



Clarence Valley and Coffs Harbour Regional Water Supply

Water Efficiency Strategic Plan



Final – adopted by Clarence Valley Council and Coffs Harbour City Council

October 2020

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**JOB 20-009: REGIONAL WATER EFFICIENCY STRATEGIC PLAN
 WATER EFFICIENCY STRATEGIC PLAN**

REV	DESCRIPTION	AUTHORS	REVIEW	APPROVAL	DATE
0	Draft for CVC and CHCC review	R. Campbell	K.Pratt	M. Howland	7 May 2020
1	Updated with feedback	R. Campbell		R. Campbell	21 May 2020
2	Rev 1 adopted by CVC and CHCC (October 2020)				2 November 2020

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1. INTRODUCTION

The 2020 *Water Efficiency Strategic Plan (WESP)* and *Water Efficiