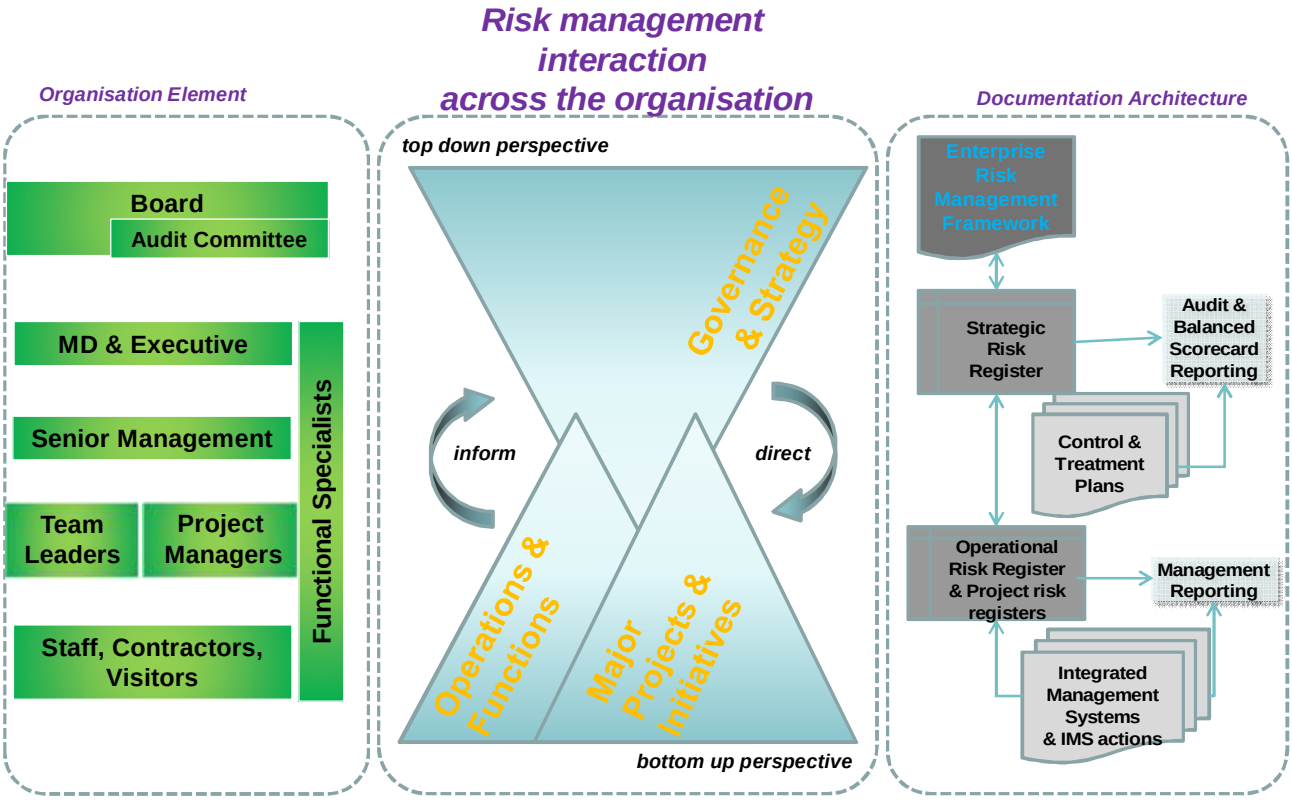
Risk Management is a future focussed mindset, looking forward at what could happen which will have an impact upon objectives. Western Water has Business Continuity Framework in place to respond to business interruptions and to ensure timely recovery. Risk Management needs to work hand in hand with the Business Continuity Framework for business resilience.

Risk Management activities need to learns from experience. This includes ensuring that lessons from the root causes of incidents and from any audit findings are integrated into the risk management processes for Western Water.

3. Risk Framework Structure and Planning

3.1 Architecture

Risk management documentation provides the guidance and means for the organisation to demonstrate that the risk management process is conducted in a systematic and consistent way across the organisation. Accessible risk framework documentation and risk registers promote organisational awareness and knowledge sharing, and the presence of control or treatment plans helps to focus management action towards mitigation. This documentation works to improve decision making within the organisation. The diagram below depicts how risk management integrates with Western Water's systems and processes.



3.2 Governance and Assurance

Consultation and communication is required between the internal groups, including those responsible for the risk and decision makers through all steps of the risk management process. It is critical that risk information can flow up, down and across the organisation in a timely fashion, achieving robust and timely decision making.

Western Water has established a Governance and Assurance structure with roles and accountabilities that not only ensures that risk is everyone's responsibility, but also provides a governance structure providing three lines of defence, ensuring and assuring that risks are actively managed.

First line of defence

Senior Managers or other nominated risk owners have primary accountability for the day-to-day management, control and reporting of risk exposures in accordance with the strategies, policies and risk parameters set by the Board.

An Operational Risk Committee comprising relevant members of the senior management team will be established to oversee the management of risks in the operational risk register.

The Board, supported by the Audit Committee, monitors Western Water's overall risk profile and ensures that adequate resources are maintained and applied.

Second line of defence

The MD and Executive Team, supported by the Risk Management function:

- **assists the Board to formulate its appetite for risk, risk management strategies, policies and tolerance/limit structures**
- **coordinate, oversee and objectively challenge the execution, management, control and reporting of risks**

A Strategic Risk Committee comprising the MD and Executive Team will be established to oversee the management of risks in the strategic risk register.

The Risk Manager and other functional specialists provide advice and assistance across the organisation in their area of expertise.

Third line of defence

The Audit Committee, informed and supported by Internal Audit and External Auditors, provides independent assurance on the design and effectiveness of the overall system of internal control, including risk management and compliance.

Internal Audit is independent of both the businesses and risk management functions and reports directly to the Audit Committee.

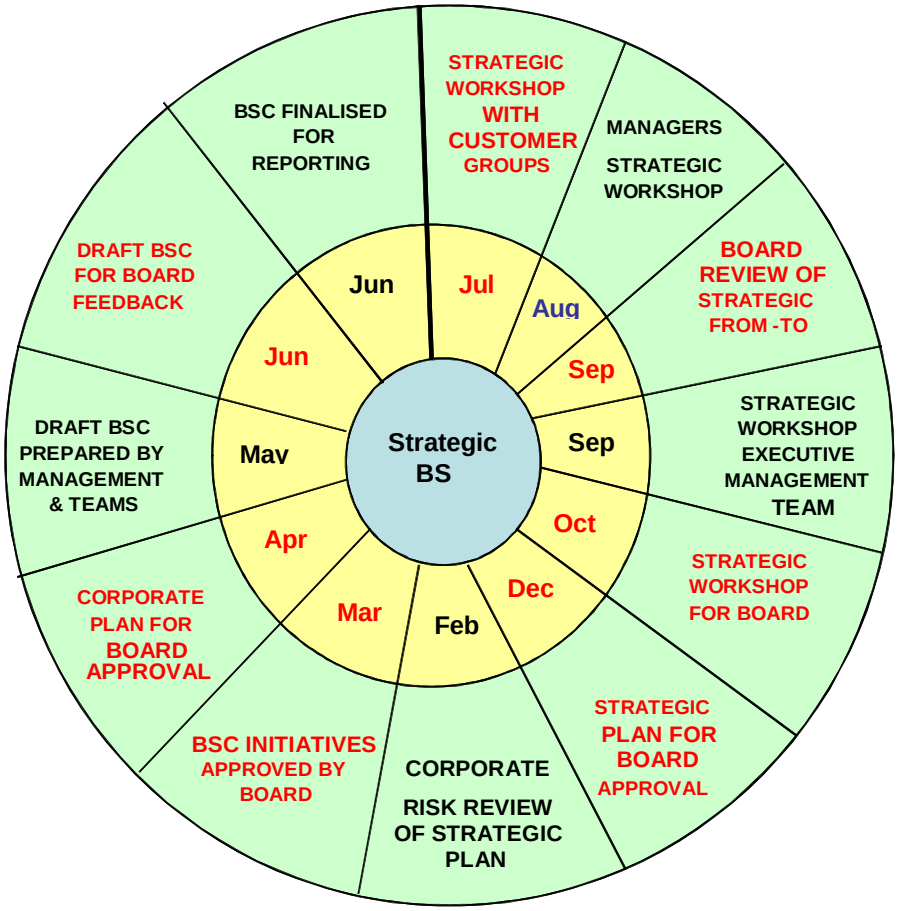
3.3 Integrating Strategic, Operational and Tactical Risk Management

Risk management is most effective and provides the highest value to the organisation when it is integrated across the organisation. Integration refers to the processes that allow interaction between the top-down strategic view of the organisation and the bottom up organisational view.

A key principle of an enterprise risk management process is the ability to integrate risk management into the strategy, business planning, budgeting and internal audit planning processes:

- **Corporate strategy – the strategic planning cycle includes the identification of key strategic and operational short and long term risks facing the organisation.**
- **Functional/strategic planning – Each function should address the key risks related to their operational goals and objectives during their annual business planning**
- **Business budgeting – Where risks require mitigation investment, budgets should be allocated and approved**
- **Audit planning – The internal audit plan should, in addition to other things, cover key risk areas**

Western Water's Strategic Planning Cycle



The Table 1 below shows examples of tools at various levels of risk activity. In an integrated system, these all interact so that consistent risk decisions are enabled.

Table 1: Examples of integrating risk across the organisation

Strategic	**Balanced Score Card**	**Strategic Risk Register**
Operational	**Integrated Management System including:** • **OHS MS** • **EMS** • **HACCP**	**Operational Risk Register** **Other risk assessment processes including:** • **Aspects and impacts register** • **JSA's** • **Hazard reports** • **Customer complaints**
Tactical	**Capital works projects** **Business improvement initiatives**	**Project/ Initiative risk registers**
Learning	**Business Continuity Planning** **Audit Schedule**	**Incident Investigations** **Audit findings**

3.4 Framework review and continuous improvement

In accordance with Western Water's commitment to continuous improvement, this Enterprise Risk Management Framework will be reviewed annually, or at a more frequent interval immediately after the occurrence events including, but not limited to, the following:

- **Significant change in the organisational context, including governmental governance arrangements**
- **Significant change in the organisational structure, resulting in obsolescence of roles outlined in the Framework or creation of additional roles not outlined in the Framework**
- **Emergence of a significant new risk clearly not able to be assessed within the existing Framework.**

In addition to the above formalised review, opportunities to innovate and further enhance the Framework and risk management practice within Western Water should be pursued and implemented at the earliest convenience. The practice of benchmarking against similar organisations is endorsed, including through participation in the DSE Water Corporations Risk Manager's Forum, and through the VMIA's Risk Framework Quality Reviews.

4. Governance Structure and Accountabilities

Effective risk management is only possible within a clear governance structure where accountabilities and responsibilities are clearly understood and supported, and regular communication and reporting occurs.

4.1 Roles and accountabilities

The following Table 2 provides the roles and responsibilities that apply to risk management at Western Water.

Table 2: Roles and Responsibilities table

Body	Responsibilities
Board of Directors	**Ultimate owners of risk for the organisation** **The Board must ensure due diligence that the key strategic and operational risks are being addressed.** **Activities include:** • **Approves the Risk Management Policy and other risk related Policies** • **Sets the risk appetite and tolerance for the organisation and reviews this annually** • **Annual review of risk profile** • **Review of monthly Balanced Score Card reports** • **Ensure processes for timely reporting and response to risks and incidents** • **Ensure adequate resources applied to manage risks** • **Chair of Board signs a risk management attestation in annual reports**
Audit Committee	**Endorses the Risk Management Framework. Monitors and reviews the adequacy of the Risk Management processes, reviews and approves key risk treatment plans, contingency plans and internal audit review of risk processes.** **Activities include:** • **Annually endorses the Risk Management Framework** • **Provides recommendations to the Board for risk management improvement opportunities** • **Reviews and oversees progress against the annual Risk Management strategy** • **Quarterly monitors health of the risk management processes** • **Quarterly review of the risk profile and progress of risk treatment plans** • **Ensures audit plan is aligned with strategic risk profile.** • **Chair of Committee signs the risk management attestation in annual reports**
Internal and External Auditors	**Provides assurance of risk control activities.** • **Conduct external and internal audits of risks and controls** • **Reviews compliance with Risk Management policy** • **Report through to the Audit Committee**
MD	**Sets the expectations for the Risk Management culture as an integral part of the Western Water culture:** • **Drives the risk culture** • **Translate and communicate board expectations** • **Responsibility for over arching strategy** • **Expects accountability** • **Active promotion of risk management**
MD and Executive team	**Leads and monitors the implementation of the Risk management strategy and framework** • **Authorise and monitors risk management objectives and KPI's through the Balanced Score Card** • **Annually develops a risk management improvement strategy** • **Communicates and promotes a risk management culture into business operations** • **Quarterly reviews risks profile, identifying and evaluating new/ emerging strategic risks** • **Quarterly monitors and review progress of treatment plans for strategic risks** • **Managerial oversight of operational risks** • **Identify interaction of risks across divisions** • **Assigns risk owners and accountability for strategic risks and treatment plans and actions.** • **Ensuring follow-up and close out of corrective and preventative actions.** • **Allocation of resources as required** • **Members of Strategic Risk Committee**

Body	Responsibilities
Senior Managers	**Driving continuous improvement through the implementation, management and review of the risk management framework and systems. Ensuring adequacy of controls for risks.** • **Communicates and promotes risk management** • **Setting expectations for risk management performance** • **Identify operational risks** • **Escalating trends, patterns and high and extreme operational and tactical risks** • **Involvement in significant incident investigations** • **Initiation, leadership and participation in risk inspections and risk assessments** • **Ensuring follow-up and close out of corrective and preventative actions.** • **Ensuring adequate resources are available for the management of risks** • **Members of Operational Risk Committee where appropriate**
Team Leaders, Project Managers and Functional Owners (OHS, Environmental, Water Quality, HR etc)	**Implementing risk controls** • **Identify risks and appropriate mitigation actions** • **Reporting any risks or incidents and escalate where required** • **Implementation of corrective actions and preventative actions as required** • **Following procedures** • **Participating in risks assessments and inspections** • **Leading incident investigations for all incidents in their area** • **Contribute to the development of procedures and systems** • **Conducting audits in functional areas such as OHS, environmental and Water Quality** • **Members of Operational Risk Committee where appropriate**
Employees, Visitors and Contractors	**Exercising Risk Awareness:** • **Reporting and escalating any risks or incidents** • **Following procedures** • **Participating in risks assessments and inspections** • **Take action to prevent/stop work that poses an unacceptable risk**
Risk Owners	**Management and Mitigation delivery for the risks which are assigned as per the strategic and operation risk registers.** • **Develop and implement risk treatment plans** • **Monitoring the level of owned risks** • **Monitoring factors that will change risk ranking** • **Communicating changes to assigned risk to their Manager and the Risk Manager** • **Update of risk reports**
Risk Manager	**Development and implementation of Risk Management Framework** • **Develops and manages the risk processes within Western Water** • **Education and coaching of Western Water's personnel in the Risk Management Framework and processes** • **Monitoring and reporting of the organisations risk profile and implementation of the risk framework across the organisation** • **Develops and maintains business systems as required to record and report on strategic, operational and project risks.** • **Developing and implementing risk control frameworks and systems for the management of risks across the organisation** • **Promoting and communicating risk management, aligned to the risk framework.** • **Facilitating and leading risk assessments on specific initiatives and projects** • **Work collaboratively with functional and business owners to ensure they effectively identify, manage, control and communicate their key risks.** • **Proactively identifying risks and escalating** • **Respond to risk incidents and assist to identify root causes and corrective action** • **Support and advises the Strategic and Operation Risk Committees**

4.2 Risk calendar

The following calendar in Table 3 presents the range and cycle of annual activities required to effectively and efficiently manage risk at Western Water.

Table 3: Risk Calender

	What	Who	When
1	**Risk Culture and context**		
1.1	Review Risk Management Policy	Board	Annually
1.2	Endorses the Risk Management Framework	Audit Committee	Annually in August
1.3	Review Risk Management Strategic Plan	Audit Committee	Annually
1.4	Review and reset Risk Tolerance Criteria	Board/Audit Committee	Annually in August
2	**Risk Identification, Risk Assessment and Evaluation**		
2.1	Identify and review Strategic Risks as part of Strategic Planning workshop	Board	Annually in October
2.2	Identify risks with new strategy plan	Audit Committee, Executive	Annually in February
2.3	Review of Strategic Risk Register, and identify any new risks	Audit Committee	Quarterly
2.4	Review of Strategic Risk Register, and identify any new risks	Executive	Quarterly
2.5	Risk discussed as an agenda item at Executive Team meetings, reviewing new risk reports,	Executive	Monthly
2.6	Review of operational risk register and identify new risks	Managers and Team leaders	Monthly
2.7	Risk discussed at team meetings	Managers and Team Leaders	Monthly
3	**Risk Monitoring and Reviewing**		
3.1	Review of strategic risk register and treatment plans for High and Extreme Risks strategic risks	Audit committee and Executive	Quarterly
3.2	Review of strategic risk register and treatment plans for High and Extreme risks during to Strategic Planning workshop	Board	Annually, in October
3.3	Review of operational risk register and treatment actions	Managers and Team leaders	Monthly
3.4	Internal Audits		As per annual schedule
3.5	External Audits		As per schedule
4	**Risk Reporting**		
4.1	Balanced Score Card reports on risks and status of treatment plans for High and Extreme risks	Board, Executive	Monthly
4.2	Strategic Risk Report and treatment plans for High and Extreme risks	Audit Committee, Executive	Quarterly
4.3	Strategic Risk Report and treatment plans for High and Extreme risks to Board Strategic Workshop	Board	Annually in October
4.4	Operational risk register and identifying the need to escalate operational risks to the strategic level	Executive, Managers and Team leaders	Monthly
4.5	Risk Treatment Plans for High and Extreme Risks	Executive, Risk Owners	Monthly

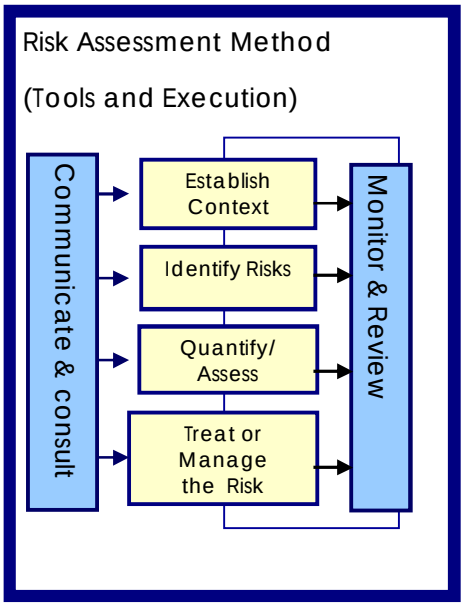
4.3 Training

In order to build organisational capability and common understanding of the risk management framework, the following training modules will be conducted as needed.

- **Risk Management for Board and Executive – with a focus on Governance and Oversight**
- **Risk Leadership for managers and functional leaders**
- **Risk Awareness for staff**
- **All new staff will be provided an induction including risk management**

5. Enterprise Risk Management Procedure

5.1 Overarching methodology



The Risk Management Methodology outlined in this procedure is aligned to the risk management process as described by ISO 31000:2009 Risk Management – Principles and Guideline. This process, as depicted by the diagram opposite explains that an organisation needs to identify, assess and treat or manage the risks facing their organization. This includes any risks which may impact the objectives of the organization, such as financial, strategic, through to operational risks and project risks.

The management of these risks needs to be monitored and reviewed for effectiveness, and done with communication and consultation throughout the organization.

5.2 Risk context

When applying the risk management process, it is important to recognise the context for the particular risks prior to the identification, assessment and treatment steps in the process. This will include:

- **Scope (Eg Strategic, Operational, Project specific)**
- **What stakeholders are involved?**
- **What are the internal and external influencing factors? Eg Technology, Regulatory requirements, Customer expectations etc?**
- **What are the objectives?**

5.3 Risk identification

Risk identification processes are critical to the success of managing risk. If risks are not identified then they are excluded from the rest of the process. This information will be important for the rest of the steps within the risk management process.

Types of risk

Risks arise from uncertainty that can impact on Western Water's objectives. Risks can either be caused by internal or external sources.

When identifying risk there are three components to consider;

- **A full description of the risk**
- **source/cause of the risk**

- **the impact on objectives arising from the risk**

Techniques for identification of risks can include:

To ensure all risks are identified consider the following sources of risk in context with the previously identified objectives. Listed below in Table 4 are some of the typical sources of risk to be considered in the identification step.

Table 4 - Sources of Risk

Generic Source	Description
Natural	Risks that emanate from the natural environment.
People	Risks resulting directly from peoples actions whether external or internal to the business.
Technological / Technical	Risks that are caused by the use and/or advancement of technology
Information	Risks that are caused from the use of information within or external to the business.
Commercial & Legal	Risks that are caused by the commercial and legal environment.
Economic & Financial	Risks resulting directly from the economic and financial environment.
Political	Risks resulting from the political environment.
Strategic	Risks involved with management of the business.
Other	Risk not otherwise defined.

Risk identification activities are planned and structured, and focussed on different levels of the organisation. The following risk identification activities will routinely be scheduled.

Strategic

- **Annual Board reviews risk profile during the Board Strategic workshop (October) as per the strategic planning cycle.**
- **Annual risk identification workshop of strategic risks, identifying risks associated as part of the strategic planning process and development of the Balanced Score Card (February)**
- **Quarterly risk identification by Audit committee and Strategic Risk committee**
- **Monthly Executive Meeting agenda item to review any escalated Operational Risks and any emerging risks from external sources.**

Operational

- **Monthly risk identification by Operational Risk Committee**
- **Monthly agenda item at each team and functional meeting, including OHS Committee.**
- **Regular tool box meetings.**

Tactical Risk

- **Project Risk Registers established and reviewed throughout life of all projects and initiatives.**

Incident Investigations and Audits

- **After each incident, a thorough investigation should be conducted. Any new risks identified through an investigation will be added to the Operational Risk Register.**
- **Any new risks identified through audits may be added to the Operational Risk Register.**

5.4 Risk assessment and evaluation

Once a risk has been identified, it needs to be assessed and evaluated, in order for risk based decisions to be made. These decisions need to be made consistently, according to the risk tolerance of the organisation. In other words, decisions are made within agreed limits of how much risk the organisation is willing to take on, as agreed by the Board. This Risk Appetite is described directly at times through organisational Policies, or more generally through the risk assessment tools; The Consequence and Likelihood Tables and the Risk Matrix. It is the Board who sets this Risk Appetite, and this needs is reviewed and updated on an annual basis within the current organisational context.

For each risk identified, the level of risk is determined within the context of the existing controls. This is done as a four step process:

1. **Identify the control environment for the risk.**
2. **Determine the consequence level using Table 5 considering the status of current controls.**
3. **Rate the likelihood for each risk using Table 6 given the consequence chosen, and the current controls. It is important that the likelihood rating chosen is a result of the previously selected consequence level and considers the controls.**
4. **Use the risk matrix to determine the risk ranking using Table 7.**

NOTE: Where either:

a. More than one area of the business or stakeholder group is affected

OR

b. More than one impact area is affected

The risk needs to escalated to the next level of authority for further discussion and review.

Consequence Criteria

Consequences of potential adverse risk events will be assessed against nine criteria:

- **Financial (cash impact not covered by insurance)**
- **Regulatory/ compliance**
- **Assets**
- **People**
- **Occupational Health & Safety**
- **Public Health**
- **Customer Service Disruption**
- **Reputation**
- **Environmental**

The impact level for each criteria is set out in Table 5 below, ranging from Insignificant to Catastrophic. Risk events shall be assessed against all criteria, and the consequence rating shall be the maximum impact level as assessed across any of the criteria. In instances where the maximum impact level is common across multiple criteria, consideration should be given to escalating the impact to the next highest consequence impact level.

These descriptors form a key input to the risk appetite of the organisation, and will to be reviewed annually to ensure an appropriate level of risk is being taken on by the organisation. This can include both upside and downside risk. Consequence descriptors are generally logarithmic between the levels on the scale.

Table 5: Consequence Table

Criteria	Insignificant	Minor	Moderate	Major	Catastrophic
Financial (cash impact not covered by insurance)	Less than $50,000	Greater than $50,000 and less than $250,000	Greater than $250,000 and less than $2 million	Greater than $2 million and less than $20 million	Greater than $20million
	Less than 0.1% of annual operating revenue	Greater than 0.1% and less than 0.4% of annual operating revenue	Greater than 0.4% and less than 3.3% of annual operating revenue	Greater than 3.3% and less than 33.3% of annual operating revenue	Greater than 33.3% of annual operating revenue
Regulatory/ compliance	Minor non-conformance	Breach of legislation resulting in prohibition notice. Minor fines.	Breach of legislation resulting moderate penalty. Litigation resulting from failure of obligation.	Major breaches resulting in significant fines or removal of licences.	Major breaches of legislation resulting in prosecution or removal of directors, executive director and or executive, or Ministerial intervention.

Criteria	Insignificant	Minor	Moderate	Major	Catastrophic
Assets	No damage to asset.	Minimal damage but no reduction in performance or efficiency to asset or systems.	Some damage to asset and corresponding reduction in either system efficiency or performance with impact on "Environmental", "Service Disruption" and/or "Drinking Water Quality" measures.	Major damage to asset with significant reduction in either system performance or efficiency with impact on :Environmental", "Service Disruption" and/or "Drinking Water Quality" measures or period offline	Destruction of asset with major period offline and corresponding impact on "Environmental", "Service Disruption" and/or "Drinking Water Quality" measures.
People	Staff complaint	Series of staff complaints	Measurable reduction in staff morale.	Competency gaps resulting in reduced organisational efficiency 10% reduction in staff engagement	Loss of key people Significant competency gaps resulting in leadership or delivery capability. 20% reduction in staff engagement
Occupational Health & Safety	First Aid injuries – superficial injury with little/no treatment.	Minor injury/illness requiring medical treatment – doctor, medical centre, hospital out- patient /emergency.	Lost Time Injuries <13 weeks. Severe injury or illness with a long period off work.	Lost Time Injuries >13 weeks. Severe injuries/ illnesses and harm to person, including permanent impairment.	Fatality, or Permanent disablement.
Public Health	Insignificant Exposure, no illness or aesthetic impact on customers.	Minor Exposure, unlikely to result in illness, however some localised customer aesthetic issues.	Exposure may result in illness in localised area and / or results in aesthetic impact within a localised area.	Exposure causes confirmed illness within a system and / or results in aesthetic impact within a Filtered / disinfected supply / system.	Exposure results in confirmed life threatening / severe illness and / or death to one or more customers. Aesthetic impacts reported across a filtered / disinfected supply / system.
	e.g. Short term failure of Water Treatment Plant < 30 minutes.	(2% - 5% customers in a supply zone contact WW within an 8 hr working day)	(>5% customers in a supply zone contact WW within an 8 hr period / working day)	(>10% customers in a supply zone system contact WW within an 8 hr period / working day)	(>15% customers in a supply zone contact WW within an 8 hr period / working day)
		Reported isolated microbiological non-conformance event within a filtered / disinfected reticulation system.	Reported microbiological non-conformance event within a filtered / disinfected reticulation system.	Reported microbiological non-conformance event within a filtered / disinfected system.	Reported microbiological non-conformance event within a filtered / disinfected system.
		(One event of Ecoli > 0)	(Greater than one event of Ecoli > 0)	(Greater than three events of Ecoli > 0)	(Greater than five events of Ecoli > 0)

Criteria	Insignificant	Minor	Moderate	Major	Catastrophic
Customer Service Disruption	<5 hours	>5 hours for up to 50 customers	>5 hours disruption for 50 - 200 customers.	>5 hours disruption to 200 – 1,000 customers.	>1 day loss of supply to >1,000 customers.
	Significant problem with major customer transactional systems for less than 2 hours.	Significant problem with major customer transactional systems for less than 4 hours.	Significant problem with major customer transactional systems for greater than 1 day but less than 3 days.	Significant problem with major customer transactional systems for greater than 3 days but less than 2 weeks.	Significant problem with major customer transactional systems for an extended period of time (greater than 2 weeks)
Reputation	Issues of individual customer significance.	Issues of local community significance.	Issues of regional area significance	Issues of State significance.	Issues of National significance.
	Stakeholder indifference.	Stakeholder aware of issue.	Stakeholder actively expressing dissatisfaction.	Stakeholder alarm or grave concern.	Enraged stakeholder with potential intervention.
Environmental	Minor environmental impact.	Minor environmental impact relating to statutory requirements which requires the EPA or other 3rd party to be notified.	Moderate environmental impact relating to statutory requirements, but a short recovery period.	Major environmental impact which requires extended recovery period.	Environmental incident resulting in long term damage, requiring long term recovery (years).
	Minor loss of containment.	Loss of containment (product or chemical).	Required to inform EPA or other 3rd party and investigation likely.	Significant financial costs associated with court action, fines and recovery costs.	Catastrophic financial costs associated with court action, fines and recovery.
			Major loss of containment (product or chemical).	Major loss of containment.	Total loss of containment including significant impact beyond the boundaries of the premises.

Likelihood Criteria

Likelihood of potential adverse risk events will be assessed against five criteria, ranging from Almost Certain to Rare, as set out in the Table 6 below.

Table 6: Likelihood Table

Likelihood Descriptor	Likelihood Definition
Almost Certain	The event is expected to occur in most circumstances ie Will occur several times a year to monthly 90 – 100% chance of occurring within a project.
Likely	The event will probably occur in most circumstances May occur annually 70-90% chance of occurring within a project.
Possible	The event may occur at some time May occur once in a 5 year period 30 – 70% chance of occurring within a project
Unlikely	The event could occur at some time Once in a 10 year period 10-30% chance of occurring within a project
Rare	The event may occur only in exceptional circumstances Once in a 100+ years period Less than 10% chance of occurring within a project

Risk Ranking

Consequence and Likelihood criteria are combined in the Enterprise Risk Matrix in Table 7 below to provide the risk ranking.

Table 7: Risk Matrix

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Catastrophic
LIKELIHOOD	Almost Certain	Medium	Medium	Extreme	Extreme	Extreme
	Likely	Low	Medium	High	Extreme	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	High

Risk Evaluation

Risk acceptability is to be evaluated, dependant on the level of risk. The Risk Response in Table 8 below shows the rate of response, and authority level for each level of risk. An action plan may include:

- **Further treatment required**
- **Current controls acceptable and monitoring regime required.**

Table 8: Risk Response Table

Risk Ranking	Risk Mitigation Strategy	Risk Escalation Level
Extreme	**Escalation and immediate course of action to be determined within 48 hours and documented in treatment plan.** **Ongoing and continuous monitoring.** **Status of treatment plan to be reported in Balanced Score Card monthly.**	**MD & Board**
High	**Escalation and immediate course of action to be determined within one week and documented in treatment plan.** **To be monitored monthly.** **Status of treatment plan to be reported in Balanced Score Card monthly.**	**MD, General Managers**
Medium	**Acceptable risk - May require further treatment** **To be monitored quarterly**	**General Managers, Senior Managers**
Low	**Acceptable Risk – Continue to manage as normal** **Review annually.**	**Senior Managers and Team Leaders**

5.5 Risk response and treatment

For High and Extreme risks the Risk Owner must develop a risk treatment plan. These will be documented on the Risk Assessment Sheets, and include responsibilities for actions, and timeframes.

To do this it is necessary to

1. **Assess the effectiveness of the current controls using the control effectiveness table using Table 9**
2. **Identify, assess and select the treatment options which include to accept, reduce, transfer, avoid or increase the risk. The most appropriate treatment option/s involves balancing the costs and benefits of implementing the option considering the nature of the risk. A number of options can be considered and applied individually or collectively.**
3. **Identify in priority order the individual risk treatment plan actions based on the treatment options selected. Where treatment actions impact elsewhere in the organisation or with stakeholders, they should be involved in the developing the treatment plan.**
4. **Assess the future risk ranking using the criteria in Tables 5, 6, 7 & 8 which provides the assessment of the risk once all the treatment actions identified have been implemented.**
5. **Document this on the treatment plan template in Appendix 2.**

Progress against treatment plan actions for High and Extreme risks will be reported monthly in the Balance Score Card report. The detailed treatment plan templates in Appendix 2 will be reported on a quarterly basis to the Executive Team and Audit Committee.

Control Effectiveness Criteria

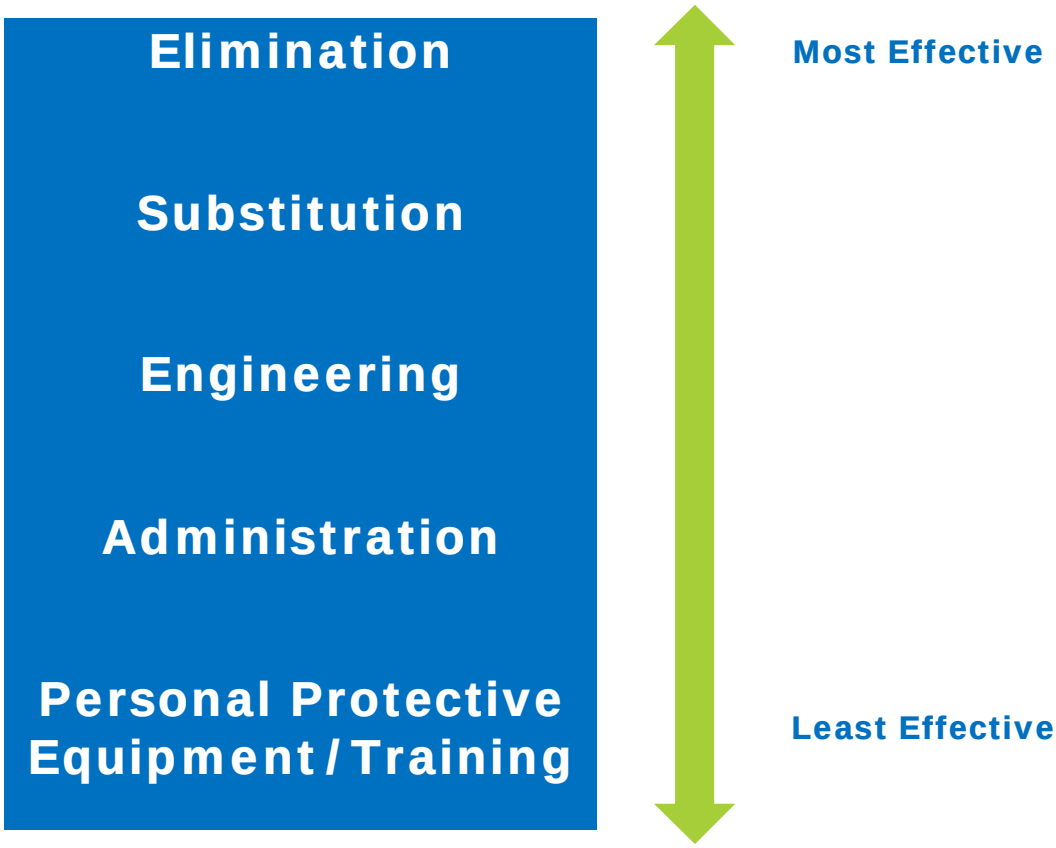
The effectiveness of the existing controls for each risk needs to be assessed against the criteria in Table 9. This assessment must consider the current status of controls in place for the risk.

Table 9 – Control Effectiveness Rating Table

Rating	Description
Fully Effective	**Controls are well designed for the risk, are operating effectively and are well documented. Reliability and repeatability has been shown through monitoring processes. Controls are well understood. Continue to monitor and review existing controls.**
Substantially Effective	**Most controls are designed correctly and are in place and effective. Some more work to be done to ensure reliability and repeatability, or to improve operating effectiveness. Controls are largely understood.**
Partially Effective	**While the design of the controls is largely correct, the controls are not currently in place or very effective. There is only limited understanding of the controls. OR The controls that are in place are operating effectively and repeatably and well understood, however some of the control design does not effectively mitigate the root cause/s of the risk.**
Substantially ineffective	**Significant control gaps. Either controls do not treat the root causes of the risk appropriately, or they do not operate at all effectively or reliably. Little knowledge exists about the controls.**
Totally ineffective	**Virtually no credible controls in place. Poor control design and very limited/no effectiveness in mitigating the root cause/s of the risk.**

Treatment Options can include the following:

If the Treatment Option is to Reduce the likelihood or consequence, it may be useful to apply the hierarchy of controls as per below. This hierarchy is obligated for Health and Safety risks.



5.6 Reporting

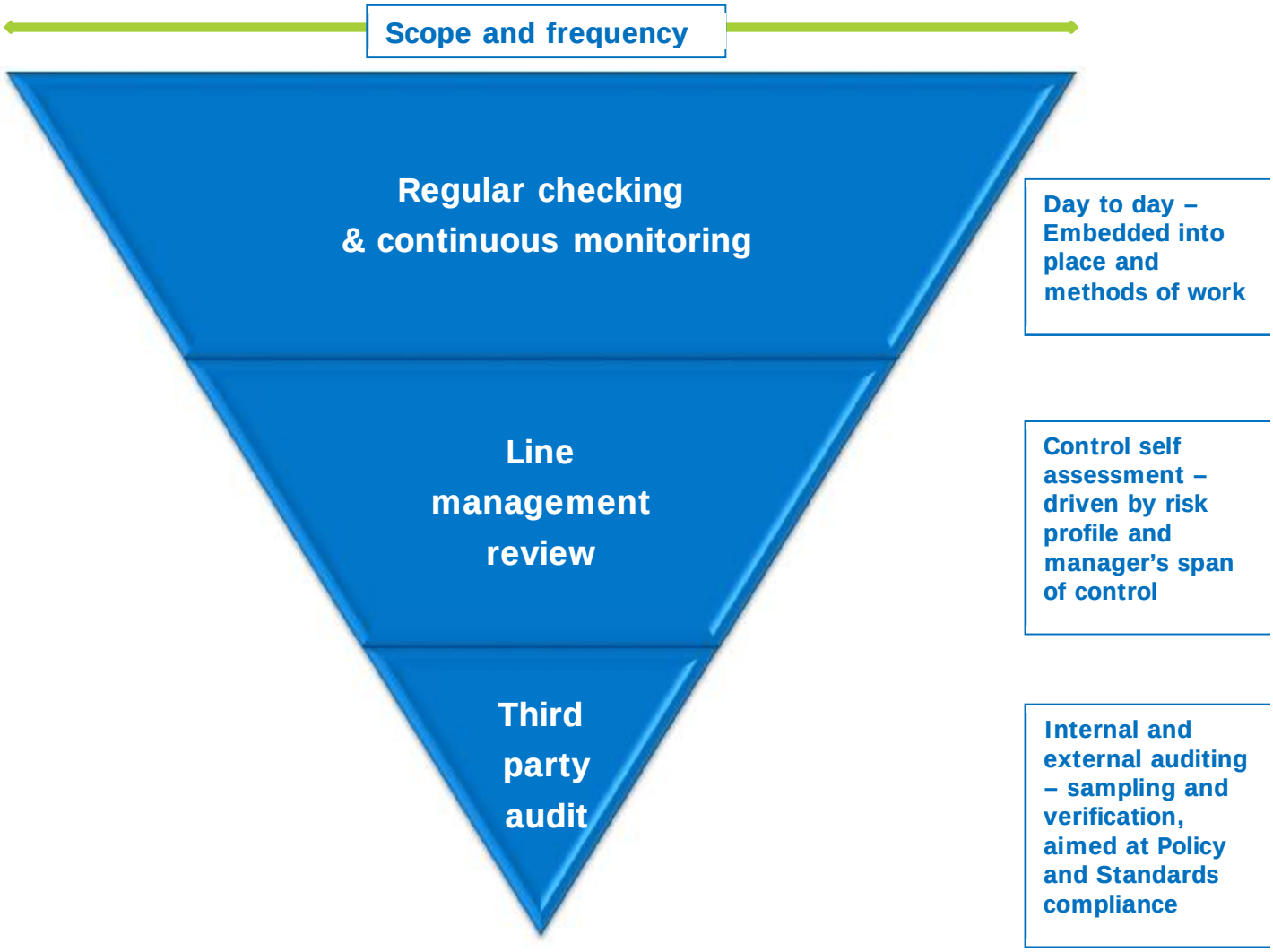
The following Table 10 shows the risk reporting schedule.

Table 10: Risk Reporting Schedule

Report Type	Purpose	Audience	Frequency
Balanced Score Card	To provide an overview of the current risk level and the status of treatment plans for High and Extreme Strategic risks	MD, Executive Team, Board.	Monthly
Strategic Risk Profile and report	To provide an overview of strategic risk profile, including progress status of treatment plans.	Audit Committee Strategic Risk Committee Board Strategic Workshop Corporate Risk Review of Strategic Plan	Quarterly Quarterly Annually, in October Annually in February
Operational Risk Register	Provide overview of operational risk profile To inform the need to escalate operational risks to the strategic level	Operational risk committee Executive Team	Monthly Quarterly
Risk Treatment Plans (for High and Extreme Risks)	Detailed reporting on status of treatment plans.	Executive, Audit committee	Quarterly

5.7 Monitoring and auditing

Monitoring / auditing process



Different types of monitoring processes are available. The appropriate form should be determined in line with the level of risk, and the criticality of the controls.

Continuous Monitoring

When treatment plans risks are established, an appropriate monitoring regime should be used to provide ongoing assurance that they are effective. The risk register will normally contain a record of existing controls and treatments, so they should be referred to when establishing the monitoring regime. The status of risks and treatment plans for High and Extreme risks will be monitored monthly in the Balanced Score Card.

Line Management Review (control self assessment)

Periodically line management should review process systems and activities to ensure that new risks have not arisen and treatment strategies are still effective. Consideration should be given to the options of sample review across a range of issues that are subject to continuous monitoring, or to undertaking short intensive reviews of a few specific areas.

Third Party Audit

The annual audit program will be aligned to the strategic risk profile, ensuring critical risk controls are monitored.

Whether from internal or external sources, third party auditing brings a measure of independence and perspective. Audits may focus on compliance with Standards (internal or external), procedures or legislative requirements. Often they are risk based, concentrating on the effectiveness and appropriateness of treatment measures.

If audits become or are seen as being the primary system of assurance, then it is often the case that the assurance regime will be weak.

6. References, Related Policies and Documents

AS/NZS ISO 31000:2009 , Risk management – Principles and guidelines

HB 158-2010 Delivering assurance based on ISO 30100:2009 Risk Management – Principles and Guidelines

HB 327:2010 Communicating and consulting about risk

Statement of Obligations Western Region Water Authority, Issuesd by the Minister for Water under the Water Industry Act 1994, commenced on 1 July 2007

Standing Directions of the Minister for Finance under the Financial Management Act 1994, Department of Treasury and Finance, updated June 2011

Risk Appetite and Tolerance Guidance Paper, Institute of Risk Management, 2011

Victorian Government Risk Management Framework, Department of Treasury and Finance, March 2011

Western Water Risk Management Policy

Western Water Business Continuity Management Policy

Western Water Public Health Policy

Western Water Asset Management Policy

Western Water Occupation Health and Safety Policy

Victorian Government Risk Management Framework, Department of Treasury and Finance, March 2011

Appendix 1 – Strategic Risk Register Overview

The table below presents the elements of the Strategic Risk Register along with a description of each element.

Strategic Risk Register Element	Description
Number	Unique identification number
Risk Title	Short form title of the risk event
Pathway	The strategic Pathway identified in the Balanced Scorecard potentially most impacted by this risk
BSC Measure	The Balanced Scorecard measure potentially most impacted by this risk
BSC Category	The Balanced Scorecard perspective or Category potentially most impacted by this risk
Division	Organisational Division that owns this risk
Function	Organisational Function, within a Division, that owns this risk
Risk Owner	The management role or title that "owns" this risk, i.e. is accountable for updating the status and responsible for coordinating mitigation efforts
Cause or Source	The cause or source of the risk event
Risk Description	A description of the risk event should it materialise
Effect or Impact	The likely effect or impact of the risk event should it materialise
Likelihood	An assessment of the Likelihood, based on defined Likelihood Criteria
Consequence	An assessment of the Consequence, based on defined Consequence Criteria, and accounting for any escalation if multiple criteria are impacted
Current Risk Ranking	The ranking of the risk based on the Enterprise Risk Matrix with current controls in place (residual risk)
Industry Risk Group	The Risk Group (as defined by DSE) most aligned with the type of risk
Industry Risk Cluster	The Risk Cluster (as defined by DSE) most aligned with the type of risk
Controls	A list of the controls that the organisation has in place to act on the risk to minimise the likelihood and/or consequence of occurrence
Control Actions	Specific actions required by the organisation to implement the controls
Industry Control Categories	The Control Category (as defined by DSE) for each control most aligned with each control
Risk Response	A list of the additional treatments that the organisation could put in place to further minimise the risk
Control Effectiveness	An assessment of the effectiveness of current controls
Future Risk Likelihood	An assessment of potential future Likelihood once additional treatments are in place
Future Risk Consequence	An assessment of potential future Consequence once additional treatments are in place
Future Risk Ranking	The ranking of the risk in the future when all treatments are in place

Appendix 2 – Strategic Risk Report and Treatment Plan Template for High and Extreme risks

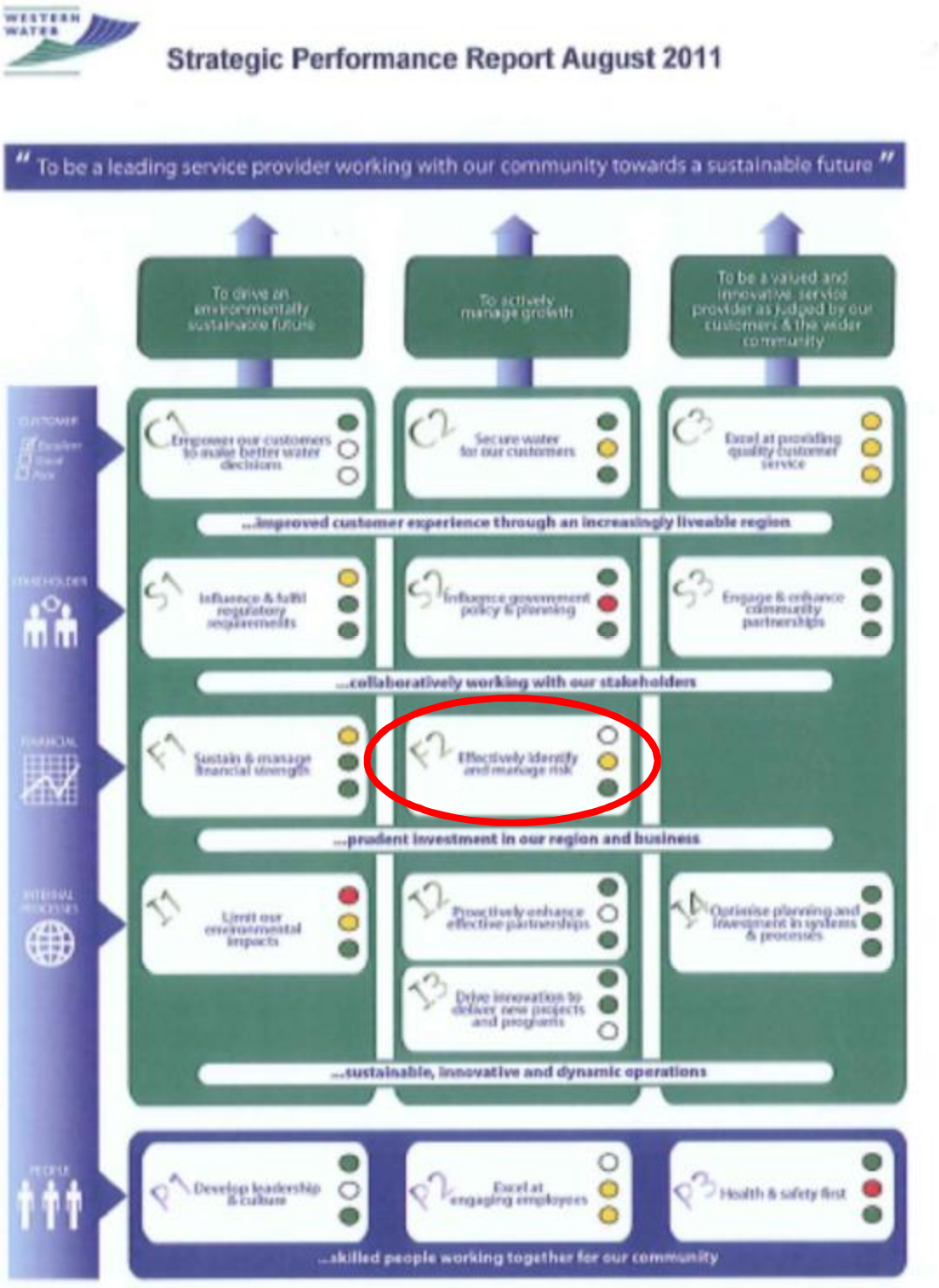
PART 1: Strategic Risk Report			
Title		Risk Assessment Completed By	
Strategic Pathway		Date Assessed	
BSC Measure and Category		Risk Type (Strategic,)	

Identify Risks			Analyse Risks			*Evaluate Action*
Cause or Source	Risk Description	Effect or Impact	Existing Controls	Control Effectiveness Assessment	Risk Assessment	Treat Risk?
					Consequence	☐ Avoid Risk
					Likelihood	☐ Accept Risk
					Current Risk Ranking	☐ Reduce Risk
						☐ Transfer Risk
						☐ Increase Risk

PART 2: Risk Treatment Plan	
Risk Owner:	
Preferred Risk Treatment & Objective	

Treat Risks				Monitor & Review	Insurance
Risk Treatment / Action Plan	Accountabilities	Timelines	Future Risk Ranking	Review / Monitor	Insurance Status
					☐ Insurable?
					☐ Insured?

Appendix 3– Balanced Scorecard Risk Report Template (F2)



Effectively identify and manage RISK

1. MEASURE: Risk index and effective controls

Number	Risk Title	BSC Page	Previous Risk Rating (Jan 2011)	Current Risk Rating (Oct 2011)	Current Control Effectiveness	Treatment Plan Status	Future risk rating
1.2	Unsafe drinking water	C3	High	High			
1.13	Emergency events	F2	High	High			
1.14	Waste water treatment failure	C3	High	High			
1.16	Major dam failure	C3	High	High			
2.1	New customer contributions	S1	High	High			
3.1	Planning for growth	I3	High	High			
4.1	Climate change	I1	High	High			
4.6	Recycled water contamination	C2	High	High			
5.2	Occupational health and safety	P3	High	High			
5.3	Organisation capability	P2	High	High			

Issues & Actions:
The table displays current high and extreme risks in the strategic risk register. Reporting on the control effectiveness, treatment plan status, future risk and overall rating of this measure will be provided progressively from February 2012 onwards as part of implementing the Risk Transformation Project.

BSC Rating

BSC trend

J A S O N D J F M A M J
Not yet rated. To be developed.

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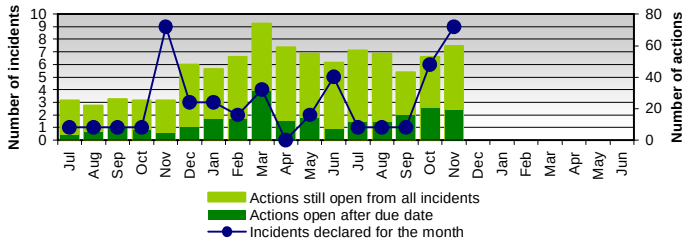
2. MEASURE: Timely processing of High Risk Incident Actions



BSC Rating

≥ 21% actions open after due date
Up to 20% actions open after due date
All actions resolved by due date

BSC trend

J A S O N D J F M A M J

Incidents declared for the month : **9**
Total number of actions currently overdue for completion : **19**

Issues & Actions: Nine incidents declared for the month - Class A UVT analyser failure, Sewer spill - Archer Drive Melton, Sunbury Region power outage, Main Break - Main St Myrnong , Contractor Injury - Gisborne RWP, Main Break - Mount Holden, Sewer Spill - Ryans Creek Melton, Mains Break - Fenwich Street Sunbury , Three spills (Avenue of Honour SPS, Hopetoun Park SPS, Melton RWP)
60 actions open with 19 past the due date. 32% open after due date. One debrief conducted generating six actions.

---

3. INITIATIVE: Implementation of Risk Management Transformation Project

Month	Plan	Status
Jul-11	Develop detailed project plan	Complete
Aug-11	Present project plan to Audit Committee	Complete
Sep-11	Complete desk top review for risk gap analysis	Complete
Oct-11	Conduct interviews for risk practices and culture	Complete
Oct-11	Conclude development of Risk Framework	Complete
Nov-11	Present draft Risk Framework to Audit Committee	Complete
Feb-12	Approval of final Risk Framework by Audit Committee	

Issues & Actions:
Milestones represent first phase of Risk Management Transformation Project as agreed by Project Steering Committee. Progress report provided to November Audit Committee meeting. A draft Project Plan for second phase of project was presented to Management in November. Additional milestones will be included once the Phase 2 Project Plan is approved which is expected by the end of February 2012.

BSC Rating

> 2 months behind Plan
Up to 2 months behind Plan
In accordance with Plan

BSC trend

J A S O N D J F M A M J

APPENDIX 4: Risk Management Policy

To be added

Appendix J

Water Resource Optimisation

Western Water
Optimisation model

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Water Resources Optimisation Model (WP3 and WP4)

INFLOWS	1	Actuals	Actuals		1	2	3	4	5	1	2	3	4	5	
Merrimu	sensitivity	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24
BE Volume in store at **start** of year			17,237	18,500	18,522	14,798	11,263	7,941	6,056	6,013	5,974	5,919	6,072	6,027	5,987
Forecast BE inflows (Merrimu & DJ)			3,305	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988
1 **Planned usage (Limited) >>**		1,804	5,428	1,500	5,600	5,800	5,800	4,400	2,600	2,600	2,600	2,400	2,600	2,600	2,600
Rosslynne															
BE Volume in store at start of year			14,360	20,700	19,808	15,333	11,305	7,501	5,549	5,444	5,351	5,266	5,190	5,122	5,060
Forecast BE inflows (Rosslynne)			3,819	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046
2 **Planned usage (Limited) >>**		73	152	200	4,200	4,200	4,200	2,400	600	600	600	600	600	600	600
Environmental flows allowance from WW's BE			532	800	800	800	800	800	800	800	800	800	800	800	800
Other local WW sources & losses															
Woodend, Romsey, Lancefield, Myrniong usage >>		785	823	800	800	800	800	800	800	800	800	800	800	800	800
Other water **to be used in this year**			2,000		950										
Treatment plant losses Mer & Ros (2% of usage)			112	50	212	216	216	152	80	80	80	76	80	80	80
total local water used.			6,350	2,500	11,550	10,800	10,800	7,600	4,000	4,000	4,000	3,800	4,000	4,000	4,000
Melb BE required (ML)		7,589	4,910	9,337	412	1,390	1,656	5,143	9,046	9,534	10,031	10,756	11,148	11,822	12,598
5 year advice to MW Feb'12...			4,500	9,500	1,000	1,000	5,500	10,500	8,000						
10 year advice for MW Aug'12...				9,500	2,000	2,000	2,000	8,000	8,000	10,000	10,000	11,000	11,000	12,000	13,000
DEMANDS suggested refinments...					1,500										
lots growth		Stage 2	Stage 1	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR	PWSR
existing areas (incl metered vacant)		49,571	50,946	51,940	52,955	53,991	55,048	56,127	57,227	58,351	59,497	60,668	61,862	63,081	64,325
new growth areas > >		0	15	915	2,215	3,815	5,565	7,565	9,715	11,776	14,304	17,413	21,242	25,964	31,800
total residential lot growth		49,571	50,961	52,855	55,170	57,806	60,613	63,692	66,942	70,126	73,802	78,081	83,104	89,045	96,125
industrial & commercial properties		2,994	2,950	3,009	3,069	3,131	3,193	3,257	3,322	3,389	3,456	3,526	3,596	3,668	3,741
existing areas population >>>	WW	150,664	155,385	158,417	161,513	164,673	167,896	171,187	174,542	177,970	181,467	185,036	188,679	192,397	196,191
new growth areas ppHH >>>	2.50	0.00	0	38	2,288	5,538	9,538	13,913	18,913	24,288	29,439	35,761	43,533	53,104	64,911
total population serviced (30 June)	144,948	150,664	155,385	158,455	163,800	170,210	177,434	185,100	193,455	202,257	210,906	220,797	232,212	245,501	261,102
usage rate l/p/d (potable)															
l/p/d existing areas > >		143	152	160	158	156	154	152	150	150	150	150	150	150	150
l/p/d new growth areas (incl DUAL pipe)		88	130	130	128	126	124	122	120	120	120	120	120	120	120
l/bus/d Industrial & commercial		1,550	1,553	1,550	1,540	1,530	1,520	1,510	1,500	1,500	1,500	1,500	1,500	1,500	1,500
demand (average pop x l/p/d)															
existing areas		7,864	8,490	9,163	9,225	9,286	9,347	9,406	9,464	9,650	9,840	10,033	10,230	10,432	10,638
new growth areas		0	0	1	54	180	341	522	719	946	1,177	1,428	1,737	2,116	2,585
total residential demand		7,864	8,490	9,164	9,279	9,466	9,688	9,928	10,183	10,596	11,016	11,461	11,967	12,548	13,222
industrial & commercial demand		1,694	1,672	1,702	1,725	1,748	1,772	1,795	1,819	1,855	1,892	1,930	1,969	2,008	2,048
total demand (including WW use ~ 1%)		9,558	10,162	10,866	11,005	11,215	11,460	11,723	12,002	12,451	12,909	13,391	13,936	14,556	15,270
losses				10,758	10,895	11,103	11,345	11,606	11,882						
Water loss %		8.72%	8.46%	8.2%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Volume of water loss (ML)		894	953	971	957	975	996	1,019	1,044	1,083	1,122	1,164	1,212	1,266	1,328
TOTAL demand (ML)		10,251	11,260	11,837	11,962	12,190	12,456	12,743	13,046	13,534	14,031	14,556	15,148	15,822	16,598

COSTS		MW pricing changes ...			-0.30%	-0.30%	-0.30%	-0.30%	1.10%	1.10%	1.10%	1.10%	1.10%	1.10%
Local water ($/ML, treatment costs)	$	150	$ 150	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180	$ 180
Melbourne Headworks water ($/ML)	$	885	$ 885	$ 886	**$ 1,789**	**$ 1,784**	**$ 1,778**	**$ 1,773**	**$ 1,768**	**$ 1,787**	**$ 1,807**	**$ 1,827**	**$ 1,847**	**$ 1,867**	**$ 1,888**
Local cost (VAR)	$M	0.399	$ 0.960	$ 0.450	$ 1.908	$ 1.944	$ 1.944	$ 1.368	$ 0.720	$ 0.720	$ 0.720	$ 0.684	$ 0.720	$ 0.720	$ 0.720
Melbourne Headworks cost (VAR)	$M	6.716	$ 4.345	$ 8.270	$ 0.736	$ 2.479	$ 2.945	$ 9.118	$ 15.990	$ 17.039	$ 18.124	$ 19.647	$ 20.587	$ 22.074	$ 23.781
Melbourne Headworks cost (FIXED)	$M	3.758	$ 4.819	$ 4.818	**$ 4.251**	**$ 4.239**	**$ 4.226**	**$ 4.213**	**$ 4.201**	**$ 4.247**	**$ 4.294**	**$ 4.341**	**$ 4.388**	**$ 4.437**	**$ 4.486**
SRW Headworks costs (FIXED)	$M	1.540	$ 1.540	$ 1.540	**$ 1.531**	**$ 1.704**	**$ 1.857**	**$ 1.921**	**$ 2.028**	**$ 2.050**	**$ 2.072**	**$ 2.095**	**$ 2.118**	**$ 2.142**	**$ 2.165**

GREEN HOUSE GASES

Indicates tCO2e saved by reducing Melbourne Headworks water used

(costs reflect power costs for pumping + Govt Carbon Tax price)

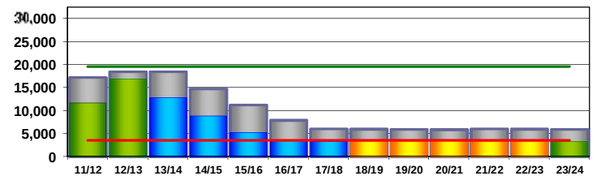
	WP3 & WP4		
Melton system	403	$ 0.009	M
Sunbury system	21,943	$ 0.505	M
Total tCO2e saved	22,346	$ 0.514	M
	Tonnes		

Bottom line .....

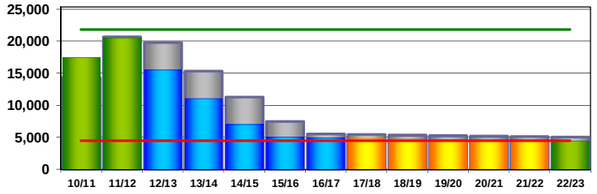
WP3 costs $M		WP4 costs $M	
$ 7.884	Local water variable costs	$ 3.564	
$ 31.270	Melbourne Headworks water variable costs	$ 97.472	
$ 21.130	Melbourne Headworks water fixed cost	$ 21.706	
$ 9.040	SRW fixed costs	$ 10.477	
$ 69	Million	$ 133	Million

$ 61.44

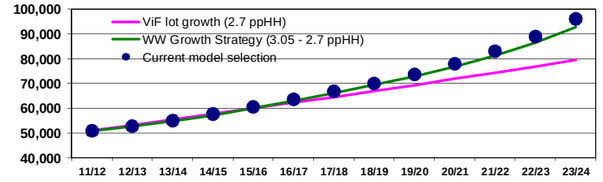
Merrimu BE



Rosslynne BE



Residential lot growth forecasts



CONTROL PANEL :

WESTERN WATER

Growth forecast		l/p/d (Res & Non Res)	
WW Growth Strategy		Conservation	
DSE ViF		Flat	
Climate	**USAGE**	**Drawdown**	**Plants**
Average (long term)	Maximise Melbourne	Low Risk	Full Capacity
Dry (long term)		Medium Risk	Limited Capacity
Return to Dry 1997-2009	OPTIMISED !!	High Risk	Prioritise MERRIMU first
Very dry (long term)			
	200 Increment		Merrimu 12/13 set 1500
Screen			Rosslynne 12/13 set 200
Quit	206	Data	

Paul Louws
Asset Manager

E:\Demand\Copy of 2f-OPTIMISATION model WP3 and WP4 - 8 SEP 12 updated for 201112 actuals.xls

Western Water
Optimisation model

08/10/20125:29 PM

DATA, ASSUMPTIONS & PRESET SCENARIOS :

GHG impacts over WP3 (5 years)	Govt $ / tCO2e	Kwh/ML /er 5 years	NET kwh/ML	Kwh saved	$/Kwh
Estimated GHG emmissions saved	$ 23	0.00121 Melton GHG	9	333,000	
by using local water over imported water		Sunbury GHG	975	18,135,000	

						1	2	3	4	5	1	2	3	4	5	
			11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24
Merrimu INFLOWS	**Max possible water**		11,700	16,970	12,810	8,882	5,347	3,453	3,404	3,361	3,322	3,471	3,420	3,375	3,335
Water remaining at end of year			11,700	16,970	12,810	8,882	5,347	3,453	3,404	3,361	3,322	3,471	3,420	3,375	3,335
WW BE			19,510	19,510	19,510	19,510	19,510	19,510	19,510	19,510	19,510	19,510	19,510	19,510	19,510
Safe storage buffer	**CC %**	Inflows	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Approx WW evaporation (10% of vol)			1,724	1,351	1,436	1,000	607	393	384	379	375	391	386	381	376
Long Term Average (7 years)	0.009	7,096	7,096	7,033	6,970	6,907	6,844	6,781	6,718	6,654	6,591	6,528	6,465	6,402	6,339
Long Term Dry (7 years)	0.015	3,950	3,950	3,891	3,832	3,773	3,713	3,654	3,595	3,536	3,476	3,417	3,358	3,299	3,239
Return to Dry (avg 1997-2009)	Step CC	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988	2,988
Long Term very dry (7 years)	0.015	1,031	1,031	1,016	1,000	985	969	954	938	923	907	892	876	861	845
Rosslynne INFLOWS	**Max possible water**		17,495	20,496	15,524	11,049	7,021	5,053	4,937	4,832	4,739	4,654	4,578	4,510	4,448
Water remaining at end of year			17,495	20,496	15,524	11,049	7,021	5,053	4,937	4,832	4,739	4,654	4,578	4,510	4,448
WW BE			21,816	21,816	21,816	21,816	21,816	21,816	21,816	21,816	21,816	21,816	21,816	21,816	21,816
% BE transferred from WW BE for EE		**0%**	-	-	-	-	-	-	-	-	-	-	-	-	-
Safe storage buffer			4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Approx WW evaporation (10% of vol)			1,436	2,111	1,734	1,237	789	567	550	538	528	518	510	502	496
Long Term Average (7 years)	0.009	9,484	9,484	9,400	9,315	9,231	9,147	9,062	8,978	8,894	8,810	8,725	8,641	8,557	8,472
Long Term Dry (7 years)	0.014	1,654	1,654	1,631	1,608	1,585	1,562	1,539	1,516	1,493	1,470	1,447	1,424	1,401	1,378
Return to Dry (avg 1997-2009)	Step CC	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046
Long Term very dry (7 years)	0.014	207	207	204	201	198	196	193	190	187	184	181	178	175	173
North / West demand split															
Merrimu demand SHARE - MW O&M		**53%**	5,108	5,414	5,480	5,601	5,742	5,894	6,054	6,313	6,576	6,854	7,168	7,526	7,937
Rosslynne demand SHARE - MW O&M		**39%**	3,731	3,956	4,005	4,094	4,198	4,310	4,428	4,618	4,812	5,017	5,248	5,511	5,813
Maximise Melb BE USAGE & have Minimum local O&M use															
Min use for O&M and PEAK DAY- Merrimu			1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Min use for O&M and PEAK DAY- Rosslynne			600	600	600	600	600	600	600	600	600	600	600	600	600
L/P/D usage and L/Bus/D usage															
l/p/d new growth areas flat 130			130	130	130	130	130	130	130	130	130	130	130	130	130
l/p/d NEW growth EFFICIENCY (Dual pipe = -25%			130	130	128	126	124	122	120	120	120	120	120	120	120
but allow for some not Dual, so 130 reducing to 120, or 160-25%)															
l/p/d for EXISTING areas flatl 160 - WSDS			152	160	160	160	160	160	160	160	160	160	160	160	160
l/p/d for EXISTING areas EFFICIENCY			152	160	158	156	154	152	150	150	150	150	150	150	150
l/business/d flat (30 June 2012 1553)			1,553	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550
l/business/d EFFICIENCY			1,553	1,550	1,540	1,530	1,520	1,510	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Plant Capacities for OPTIMISATION calculation (starting 2012/12)															
Capacity at Merrimu WFP				5,915	5,915	5,915	5,915	5,915	5,915	5,915	5,915	5,915	5,915	5,915	5,915
Capacity at Rosslynne WFP				4,225	4,225	4,225	4,225	4,225	4,225	4,225	4,225	4,225	4,225	4,225	4,225
Growth forecasts															
ViF % lot growth				4.1%	4.1%	4.1%	4.1%	3.7%	3.7%	3.7%	3.7%	3.7%	3.4%	3.4%	3.4%
Growth strategy % lot growth EXISTING				2.16%	2.16%	2.16%	2.16%	2.16%	2.17%	2.17%	2.17%	2.17%	2.18%	2.18%	2.18%
Growth strategy % lot growth NEW AREAS				233.33%	90.00%	68.42%	50.00%	36.46%	30.53%	25.15%	19.65%	20.02%	20.39%	20.76%	21.12%
Growth Strategy % lots Industrial Growth				2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
ViF ppHH			2.684	2.684	2.684	2.684	2.634	2.634	2.634	2.634	2.634	2.592	2.592	2.592	2.557
ViF allowance for dual pipe area (NEW)			0	0	0	0	0	0	0	0	0	0	0	0	0
ViFlot growth		49,571	51,123	53,228	55,419	57,701	60,076	62,275	64,554	66,917	69,366	71,904	74,339	76,856	79,458
Growth strategy lot growth EXISTING		49,571	50,661	51,753	52,869	54,011	55,179	56,373	57,595	58,844	60,122	61,429	62,765	64,132	65,531
Growth strategy lot growth NEW AREAS		0	300	1,000	1,900	3,200	4,800	6,550	8,550	10,700	12,803	15,366	18,500	22,340	27,058
Growth Strategy lots Industrial Growth		2,994	2,950	3,009	3,069	3,131	3,193	3,257	3,322	3,389	3,456	3,526	3,596	3,668	3,741
Total WW res growth		49,571	50,961	52,753	54,769	57,211	59,979	62,923	66,145	69,544	72,924	76,795	81,265	86,473	92,589
Growth Strategy ppHH EXISTING			3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
Growth Strategy ppHH NEW AREAS			2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50

ASSET INFORMATION

Merrimu	ML/day	Days/ week	Annual	
Max plant througput	35	7	12,740	Max BE take allowed
Reasonable Maximum	17.5	6.5	**5,915**	8,500
Maximum BE storage	19,510	ML	Limited	Full
Adequate air space	5,000	ML		
Safe buffer risk low	4,500	ML	3,500	2,500
100% full	32,516	ML	medium	high
Min O&M use	500	ML		
PEAK DAY allowance	500			

Rosslynne	ML/day	Days/ week	Annual	
Max plant througput	35	7	12,740	Max BE take allowed
Reasonable Maximum	12.5	6.5	**4,225**	6,100
Maximum BE storage	21,816	ML	Limited	Full
Adequate air space	5,000	ML		
Safe buffer risk low	5,500	ML	4,500	3,500
100% full	25,368	ML	medium	high
Min O&M use	300	ML		
PEAK DAY allowance	300			

Typical Rosslynne Env Flow needed 800
300 Gisborne RWP Class B water avail

Growth Strategy	existing	new
upper per lot/d	800	650
lower per lot/d	600	500
with sub per lot/d		488
with 50% sub per lot/d		325
upper l/p/d	262	260
lower l/p/d	197	200
with sub l/p/d		195
with 50% sub l/p/d		130
WSDS existing l/p/d		160

Melb supply LOW LIMITS

Hillside O&M & PEAK DAY minimum use	860	gravity flows is OK
Loemans O&M & PEAK DAY minimum use	660	5ML/week
Hillside O&M allowance	260	
Loemans O&M allowance	260	
HillsidePEAK DAY allowance	600	
Loemans PEAK DAY allowance	400	

Therefore : Lowest MW usage 1,520 **ML**

Back to MODEL Contorl Panel

Paul Louws
Asset Manager

Appendix K

Developer Financed Works

ITEM FOR NOTING
GENERAL MANAGER – SUSTAINABLE WATER SOLUTIONS

SUBJECT
Western Water administration fees charged to developers for subdivisions

PURPOSE
To approve a change in the calculation and collection of the administration fees associated with subdivisions within the Western Water region.

BACKGROUND
Since the start of Water Plan 1 (in 2005/06), Western Water has had an actual cost recovery regime to cover the administration costs incurred during a subdivision.

This involves charging an initial fee based on the number of lots within the subdivision. A final reconciliation is completed prior to Western Water's consent to a statement of compliance being provided.

This requires project managers to, at times, request additional payments from developers when there is a shortfall between the initial estimate and the actual cost. This creates unnecessary tension between the developers and Western Water.

As part of the WP3 submission, Western Water intends to move away from the initial fee system to a per lot fixed cost that will cover the typical cost of the subdivision. This will bring Western Water in line with other water businesses.

The fee is based on the time it takes to process the application and includes an allowance for the first lot. The rate per lot is then based on an allowance for the Clerk of Works Officer to visit the site as well as a surveyor. An assessment has been made that proportionally the costs are higher for smaller subdivisions than larger one and this has been reflected in the per lot rate. Our data, taken over the last water plan period supports these figures.

The different pricing structure has been shown in the table below as well as a comparison to other water corporations.

Land Development	**application fee**	**up to 10 lots**	**10 lots**	**over 10 lots**	**20 lots**	**40 lots**
		rate	total	rate	total	total
WW - inc survey	$ 1,412.25	$ 416.96	$5,164.89	$208.48	$7,249.68	$11,419.28
WW - no survey	$ 1,312.25	$ 146.96	$2,781.85	$ 58.48	$3,366.64	$ 4,536.24
Other Authorities						
CWW			$3,309.00		$5,800.00	
BW			$3,237.81		$3,237.81	$ 9,693.57
YVW			$ 787.63		$1,760.16	
SEWL			$1,416.00		$1,416.00	

CWW, SEWL and YVW have a significantly different system to Western Water in regards to land developments. They audit contractors and consultants as opposed to Western Water's review and acceptance model, which provides a higher quality of infrastructure.

Based on the table above, Western Water would be cheaper than CWW when surveying is removed, whilst still carrying out what we believe is a more robust system. Western Water would generally be cheaper than Barwon Water if the sewer component of the works are removed. SEWL is difficult to measure because their figure assumes they do not need to carry out any audits otherwise a figure of approximately $50 per metre is charged to audit the design, construction and survey. YVW does very little auditing of the works and this is reflected in their fees.

RECOMMENDATIONS
That approval be given to change the per lot initial fee to an upfront fixed fee and variable charge based on the number of lots within the subdivision. This will cover Western Water's costs for a typical subdivision.

Responsible for Report 10/09/12
Manager – Capital Planning and Investments

Approved by: 15/10/12
General Manager – Sustainable Water Solutions

Appendix L

Schedule of Tariffs

WESTERN WATER
SCHEDULE OF TARIFFS

Variable water, wastewater and tradewaste charges are rounded down to 4 decimal places
All other charges are rounded down to 2 decimal places

Tariff and Price Component	*Price (1 July 2012)*	**Water Plan 2008-2013** *Price (1 July 2013)*	*Price (1 July 2014)*	*Price (1 July 2015)*	*Price (1 July 2016)*	*Price (1 July 2017)*
1.1 Residential water tariff						
Service charge (per annum)						
20mm	215.26	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
25mm	336.36	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
32mm	551.11	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
40mm	861.11	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
50mm	1345.49	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
80mm	3444.49	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
100mm	5382.04	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
150mm	12109.6	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
Usage charge block 1 (0-440 litres/day) (per Kl)	1.3838	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
Usage charge block 2 (441-880 litres/day) (per Kl)	1.8358	CPI + 8.86%	CPI + 10.86%	CPI + 10.86%	CPI + 10.86%	CPI + 10.86%
Usage charge block 3 (881+ litres/day) (per Kl)	3.6717	CPI + 8.86%	CPI	CPI	CPI	CPI
1.2 Non-residential water tariff						
Service charge – Commercial/Free Access/Benevolent (per annum)						
20mm	215.26	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
25mm	336.36	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
32mm	551.11	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
40mm	861.11	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
50mm	1,345.49	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
80mm	3,444.49	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
100mm	5,382.04	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
150mm	12,109.60	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
Usage charge – Non-residential (per kL)	1.83580	CPI + 8.86%	CPI + 10.86%	CPI + 10.86%	CPI + 10.86%	CPI + 10.86%
1.3 Residential sewerage tariff (per annum)						
Service charge (per annum)	496.33	CPI + 3.54%	CPI + 3.54%	CPI + 3.54%	CPI + 3.54%	CPI + 3.54%
1.4 Non-residential sewerage tariff (per annum)						
Service charge – Commercial/Free Access/Benevolent (per annum)	496.33	CPI + 3.54%	CPI + 3.54%	CPI + 3.54%	CPI + 3.54%	CPI + 3.54%
1.5 Residential recycled water tariff - Class A						
Service charge – All (per annum)						
20mm	93.06	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
25mm	145.41	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
32mm	238.24	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
40mm	372.27	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
50mm	581.69	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
80mm	1,489.14	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
100mm	2,326.77	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
150mm	5,235.27	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
Usage charge Class A recycled water – Residential (per kL)	1.3838	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%	CPI + 8.86%
1.6 Trade waste charges						

Tariff and Price Component	Price (1 July 2012)	Water Plan 2008-2013 Price (1 July 2013)	Price (1 July 2014)	Price (1 July 2015)	Price (1 July 2016)	Price (1 July 2017)
Application Fee – Risk Rank 1 (per application)	122.84	CPI	CPI	CPI	CPI	CPI
Application Fee – Risk Rank 2 (per application)	193.08	CPI	CPI	CPI	CPI	CPI
Application Fee – Risk Rank 3 (per application)	358.40	CPI	CPI	CPI	CPI	CPI
Application Fee – Risk Rank 4 (per application)	849.94	CPI	CPI	CPI	CPI	CPI
Management Fee – Risk Rank 1 (per annum)	238.66	CPI	CPI	CPI	CPI	CPI
Management Fee – Risk Rank 2 (per annum)	500.62	CPI	CPI	CPI	CPI	CPI
Management Fee – Risk Rank 3 (per annum)	1,119.21	CPI	CPI	CPI	CPI	CPI
Management Fee – Risk Rank 4 (per annum)	2,276.97	CPI	CPI	CPI	CPI	CPI
Volumetric Charge – Category B (per kL)	1.3343	11.65% + CPI	CPI	CPI	CPI	CPI
Volumetric Charge – Category C (per kL)	0.9283	12.35% + CPI	CPI	CPI	CPI	CPI
1.7 Trade waste quality charges — Risk Ranks 2, 3 and 4, (per kg)						
BOD >400mg/L	0.3013	CPI	CPI	CPI	CPI	CPI
Suspended Solids >400mg/L	0.1922	CPI	CPI	CPI	CPI	CPI
Total Phosphorus >30mg/L	0.4486	CPI	CPI	CPI	CPI	CPI
Total Combined Nitrogen >60mg/L	0.5770	CPI	CPI	CPI	CPI	CPI
Total Oxidisable Sulphur >100mg/L	0.8334	CPI	CPI	CPI	CPI	CPI
Sodium >250mg/L	0.1279	CPI	CPI	CPI	CPI	CPI
Arsenic >0.2g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Cadmium >0.4g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Chromium (III & V) >100g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Copper >100g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Lead >100g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Mercury >0.2 g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Nickel >10g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Selenium >10g/day	0.1922	CPI	CPI	CPI	CPI	CPI
Heavy Metals — Zinc >100g/day	0.1922	CPI	CPI	CPI	CPI	CPI
1.8 Trade waste Penalty units						
Contravention Management						
1st Major Breach	180.0000	180.00	180.00	180.00	180.00	180.00
2nd Major Breach	380.0000	380.00	380.00	380.00	380.00	380.00
3rd Major Breach	850.0000	850.00	850.00	850.00	850.00	850.00
4th Major Breach	1730.0000	1,730.00	1,730.00	1,730.00	1,730.00	1,730.00
1.9 Customer contribution (per lot)						
Customer contribution — sewerage	1217.30	CPI	CPI	CPI	CPI	CPI
Customer contribution — water	1217.30	CPI	CPI	CPI	CPI	CPI
Customer contribution — recycled water	1217.30	CPI	CPI	CPI	CPI	CPI
2.0 Miscellaneous fees and charges						
Information statements – Standard (per item)	58.57	CPI	CPI	CPI	CPI	CPI
Information statements – Urgent (per item)(*)	79.87	CPI	CPI	CPI	CPI	CPI

Tariff and Price Component	*Price (1 July 2012)*	**Water Plan 2008-2013** *Price (1 July 2013)*	*Price (1 July 2014)*	*Price (1 July 2015)*	*Price (1 July 2016)*	*Price (1 July 2017)*
Information statements – Taxation Statement (per item)	24.99	CPI	CPI	CPI	CPI	CPI
Water tapping fees - Potable & Recyled Water		CPI	CPI	CPI	CPI	CPI
20mm meter, installation (per tapping)	381.16	CPI	CPI	CPI	CPI	CPI
25mm meter, installation (per tapping)	703.64	CPI	CPI	CPI	CPI	CPI
32mm meter, installation (per tapping)	1,480.62	CPI	CPI	CPI	CPI	CPI
40mm meter, installation (per tapping)	1,920.29	CPI	CPI	CPI	CPI	CPI
50mm meter, installation (per tapping)	2,946.40	CPI	CPI	CPI	CPI	CPI
Water Meter Test – 20 to 32mm (per test)	102.69	CPI	CPI	CPI	CPI	CPI
Urgent Water Tapping Fee		Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)
Conditions of Connection – Sewer -						
Residential standard (per application)	190.51	CPI	CPI	CPI	CPI	CPI
Residential other (per application)	263.85	CPI	CPI	CPI	CPI	CPI
Commercial small (per application)	263.85	CPI	CPI	CPI	CPI	CPI
Commercial large (per application)	483.74	CPI	CPI	CPI	CPI	CPI
Urgent Sewer Connection	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)	Cost plus 2 charge units (*)
Plan copy sewer (per item)	11.89	15.00	CPI	CPI	CPI	CPI
Backflow Prevention -						
Assessment of application & preparation of agreement (per application)	Full Cost Recovery	CPI	CPI	CPI	CPI	CPI
Private Fire Service -		CPI	CPI	CPI	CPI	CPI
Pressure and flow information (per item)	274.18	CPI	CPI	CPI	CPI	CPI
Annual inspection fee (per item))	Full Cost Recovery	CPI	CPI	CPI	CPI	CPI
Sealing fire hose taps – first tap (per item)	Full Cost Recovery	CPI	CPI	CPI	CPI	CPI
Sealing & Resealing fire hose taps – additional (per item)	Full Cost Recovery	CPI	CPI	CPI	CPI	CPI
Resealing fire hose taps – first resealing (per item)	Full Cost Recovery	CPI	CPI	CPI	CPI	CPI
Plugging Fees - Potable & Recyled (per item)	139.65	CPI	CPI	CPI	CPI	CPI
Size depth and offset information (per item)	10.79	2 charge units	CPI	CPI	CPI	CPI
Build over applications, conditions of connection - alterations & extensions (per item)	113.57	CPI	CPI	CPI	CPI	CPI
Swimming pool backwash approval (per item)	59.80	CPI	CPI	CPI	CPI	CPI
Developer Financed Works - Construction, Feasibility, Design, Supervision & Quality Control						
- up to 10 lots - over 10 lots	Full Cost Recovery	Per lot charge	CPI	CPI	CPI	CPI

Tariff and Price Component	*Price (1 July 2012)*	**Water Plan 2008-2013** *Price (1 July 2013)*	*Price (1 July 2014)*	*Price (1 July 2015)*	*Price (1 July 2016)*	*Price (1 July 2017)*
Recycled Water – Inspection Fee - (To be forwarded to the Plumbing Industry Commission)	Actual cost	Actual cost	Actual cost	Actual cost	Actual cost	Actual cost
All other Miscellaneous Charges/Ancillary Costs pursuant to Water Act (1989) & relevant By-Laws	Cost plus	Cost plus	Cost plus	Cost plus	Cost plus	Cost plus

(*)urgent fee: **equivalent to 2 charge units** This fee will only be applied when customer requests a 24 hour turnaround that can not be met without the use of overtime and/or additional resources

charge unit =$12.45 2012/13 (+ CPI pa)

na not applicable. **NOM** prices to be unchanged in nominal terms

cost plus: Contractor Cost plus $80.00 Admin. Charge (+ CPI pa) and GST where applicable and reflects recovery of administration costs

Appendix M

Customer Impacts

Appendix M: Customer impact (based on 200, 250 & 300KL consumption)

Notes:

- **Applies to all regions (20mm meter)**
- **Real prices as at 1/1/13$**

Residential Customers 200kl Consumption

	Water Tariffs		Sewer	Total	% Change from previous year
	Fixed	Variable	Fixed	Tariffs	
2012/13 Tariffs	$215.26	$295.29	$496.33	$1,006.88	
2013/14	$234.33	$321.45	$513.92	$1,069.71	6.24%
2014/15	$255.09	$351.57	$532.13	$1,138.80	6.46%
2015/16	$277.70	$384.54	$550.99	$1,213.23	6.54%
2016/17	$302.30	$420.62	$570.52	$1,293.44	6.61%
2017/18	$329.08	$460.13	$590.74	$1,379.95	6.69%

Residential Customers 250kl consumption

2012/13 Tariffs	$215.26	$387.08	$496.33	$1,098.67	
2013/14	$234.33	$421.38	$513.92	$1,169.63	6.46%
2014/15	$255.09	$462.35	$532.13	$1,249.58	6.84%
2015/16	$277.70	$507.34	$550.99	$1,336.03	6.92%
2016/17	$302.30	$556.77	$570.52	$1,429.58	7.00%
2017/18	$329.08	$611.05	$590.74	$1,530.87	7.09%

Residential Customers 300kl consumption

2012/13 Tariffs	$215.26	$478.87	$496.33	$1,190.46	
2013/14	$234.33	$521.30	$513.92	$1,269.55	6.64%
2014/15	$255.09	$573.12	$532.13	$1,360.35	7.15%
2015/16	$277.70	$630.15	$550.99	$1,458.84	7.24%
2016/17	$302.30	$692.91	$570.52	$1,565.72	7.33%
2017/18	$329.08	$761.98	$590.74	$1,681.80	7.41%

Non-Residential Customers 200kl Consumption

	Water Tariffs		Sewer	Total	% Change from previous year
	Fixed	Variable	Fixed	Tariffs	
2012/13 Tariffs	$215.26	$367.16	$496.33	$1,078.75	
2013/14	$234.33	$399.69	$513.92	$1,147.94	6.41%
2014/15	$255.09	$443.10	$532.13	$1,230.32	7.18%
2015/16	$277.70	$491.22	$550.99	$1,319.90	7.28%
2016/17	$302.30	$544.56	$570.52	$1,417.38	7.39%
2017/18	$329.08	$603.70	$590.74	$1,523.52	7.49%

Non-Residential Customers 250kl Consumption

2012/13 Tariffs	$215.26	$458.95	$496.33	$1,170.54	
2013/14	$234.33	$499.61	$513.92	$1,247.86	6.61%
2014/15	$255.09	$553.87	$532.13	$1,341.10	7.47%
2015/16	$277.70	$614.02	$550.99	$1,442.71	7.58%
2016/17	$302.30	$680.70	$570.52	$1,553.52	7.68%
2017/18	$329.08	$754.63	$590.74	$1,674.45	7.78%

Non-Residential Customers 300kl Consumption

2012/13 Tariffs	$215.26	$550.74	$496.33	$1,262.33	
2013/14	$234.33	$599.54	$513.92	$1,347.79	6.77%
2014/15	$255.09	$664.65	$532.13	$1,451.87	7.72%
2015/16	$277.70	$736.83	$550.99	$1,565.51	7.83%
2016/17	$302.30	$816.84	$570.52	$1,689.66	7.93%
2017/18	$329.08	$905.55	$590.74	$1,825.38	8.03%

Residential Tenant Customers 200kl consumption

	Water Tariffs		Sewer	Total	% Change from
200kl consumption	Fixed	Variable	Fixed	Tariffs	previous year
2012/13 Tariffs		$295.29		$295.29	
2013/14		$321.45		$321.45	8.86%
2014/15		$351.57		$351.57	9.37%
2015/16		$384.54		$384.54	9.38%
2016/17		$420.62		$420.62	9.38%
2017/18		$460.13		$460.13	9.39%

Residential Tenant Customers 250kl consumption

2012/13 Tariffs		$387.08		$387.08	
2013/14		$421.38		$421.38	8.86%
2014/15		$462.35		$462.35	9.72%
2015/16		$507.34		$507.34	9.73%
2016/17		$556.77		$556.77	9.74%
2017/18		$611.05		$611.05	9.75%

Residential Tenant Customers 300kl consumption

2012/13 Tariffs		$478.87		$478.87	
2013/14		$521.30		$521.30	8.86%
2014/15		$573.12		$573.12	9.94%
2015/16		$630.15		$630.15	9.95%
2016/17		$692.91		$692.91	9.96%
2017/18		$761.98		$761.98	9.97%

Unconnected Residential Vacant Land Customers (0kl consumption)

	Water Tariffs		Sewer	Total	% Change from
	Fixed	Variable	Fixed	Tariffs	previous year
2012/13 Tariffs	$215.26		$496.33	$711.59	
2013/14	$234.33		$513.92	$748.25	5.15%
2014/15	$255.09		$532.13	$787.23	5.21%
2015/16	$277.70		$550.99	$828.69	5.27%
2016/17	$302.30		$570.52	$872.82	5.33%
2017/18	$329.08		$590.74	$919.82	5.39%

Appendix N

Information Template

ESSENTIAL SERVICES COMMISSION
Water Price Review 2013-14 to 2017-18
Financial Model Template

Western Water

NOTE: BLUE SHADED AREAS DENOTE INPUT MAY BE REQUIRED BY BUSINESSES

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General Cover Notes:
This model applies to the metroplitan retail and urban regional water businesses for the 2013-14 to 2017-18 ESC water price review
Version 2.0
10 August 2012

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Section & Sheet Titles

Key Assumptions Price Control

Western Water

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	FIRST REG PERIOD					SECOND REG PERIOD				THIRD REG PERIOD						FOURTH REG PERIOD				
	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Inflation assumptions																				
March quarter annual CPI	141.3	144.1	147.5	151.9	155.6	162.2	166.2	171.0	176.7	179.5										
Inflation		1.98%	2.36%	2.98%	2.44%	4.24%	2.47%	2.89%	3.33%	1.58%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%
Inflation factor	0.787	0.803	0.822	0.846	0.867	0.904	0.926	0.953	0.984	1.000	1.028	1.056	1.085	1.115	1.145	1.177	1.209	1.242	1.277	1.312

WACC assumptions	1st period	2nd period	3rd period forecast																
Parameters																			
Risk Free Rate (Real)	2.67%	3.23%	2.10%																
Debt Premium	1.16%	1.75%	2.35%																
Equity Premium	6.00%	6.00%	6.00%							9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	
Equity Beta	0.75	0.65	0.65																	
Gearing (Debt/Assets)	60.00%	60.00%	60.00%																	
Forecast Inflation	2.55%	2.50%	2.75%																	
Franking credit value	0.5	0.5	0.50																	
'Vanilla' After Tax WACC (Real)	5.20%	5.80%	5.10%																	

Labour assumptions																			
Current FTEs (at 30 June)						123.0	130.0	136.0	151.0										
Actual and forecast labour costs for 100.00%						9.5	10.2	11.3	13.6	12.8	13.1	13.5	13.9	14.3	14.7	15.3	15.7	16.1	16.5	16.9
Cost per FTE ($000)						$76.88	$78.3	$83.4	$90.3	$84.8	$87.0	$89.3	$92.0	$94.8	$97.6	$101.1	$104.1	$106.8	$109.4	$112.2
Annual growth in labour costs for current FTEs							1.78%	6.53%	8.28%	-6.02%	2.50%	2.75%	3.00%	3.00%	3.00%	3.56%	3.01%	2.52%	2.51%	2.51%
Change in FTEs in future periods (net no. annual change)										-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0
Increase or decrease in labour costs ($m)										-	-	-	-	-	-	0.2	0.4	0.6	0.8	1.0
Total FTEs						123.0	130.0	136.0	151.0	151.0	151.0	151.0	151.0	151.0	151.0	153.0	155.0	157.0	159.0	161.0
Total labour costs ($m)						9.5	10.2	11.3	13.6	12.8	13.1	13.5	13.9	14.3	14.7	15.5	16.1	16.8	17.3	17.9
Cost per FTE						0.1	0.1	0.1	0.1	0.08	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Annual growth in total labour costs							7.58%	11.45%	20.23%	-6.02%	2.50%	2.75%	3.00%	3.00%	3.00%	4.91%	4.35%	3.83%	3.16%	3.79%
Annual growth in total labour costs per FTE							1.78%	6.53%	8.28%	-6.02%	2.50%	2.75%	3.00%	3.00%	3.00%	3.54%	3.01%	2.51%	1.86%	2.50%

IT cost assumptions																			
Water related IT costs																			
Sewerage and trade waste related IT costs																			
Other IT costs						1.7637	1.8131	2.3937	2.5781	2.779	2.817	2.865	2.918	2.975	3.032	3.1	3.2	3.2	3.3	3.3
Total IT costs						1.8	1.8	2.4	2.6	2.8	2.8	2.9	2.9	3.0	3.0	3.1	3.2	3.2	3.3	3.3
% increase p.a.							2.81%	32.02%	7.70%	7.78%	1.39%	1.70%	1.84%	1.94%	1.93%	2.01%	2.00%	2.00%	2.00%	2.00%

Chemical cost assumptions																			
Water related chemical costs						0.3	0.2	0.3	0.5	0.7	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7
Sewerage and trade waste related chemical costs						0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.8	0.8	0.8	0.9	0.9
Other chemical costs																				
Total chemical costs						0.7	0.6	0.8	1.0	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.6
% increase p.a.							-4.53%	27.55%	29.15%	15.21%	2.02%	2.37%	-1.91%	3.11%	7.91%	2.79%	5.07%	3.45%	4.00%	5.13%

Form of price control selected

Price caps ◉

Revenue cap / Hybrid Tariff Basket ○

BAU Operating Expenditure forecast - from 1/7/13

Western Water

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Operating Expenditure Summary																		
Water	9.90	11.95	12.49	7.90	8.24	9.27	15.57	15.61	16.55	16.88	16.66	16.86	16.70	17.62	18.30	18.95	19.58	20.22
Sewerage	8.06	9.75	9.86	11.81	13.21	14.59	12.22	13.85	13.86	14.02	14.41	15.05	15.46	16.12	16.74	17.34	17.91	18.60
Recycled Water	0.63	0.59	0.88	1.61	1.50	1.69	3.53	4.00	4.02	4.12	4.37	4.54	4.59	4.94	5.10	5.27	5.44	5.62
Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.15	0.22	0.30	0.37
Bulk Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rural Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Business as Usual	18.58	22.30	23.23	21.32	22.95	25.55	31.32	33.46	34.43	35.03	35.44	36.44	36.74	38.75	40.28	41.79	43.23	44.82
New initiatives and obligations									0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
External bulk water charges (excl. temporary purchases)	7.18	7.65	7.89	9.53	11.12	11.28	11.45	14.63	6.52	8.23	8.91	15.34	22.70	24.40	25.64	26.96	27.49	30.11
External temporary water purchases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Licence fees	0.25	0.14	0.21	0.19	0.17	0.13	0.14	0.17	0.21	0.15	0.15	0.15	0.17	0.21	0.15	0.15	0.15	0.17
Environment Contribution	1.58	1.54	1.50	1.81	1.76	1.71	1.62	1.62	2.41	2.35	2.29	2.23	2.18	3.75	3.66	3.56	3.48	3.39
Total prescribed opex	27.59	31.63	32.83	32.85	36.00	38.68	44.52	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76

Total BAU operating expenditure $m, 01/01/13

Water

Operations & Maintenance	3.42	4.16	4.32	-	-	-	3.47	3.67	3.64	3.72	3.79	4.07	3.88	4.16	4.30	4.48	4.68	4.82
External bulk charges (excl. temporary purchases)	7.18	7.65	7.89	9.53	11.12	11.28	11.45	14.63	6.52	8.23	8.91	15.34	22.70	24.40	25.64	26.96	27.49	30.11
Treatment	2.13	2.12	2.29	2.54	2.53	2.71	2.94	3.26	4.09	4.15	3.74	3.29	3.38	4.01	4.25	4.38	4.52	4.66
Customer Service and billing	0.97	1.00	1.35	1.72	1.78	2.02	2.60	2.74	2.73	2.77	2.82	2.87	2.92	3.06	3.16	3.31	3.41	3.57
GSL Payments	-	-	-	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Licence Fees	-	-	-				-	-	-	-	-	-	-	-	-	-	-	-
Corporate	3.38	4.67	4.53	3.47	3.71	4.28	5.32	5.14	5.29	5.42	5.46	5.76	5.63	5.47	5.64	5.81	5.97	6.15
Other operating expenditure	-	-	-	0.17	0.21	0.26	1.23	0.81	0.81	0.83	0.85	0.87	0.89	0.92	0.95	0.97	1.00	1.02
Total Water	17.07	19.61	20.38	17.43	19.36	20.56	27.02	30.24	23.07	25.12	25.57	32.19	39.40	42.02	43.93	45.92	47.07	50.33

Sewerage

Operations & Maintenance	2.00	2.29	2.36	2.29	3.08	3.48	3.08	3.47	3.57	3.54	3.67	3.70	3.76	4.02	4.15	4.33	4.52	4.66
External bulk charges (excl. temporary purchases)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Treatment	2.50	2.82	2.74	3.66	3.93	4.24	2.68	2.92	2.73	2.75	2.93	3.21	3.57	4.00	4.23	4.36	4.49	4.74
Customer Service and billing	0.79	0.82	1.10	1.39	1.46	1.65	1.65	2.37	2.35	2.39	2.43	2.47	2.52	2.64	2.73	2.86	2.94	3.08
GSL Payments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Licence Fees	-	-	-				-	-	-	-	-	-	-	-	-	-	-	-
Corporate	2.77	3.82	3.67	4.33	4.56	5.00	4.59	4.51	4.61	4.72	4.76	5.02	4.94	4.77	4.92	5.07	5.21	5.36
Other operating expenditure	-	-	-	0.14	0.17	0.22	0.22	0.58	0.59	0.61	0.63	0.65	0.67	0.69	0.71	0.73	0.74	0.76
Total Sewerage	8.06	9.75	9.86	11.81	13.21	14.59	12.22	13.85	13.86	14.02	14.41	15.05	15.46	16.12	16.74	17.34	17.91	18.60

BAU Operating Expenditure forecast - from 1/7/13

Western Water

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Operating Expenditure Summary																		
Water	9.90	11.95	12.49	7.90	8.24	9.27	15.57	15.61	16.55	16.88	16.66	16.86	16.70	17.62	18.30	18.95	19.58	20.22
Sewerage	8.06	9.75	9.86	11.81	13.21	14.59	12.22	13.85	13.86	14.02	14.41	15.05	15.46	16.12	16.74	17.34	17.91	18.60
Recycled Water	0.63	0.59	0.88	1.61	1.50	1.69	3.53	4.00	4.02	4.12	4.37	4.54	4.59	4.94	5.10	5.27	5.44	5.62
Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.15	0.22	0.30	0.37
Bulk Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rural Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Business as Usual	18.58	22.30	23.23	21.32	22.95	25.55	31.32	33.46	34.43	35.03	35.44	36.44	36.74	38.75	40.28	41.79	43.23	44.82
New initiatives and obligations									0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
External bulk water charges (excl. temporary purchases)	7.18	7.65	7.89	9.53	11.12	11.28	11.45	14.63	6.52	8.23	8.91	15.34	22.70	24.40	25.64	26.96	27.49	30.11
External temporary water purchases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Licence fees	0.25	0.14	0.21	0.19	0.17	0.13	0.14	0.17	0.21	0.15	0.15	0.15	0.17	0.21	0.15	0.15	0.15	0.17
Environment Contribution	1.58	1.54	1.50	1.81	1.76	1.71	1.62	1.62	2.41	2.35	2.29	2.23	2.18	3.75	3.66	3.56	3.48	3.39
Total prescribed opex	27.59	31.63	32.83	32.85	36.00	38.68	44.52	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Recycled Water																		
Operations & Maintenance				1.61	1.50	1.69	1.22	1.59	1.60	1.60	1.68	1.68	1.61	1.71	1.77	1.83	1.89	1.96
External bulk charges (excl. temporary purchases)							-	-	-	-	-	-	-	-	-	-	-	-
Treatment							1.06	1.12	1.16	1.23	1.37	1.49	1.60	1.79	1.85	1.92	1.98	2.05
Customer Service and billing							0.19	0.27	0.26	0.27	0.27	0.28	0.28	0.30	0.31	0.32	0.33	0.35
GSL Payments							-	-	-	-	-	-	-	-	-	-	-	-
Licence Fees							-	-	-	-	-	-	-	-	-	-	-	-
Corporate							0.52	0.51	0.48	0.50	0.50	0.53	0.52	0.54	0.56	0.57	0.59	0.61
Other operating expenditure							0.54	0.52	0.52	0.53	0.55	0.56	0.57	0.59	0.61	0.63	0.64	0.66
Total Recycled Water	0.63	0.59	0.88	1.61	1.50	1.69	3.53	4.00	4.02	4.12	4.37	4.54	4.59	4.94	5.10	5.27	5.44	5.62
Waterways																		
Operations & Maintenance																		
External bulk charges (excl. temporary purchases)																		
Treatment																		
Customer Service and billing																		
GSL Payments																		
Licence Fees																		
Corporate																		
Other operating expenditure																		
Total Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diversions																		
Operations & Maintenance																		
External bulk charges (excl. temporary purchases)																		
Treatment																		
Customer Service and billing																		
GSL Payments																		
Licence Fees																		
Corporate																		
Other operating expenditure														0.07	0.15	0.22	0.30	0.37
Total Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.15	0.22	0.30	0.37
Bulk water																		
Operations & Maintenance																		
Treatment																		
Customer Service and billing																		
GSL Payments																		
Licence Fees																		
Corporate																		
Other operating expenditure																		
Total Bulk water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
External temporary water purchases																		
Rural water	-	-	-															

BAU Operating Expenditure forecast - from 1/7/13

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Operating Expenditure Summary																		
Water	9.90	11.95	12.49	7.90	8.24	9.27	15.57	15.61	16.55	16.88	16.66	16.86	16.70	17.62	18.30	18.95	19.58	20.22
Sewerage	8.06	9.75	9.86	11.81	13.21	14.59	12.22	13.85	13.86	14.02	14.41	15.05	15.46	16.12	16.74	17.34	17.91	18.60
Recycled Water	0.63	0.59	0.88	1.61	1.50	1.69	3.53	4.00	4.02	4.12	4.37	4.54	4.59	4.94	5.10	5.27	5.44	5.62
Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.15	0.22	0.30	0.37
Bulk Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rural Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Business as Usual	18.58	22.30	23.23	21.32	22.95	25.55	31.32	33.46	34.43	35.03	35.44	36.44	36.74	38.75	40.28	41.79	43.23	44.82
New initiatives and obligations									0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
External bulk water charges (excl. temporary purchases)	7.18	7.65	7.89	9.53	11.12	11.28	11.45	14.63	6.52	8.23	8.91	15.34	22.70	24.40	25.64	26.96	27.49	30.11
External temporary water purchases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Licence fees	0.25	0.14	0.21	0.19	0.17	0.13	0.14	0.17	0.21	0.15	0.15	0.15	0.17	0.21	0.15	0.15	0.15	0.17
Environment Contribution	1.58	1.54	1.50	1.81	1.76	1.71	1.62	1.62	2.41	2.35	2.29	2.23	2.18	3.75	3.66	3.56	3.48	3.39
Total prescribed opex	27.59	31.63	32.83	32.85	36.00	38.68	44.52	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Licence fees																		
Essential Services Commission	0.14	0.03	0.09	0.08	0.08	0.04	0.05	0.08	0.12	0.05	0.05	0.05	0.08	0.12	0.05	0.05	0.05	0.08
Department of Human Services	0.03	0.03	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Environment Protection Authority	0.09	0.08	0.08	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Total Licence fees	0.25	0.14	0.21	0.19	0.17	0.13	0.14	0.17	0.21	0.15	0.15	0.15	0.17	0.21	0.15	0.15	0.15	0.17
Environment Contribution	1.58	1.54	1.50	1.81	1.76	1.71	1.62	1.62	2.41	2.35	2.29	2.23	2.18	3.75	3.66	3.56	3.48	3.39

Adjusted BAU expenditure and productivity test

Western Water

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		THIRD REG PERIOD					FOURTH REG PERIOD				
		2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Business as usual operating expenditure less transitory costs	Baseline growth adjusted BAU calculation (2011-12)										
Total Business as Usual	31.32	34.43	35.03	35.44	36.44	36.74	38.75	40.28	41.79	43.23	44.82
Less growth operating expenditure associated with:											
Water conservation											
Carbon offsets											
Drought management initiatives											
BAU expenditure less transitory costs	31.32	34.43	35.03	35.44	36.44	36.74	38.75	40.28	41.79	43.23	44.82
Customer growth forecast for average growth % per annum 2011-12 to 2017-18	4.9%										
Productivity growth % p.a.	2.0%										
		9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%
Productivity hurdle achieved for third regulatory period? PASS		Annual test: FAIL	FAIL	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL

Note: it is not mandatory for the annual test to be passed

NOTE: The input cell at P21 will be updated post draft-water plans to include an automated calculation based on estimates of customer numbers in the revenue calculation sheets

BAU Capital Expenditure forecast by Asset Category - from 1/7/13

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Capital Expenditure Summary (Including New Initiatives)																			
Water	9.15	12.30	10.96	8.22	7.59	9.30	14.99	10.46	6.38	7.20	12.78	11.79	20.21	19.45	19.18	26.32	19.09	34.93	29.73
Sewerage	15.87	16.69	13.85	21.87	28.96	28.52	17.89	12.15	4.82	16.25	18.84	23.35	36.12	40.34	35.84	18.30	40.52	26.02	48.05
Recycled Water	0.96	0.79	1.74	9.55	5.24	1.05	0.65	3.83	7.66	4.02	7.65	17.79	11.78	4.38	18.88	31.45	10.28	9.17	10.76
Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulk Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rural Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total prescribed BAU capex	25.98	29.78	26.55	39.64	41.78	38.88	33.53	26.44	18.86	27.47	39.27	52.93	68.10	64.17	73.90	76.07	69.89	70.12	88.53
Government contributions	-	-	4.14	-	-	-	-	-	-	1.25	3.18	1.94	2.87	-	-	-	-	-	-
Customer contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74	6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Gifted Assets	13.06	16.97	12.19	14.68	11.48	13.04	13.40	16.05	12.68	15.48	17.69	18.86	20.72	26.31	27.24	32.20	38.40	46.15	55.89
Proceeds from disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80	0.80
Written down value of assets disposed	1.04	1.73	1.39	1.17	1.16	1.49	1.50	1.20	1.14	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

$m, 01/01/13

Total BAU capital expenditure

Water

Headworks	1.78	6.73	0.44	0.16	2.27	0.60	0.41	0.58	0.27	0.37	0.17	0.61	2.13	1.17	1.98	0.28	2.08	3.63	0.33
Pipelines/network	4.83	3.26	4.00	5.73	2.94	5.07	10.40	6.15	3.71	4.13	7.62	5.45	12.41	8.90	13.08	23.01	11.20	26.35	25.31
Treatment	1.04	0.95	3.53	0.44	0.93	0.82	1.55	0.79	1.51	0.39	2.37	2.57	2.16	5.69	1.20	0.49	1.99	0.49	0.51
Corporate	1.51	1.37	2.99	1.89	1.45	2.81	2.64	2.94	0.90	2.32	2.63	3.17	3.52	3.69	2.93	2.54	3.82	4.47	3.58
Total Water	9.15	12.30	10.96	8.22	7.59	9.30	14.99	10.46	6.38	7.20	12.78	11.79	20.21	19.45	19.18	26.32	19.09	34.93	29.73

Sewerage

Headworks	-	-	-	-	0.02	0.12	0.12	0.59	-	-	-	-	-	0.34	3.00	-	6.45	2.70	-
Pipelines/network	10.32	7.33	3.01	8.51	12.85	5.75	4.87	4.70	3.28	7.11	9.25	7.25	8.76	26.34	19.09	12.77	21.26	11.21	21.38
Treatment	2.93	7.49	8.35	11.82	14.91	20.36	10.74	4.46	0.58	7.25	7.44	12.51	23.49	10.64	10.82	2.99	8.99	7.65	23.09
Corporate	2.63	1.87	2.50	1.55	1.18	2.30	2.16	2.41	0.96	1.90	2.15	2.59	2.88	3.02	2.93	2.54	3.82	4.47	3.58
Total Sewerage	15.87	16.69	13.85	21.87	28.96	28.52	17.89	12.15	4.82	16.25	18.84	22.35	35.12	40.34	35.84	18.30	40.52	26.02	48.05

Recycled Water

Headworks				-	-	-	0.10	0.01		-	-	-	-	-	13.88	24.95	6.78	7.17	6.04
Pipelines/network				1.91	5.24	1.05	0.55	3.82		0.84	0.52	7.33	8.70	4.38					
Treatment				7.64	-	-	-	-		-	-	2.58	2.57	-	5.00	6.50	3.50	-	2.50
Corporate				-	-	-	-	-		-	-	-	-	-					
Total Recycled Water	0.96	0.79	1.74	9.55	5.24	1.05	0.65	3.83	7.66	0.84	0.52	9.91	11.28	4.38	18.88	31.45	10.28	7.17	8.54

Waterways

Headworks																			
Pipelines/network																			
Treatment																			
Corporate																			
Total Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Diversions

Headworks																			
Pipelines/network																			
Treatment																			
Corporate																			
Total Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Bulk Water

Headworks		-	-	-															
Pipelines/network		-	-	-															
Treatment		-	-																
Corporate		-	-	-															
Total Bulk Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Rural Water

Above figures include contributions from:

Government contributions

Water																			
Sewerage																			
Recycled Water														-					

BAU Capital Expenditure forecast by Asset Category - from 1/7/13

Western Water

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Capital Expenditure Summary (Including New Initiatives)																			
Water	9.15	12.30	10.96	8.22	7.59	9.30	14.99	10.46	6.38	7.20	12.78	11.79	20.21	19.45	19.18	26.32	19.09	34.93	29.73
Sewerage	15.87	16.69	13.85	21.87	28.96	28.52	17.89	12.15	4.82	16.25	18.84	23.35	36.12	40.34	35.84	18.30	40.52	26.02	48.05
Recycled Water	0.96	0.79	1.74	9.55	5.24	1.05	0.65	3.83	7.66	4.02	7.65	17.79	11.78	4.38	18.88	31.45	10.28	9.17	10.76
Waterways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diversions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulk Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rural Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total prescribed BAU capex	25.98	29.78	26.55	39.64	41.78	38.88	33.53	26.44	18.86	27.47	39.27	52.93	68.10	64.17	73.90	76.07	69.89	70.12	88.53
Government contributions	-	-	4.14	-	-	-	-	-	-	1.25	3.18	1.94	2.87	-	-	-	-	-	-
Customer contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74	6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Gifted Assets	13.06	16.97	12.19	14.68	11.48	13.04	13.40	16.05	12.68	15.48	17.69	18.86	20.72	26.31	27.24	32.20	38.40	46.15	55.89
Proceeds from disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80	0.80
Written down value of assets disposed	1.04	1.73	1.39	1.17	1.16	1.49	1.50	1.20	1.14	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Waterways																			
Diversions																			
Bulk Water																			
Rural Water																			
Total Government contributions	-	-	4.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions																			
Water					0.94	1.99	1.89	2.38		1.95	2.22	2.42	2.51	2.90	2.87	3.23	3.69	4.28	4.95
Sewerage					0.92	1.90	1.89	2.08		2.82	3.21	3.42	3.75	3.96	3.88	4.47	5.21	6.11	7.23
Recycled Water					2.03	0.02	0.00	0.74		1.73	1.98	1.98	1.98	2.10	2.01	2.48	3.04	3.67	4.56
Waterways																			
Diversions																			
Bulk Water																			
Rural Water																			
Total Customer contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74	6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Gifted Assets	13.06	16.97	12.19	14.68	11.48	13.04	13.40	16.05	12.68	15.48	17.69	18.86	20.72	26.31	27.24	32.20	38.40	46.15	55.89
Asset disposals																			
Proceeds from disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.80	0.91	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Written down value of assets disposed	1.04	1.73	1.39	1.17	1.16	1.49	1.50	1.20	1.14	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

BAU Capital Expenditure forecast by Cost Driver - from 1/7/13

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FIRST REG PERIOD								SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
								1	2	3	4	5	6	7	8	9	10

Capital Expenditure Summary (Including New Initiatives)

Net capital expenditure - renewals								4.71	7.10	6.58	7.48	11.88	5.31	4.58	6.69	5.85	5.13
Net capital expenditure - growth								10.53	16.40	29.80	42.09	30.37	50.02	52.65	27.76	29.28	58.46
Net capital expenditure - improved service								2.26	2.69	3.07	3.24	4.98	4.73	5.54	7.60	16.12	6.60
Net capital expenditure - compliance								2.22	2.50	3.72	4.19	7.98	5.08	3.11	15.91	4.81	1.61
Government contributions								1.25	3.18	1.94	2.87	-	-	-	-	-	-
Customer contributions								6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Total prescribed BAU capex								**27.47**	**39.27**	**52.93**	**68.10**	**64.17**	**73.90**	**76.07**	**69.89**	**70.12**	**88.53**
Regulatory Depreciation								0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Return on assets								0.50	1.72	3.52	6.01	8.76	11.68	14.82	17.73	20.35	23.27
Gifted Assets								15.48	17.69	18.86	20.72	26.31	27.24	32.20	38.40	46.15	55.89
Proceeds from disposals								0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80	0.80
Written down value of assets disposed								1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
							0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	

Total BAU capital expenditure

$m, 01/01/13

Renewal of existing infrastructure

Water Renewal	Year asset operational-->	[Year finalised?]												
Asset life (years)	66.67													
Depreciation method	Straight line													
Gross capital expenditure								0.89	1.22	0.97	1.59	0.83	1.98	0.88	2.18	2.18	1.25
Government contributions																	
Customer contributions																	
Net capital expenditure								**0.89**	**1.22**	**0.97**	**1.59**	**0.83**	**1.98**	**0.88**	**2.18**	**2.18**	**1.25**
Regulatory Depreciation								0.01	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.17	0.20
Closing asset base							-	0.88	2.08	3.01	4.55	5.30	7.18	7.94	9.97	11.97	13.02
Return on assets								0.02	0.08	0.13	0.19	0.25	0.32	0.39	0.46	0.56	0.64
Cost of project for pricing (capital cost only)								0.03	0.10	0.17	0.25	0.33	0.42	0.50	0.60	0.73	0.84
Accumulated capex								0.89	1.22	0.97	1.59	0.83	1.98	0.88	2.18	2.18	1.25
Declining balance cumulative depreciation term - first period capex								0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex								-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex								1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex								0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex								1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance								(0.01)	(0.03)	(0.06)	(0.08)	(0.11)	(0.14)	(0.17)	(0.20)	(0.24)	(0.28)

Sewer Renewal	Year asset operational-->	[Year finalised?]												
Asset life (years)	66.67													
Depreciation method	Straight line													
Gross capital expenditure								0.71	2.17	1.56	0.98	5.99	1.24	1.42	1.84	1.12	1.08
Government contributions																	
Customer contributions																	
Net capital expenditure								**0.71**	**2.17**	**1.56**	**0.98**	**5.99**	**1.24**	**1.42**	**1.84**	**1.12**	**1.08**
Regulatory Depreciation								0.01	0.03	0.05	0.07	0.13	0.18	0.20	0.22	0.25	0.26
Closing asset base							-	0.70	2.85	4.36	5.26	11.12	12.18	13.40	15.02	15.89	16.71
Return on assets								0.02	0.09	0.18	0.25	0.42	0.59	0.65	0.72	0.79	0.83
Cost of project for pricing (capital cost only)								0.02	0.12	0.24	0.32	0.54	0.77	0.85	0.95	1.04	1.09
Accumulated capex								0.71	2.17	1.56	0.98	5.99	1.24	1.42	1.84	1.12	1.08
Declining balance cumulative depreciation term - first period capex								0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex								-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex								1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex								0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex								1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance								(0.01)	(0.04)	(0.08)	(0.11)	(0.18)	(0.26)	(0.29)	(0.32)	(0.34)	(0.36)

Recycled Water Renewal	Year asset operational-->	[Year finalised?]												
Asset life (years)	66.67													
Depreciation method	Straight line													
Gross capital expenditure								0.07	0.06	0.05	0.19	0.25	-	0.07	0.45	0.06	0.05

Government contributions											
Customer contributions											
Net capital expenditure		**0.07**	**0.06**	**0.05**	**0.19**	**0.25**	**-**	**0.07**	**0.45**	**0.06**	**0.05**
Regulatory Depreciation		0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02
Closing asset base	-	0.07	0.13	0.18	0.36	0.60	0.59	0.65	1.09	1.13	1.16
Return on assets		0.00	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.06	0.06
Cost of project for pricing (capital cost only)		0.00	0.01	0.01	0.02	0.03	0.04	0.04	0.06	0.07	0.08
Accumulated capex		0.07	0.06	0.05	0.19	0.25	-	0.07	0.45	0.06	0.05
Declining balance cumulative depreciation term - first period capex		0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex		-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex		1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex		0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex		1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance		(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)

Other	Year asset operational-->	[Year finalised?]									
Asset life (years)	66.67										
Depreciation method	Straight line										
Gross capital expenditure			3.04	3.65	4.00	4.71	4.81	2.10	2.22	2.22	2.50	2.74
Government contributions												
Customer contributions												
Net capital expenditure			**3.04**	**3.65**	**4.00**	**4.71**	**4.81**	**2.10**	**2.22**	**2.22**	**2.50**	**2.74**
Regulatory Depreciation			0.02	0.07	0.13	0.20	0.27	0.32	0.35	0.38	0.42	0.46
Closing asset base	-		3.02	6.60	10.47	14.98	19.53	21.31	23.18	25.02	27.10	29.37
Return on assets			0.08	0.25	0.44	0.65	0.88	1.04	1.13	1.23	1.33	1.44
Cost of project for pricing (capital cost only)			0.10	0.32	0.57	0.84	1.15	1.36	1.49	1.61	1.75	1.90
Accumulated capex			3.04	3.65	4.00	4.71	4.81	2.10	2.22	2.22	2.50	2.74
Declining balance cumulative depreciation term - first period capex			0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex			-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex			1.12%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex			0.00%	1.12%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.12%	0.00%
Depreciation - declining balance			(0.03)	(0.11)	(0.19)	(0.29)	(0.39)	(0.46)	(0.49)	(0.53)	(0.57)	(0.62)

Total

Gross capital expenditure			4.71	7.10	6.58	7.48	11.88	5.31	4.58	6.69	5.85	5.13
Government contributions			-	-	-	-	-	-	-	-	-	-
Customer contributions			-	-	-	-	-	-	-	-	-	-
Net capital expenditure			**4.71**	**7.10**	**6.58**	**7.48**	**11.88**	**5.31**	**4.58**	**6.69**	**5.85**	**5.13**
Regulatory Depreciation			0.04	0.12	0.23	0.33	0.48	0.61	0.68	0.76	0.86	0.94
Return on assets			0.12	0.42	0.76	1.10	1.57	1.98	2.20	2.45	2.73	2.97

Growth

Water Growth	Year asset operational-->	[Year finalised?]									
Asset life (years)	66.67										
Depreciation method	Straight line										
Gross capital expenditure			3.07	7.49	6.20	12.19	8.35	12.50	20.75	11.45	23.14	23.25
Government contributions												
Customer contributions			6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Net capital expenditure			**(3.43)**	**0.08**	**(1.61)**	**3.96**	**(0.61)**	**3.75**	**10.56**	**(0.49)**	**9.08**	**6.50**
Regulatory Depreciation			(0.03)	(0.05)	(0.06)	(0.04)	(0.02)	0.00	0.11	0.19	0.25	0.37
Closing asset base	-		(3.41)	(3.27)	(4.83)	(0.83)	(1.42)	2.33	12.78	12.11	20.93	27.07
Return on assets			(0.09)	(0.17)	(0.21)	(0.14)	(0.06)	0.02	0.39	0.63	0.84	1.22
Cost of project for pricing (capital cost only)			(0.11)	(0.22)	(0.27)	(0.19)	(0.08)	0.03	0.50	0.82	1.09	1.59
Accumulated capex			(3.43)	0.08	(1.61)	3.96	(0.61)	3.75	10.56	(0.49)	9.08	6.50
Declining balance cumulative depreciation term - first period capex			0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex			-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex			1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex			0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance			0.04	0.08	0.09	0.06	0.02	(0.01)	(0.17)	(0.28)	(0.37)	(0.54)

Sewer Growth	Year asset operational-->	[Year finalised?]									
Asset life (years)	66.67										
Depreciation method	Straight line										
Gross capital expenditure			11.28	11.91	15.62	29.42	26.85	26.42	10.70	18.47	11.14	41.25
Government contributions												
Customer contributions												
Net capital expenditure			**11.28**	**11.91**	**15.62**	**29.42**	**26.85**	**26.42**	**10.70**	**18.47**	**11.14**	**41.25**
Regulatory Depreciation			0.08	0.26	0.47	0.80	1.22	1.62	1.90	2.12	2.34	2.74
Closing asset base	-		11.20	22.85	38.00	66.62	92.25	117.04	125.84	142.18	150.98	189.49
Return on assets			0.29	0.87	1.55	2.67	4.05	5.34	6.19	6.83	7.48	8.68
Cost of project for pricing (capital cost only)			0.37	1.13	2.02	3.47	5.28	6.96	8.10	8.96	9.82	11.42

Accumulated capex			11.28	11.91	15.62	29.42	26.85	26.42	10.70	18.47	11.14	41.25
Declining balance cumulative depreciation term - first period capex			0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex			-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex			1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex			0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance			(0.13)	(0.38)	(0.69)	(1.18)	(1.78)	(2.34)	(2.71)	(2.98)	(3.24)	(3.76)

Recycled Water Growth	Year asset operational-->	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure				0.75	0.45	9.86	11.08	4.13	18.88	31.39	9.78	7.06	8.49
Government contributions													
Customer contributions													
Net capital expenditure				**0.75**	**0.45**	**9.86**	**11.08**	**4.13**	**18.88**	**31.39**	**9.78**	**7.06**	**8.49**
Regulatory Depreciation				0.01	0.01	0.09	0.25	0.36	0.54	0.91	1.22	1.35	1.46
Closing asset base			-	0.75	1.18	10.95	21.78	25.55	43.90	74.37	82.93	88.64	95.66
Return on assets				0.02	0.05	0.31	0.83	1.21	1.77	3.02	4.01	4.37	4.70
Cost of project for pricing (capital cost only)				0.02	0.06	0.40	1.08	1.57	2.31	3.93	5.23	5.72	6.16
Accumulated capex				0.75	0.45	9.86	11.08	4.13	18.88	31.39	9.78	7.06	8.49
Declining balance cumulative depreciation term - first period capex				0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex				-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex				1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex				0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex				1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance				(0.01)	(0.02)	(0.14)	(0.37)	(0.53)	(0.78)	(1.33)	(1.76)	(1.91)	(2.04)

Corporate Growth	Year asset operational-->	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure				-	-	-	-	-	0.97	-	-	-	-
Government contributions													
Customer contributions													
Net capital expenditure				**-**	**-**	**-**	**-**	**-**	**0.97**	**-**	**-**	**-**	**-**
Regulatory Depreciation				-	-	-	-	-	0.01	0.01	0.01	0.01	0.01
Closing asset base			-	-	-	-	-	-	0.97	0.95	0.94	0.92	0.91
Return on assets				-	-	-	-	-	0.02	0.05	0.05	0.05	0.05
Cost of project for pricing (capital cost only)				-	-	-	-	-	0.03	0.06	0.06	0.06	0.06
Accumulated capex				-	-	-	-	-	0.97	-	-	-	-
Declining balance cumulative depreciation term - first period capex				0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex				-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex				1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex				0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex				1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance				-	-	-	-	-	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)

Total

Gross capital expenditure				15.10	19.85	31.68	52.70	39.33	58.77	62.84	39.69	41.34	72.99
Government contributions				-	-	-	-	-	-	-	-	-	-
Customer contributions				6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Net capital expenditure				**8.60**	**12.45**	**23.86**	**44.46**	**30.37**	**50.02**	**52.65**	**27.76**	**27.28**	**56.24**
Regulatory Depreciation				0.06	0.22	0.49	1.01	1.57	2.17	2.94	3.54	3.96	4.58
Return on assets				0.22	0.75	1.65	3.36	5.20	7.16	9.64	11.53	12.74	14.65

Improvement in service

Water Improvement	Year asset operational-->	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure				0.42	0.72	0.52	0.97	2.49	0.85	1.58	1.08	4.58	1.08
Government contributions													
Customer contributions													
Net capital expenditure				**0.42**	**0.72**	**0.52**	**0.97**	**2.49**	**0.85**	**1.58**	**1.08**	**4.58**	**1.08**
Regulatory Depreciation				0.00	0.01	0.02	0.03	0.06	0.08	0.10	0.12	0.16	0.21
Closing asset base			-	0.42	1.13	1.62	2.56	4.99	5.76	7.24	8.20	12.61	13.49
Return on assets				0.01	0.04	0.07	0.11	0.19	0.27	0.33	0.39	0.53	0.67
Cost of project for pricing (capital cost only)				0.01	0.05	0.09	0.14	0.25	0.36	0.43	0.51	0.69	0.87
Accumulated capex				0.42	0.72	0.52	0.97	2.49	0.85	1.58	1.08	4.58	1.08
Declining balance cumulative depreciation term - first period capex				0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex				-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex				1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex				0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%

Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance			(0.00)	(0.02)	(0.03)	(0.05)	(0.08)	(0.12)	(0.15)	(0.17)	(0.23)	(0.29)

Sewer Improvement	Year asset operational-->	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure			0.68	0.85	0.80	0.60	0.60	1.11	1.11	1.11	5.11	1.11
Government contributions												
Customer contributions												
Net capital expenditure			**0.68**	**0.85**	**0.80**	**0.60**	**0.60**	**1.11**	**1.11**	**1.11**	**5.11**	**1.11**
Regulatory Depreciation			0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.14	0.19
Closing asset base	-	-	0.67	1.50	2.27	2.84	3.39	4.43	5.46	6.47	11.43	12.35
Return on assets			0.02	0.06	0.10	0.13	0.16	0.20	0.25	0.30	0.46	0.61
Cost of project for pricing (capital cost only)			0.02	0.07	0.13	0.17	0.21	0.26	0.33	0.40	0.60	0.79
Accumulated capex			0.68	0.85	0.80	0.60	0.60	1.11	1.11	1.11	5.11	1.11
Declining balance cumulative depreciation term - first period capex			0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex			-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex			1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex			0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance			(0.01)	(0.02)	(0.04)	(0.06)	(0.07)	(0.09)	(0.11)	(0.13)	(0.20)	(0.26)

Corporate Improvement	Year asset operational-->	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure			1.17	1.12	1.75	1.67	1.89	2.78	2.86	5.42	6.43	4.42
Government contributions												
Customer contributions												
Net capital expenditure			**1.17**	**1.12**	**1.75**	**1.67**	**1.89**	**2.78**	**2.86**	**5.42**	**6.43**	**4.42**
Regulatory Depreciation			0.01	0.03	0.05	0.07	0.10	0.13	0.18	0.24	0.33	0.41
Closing asset base	-	-	1.16	2.25	3.95	5.55	7.33	9.97	12.65	17.83	23.93	27.94
Return on assets			0.03	0.09	0.16	0.24	0.33	0.44	0.58	0.78	1.06	1.32
Cost of project for pricing (capital cost only)			0.04	0.11	0.21	0.32	0.43	0.58	0.75	1.02	1.39	1.73
Accumulated capex			1.17	1.12	1.75	1.67	1.89	2.78	2.86	5.42	6.43	4.42
Declining balance cumulative depreciation term - first period capex			0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex			-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex			1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex			0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance			(0.01)	(0.04)	(0.07)	(0.11)	(0.14)	(0.19)	(0.25)	(0.34)	(0.47)	(0.58)

Total

Gross capital expenditure			2.26	2.69	3.07	3.24	4.98	4.73	5.54	7.60	16.12	6.60
Government contributions			-	-	-	-	-	-	-	-	-	-
Customer contributions			-	-	-	-	-	-	-	-	-	-
Net capital expenditure			**2.26**	**2.69**	**3.07**	**3.24**	**4.98**	**4.73**	**5.54**	**7.60**	**16.12**	**6.60**
Regulatory Depreciation			0.02	0.05	0.10	0.14	0.21	0.28	0.36	0.45	0.63	0.80
Return on assets			0.06	0.18	0.32	0.48	0.68	0.91	1.16	1.48	2.05	2.59

Compliance

Water Compliance	Year asset operational-->	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure			0.51	0.73	0.93	1.94	4.09	0.93	0.57	0.57	0.57	0.57
Government contributions												
Customer contributions												
Net capital expenditure			**0.51**	**0.73**	**0.93**	**1.94**	**4.09**	**0.93**	**0.57**	**0.57**	**0.57**	**0.57**
Regulatory Depreciation			0.00	0.01	0.03	0.05	0.09	0.13	0.14	0.15	0.16	0.17
Closing asset base	-	-	0.50	1.22	2.12	4.01	8.00	8.80	9.22	9.64	10.04	10.44
Return on assets			0.01	0.04	0.09	0.16	0.31	0.43	0.46	0.48	0.50	0.52
Cost of project for pricing (capital cost only)			0.02	0.06	0.11	0.20	0.40	0.56	0.60	0.63	0.66	0.69
Accumulated capex			0.51	0.73	0.93	1.94	4.09	0.93	0.57	0.57	0.57	0.57
Declining balance cumulative depreciation term - first period capex			0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex			-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex			1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex			0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex			1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance			(0.01)	(0.02)	(0.04)	(0.07)	(0.14)	(0.19)	(0.20)	(0.21)	(0.22)	(0.23)

Sewer Compliance	Year asset operational-->	[Year finalised?]

Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure					1.69	1.76	1.79	1.24	3.88	4.15	2.53	15.28	4.19	1.03
Government contributions														
Customer contributions														
Net capital expenditure					**1.69**	**1.76**	**1.79**	**1.24**	**3.88**	**4.15**	**2.53**	**15.28**	**4.19**	**1.03**
Regulatory Depreciation					0.01	0.04	0.07	0.09	0.13	0.19	0.24	0.37	0.52	0.56
Closing asset base			-	-	1.67	3.39	5.11	6.26	10.02	13.98	16.27	31.19	34.86	35.34
Return on assets					0.04	0.13	0.22	0.29	0.42	0.61	0.77	1.21	1.68	1.79
Cost of project for pricing (capital cost only)					0.06	0.17	0.28	0.38	0.54	0.80	1.01	1.58	2.20	2.35
Accumulated capex					1.69	1.76	1.79	1.24	3.88	4.15	2.53	15.28	4.19	1.03
Declining balance cumulative depreciation term - first period capex					0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex					-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex					1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex					0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex					1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance					(0.02)	(0.06)	(0.10)	(0.13)	(0.18)	(0.27)	(0.34)	(0.53)	(0.74)	(0.78)

Recycled Water Compliance	**Year asset operational-->**	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure					0.02	-	-	-	-	-	-	0.05	0.05	-
Government contributions														
Customer contributions														
Net capital expenditure					**0.02**	**-**	**-**	**-**	**-**	**-**	**-**	**0.05**	**0.05**	**-**
Regulatory Depreciation					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Closing asset base			-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.11	0.11
Return on assets					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Cost of project for pricing (capital cost only)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Accumulated capex					0.02	-	-	-	-	-	-	0.05	0.05	-
Declining balance cumulative depreciation term - first period capex					0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex					-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex					1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex					0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex					1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance					(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Corporate Compliance	**Year asset operational-->**	[Year finalised?]										
Asset life (years)	66.67											
Depreciation method	Straight line											
Gross capital expenditure					0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Government contributions														
Customer contributions														
Net capital expenditure					**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Regulatory Depreciation					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Closing asset base			-	-	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.08	0.09
Return on assets					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cost of project for pricing (capital cost only)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Accumulated capex					0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Declining balance cumulative depreciation term - first period capex					0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ capex					-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex					1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 2+ capex					0.00%	1.13%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex					1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.13%	0.00%
Depreciation - declining balance					(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Total												
Gross capital expenditure					2.22	2.50	2.72	3.19	7.98	5.08	3.11	15.91	4.81	1.61
Government contributions					-	-	-	-	-	-	-	-	-	-
Customer contributions					-	-	-	-	-	-	-	-	-	-
Net capital expenditure					**2.22**	**2.50**	**2.72**	**3.19**	**7.98**	**5.08**	**3.11**	**15.91**	**4.81**	**1.61**
Regulatory Depreciation					0.02	0.05	0.09	0.14	0.22	0.32	0.38	0.52	0.68	0.72
Return on assets					0.06	0.17	0.30	0.45	0.72	1.04	1.23	1.70	2.19	2.32

New Initiatives

Western Water

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	FIRST REG PERIOD							SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
									1	2	3	4	5	6	7	8	9	10
New Initiatives																		
Operating expenditure								0.46	0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
Gross capital expenditure									3.18	7.14	8.88	1.50	-	-	-	-	2.00	2.22
Government contributions									1.25	3.18	1.94	2.87	-	-	-	-	-	-
Customer contributions									-	-	-	-	-	-	-	-	-	-
Net capital expenditure on New Initiatives									**1.93**	**3.96**	**6.95**	**(1.37)**	**-**	**-**	**-**	**-**	**2.00**	**2.22**
Regulatory Depreciation									-	-	-	0.01	0.03	0.03	0.03	0.03	0.03	0.13
Return on assets									0.05	0.20	0.48	0.62	0.58	0.58	0.58	0.58	0.63	0.73
Carbon Tax																		
Water								0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
Compliance																		
Operating expenditure								0.46	0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
Capital expenditure	Year asset operational-->	[Year finalised?]																
Asset life (years)	0.00																	
Depreciation method	Straight line																	
Gross capital expenditure																		
Government contributions																		
Customer contributions																		
Net capital expenditure									**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Regulatory Depreciation									-	-	-	-	-	-	-	-	-	-
Closing asset base								-	-	-	-	-	-	-	-	-	-	-
Return on assets									-	-	-	-	-	-	-	-	-	-
Cost of project for pricing (inclusive of opex)									0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
Accumulated capex									-	-	-	-	-	-	-	-	-	-
Declining balance cumulative depreciation term - first period capex								-	-	-	-	-	-	-	-	-	-	-
Declining balance cumulative depreciation term - period 3+ capex									-	-	-	-	-	-	-	-	-	-
Periodic depreciation % - second period capex									0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Periodic depreciation % - period 3+ capex									0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Reversed depreciation - first period capex									0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Depreciation - declining balance									-	-	-	-	-	-	-	-	-	-
Toolern Stormwater Infrastructure																		
Recycled Water																		
Growth																		
Operating expenditure																		
Capital expenditure	Year asset operational-->	2022-23																
Asset life (years)	66.67																	
Depreciation method	Straight line																	
Gross capital expenditure									3.18	7.14	7.88	0.50					2.00	2.22
Government contributions									1.25	3.18	1.94	2.87						
Customer contributions																		
Net capital expenditure									**1.93**	**3.96**	**5.95**	**(2.37)**	**-**	**-**	**-**	**-**	**2.00**	**2.22**
Regulatory Depreciation									-	-	-	-	-	-	-	-	-	0.10
Closing asset base								-	1.93	5.88	11.83	9.46	9.46	9.46	9.46	9.46	11.46	13.57
Return on assets									0.05	0.20	0.45	0.54	0.48	0.48	0.48	0.48	0.53	0.64
Cost of project for pricing (inclusive of opex)									0.05	0.20	0.45	0.54	0.48	0.48	0.48	0.48	0.53	0.74
Accumulated capex									-	-	-	-	-	-	-	-	-	13.68

New Initiatives

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
									1	2	3	4	5	6	7	8	9	10
New Initiatives																		
Operating expenditure								0.46	0.53	0.72	0.84	0.97	1.14	1.19	1.21	1.23	1.25	1.27
Gross capital expenditure									3.18	7.14	8.88	1.50	-	-	-	-	2.00	2.22
Government contributions									1.25	3.18	1.94	2.87	-	-	-	-	-	-
Customer contributions									-	-	-	-	-	-	-	-	-	-
Net capital expenditure on New Initiatives									**1.93**	**3.96**	**6.95**	**(1.37)**	**-**	**-**	**-**	**-**	**2.00**	**2.22**
Regulatory Depreciation									-	-	-	0.01	0.03	0.03	0.03	0.03	0.03	0.13
Return on assets									0.05	0.20	0.48	0.62	0.58	0.58	0.58	0.58	0.63	0.73
Declining balance cumulative depreciation term - first period capex								-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 3+ capex									-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - second period capex									1.12%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 3+ capex									0.00%	1.12%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex									1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.12%	0.00%
Depreciation - declining balance									(0.02)	(0.09)	(0.20)	(0.23)	(0.20)	(0.20)	(0.19)	(0.19)	(0.21)	(0.25)

Centralised composting system

Sewerage

Compliance

Operating expenditure

Capital expenditure — **Year asset operational-->** 2016-17

Asset life (years) 66.67

Depreciation method Straight line

Gross capital expenditure											1.00	1.00						
Government contributions																		
Customer contributions																		
Net capital expenditure									**-**	**-**	**1.00**	**1.00**	**-**	**-**	**-**	**-**	**-**	**-**
Regulatory Depreciation									-	-	-	0.01	0.03	0.03	0.03	0.03	0.03	0.03
Closing asset base								-	-	-	1.00	1.99	1.96	1.93	1.90	1.87	1.84	1.81
Return on assets									-	-	0.03	0.08	0.10	0.10	0.10	0.10	0.09	0.09
Cost of project for pricing (inclusive of opex)									-	-	0.03	0.09	0.13	0.13	0.13	0.13	0.12	0.12
Accumulated capex									-	-	-	2.00	-	-	-	-	-	-
Declining balance cumulative depreciation term - first period capex								-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 3+ capex									-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - second period capex									1.12%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%	1.85%
Periodic depreciation % - period 3+ capex									0.00%	1.12%	2.22%	2.17%	2.13%	2.08%	2.03%	1.99%	1.94%	1.90%
Reversed depreciation - first period capex									1.90%	1.94%	1.99%	2.03%	2.08%	2.13%	2.17%	2.22%	1.12%	0.00%
Depreciation - declining balance									-	-	(0.01)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

Expenditure Summary

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Operating Expenditure																			
Total Operating Expenditure	-	27.59	31.63	32.83	32.85	36.00	38.68	44.52	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Capex by Asset Category																			
Total Gross Capital Expenditure	25.98	29.78	26.55	39.64	41.78	38.88	33.53	26.44	18.86	27.47	39.27	52.93	68.10	64.17	73.90	76.07	69.89	70.12	88.53
Total Government Contributions	-	-	4.14	-	-	-	-	-	-	1.25	3.18	1.94	2.87	-	-	-	-	-	-
Total Customer Contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74	6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Total Net Capital Expenditure	12.11	26.44	20.54	34.53	37.90	34.97	29.74	21.24	14.12	19.72	28.69	43.18	57.00	55.21	65.15	65.88	57.95	56.06	71.79
Gifted Assets	13.06	16.97	12.19	14.68	11.48	13.04	13.40	16.05	12.68	15.48	17.69	18.86	20.72	26.31	27.24	32.20	38.40	46.15	55.89
Proceeds from disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80	0.80
Capex by Class																			
Total Gross Capital Expenditure								0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	70.12	88.53
Total Government Contributions										1.25	3.18	1.94	2.87	-	-	-	-	-	-
Total Customer Contributions										6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Total Net Capital Expenditure										(7.66)	(10.49)	(9.66)	(11.01)	(8.86)	(8.66)	(10.09)	(11.84)	56.06	71.79
Total Regulatory Depreciation on new assets										0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Capex for Tax										2.29	6.50	10.55	14.44	17.83	94.60	100.14	97.90	103.17	127.80

Rolled forward regulatory asset base

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
										1	2	3	4	5	6	7	8	9	10
Rolled forward asset base																			
Opening asset base	107.98	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	297.48	324.49	364.28	418.11	466.41	523.75	580.84	629.07	673.86
Closing asset base	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	297.48	324.49	364.28	418.11	466.41	523.75	580.84	629.07	673.86	733.45
Depreciation rate of existing assets										66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7
Regulatory depreciation - Existing	6.49	5.38	4.70	4.70	3.57	3.57	3.57	3.57	3.57	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
Regulatory depreciation - New Assets	0.19	0.68	1.19	1.75	0.43	1.23	1.86	2.29	2.60	0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Regulatory depreciation - Total	6.67	6.05	5.90	6.45	4.00	4.80	5.43	5.86	6.17	4.35	4.67	5.13	5.85	6.72	7.62	8.60	9.53	10.37	11.40

Rolled forward asset base

$m, 01/01/13

Opening asset base	107.98	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.054	297.484	324.490	364.284	418.110	466.41	523.75	580.84	629.07	673.86
plus Gross capex	25.98	29.78	26.55	39.64	41.78	38.88	33.53	26.44	18.86	27.470	39.267	52.929	68.104	64.169	73.90	76.07	69.89	70.12	88.53
less Government contributions	-	-	4.14	-	-	-	-	-	0.10	0.096	0.096	0.096	0.096	0.096	0.10	0.10	0.10	0.10	-
less Customer contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74	6.500	7.402	7.819	8.237	8.960	8.75	10.19	11.94	14.06	16.74
less Proceeds from disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.10	0.10	0.096	0.096	0.096	0.096	0.096	0.10	0.10	0.10	0.80	0.80
less Regulatory depreciation	6.67	6.05	5.90	6.45	4.00	4.80	5.43	5.86	6.17	4.349	4.668	5.125	5.850	6.717	7.62	8.60	9.53	10.37	11.40
Closing asset base	**112.48**	**130.86**	**144.59**	**171.71**	**204.92**	**234.25**	**258.01**	**273.30**	**281.05**	**297.484**	**324.490**	**364.284**	**418.110**	**466.411**	**523.75**	**580.84**	**629.07**	**673.86**	**733.45**

Rolled forward regulatory asset base

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
										1	2	3	4	5	6	7	8	9	10
Rolled forward asset base																			
Opening asset base	107.98	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	297.48	324.49	364.28	418.11	466.41	523.75	580.84	629.07	673.86
Closing asset base	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	297.48	324.49	364.28	418.11	466.41	523.75	580.84	629.07	673.86	733.45
Depreciation rate of existing assets										66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7
Regulatory depreciation - Existing	6.49	5.38	4.70	4.70	3.57	3.57	3.57	3.57	3.57	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
Regulatory depreciation - New Assets	0.19	0.68	1.19	1.75	0.43	1.23	1.86	2.29	2.60	0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Regulatory depreciation - Total	6.67	6.05	5.90	6.45	4.00	4.80	5.43	5.86	6.17	4.35	4.67	5.13	5.85	6.72	7.62	8.60	9.53	10.37	11.40
Depreciation of asset base as at 1/7/13									**Depreciation override:**	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22

Previous period adjustments

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FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
								1	2	3	4	5	6	7	8	9	10

Adjustments Summary

Additional expenses incurred to be carried forwar			-	-	-	-	-										
Allocation of carried forward expenses (NPV of cash flows should equate to net present cost to recove			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Previous period adjustments

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FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
								1	2	3	4	5	6	7	8	9	10

Adjustments Summary

Additional expenses incurred to be carried forwar			-	-	-	-	-										
Allocation of carried forward expenses (NPV of cash flows should equate to net present cost to recove			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Revenue forecast (price caps)

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Revenue Summary																		
Non-scheduled tariff revenue	2.45	2.22	1.92	2.30	2.40	2.49	2.60	2.82	2.37	2.47	2.47	2.59	2.87	2.58	2.64	2.65	2.71	2.77
Tariff revenue	39.21	39.01	41.95	49.89	56.29	61.81	69.18	76.07	63.68	70.26	77.68	86.36	96.19	101.30	109.76	117.50	126.39	136.70
Total prescribed revenue	41.65	41.23	43.87	52.19	58.69	64.30	71.78	78.89	66.05	72.73	80.15	88.94	99.05	103.88	112.39	120.15	129.11	139.47
Revenue not collected	0.06	0.07	0.07	0.11	0.17	0.27	0.35	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Net prescribed revenue	41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15
Revenue requirement	*43.12*	*41.85*	*43.10*	*53.16*	*59.42*	*65.03*	*70.53*	*76.48*	18.47	23.77	27.68	27.69	26.25	21.97	23.25	24.62	28.61	114.62
Non-prescribed revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL REVENUE	41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15

9.55%

3rd period productivity hurdle achieved?

PASS

Price control - Third period

NPV Net Presc Rev	355.24
NPV Rev Requirement	108.77
Variance	246.462

BREACH

Ave price incr (reg period 3): -33.79%

Ave price change required to 17/18: 35.07%

Price control - Fourth period

NPV Net Presc Rev	530.31
NPV Rev Requirement	180.43

Ave price incr (reg period 4): -33.48%

Ave p0 adjustment reqd in fourth reg period: 8.46%

Revenue forecast

Non-scheduled tariff revenue $m, 01/01/13

Contract revenue																		
Trade Waste Contract Revenue	0.13	0.14	-	-	-	-	-	-										
Sewerage Contract Revenue	-	-	-	-	-	-	-	-										
Water Contract Revenue	-	-	-	-	-	-	-	-										
Recycled Water Contract Revenue	0.49	0.35	0.15	0.24	0.26	0.28	0.30	0.32	0.34	0.39	0.34	0.39	0.60	0.20	0.20	0.16	0.16	0.16
Total Contract revenue	0.62	0.48	0.15	0.24	0.26	0.28	0.30	0.32	0.34	0.39	0.34	0.39	0.60	0.20	0.20	0.16	0.16	0.16
Other non-scheduled tariff revenue																		
Miscellaneous Services	1.25	1.16	1.19	1.47	1.52	1.58	1.64	1.71	1.59	1.64	1.69	1.75	1.81	1.87	1.93	1.99	2.05	2.11
Government contribution to operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Revenue	0.58	0.58	0.58	0.58	0.61	0.63	0.65	0.78	0.44	0.44	0.44	0.45	0.45	0.50	0.50	0.50	0.50	0.50
Total Other non-scheduled tariff revenue	1.83	1.74	1.77	2.05	2.14	2.21	2.30	2.50	2.03	2.08	2.14	2.20	2.26	2.37	2.43	2.49	2.55	2.61
Total Non-scheduled tariff revenue	2.45	2.22	1.92	2.30	2.40	2.49	2.60	2.82	2.37	2.47	2.47	2.59	2.87	2.58	2.64	2.65	2.71	2.77
Revenue not collected $m, 01/01/13	0.06	0.07	0.07	0.11	0.17	0.27	0.35	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Non-prescribed revenue offset of revenue requirement $m, 01/01/13																		

Tariff revenue $m, 01/01/13

	PQR	Service	Category	Tariff Description	Type	Unit	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
1	Price	Water	Fixed Service C	Residential	Fixed price cap	$	155.98	156.11	156.10	173.52	190.70	205.42	221.28	215.26	234.33	255.09	277.70	302.30	329.08	336.65	344.39	352.32	360.42	368.71
	Qty					Cust	45,071	47,819	49,370	43,438	46,339	48,487	50,219	51,908	54,013	56,488	59,209	62,152	65,317	69,252	72,826	76,951	81,752	87,385
	Rev					$m	7.03	7.47	7.71	8.74	9.92	11.03	12.29	13.72	12.66	14.41	16.44	18.79	21.49	23.31	25.08	27.11	29.46	32.22
2	Price	Water	Variable - 1st tie	Residential	Variable price ca	$	0.94	0.95	0.96	1.12	1.23	1.32	1.42	1.38	1.51	1.64	1.79	1.94	2.12	2.16	2.21	2.26	2.32	2.37
	Qty					kL	6,230,329	5,410,000	5,358,000	6,083,065	6,824,242	6,410,402	5,747,916	6,689,659	6,774,025	6,910,495	7,072,238	7,247,657	7,433,749	7,735,155	8,041,822	8,366,455	8,735,891	9,160,251
	Rev					$m	5.88	5.15	5.15	6.20	7.43	8.35	9.76	10.89	10.20	11.33	12.63	14.08	15.73	16.74	17.80	18.95	20.24	21.71
3	Price	Water	Variable - 2nd ti	Residential	Variable price ca	$	1.11	1.12	1.13	1.48	1.63	1.75	1.89	1.84	2.00	2.22	2.46	2.72	3.02	3.09	3.16	3.23	3.31	3.38
	Qty					kL	2,461,000	1,893,000	2,370,000	1,256,355	1,409,433	1,323,961	1,187,135	1,832,783	1,855,897	1,893,286	1,937,600	1,985,659	2,036,644	2,119,220	2,203,239	2,292,179	2,393,395	2,509,658
	Rev					$m	2.72	2.11	2.67	3.65	4.37	4.92	5.75	6.39	3.71	4.19	4.76	5.41	6.15	6.54	6.96	7.41	7.91	8.49
4	Price	Water	Variable - 3rd tie	Residential	Variable price ca	$	1.63	1.65	1.67	2.96	3.25	3.50	3.77	3.67	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	Qty					kL	1,780,000	1,370,000	1,631,000	219,862	246,651	231,693	207,749	641,474	649,564	662,650	678,160	694,981	712,825	741,727	771,134	802,263	837,688	878,380
	Rev					$m	2.91	2.26	2.72	5.14	6.15	6.91	8.07	8.79	2.60	2.65	2.71	2.78	2.85	2.96	3.08	3.21	3.35	3.51
5	Price	Water	Fixed Service C	Non-residential	Fixed price cap	$	155.98	156.11	156.10	173.52	190.70	205.42	221.28	215.26	234.33	255.09	277.70	302.30	329.08	336.65	344.39	352.32	360.42	368.71
	Qty					Cust	3,313	3,418	3,676	3,798	3,921	4,046	4,194	3,050	3,777	3,755	3,219	3,545	3,794	3,971	4,153	4,346	4,567	4,822
	Rev					$m	0.52	0.53	0.57	0.65	0.74	0.82	0.92	1.02	0.89	0.96	0.89	1.07	1.25	1.34	1.43	1.53	1.65	1.78
6	Price	Water	Variable - usage	Non-residential	Variable price ca	$	1.04	1.05	1.06	1.48	1.63	1.75	1.89	1.84	2.00	2.18	2.37	2.58	2.81	2.87	2.94	3.00	3.07	3.14
	Qty					kL	1,609,671	1,713,000	1,820,000	1,909,393	2,081,664	2,172,015	2,358,465	1,593,679	1,615,139	1,636,116	1,656,978	1,677,883	1,698,872	1,182,837	1,763,291	1,796,313	1,829,470	1,862,640
	Rev					$m	1.68	1.81	1.94	2.79	3.35	3.76	4.40	4.91	3.23	3.56	3.92	4.33	4.77	3.40	5.18	5.40	5.62	5.86
7	Price	Sewerage	Fixed Service C	Residential	Fixed price cap	$	-	-	448.87	469.00	484.48	496.94	509.73	496.33	513.92	532.13	550.99	570.52	590.74	596.17	601.66	607.19	612.78	618.42
	Qty					Cust	1,489	1,635	42,516	36,527	39,166	42,618	46,609	51,561	53,473	55,923	58,617	61,531	64,664	67,938	71,378	75,359	80,006	85,472
	Rev					$m	-	-	19.08	20.35	21.71	22.98	24.38	25.91	27.48	29.76	32.30	35.10	38.20	40.50	42.95	45.76	49.03	52.86
8	Price	Sewerage	Fixed Service C	Non-residential	Fixed price cap	$	-	-	448.87	469.00	484.48	496.94	509.73	496.33	513.92	532.13	550.99	570.52	590.74	596.17	601.66	607.19	612.78	618.42
	Qty					Cust	-	-	2,599	3,176	2,993	2,788	2,486	2,533	2,661	2,764	2,882	3,010	3,149	3,149	3,294	3,439	3,593	3,771

Revenue forecast (price caps)

Western Water

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						FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
						2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Revenue Summary																							
Non-scheduled tariff revenue						2.45	2.22	1.92	2.30	2.40	2.49	2.60	2.82	2.37	2.47	2.47	2.59	2.87	2.58	2.64	2.65	2.71	2.77
Tariff revenue						39.21	39.01	41.95	49.89	56.29	61.81	69.18	76.07	63.68	70.26	77.68	86.36	96.19	101.30	109.76	117.50	126.39	136.70
Total prescribed revenue						41.65	41.23	43.87	52.19	58.69	64.30	71.78	78.89	66.05	72.73	80.15	88.94	99.05	103.88	112.39	120.15	129.11	139.47
Revenue not collected						0.06	0.07	0.07	0.11	0.17	0.27	0.35	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Net prescribed revenue						41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15
Revenue requirement						*43.12*	*41.85*	*43.10*	*53.16*	*59.42*	*65.03*	*70.53*	*76.48*	18.47	23.77	27.68	27.69	26.25	21.97	23.25	24.62	28.61	114.62
Non-prescribed revenue						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL REVENUE						41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15

	Rev				$m	-	-	1.17	1.24	1.33	1.41	1.49	1.59	1.37	1.47	1.59	1.72	1.86	1.88	1.98	2.09	2.20	2.33
9	Price	0	0	0	0	$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Qty					0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rev					$m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Price	Recycled wati	Fixed Service C	Class A - Golf Course	Fixed price cap	$	-	-	1,079.77	1,200.28	1,319.10	1,420.92	1,530.61	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23	5,235.23
	Qty					Cust	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Rev					$m	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
11	Price	Recycled wati	Fixed Service C	Class A	Fixed price cap	$	-	-	67.49	75.02	82.45	88.81	95.66	93.06	117.17	127.55	138.85	151.15	164.54	168.33	172.20	176.16	180.21	184.35
	Qty					Cust	-	-	120	260	545	1,085	1,908	433	720	880	1,040	1,200	1,360	1,520	1,680	1,840	2,000	2,160
	Rev					$m	-	-	0.01	0.02	0.04	0.10	0.18	0.28	0.08	0.11	0.14	0.18	0.22	0.26	0.29	0.32	0.36	0.40
12	Price	Recycled wati	Variable - usage	Class A	Variable price ca	$	-	-	0.96	1.12	1.23	1.32	1.42	1.38	1.51	1.64	1.79	1.94	2.12	2.16	2.21	2.26	2.32	2.37
	Qty					kL	-	-	228,000	249,000	295,000	409,000	578,000	35,040	46,720	58,400	70,080	81,760	93,440	105,120	116,800	128,480	140,160	151,840
	Rev					$m	-	-	0.22	0.27	0.36	0.53	0.81	1.13	0.07	0.10	0.13	0.16	0.20	0.23	0.26	0.29	0.32	0.36
13	Price	Recycled wati	Fixed Service C	Gisborne	Fixed price cap	$	608.47	590.85	590.85	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty					kL	5	5	6	15	15	15	15	1	19	19	20	20	20	21	21	21	22	22
	Rev					$m	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
14	Price	Recycled wati	Variable - peak	Gisborne	Variable price ca	$	340.75	330.88	330.88	334.67	334.67	339.10	350.40	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90
	Qty					kL	29	29	137	179	105	112	118	4	90	94	98	102	106	110	114	118	122	126
	Rev					$m	0.01	0.01	0.05	0.06	0.03	0.04	0.04	0.06	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
15	Price	Recycled wati	Variable - off pe	Gisborne	Variable price ca	$	243.39	236.34	236.34	214.90	214.90	214.90	214.90	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty					kL	54	54	59	64	64	64	64	4	115	119	123	127	131	135	139	143	147	151
	Rev					$m	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
16	Price	Recycled wati	Fixed Service C	Sunbury-Melton	Fixed price cap	$	608.47	590.85	590.85	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty					Cust	30	35	40	59	65	72	79	1	55	56	58	60	62	63	64	65	66	67
	Rev					$m	0.02	0.02	0.02	0.03	0.04	0.04	0.05	0.05	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04
17	Price	Recycled wati	Variable - peak	Sunbury-Melton	Variable price ca	$	340.75	330.88	330.88	334.67	334.67	339.10	350.40	355.90	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40
	Qty					kL	163	450	571	725	910	1,125	1,351	31	592	599	626	653	687	718	749	780	811	842
	Rev					$m	0.06	0.15	0.19	0.24	0.30	0.37	0.45	0.53	0.21	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.30
18	Price	Recycled wati	Variable - off pe	Sunbury-Melton	Variable price ca	$	243.39	236.34	236.34	214.90	214.90	214.90	214.90	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty					kL	163	450	413	391	432	478	528	31	352	359	386	413	447	478	509	540	571	602
	Rev					$m	0.04	0.11	0.10	0.09	0.10	0.11	0.12	0.14	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.13	0.13
19	Price	Recycled wati	Variable - usage	Eynesbury Golf Course	Variable price ca	$	-	-	-	-	-	-	-	1.38	1.51	1.64	1.79	1.94	2.12	2.16	2.21	2.26	2.32	2.37
	Qty					0	-	-	-	-	-	-	-	60,000	111,001	111,001	111,001	111,001	111,001	111,001	111,001	111,001	111,001	111,001
	Rev					$m	-	-	-	-	-	-	-	0.08	0.17	0.18	0.20	0.22	0.23	0.24	0.25	0.25	0.26	0.26
20	Price	0	0	0	0	$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Qty					0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rev					$m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Price	Trade waste	Availability	0	Fixed price cap	$	251.26	251.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Qty					Cust	396	403	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rev					$m	0.10	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Price	Trade waste	Risk Rank 1	Management Fee	Fixed price cap	$	-	-	206.47	225.52	232.96	238.95	245.10	238.66	238.66	238.66	238.66	238.66	238.66	238.66	238.66	238.66	238.66	238.66
	Qty					Cust	-	-	255	335	350	361	372	319	329	338	349	359	370	380	390	400	410	420
	Rev					$m	-	-	0.05	0.07	0.08	0.09	0.09	0.10	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
23	Price	Trade waste	Risk Rank 2	Management Fee	Fixed price cap	$	-	-	439.65	473.05	488.66	501.24	514.13	500.62	500.62	500.62	500.62	500.62	500.62	500.62	500.62	500.62	500.62	500.62
	Qty					Cust	-	-	124	79	83	86	88	119	123	126	130	134	138	142	146	150	154	158
	Rev					$m	-	-	0.05	0.04	0.04	0.04	0.04	0.05	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08
24	Price	Trade waste	Risk Rank 3	Management Fee	Fixed price cap	$	-	-	995.91	1,057.55	1,092.45	1,120.56	1,149.39	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21	1,119.21
	Qty					Cust	-	-	18	7	9	9	9	2	2	2	2	2	2	2	2	2	2	2
	Rev					$m	-	-	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	Price	Trade waste	Risk Rank 4	Management Fee	Fixed price cap	$	-	-	2,016.12	2,151.52	2,222.52	2,279.70	2,338.36	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97	2,276.97
	Qty					Cust	-	-	3	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3
	Rev					$m	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
26	Price	Trade waste	Risk Rank 2	Vol Fee	Variable price ca	$	-	-	0.57	0.95	0.99	1.01	1.04	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	Qty					kL	-	-	3,140	3,860	4,660	5,460	6,260	-	-	-	-	-	-	-	-	-	-	-
	Rev					$m	-	-	0.00	0.00	0.00	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-
27	Price	Trade waste	Risk Rank 3	Vol Fee	Variable price ca	$	-	-	0.88	1.35	1.40	1.43	1.47	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
	Qty					kL	-	-	3,100	4,450	5,950	7,450	8,950	59,532	60,127	60,729	61,336	61,949	62,569	63,194	63,826	64,465	65,109	65,760
	Rev					$m	-	-	0.00	0.01	0.01	0.01	0.01	0.02	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
28	Price	Trade waste	Risk Rank 4	Vol Fee	Variable price ca	$	-	-	0.57	0.95	0.99	1.01	1.04	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	Qty					kL	-	-	156,000	125,000	125,000	125,000	125,000	292,196	298,040	304,001	310,081	316,282	322,608	329,060	335,641	342,354	349,201	356,185
	Rev					$m	-	-	0.09	0.12	0.12	0.12	0.13	0.13	0.30	0.31	0.32	0.33	0.33	0.33	0.34	0.35	0.35	0.36
29	Price	Trade waste	Category C - Ri	Quality Fee	Variable price ca	$	-	-	2,717.91	5,139.60	5,309.20	5,445.81	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93	5,585.93

Revenue forecast (price caps)

Western Water

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Revenue Summary																		
Non-scheduled tariff revenue	2.45	2.22	1.92	2.30	2.40	2.49	2.60	2.82	2.37	2.47	2.47	2.59	2.87	2.58	2.64	2.65	2.71	2.77
Tariff revenue	39.21	39.01	41.95	49.89	56.29	61.81	69.18	76.07	63.68	70.26	77.68	86.36	96.19	101.30	109.76	117.50	126.39	136.70
Total prescribed revenue	41.65	41.23	43.87	52.19	58.69	64.30	71.78	78.89	66.05	72.73	80.15	88.94	99.05	103.88	112.39	120.15	129.11	139.47
Revenue not collected	0.06	0.07	0.07	0.11	0.17	0.27	0.35	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Net prescribed revenue	41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15
Revenue requirement	*43.12*	*41.85*	*43.10*	*53.16*	*59.42*	*65.03*	*70.53*	*76.48*	18.47	23.77	27.68	27.69	26.25	21.97	23.25	24.62	28.61	114.62
Non-prescribed revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL REVENUE	41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15

	Qty			0	-	-	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-
	Rev			$m	-	-	0.00	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-
30	Price	Trade waste Category B - Ri	Quality Fee	Variable price ca	$	-	-	5,672.15	3,346.71	3,457.16	3,546.11	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35	3,637.35
	Qty			0	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	Rev			$m	-	-	0.01	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
31	Price	Trade waste Category C - Ri	Quality Fee	Variable price ca	$	-	-	10,635.29	10,757.30	11,112.29	11,398.21	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48	11,691.48
	Qty			0	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	Rev			$m	-	-	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-
32	Price	Trade waste Risk Rank 1	Application Fee	Fixed price cap	$	114.44	114.44	114.44	116.08	119.91	123.00	126.16	122.84	122.84	122.84	122.84	122.84	122.84	122.84	122.84	122.84	122.84	122.84
	Qty			0	-	-	15	15	11	11	13	24	24	24	24	24	24	24	24	24	24	24	24
	Rev			$m	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Price	Trade waste Risk Rank 2	Application Fee	Fixed price cap	$	182.34	182.34	182.34	182.46	188.48	193.33	198.30	193.08	193.08	193.08	193.08	193.08	193.08	193.08	193.08	193.08	193.08	193.08
	Qty			0	-	-	4	4	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3
	Rev			$m	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Price	Trade waste Risk Rank 3	Application Fee	Fixed price cap	$	-	334.30	334.30	338.66	349.84	358.84	368.07	358.40	358.40	358.40	358.40	358.40	358.40	358.40	358.40	358.40	358.40	358.40
	Qty			0	-	-	2	2	-	-	1	3	3	3	3	3	3	3	3	3	3	3	3
	Rev			$m	-	-	0.00	0.00	-	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Price	Trade waste Risk Rank 4	Application Fee	Fixed price cap	$	-	790.18	790.18	803.13	829.63	850.98	872.87	849.94	849.94	849.94	849.94	849.94	849.94	849.94	849.94	849.94	849.94	849.94
	Qty			0	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1
	Rev			$m	-	-	-	-	-	-	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Price	Recycled wat	Fixed Service C	Romsey	Fixed price cap	$	-	-	590.85	597.63	597.63	597.63	597.63	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty			0	-	-	1	2	3	4	5	6	3	4	4	4	4	5	5	5	5	5	5
	Rev			$m	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	Price	Recycled wat	Variable - peak	Romsey	Variable price ca	$	-	-	330.88	334.67	334.67	334.67	334.67	355.90	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40
	Qty			0	-	-	56	68	80	92	105	79	36	42	42	42	42	72	72	72	72	72	72
	Rev			$m	-	-	0.02	0.02	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.03	0.03	0.03	0.03
38	Price	Recycled wat	Variable - off pe	Romsey	Variable price ca	$	-	-	236.34	239.05	239.05	239.05	239.05	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty			0	-	-	17	5	5	5	5	45	7	9	9	9	9	39	39	39	39	39	39
	Rev			$m	-	-	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
49	Price	Recycled wat	Fixed Service C	Woodend	Fixed price cap	$	-	-	590.85	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty			0	-	-	3	3	3	3	10	10	10	3	3	3	4	5	6	7	7	7	7
	Rev			$m	-	-	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	Price	Recycled wat	Variable - peak	Woodend	Variable price ca	$	-	-	330.88	334.67	334.67	339.10	350.40	355.90	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40
	Qty			0	-	-	109	115	128	80	87	94	20	20	20	34	65	102	102	102	102	102	102
	Rev			$m	-	-	0.04	0.04	0.04	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.02	0.04	0.04	0.04	0.04	0.04	0.04
51	Price	Recycled wat	Variable - off pe	Woodend	Variable price ca	$	-	-	236.34	214.90	214.90	214.90	214.90	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty			0	-	-	104	41	41	96	96	96	11	11	11	25	56	93	93	93	93	93	93
	Rev			$m	-	-	0.02	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
52	Price	Recycled wat	Fixed Service C	Riddells Creek	Fixed price cap	$	-	-	590.85	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty			0	-	-	-	4	4	4	4	6	5	5	6	9	13	13	13	13	13	13	13
	Rev			$m	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
53	Price	Recycled wat	Variable - peak	Riddells Creek	Variable price ca	$	-	-	330.88	334.67	334.67	339.10	350.40	355.90	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40
	Qty			0	-	-	-	30	30	30	33	40	17	17	17	17	17	20	23	26	29	32	32
	Rev			$m	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
54	Price	Recycled wat	Variable - off pe	Riddells Creek	Variable price ca	$	-	-	236.34	214.90	214.90	214.90	214.90	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty			0	-	-	-	10	10	10	10	10	49	49	60	188	370	373	376	379	382	385	385
	Rev			$m	-	-	-	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.04	0.08	0.08	0.08	0.08	0.08	0.08	0.09
55	Price	Recycled wat	Fixed Service C	Bacchus Marsh	Fixed price cap	$				-	-	-	-	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty				[Pricing Unit]				-	-	-	-	-	1	1	1	1	2	2	3	3	4	4
	Rev				$m	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	Price	Recycled wat	Variable - peak	Bacchus Marsh	Variable price ca	$				-	-	-	-	355.90	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40	350.40
	Qty				[Pricing Unit]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rev				$m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	Price	Recycled wat	Variable - off pe	Bacchus Marsh	Variable price ca	$				-	-	-	-	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty				[Pricing Unit]				-	-	-	-	-	25	34	43	43	51	51	51	51	64	80
	Rev				$m	-	-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
58	Price	Recycled Wa	Class A - Toolern		Fixed price cap	$				-	-	-	-	93.06	117.17	127.55	138.85	151.15	164.54	168.33	172.20	176.16	180.21	184.35
	Qty				[Pricing Unit]				-	-	-	-	300	1,000	1,700	2,400	3,100	3,800	4,526	5,194	5,961	6,841	7,851
	Rev				$m	-	-	-	-	-	-	-	0.03	0.12	0.22	0.33	0.47	0.63	0.76	0.89	1.05	1.23	1.45
59	Price	Recycled Wa	Class A - Toolern		Variable price ca	$				-	-	-	-	1.38	1.51	1.64	1.79	1.94	2.12	2.16	2.21	2.26	2.32	2.37
	Qty				[Pricing Unit]				-	-	-	-	10,950	47,450	98,550	149,650	200,750	251,850	301,850	351,850	401,850	451,850	501,850
	Rev				$m	-	-	-	-	-	-	-	0.02	0.07	0.16	0.27	0.39	0.53	0.65	0.78	0.91	1.05	1.19

Revenue forecast (price caps)

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Revenue Summary																		
Non-scheduled tariff revenue	2.45	2.22	1.92	2.30	2.40	2.49	2.60	2.82	2.37	2.47	2.47	2.59	2.87	2.58	2.64	2.65	2.71	2.77
Tariff revenue	39.21	39.01	41.95	49.89	56.29	61.81	69.18	76.07	63.68	70.26	77.68	86.36	96.19	101.30	109.76	117.50	126.39	136.70
Total prescribed revenue	41.65	41.23	43.87	52.19	58.69	64.30	71.78	78.89	66.05	72.73	80.15	88.94	99.05	103.88	112.39	120.15	129.11	139.47
Revenue not collected	0.06	0.07	0.07	0.11	0.17	0.27	0.35	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Net prescribed revenue	41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15
Revenue requirement	*43.12*	*41.85*	*43.10*	*53.16*	*59.42*	*65.03*	*70.53*	*76.48*	18.47	23.77	27.68	27.69	26.25	21.97	23.25	24.62	28.61	114.62
Non-prescribed revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL REVENUE	41.59	41.16	43.79	52.08	58.52	64.03	71.43	78.58	65.74	72.42	79.84	88.63	98.74	103.56	112.07	119.84	128.79	139.15

60	Price	Recycled Wa	Class A - Melton		Fixed price cap	$				-	-	-	-	93.06	117.17	127.55	138.85	151.15	164.54	168.33	172.20	176.16	180.21	184.35
	Qty					[Pricing Unit]				-	-	-	-	-	200	600	1,200	1,950	2,950	4,000	5,039	6,347	7,995	10,071
	Rev					$m	-	-	-	-	-	-	-	-	0.02	0.08	0.17	0.29	0.49	0.67	0.87	1.12	1.44	1.86
61	Price	Recycled Wa	Class A - Melton		Variable price ca	$				-	-	-	-	1.38	1.51	1.64	1.79	1.94	2.12	2.16	2.21	2.26	2.32	2.37
	Qty					[Pricing Unit]				-	-	-	-	-	3,650	14,600	32,850	57,488	89,425	129,425	169,425	209,425	249,425	289,425
	Rev					$m	-	-	-	-	-	-	-	-	0.01	0.02	0.06	0.11	0.19	0.28	0.38	0.47	0.58	0.69
62	Price	Trade Waste	BOD	Quality Fee	Variable price ca	$				-	-	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
	Qty					[Pricing Unit]				-	-	-	-	82,645	84,298	85,984	87,704	89,458	91,247	93,072	94,933	96,832	98,768	100,744
	Rev					$m	-	-	-	-	-	-	-	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
63	Price	Trade Waste	SS	Quality Fee	Variable price ca	$				-	-	0.19	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
	Qty					[Pricing Unit]				-	-	-	-	4,652	4,745	4,840	4,937	5,035	5,136	5,239	5,344	5,451	5,560	5,671
	Rev					$m	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	Price	Trade Waste	TOS	Quality Fee	Variable price ca	$				-	-	0.82	0.85	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
	Qty					[Pricing Unit]				-	-	-	-	3,420	3,488	3,558	3,629	3,702	3,776	3,851	3,929	4,007	4,087	4,169
	Rev					$m	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	Price	Diversions	Sodium	Quality Fee	Variable price ca	$				-	-	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	Qty					[Pricing Unit]				-	-	-	-	24,608	25,100	25,602	26,114	26,636	27,169	27,713	28,267	28,832	29,409	29,997
	Rev					$m	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	Price	Recycled wat	Fixed Service C	Melton class C	Fixed	$				-	-	-	-	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79	567.79
	Qty					[Pricing Unit]				-	-	-	-	-	-	1	3	5	7	14	18	22	26	30
	Rev					$m	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02
67	Price	Recycled wat	Peak	Melton class C	Variable	$				-	-	-	-	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90	355.90
	Qty					[Pricing Unit]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rev					$m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	Price	Recycled wat	Off Peak	Melton class C	Variable	$				-	-	-	-	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00	222.00
	Qty					[Pricing Unit]				-	-	-	-	-	-	70	280	490	700	910	971	1,032	1,093	1,154
	Rev					$m	-	-	-	-	-	-	-	-	-	0.02	0.06	0.11	0.16	0.20	0.22	0.23	0.24	0.26

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Non Prescribed Services summary																		
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross capital expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Government contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net capital expenditure - non-prescribed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gifted Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from disposals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Cash, debt and tax assumptions

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									1	2	3	4	5	6	7	8	9	10
Finance and tax summary																		
Opening cash balance	15.63	1.11	5.22	7.88	1.44	7.74	4.64	12.46	9.06	8.54	7.47	9.13	7.92	7.34	5.55	5.81	4.01	6.40
Interest earned	0.37	0.11	0.12	0.13	0.04	0.05	0.14	0.10	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Opening debt balance	2.13	6.50	23.35	47.59	74.79	107.33	131.04	149.00	169.00	173.87	190.01	223.36	268.54	315.27	370.27	425.27	465.27	500.27
Interest incurred	0.25	1.11	2.61	4.26	6.16	8.29	9.47	10.11	10.97	12.35	15.19	19.13	23.82	28.77	33.72	37.32	40.47	44.07
Book depreciation	11.00	11.60	11.80	12.89	14.36	15.32	15.51	16.88	17.25	17.88	18.84	19.09	19.19	20.00	21.05	22.50	24.33	26.48
Tax depreciation - existing	19.43	18.74	18.65	17.03	18.33	19.39	19.83	18.17	16.34	14.92	13.74	12.74	11.96	11.12	10.34	9.62	8.95	8.32
Tax depreciation - new									2.29	6.50	10.55	14.44	17.83	20.98	23.93	27.77	32.10	35.36
Tax losses brought forwarc	-			0.37					2.05									

Cash and Debt

$m, 01/01/13

								9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	
Opening cash balance	15.63	1.11	5.22	7.88	1.44	7.74	4.64	12.46	9.06	8.54	7.47	9.13	7.92	7.34	5.55	5.81	4.01	6.40
Interest earned	0.37	0.11	0.12	0.13	0.04	0.05	0.14	0.10	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Opening debt balance	2.13	6.50	23.35	47.59	74.79	107.33	131.04	149.00	169.00	173.87	190.01	223.36	268.54	315.27	370.27	425.27	465.27	500.27
Interest incurred	0.25	1.11	2.61	4.26	6.16	8.29	9.47	10.11	10.97	12.35	15.19	19.13	23.82	28.77	33.72	37.32	40.47	44.07

Depreciation

$m, MOD

Tax losses brought forward (enter a positive value	-			0.37					2.05									
Book depreciation	11.00	11.60	11.80	12.89	14.36	15.32	15.51	16.88	17.25	17.88	18.84	19.09	19.19	20.00	21.05	22.50	24.33	26.48
Tax depreciation - existing asset	19.43	18.74	18.65	17.03	18.33	19.39	19.83	18.17	16.34	14.92	13.74	12.74	11.96	11.12	10.34	9.62	8.95	8.32

Tax depreciation on capital expenditure (incl non-prescribed)

1 Infrastructure

Asset life (years)	75.00																	
Depreciation method	Declining balance	2.67	declining balance multiple															
Gross capital expenditure		No	switch to straight line?						36.95	48.43	60.73	79.68	75.44	82.48	88.44	84.83	89.03	113.18
Tax Depreciation - new									0.66	2.15	4.02	6.38	8.91	11.40	14.04	16.63	19.13	22.05
Declining balance cumulative depreciation term - first period cape									0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ cape									-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex									1.78%	3.50%	3.37%	3.25%	3.14%	3.02%	2.92%	2.81%	2.71%	2.62%
Periodic depreciation % - period 2+ capex									0.00%	1.78%	3.50%	3.37%	3.25%	3.14%	3.02%	2.92%	2.81%	2.71%
Reversed depreciation - first period capex									2.71%	2.81%	2.92%	3.02%	3.14%	3.25%	3.37%	3.50%	1.78%	0.00%
Depreciation - declining balance									(0.66)	(2.15)	(4.02)	(6.38)	(8.91)	(11.40)	(14.04)	(16.63)	(19.13)	(22.05)

2 Property Plant & Equipment

Asset life (years)	25.00																	
Depreciation method	Declining balance	8.00	declining balance multiple															
Gross capital expenditure		No	switch to straight line?						3.71	5.27	6.73	3.68	4.39	7.40	7.62	6.99	7.02	8.86
Tax Depreciation - new									0.59	1.84	3.17	3.82	3.89	4.53	5.49	6.07	6.37	6.87
Declining balance cumulative depreciation term - first period cape									0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50
Declining balance cumulative depreciation term - period 2+ cape									-	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50
Periodic depreciation % - first period capex									16.00%	26.88%	18.28%	12.43%	8.45%	5.75%	3.91%	2.66%	1.81%	1.23%
Periodic depreciation % - period 2+ capex									0.00%	16.00%	26.88%	18.28%	12.43%	8.45%	5.75%	3.91%	2.66%	1.81%
Reversed depreciation - first period capex									1.81%	2.66%	3.91%	5.75%	8.45%	12.43%	18.28%	26.88%	16.00%	0.00%
Depreciation - declining balance									(0.59)	(1.84)	(3.17)	(3.82)	(3.89)	(4.53)	(5.49)	(6.07)	(6.37)	(6.87)

Cash, debt and tax assumptions

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	FIRST REG PERIOD			SECOND REG PERIOD				THIRD REG PERIOD					FOURTH REG PERIOD				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
									1	2	3	4	5	6	7	8	9	10
3 Intangibles																		
Asset life (years)	5.00																	
Depreciation method	Declining balance	40.00	declining balance multiple															
Gross capital expenditure		No	switch to straight line?						2.08	2.93	3.78	4.69	5.37	4.72	4.08	6.08	7.12	5.76
Tax Depreciation - new									1.04	2.50	3.36	4.24	5.03	5.05	4.40	5.08	6.60	6.44
Declining balance cumulative depreciation term - first period capex									0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Declining balance cumulative depreciation term - period 2+ capex									-	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Periodic depreciation % - first period capex									50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Periodic depreciation % - period 2+ capex									0.00%	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Reversed depreciation - first period capex									0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	50.00%	0.00%
Depreciation - declining balance									(1.04)	(2.50)	(3.36)	(4.24)	(5.03)	(5.05)	(4.40)	(5.08)	(6.60)	(6.44)

Revenue requirement detail

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Revenue requirement and RAV outputs																			
Revenue requirement																			
Operating expenditure										0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Return on assets to 30/6/13										14.22	14.00	13.78	13.56	13.34	13.12	12.90	12.68	12.45	12.19
Regulatory depreciation of assets to 30/6/13										4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
Return on new assets										(0.20)	(0.68)	(1.22)	(1.82)	(2.43)	(3.03)	(3.70)	(4.51)	(3.67)	(0.75)
Regulatory depreciation of new assets										0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Adjustments from last period										-	-	-	-	-	-	-	-	-	-
Tax liability										-	5.68	9.90	10.00	8.52	4.16	5.35	6.82	9.37	12.03
Total revenue requirement		43.12	41.85	43.10	53.16	59.42	65.03	70.53	76.48	**18.47**	**23.77**	**27.68**	**27.69**	**26.25**	**21.97**	**23.25**	**24.62**	**28.61**	**114.62**
									0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
Revenue requirement detail																			
WACC detail																			
Risk Free Rate (Real)		2.1%																	
Debt Premium		2.4%																	
Equity Premium		6.0%																	
Equity Beta		65.0%																	
Gearing (Debt/Assets)		60.0%																	
Forecast Inflation		2.8%																	
Franking credit value		0.5																	
'Vanilla' After Tax WACC (Real)		**5.1%**																	
Existing assets detail																			
Opening asset base	107.98	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	276.74	272.43	268.12	263.81	259.50	255.19	250.88	246.56	241.55
plus capital expenditure	25.98	29.78	26.55	39.64	41.78	38.88	33.53	26.44	18.86										
less customer contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74										
less government contributions	-	-	4.14	-	-	-	-	-	0.10										
less regulatory depreciation	6.67	6.05	5.90	6.45	4.00	4.80	5.43	5.86	6.17	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
less disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80	0.80
Closing asset base	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	276.74	272.43	268.12	263.81	259.50	255.19	250.88	246.56	241.55	236.53
Average asset base	110.23	121.67	137.72	158.15	188.31	219.59	246.13	265.65	277.18	278.90	274.59	270.28	265.96	261.65	257.34	253.03	248.72	244.06	239.04
Return on assets	5.85	6.57	7.39	8.34	10.06	9.80	9.54	9.28	9.02	14.22	14.00	13.78	13.56	13.34	13.12	12.90	12.68	12.45	12.19
Return on and of existing assets	**12.52**	**12.63**	**13.28**	**14.79**	**14.07**	**14.60**	**14.98**	**15.14**	**15.19**	**18.44**	**18.22**	**18.00**	**17.78**	**17.56**	**17.34**	**17.12**	**16.90**	**16.66**	**16.41**

Revenue requirement detail

Western Water

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Revenue requirement and RAV outputs																			
Revenue requirement																			
Operating expenditure										0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Return on assets to 30/6/13										14.22	14.00	13.78	13.56	13.34	13.12	12.90	12.68	12.45	12.19
Regulatory depreciation of assets to 30/6/13										4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
Return on new assets										(0.20)	(0.68)	(1.22)	(1.82)	(2.43)	(3.03)	(3.70)	(4.51)	(3.67)	(0.75)
Regulatory depreciation of new assets										0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Adjustments from last period										-	-	-	-	-	-	-	-	-	-
Tax liability										-	5.68	9.90	10.00	8.52	4.16	5.35	6.82	9.37	12.03
Total revenue requirement		43.12	41.85	43.10	53.16	59.42	65.03	70.53	76.48	**18.47**	**23.77**	**27.68**	**27.69**	**26.25**	**21.97**	**23.25**	**24.62**	**28.61**	**114.62**
									0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
New capital expenditure																			
Opening asset base										-	(7.79)	(18.73)	(29.30)	(41.94)	(53.31)	(65.37)	(79.85)	(97.00)	(47.10)
plus capital expenditure										0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	70.12	88.53
less customer contributions										6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
less government contributions										1.25	3.18	1.94	2.87	-	-	-	-	-	-
less regulatory depreciation										0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
less disposals (all disposals included in existing assets)										-	-	-	-	-	-	-	-	-	-
Closing asset base										(7.79)	(18.73)	(29.30)	(41.94)	(53.31)	(65.37)	(79.85)	(97.00)	(47.10)	17.50
Average asset base										(3.90)	(13.26)	(24.01)	(35.62)	(47.62)	(59.34)	(72.61)	(88.43)	(72.05)	(14.80)
Return on assets (new)										(0.20)	(0.68)	(1.22)	(1.82)	(2.43)	(3.03)	(3.70)	(4.51)	(3.67)	(0.75)
Return on and of new assets										**(0.07)**	**(0.22)**	**(0.32)**	**(0.18)**	**0.07**	**0.38**	**0.68**	**0.81**	**2.48**	**6.43**
Rolled forward RAV																			
Opening asset base	107.98	112.48	130.86	144.59	171.71	204.92	234.25	258.01	273.30	281.05	268.95	253.70	238.82	221.87	206.19	189.82	171.03	149.56	194.45
plus capital expenditure	25.98	29.78	26.55	39.64	41.78	38.88	33.53	26.44	18.86	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	70.12	88.53
less customer contributions	13.87	3.34	1.87	5.11	3.89	3.91	3.79	5.20	4.74	6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
less government contributions	-	-	4.14	-	-	-	-	-	0.10	1.25	3.18	1.94	2.87	-	-	-	-	-	-
less regulatory depreciation	6.67	6.05	5.90	6.45	4.00	4.80	5.43	5.86	6.17	4.35	4.67	5.13	5.85	6.72	7.62	8.60	9.53	10.37	11.40
less disposals	0.94	2.01	0.93	0.96	0.68	0.84	0.55	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80	0.80
Rolled forward RAV	**112.48**	**130.86**	**144.59**	**171.71**	**204.92**	**234.25**	**258.01**	**273.30**	**281.05**	**268.95**	**253.70**	**238.82**	**221.87**	**206.19**	**189.82**	**171.03**	**149.56**	**194.45**	**254.04**

Revenue requirement detail

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	FIRST REG PERIOD				SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD				
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Revenue requirement and RAV outputs																			
Revenue requirement																			
Operating expenditure										0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Return on assets to 30/6/13										14.22	14.00	13.78	13.56	13.34	13.12	12.90	12.68	12.45	12.19
Regulatory depreciation of assets to 30/6/13										4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
Return on new assets										(0.20)	(0.68)	(1.22)	(1.82)	(2.43)	(3.03)	(3.70)	(4.51)	(3.67)	(0.75)
Regulatory depreciation of new assets										0.13	0.45	0.91	1.63	2.50	3.40	4.39	5.31	6.16	7.18
Adjustments from last period										-	-	-	-	-	-	-	-	-	-
Tax liability										-	5.68	9.90	10.00	8.52	4.16	5.35	6.82	9.37	12.03
Total revenue requirement		43.12	41.85	43.10	53.16	59.42	65.03	70.53	76.48	**18.47**	**23.77**	**27.68**	**27.69**	**26.25**	**21.97**	**23.25**	**24.62**	**28.61**	**114.62**
									0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
Benchmark tax liability																			
Parameters																			
Forecast inflation	2.0%	2.4%	3.0%	2.4%	4.2%	2.5%	2.9%	3.3%	1.6%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%
Inflation factor	0.803	0.822	0.846	0.867	0.904	0.926	0.953	0.984	1.000	1.028	1.056	1.085	1.115	1.145	1.177	1.209	1.242	1.277	1.312
Gearing	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Tax rate	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Risk free rate (real)										2.10%									
Debt premium										2.35%									
Cost of debt (nominal)										7.32%									
Franking credit value										50%									
Taxation calculation																			
$m, 01/01/13																			
Revenue requirement										18.47	18.09	17.78	17.69	17.73	17.81	17.90	17.80	19.24	102.59
Customer contributions										6.50	7.40	7.82	8.24	8.96	8.75	10.19	11.94	14.06	16.74
Government contributions										1.25	3.18	1.94	2.87	-	-	-	-	-	-
Gifted assets										15.48	17.69	18.86	20.72	26.31	27.24	32.20	38.40	46.15	55.89
Operating & maintenance expenditure										0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	79.76
Average RAV										275.00	261.33	246.26	230.35	214.03	198.00	180.42	160.29	172.00	224.24
Debt (60% of ARAV)										165.00	156.80	147.76	138.21	128.42	118.80	108.25	96.18	103.20	134.54
$m (MOD)																			
Revenue requirement										18.98	19.10	19.29	19.72	20.30	20.96	21.64	22.12	24.56	134.57
Customer contributions										6.68	7.82	8.48	9.18	10.26	10.30	12.32	14.83	17.95	21.96
Government contributions										1.29	3.36	2.10	3.20	-	-	-	-	-	-
Gifted assets										15.90	18.67	20.46	23.10	30.14	32.06	38.93	47.70	58.91	73.31
Operating & maintenance expenditure										0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	104.61
Tax depreciation (new)										2.29	6.50	10.55	14.44	17.83	20.98	23.93	27.77	32.10	35.36
Tax depreciation (existing)										16.34	14.92	13.74	12.74	11.96	11.12	10.34	9.62	8.95	8.32
Interest										12.41	12.12	11.74	11.28	10.77	10.24	9.58	8.75	9.65	12.92
Tax losses brought forward										2.05	-	-	-	-	-	-	-	-	-
Before tax net income										8.36	11.95	12.09	13.44	20.03	20.86	28.92	38.39	50.61	68.63
Benchmark gross tax liability										2.95	4.22	4.27	4.74	7.07	7.36	10.21	13.55	17.86	24.22
Franking benefit										1.48	2.11	2.13	2.37	3.53	3.68	5.10	6.77	8.93	12.11
Tax attributed to non-prescribed services										0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	-
Benchmark tax liability (MOD)										1.38	2.01	2.04	2.28	3.44	3.59	5.01	6.68	8.84	12.11
Benchmark tax liability (real)										**1.34**	**1.91**	**1.88**	**2.04**	**3.00**	**3.05**	**4.14**	**5.38**	**6.92**	**9.23**

Service Standards and GSLs

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD						
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	5 Year Act Avg	5 Year Fcst Avg
	ACTUAL			ACTUAL				APPROVED	FORECAST					FORECAST						
Water																				
Unplanned water supply interruptions (per 100km)	23.20	22.60	19.60	17.00	11.60	12.90	13.85	20.00	17.90	17.90	17.90	17.90	17.90	17.90	17.90	17.90	17.90	17.90	19.6	17.9
Average time taken to attend bursts and leaks (priority 1)	16.50	0.00	0.00	0.00	0.00	0.00	35.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	0.0	25.0
Average time taken to attend bursts and leaks (priority 2)	23.00	21.67	24.17	18.40	17.20	11.00	28.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	24.2	25.0
Average time taken to attend bursts and leaks (priority 3)	105.00	124.00	124.98	55.65	43.72	28.42	28.30	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	125.0	90.0
Unplanned water supply interruptions restored within 5 hours (per cent)	98.00	99.00	98.88	99.22	98.76	98.01	99.12	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.9	98.0
Planned water supply interruptions restored within 5 hours (per cent)	82.00	67.00	82.14	95.60	98.80	100.00	100.00	90.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	82.1	95.0
Average unplanned customer minutes off water supply	17.40	14.90	14.42	23.93	7.87	9.97	7.48	13.50	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	14.4	12.7
Average planned customer minutes off water supply	12.10	9.50	13.60	10.02	4.68	8.89	23.22	6.00	12.08	12.08	12.08	12.08	12.08	12.08	12.08	12.08	12.08	12.08	13.6	12.1
Average unplanned frequency of water supply interruptions	0.18	0.15	0.18	0.23	0.13	0.14	0.13	0.20	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.2	0.2
Average planned frequency of water supply interruptions	0.06	0.04	0.07	0.08	0.05	0.08	0.18	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.1	0.1
Average duration of unplanned water supply interruptions (minutes)	97.00	102.00	89.00	128.00	74.00	81.00	66.99	90.00	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	87.80	89.0	87.8
Average duration of planned water supply interruptions (minutes)	215.00	257.00	209.00	151.00	110.00	129.00	144.55	120.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	209.0	180.0
Number of customers experiencing more than 5 unplanned water supply interruptions in the year	1.00	1.00	1.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.0	2.0
Unaccounted for water	9.70%	10.90%	11.20%	9.90%	9.10%	8.72%	8.85%	8.00%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	9.55%	0.1	0.1
Sewerage																				
Sewerage blockages (per 100km)	28.20	29.40	27.64	28.44	30.02	21.70	15.58	27.00	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.68	24.7	24.7
Average time to attend sewer spills and blockages (minutes)	27.10	26.10	22.11	24.42	22.03	25.82	26.68	30.00	24.21	24.21	24.21	24.21	24.21	24.21	24.21	24.21	24.21	24.21	24.2	24.2
Average time to rectify a sewer blockage (minutes)	106.00	101.00	95.86	94.36	93.89	86.11	91.45	103.00	92.33	92.33	92.33	92.33	92.33	92.33	92.33	92.33	92.33	92.33	92.3	92.3
Spills contained within 5 hours (per cent)	100.00	100.00	100.00	100.00	99.31	100.00	100.00	100.00	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.9	99.9
Customers receiving more than 3 sewer blockages in the year	4.00	3.00	3.00	2.00	2.00	2.00	0.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.8	2.0
Customer service																				
Complaints to EWOV		45.00	36.00	50.00	48.00	48.00	48.00	46.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	46.0	1.0
Telephone calls answered within 30 seconds (as a per cent of all calls)		85.00	90.00	94.00	95.00	96.00	97.00	90.00	94.40	94.40	94.40	94.40	94.40	94.40	94.40	94.40	94.40	94.40	94.4	94.4

Minimum flow rates

20mm	20
25mm	35
32mm	60
40mm	90
50mm	160

Service Standards and GSLs

Western Water

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	FIRST REG PERIOD			SECOND REG PERIOD					THIRD REG PERIOD					FOURTH REG PERIOD						
Additional service standards																				
[CO2 / Green energy target] (tonne)			22,796	22,826	20,923	19,021	17,119	15,217	15,217	15,217	15,217	15,217	15,217	15,217	15,217	15,217	15,217	15,217	20537.0	15217.0
[Recycled water target] (%)	81.00%	84.00%	86.00%	88.00%	90.00%	92.00%	95.00%	100.00%	70.00%	80.00%	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%	0.9	0.9
[Biosolids reuse] (%)	60.00%	143.00%	132.00%	86.00%	100.00%	92.00%	97.00%	90.00%	90.00%	80.00%	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%	1.0	0.9
[Sewer backlog connections]	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%	1.0	1.0
[Environmental discharge indicator]	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%	1.0	1.0
[Drinking water quality indicators] E.coli (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%	1.0	1.0
[Drinking water quality indicators] Turbity (%)	100.00	100.00%	99.90%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%	1.0	1.0
Info statements turned around in 5 days (%)	79.00%	85.00%	86.00%	90.00%	90.00%	90.00%	90.00%	90.00%	90.00%	90.00%	90.00%	90.00%	90.00%	90%	90%	90%	90%	90%	0.9	0.9

Guaranteed Service Levels	**GSL Value - $nom**	**Number of GSL applicable events for each GSL indicator**															
Planned interruptions during peak hours (5am to 9am & 5pm to 11p	50		0	3	0	0	0	2	2	2	2	2	2	2	2	2	2
Planned water interruption longer than notification given	50		44	3	4	0	0	10	10	10	10	10	10	10	10	10	10
No more than 3 sewer interruptions in 12 months	50		0	2	0	0	0	1	1	1	1	1	1	1	1	1	1
Sewer spills within a house not contained within 1 hour of notificatio	500		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardship GSL	300		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Key business metrics

Western Water

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Figures in tables displayed in Real dollars

Western Water INDICATIVE INCOME STATEMENT

Financial Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	
Prescribed revenue	41.6	41.2	43.8	52.1	58.5	64.0	71.4	78.6	65.7	72.4	79.8	88.6	98.7	103.6	112.1	119.8	128.8	139.2	
Contributions and gifted assets	20.3	18.2	14.5	15.4	16.9	17.2	21.3	17.4	23.2	28.3	28.6	31.8	35.3	36.0	42.4	50.3	60.2	72.6	
Other revenue *	2.4	1.1	1.0	0.5	0.9	0.3	0.1	(0.3)	(0.1)	(0.2)	(0.1)	(0.2)	0.8	2.1	3.5	4.8	6.8	7.9	
Total revenue	**64.3**	**60.4**	**59.3**	**67.9**	**76.4**	**81.5**	**92.8**	**95.7**	**88.9**	**100.5**	**108.3**	**120.3**	**134.8**	**141.6**	**157.9**	**174.9**	**195.8**	**219.7**	
Prescribed operating expenditure	27.6	31.6	32.8	32.8	36.0	38.7	44.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	79.8	
Other operating expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WDV of assets disposed	1.7	1.4	-	1.2	1.5	1.5	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Total expenditure	**29.3**	**33.0**	**32.8**	**34.0**	**37.5**	**40.2**	**45.7**	**1.2**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**81.0**	
EBITDA	**34.9**	**27.4**	**26.5**	**33.9**	**38.9**	**41.4**	**47.1**	**94.4**	**87.6**	**99.2**	**107.0**	**119.0**	**133.5**	**140.4**	**156.7**	**173.6**	**194.5**	**138.8**	
Book depreciation	13.4	13.7	13.6	14.3	15.5	16.1	15.8	16.9	16.8	16.9	17.4	17.1	16.8	17.0	17.4	18.1	19.1	20.2	
EBIT	**21.6**	**13.7**	**12.8**	**19.6**	**23.4**	**25.3**	**31.4**	**77.6**	**70.8**	**82.3**	**89.7**	**101.8**	**116.7**	**123.4**	**139.2**	**155.5**	**175.5**	**118.6**	
Interest expense *	0.3	1.1	2.6	3.9	6.0	7.6	8.5	8.8	6.3	5.5	5.4	5.3	0.1	0.1	0.1	0.1	0.1	0.1	####
NPBT	**21.3**	**12.6**	**10.2**	**15.8**	**17.4**	**17.6**	**22.8**	**68.7**	**64.5**	**76.8**	**84.2**	**96.5**	**116.6**	**123.3**	**139.1**	**155.4**	**175.4**	**118.5**	
Income tax expense *	6.4	3.9	3.3	4.7	5.2	5.3	6.9	20.6	19.3	23.0	25.3	29.0	33.1	34.5	38.9	43.8	49.6	32.1	
NPAT	**14.9**	**8.7**	**7.0**	**11.0**	**12.2**	**12.3**	**16.0**	**48.1**	**45.1**	**53.8**	**59.0**	**67.6**	**83.5**	**88.7**	**100.3**	**111.7**	**125.8**	**86.4**	

Western Water PRESCRIBED REVENUE & OPERATING EXPENSES

Financial Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
REVENUE																		
Water	20.8	19.4	20.8	27.2	32.0	35.8	41.2	45.7	33.3	37.1	41.4	46.5	52.2	54.3	59.5	63.6	68.2	73.6
Sewerage	18.2	19.3	20.3	21.6	23.0	24.4	25.9	27.5	28.8	31.2	33.9	36.8	40.1	42.4	44.9	47.8	51.2	55.2
Bulk water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recycled water	0.1	0.3	0.7	0.8	1.0	1.3	1.8	2.4	0.8	1.2	1.6	2.3	3.0	3.7	4.4	5.1	6.0	7.0
Rural water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	2.5	2.3	2.1	2.5	2.5	2.5	2.6	3.0	2.8	2.9	3.0	3.1	3.4	3.1	3.2	3.2	3.3	3.4
TOTAL REVENUE	**41.6**	**41.2**	**43.8**	**52.1**	**58.5**	**64.0**	**71.4**	**78.6**	**65.7**	**72.4**	**79.8**	**88.6**	**98.7**	**103.6**	**112.1**	**119.8**	**128.8**	**139.2**
OPEX																		
Water	17.1	19.6	20.4	17.4	19.4	20.6	27.0	30.2	23.1	25.1	25.6	32.2	39.4	42.0	43.9	45.9	47.1	50.3
Sewerage	8.1	9.8	9.9	11.8	13.2	14.6	12.2	13.8	13.9	14.0	14.4	15.0	15.5	16.1	16.7	17.3	17.9	18.6
Bulk water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recycled water	0.6	0.6	0.9	1.6	1.5	1.7	3.5	4.0	4.0	4.1	4.4	4.5	4.6	4.9	5.1	5.3	5.4	5.6
Rural water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New obligations	-	-	-	-	-	-	-	0.5	0.5	0.7	0.8	1.0	1.1	1.2	1.2	1.2	1.3	1.3
Licence fees / Enviro levy	1.8	1.7	1.7	2.0	1.9	1.8	1.8	1.8	2.6	2.5	2.4	2.4	2.3	4.0	3.8	3.7	3.6	3.6
TOTAL OPEX	**27.6**	**31.6**	**32.8**	**32.8**	**36.0**	**38.7**	**44.5**	**50.3**	**44.1**	**46.5**	**47.6**	**55.1**	**62.9**	**68.2**	**70.8**	**73.5**	**75.3**	**79.4**

* Note: interest earned and interest expense (which impacts income tax expense) have been imputed for the second regulatory period based on forecast revenue and expenditure. Refer to the Indicators worksheet, Interest Adjustments section for assumptions.

Breakdown of tariff revenue - fixed v. variable

Capital expenditure by cost driver - regulatory period

Key business metrics

Western Water

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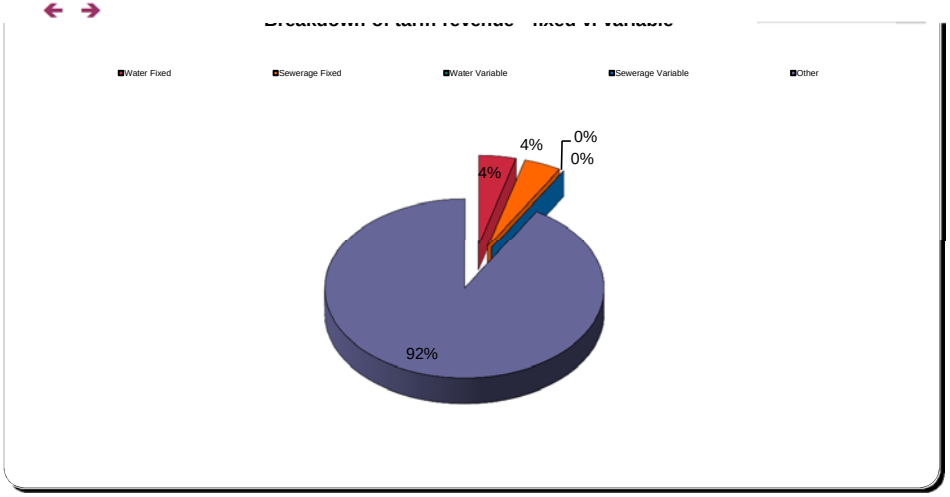

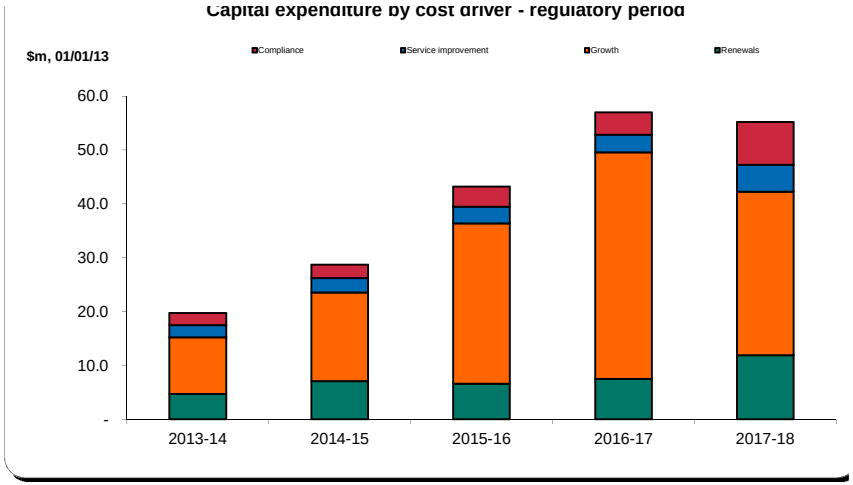

Appendix O

Hydrology Modelling

Appendix O – Hydrology Modelling

Historical Australian Climate

Climate, as distinct from the 'the weather' is a sum of previously recorded weather to provide the typical or most common weather conditions for a particular area. Climate can be broken into numerous different categories such as humidity, temperature, rainfall, wind, daylight hours, cloudy days, clear days, evaporation etc. For the purposes of water resources and supply planning, rainfall and temperature are critical.

Due to its geographical size, climate varies greatly across the Australian continent. Local climates range from tropical in the north to temperate in the south, with large differences between the coasts and the interior. This includes almost all types of environments, including desert, forest, grassland and alpine regions. However the Australian climate could be generally described as 'dry', with 80% of the land having annual rainfall less than 600mm and 50% having even less than 300mm annual rainfall.

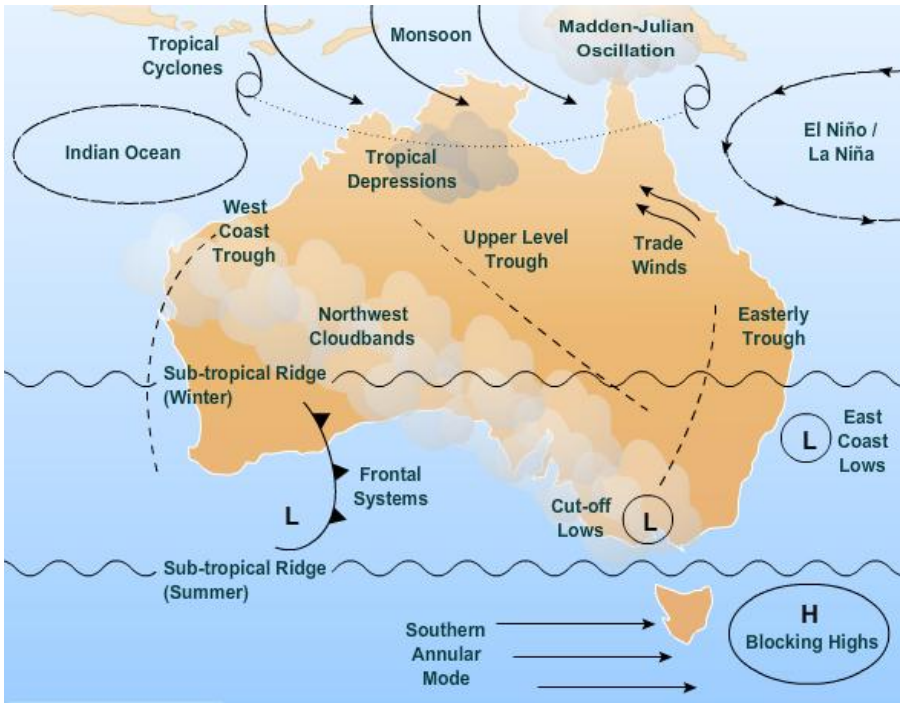

Figure 1: Map illustrating the climate drivers influencing Australia

While the seasonal cycle (changes in weather across summer, autumn, winter and spring) dominates climate variability in most parts of the world, considerable departures from 'typical' seasonal conditions are a strong feature of Australia's climate.

Australian climate from month to month and year to year is strongly affected by what is occurring in the surrounding oceans and also the belt of air to the south of the mainland called the sub-tropical ridge. In particular, 'abnormal' seasonal rainfall is driven by variations (warming or cooling) in ocean temperatures to the north, east and west of Australia. Periodic changes in local ocean temperatures are closely connected with El Niño (cooler oceans and below average rainfall) and La Niña (warmer oceans above average rainfall) events.

Victoria's climate matches that of the rest of Australia in that it varies geographically. The Mallee area in the North West is typically hot and dry, some areas receive less than 250mm of rainfall annually while the Alpine ranges, though can still be quite hot, may receive 1800mm of rainfall annually. Importantly, the climate of south-eastern Australia sits at a confluence between tropical

climate influences from the north and temperature climate influences from the south. This means that the region is strongly influenced by natural climate variability.

Western Water is located in the lowland plains to the west of Melbourne and has an average long term rainfall of less than 600mm annually. The rainfall in the Western Water region is in stark contrast to the east of Melbourne where the majority of the city's water catchments are located. Rainfall averages for these areas are typically greater than 1000mm annually. It is thus prudent for Western Water to plan for a drier climate than that experienced in Melbourne. The figure below illustrates this significant difference in rainfall to the west of Melbourne.

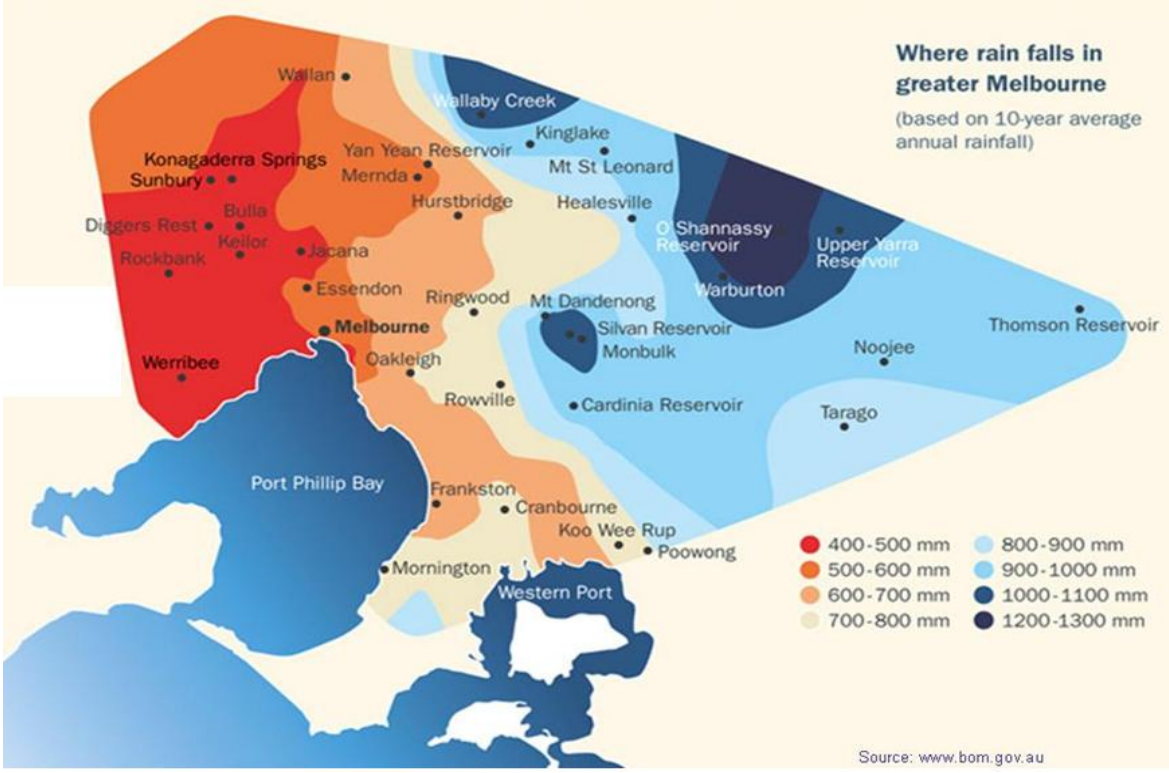

Figure 2: Isohyet map demonstrating the drier climate in the Western Water region

Recent Millennium Drought and Impacts on Western Water

During the period of 1997-2009, a large part of south-eastern Australia underwent an unprecedented drought now known as the Millennium Drought. Much of the state of Victoria recorded annual rainfall totals that were the lowest on record (Victorian Government, 2011). It was longer than any other period of rainfall deficiency, with no significant wet years to offset the dry years until 2010 (CSIRO, 2010). This caused a large impact on water resources mainly because the highest seasonal period of rainfall deficiency was seen in autumn (-25%) resulting in dry catchments leading into the historical filling seasons in winter and spring. The filling season was also effected during this period with rainfall deficiencies between -5% to -9%. The impact of these deficiencies during this drought can be seen on the Western Water storage reservoirs in the below Figure 3.

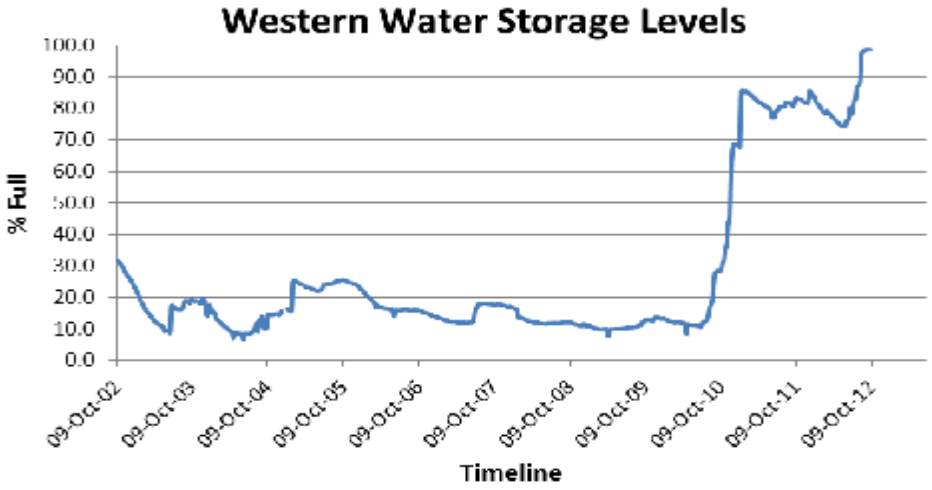

Figure 3: Graph displaying Western Water storage levels as a percentage during the latter half of the Millennium Drought and the rainfall received in 2010 until current

The drought ending rainfall that came about in 2010 was due to a La Niña event and followed with a second successive La Nina event in 2011. These two years were the highest recorded two year rainfall total on record.

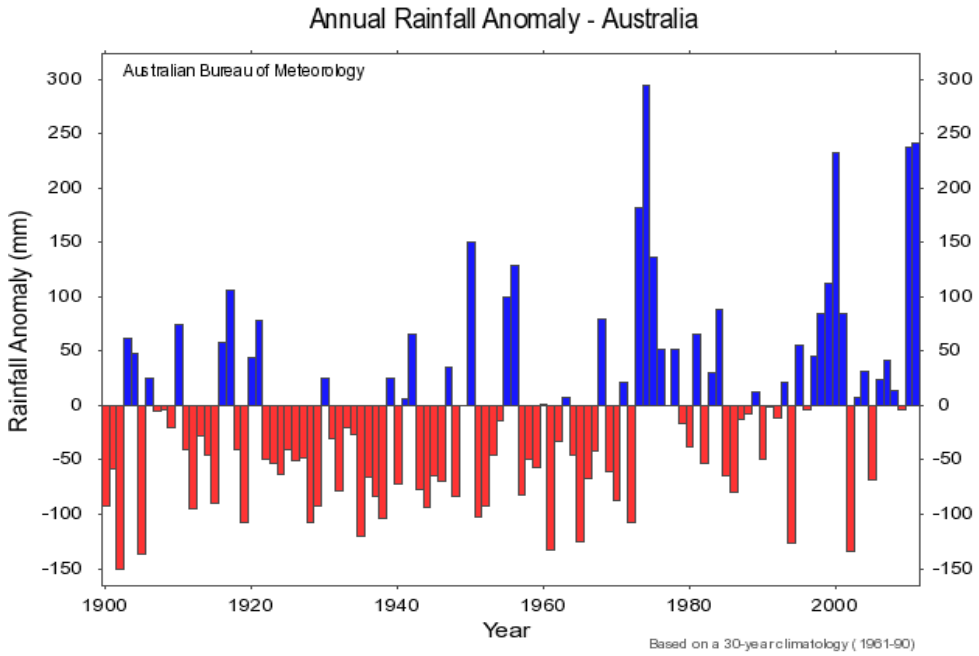

Figure 4: Graph displaying annual rainfall anomalies in Australia.
The final two blue columns are rainfall received in 2010 and 2011

The Millennium Drought followed by the heavy rainfall in 2010 and 2011 highlights the large extremes and variability in the Australian climate.

Predicting Future Climates

A prediction on the future climate is a probability statement on climate conditions based on historical and current weather conditions and assumptions about the physical processes that determine climates. Climate predictions can vary in scale from global to regional and from the near future to the far future.

Rainfall forecasts for the coming season (the next three months) are provided as the probability of receiving above or below historical median rainfall amounts. These forecasts are mostly informed by current conditions, particularly ocean temperatures. Predictions for the far future are provided as climate scenarios, based on knowledge of future drivers of climate such as greenhouse gases. Multiple models are developed to simulate climate systems to produce a 'most likely' scenario or a range of possible climate futures. It should be noted that these are probability predictions, and as such they provide an indication of rainfall that is likely based on current climate drivers. These are expressed as percentage chance, and it should be noted that outcomes with a greater than 80% chance of occurring are rarely possible for rainfall.

It should also be noted that rainfall is one of the most difficult things to predict into the future, a task made more complicated by the impact of global warming on regional climates. For every degree that the earth's atmosphere warms, global climate models (GCMs) produce different climate scenarios. Models also tend to produce a spread of results for single regions due to the innate complexity of rainfall. The challenge is estimating what the future global temperature increase may be, how physical processes that drive natural variability may change with the increase in global temperature and then how this impacts on natural climate variability for a given region.

In general, the approach taken is to run many different climate simulations across various different climate models. For the Victorian region, this process produces a range of different future scenarios, each with different probabilities.

Department of Sustainability and Environment Water Supply Demand Strategy Scenarios

The establishment and update of Water Supply Demand Strategies (WSDS) is a requirement by the Victorian Government for all Victorian Water Authorities. WSDS's are a key document when preparing a Water Plan. The Guidelines for the Development of a WSDS Version 2, prepared by the Victorian Government, provide four future climate scenarios – wet, median, dry and return to dry. Water authorities must develop their WSDS with regard to these four scenarios. The first three scenarios (wet, median and dry) were developed by CSIRO by running 15 different global climate models (GCMs).

The fourth scenario is a return to the conditions of the Millennium Drought of 1997-2009. This scenario has been included by the authors as research suggests it was at least partially linked to global warming mainly via intensification of the sub-tropical ridge. There is a possibility that this may again become a dominant influence on our climate. This inclusion is also informed by the fact that the recent drying was more severe than many climate models have predicted for the near future.

These scenarios are to be used when calculating system yields for water catchments. To assist with estimating system yields, figures were provided in the guidelines for each scenario such as future runoff (mm), change in future runoff (mm), change in future rainfall (%) and change in evapotranspiration (%).

The guidelines stated that there is no most likely scenario and future planning for water resource management should cater for a range of possible climate futures.

Current Predictions

To further assist in development of the WSDS and incorporation of it into the Water Plan, Western Water sought future climate predictions from a range of sources. Most climate predictions available are either short term seasonal (month to month) or long term (2030 and beyond).

Western Water has also undertaken Realm modelling for its key local catchments of the Rosslynne Reservoir and Lake Merrimu with the assistance of expert consultants. This data has been used in developing the inflow scenarios into these storages which were then applied in Western Water's Optimisation Model.

CSIRO

At the request of Western Water, CSIRO ran 18 GCMs for the region centred at 37.5^{O} S and 146.5^{O} E to produce predictions for the period 2013-2020. The results of the 18 models vary, the largest majority being 6 out of the 18 models indicating a warmer drier climate for Western Water's region with a 2.7% decrease in rainfall. A warmer much drier climate with a 5.9% decrease in rainfall was predicted by 4 out of 18 models. Additionally, 13 GCMs were run to predict future extreme rainfall events. While it is predicted the mean rainfall may decline, extreme rainfall events are very likely to increase. That is, we could expect fewer but heavier rainfall events in our region.

These predictions provided by CSIRO are of particular importance as they both focus on Western Water's region, and target the period of Water Plan 3.

South East Australian Climate Initiative (SEACI)

SEACI is an organisation set up in partnership with the CSIRO and the Bureau of Meteorology to improve understanding of the nature and cause of climate variability and change in south-eastern Australia. Climate model projections for the coming decades indicate an increasing risk of below average rainfall particularly across the south-east of Australia. Although the average rainfall may decline, particularly in the cooler months of the year, research also suggest that short-duration storms may become more intense across the region due to warmer temperatures providing stronger convection and an increase of moisture held in the air. SEACI states "*The future climate for south-eastern Australia will be one that still produces drought and floods, but where the average rainfall and runoff is likely to be lower. The low river flows experienced during the Millennium Drought may be expected to continue in the future*" (SEACI, 2011). The key message for water planning is that the filling season typically between May-November may not be as reliable in the future. Replenishment of storages may take place during spring/summer rainfall. Again, it is prudent to plan for conditions that are likely to be drier than long-term averages.

Bureau of Meteorology

Climate models have consistently predicted an intensification of the hydrological cycle as the planet warms which means less rainfall in the winter half of the year and more intense drought. Heavy rainfall events are likely to increase even in areas where drying will predominate.

Bureau scientists have highlighted the historical variability and changing climate we are seeing in these powerful words during a meeting with Water Businesses in Melbourne, *"due to the shift and*

variability of climate in Australia, predicting climate and hence water cycle scenarios for future planning by use of historical data, is becoming increasingly irrelevant" This, along with recently experienced extreme weather variability, requires Western Water to make a careful risk based assessment in its future water resources planning decisions.

The Western Water Scenario and Decision Matrix

Western Water is in a unique situation in the water industry in that it has a rainfall dependent source of *local* water at a relatively low price, and a more reliable but less rainfall dependent delivery entitlement of water from its *remote* Melbourne Headworks Bulk Entitlement (BE) which includes desalinated water as needed. As a consequence of this position, Western Water must use a risk management approach which considers all factors associated with the use of these dual sources of supply. Our *current* position is not one of water resource shortage, but rather one of *selection of which water source* is most cost effective for our customers depending on local weather conditions. There is a need to optimise the use of local water in order to minimise customer prices.

The other unique aspect of Western Water's situation is the very high residential growth expected over the planning period across the North and West of Melbourne. Growth is also a widely varying parameter in water supply and demand calculations, since growth and economics are closely tied together. While not as difficult to predict as the weather, growth has multiple drivers which must be both monitored and predicted.

Although there is a general consensus that South-Eastern Australia's future climate will produce a warmer and drier environment, it is prudent when optimising the use of local water to consider various climate scenarios, each of which yield a different level of inflow into local storages. In selecting the scenario on which to base its planning, a risk management approach must be taken. Assuming average conditions that do not eventuate will result in higher bulk water costs to Western Water resulting in inadequate funds to meet these costs. Conversely assuming very low inflows which are less than what actually happens would mean a lower cost of bulk water to Western Water.

A similar case can be presented for growth, with greater growth driving greater demand and ensuring adequate revenue, while a growth forecast shortfall will result in underfunding. To further complicate demand calculations, another key parameter is the water consumption of individual customers i.e. litres/person/day. Assuming a usage rate that is too high will result in a shortfall of in revenue, and vice versa.

Western Water is committed to providing minimised tariffs to its customers over the Water Plan, and as a consequence has adopted a risk based approach in each of the parameters around demand and supply per the examples above. In the case of inflows to local water storages, taking into account the expert and scientific advice as outlined in this paper, Western Water is planning for a 'Return to Dry' climate scenario. In doing this it plans to *ensure* adequate supply for its high growth forecast and low rainfall region. Decisions and forecasts made now, must be adaptive, and will be closely monitored to allow flexibility into the future. As actual results are realised Western Water will be in a better position to determine the bulk water purchases required.

References

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Appendix P

New Customer Contributions

Appendix P: New Customer Contributions

To be provided following review of new NCC framework, along with appropriate further amendments to Water Plan 2013/18.

This is due for submission to ESC by 7 December 2012.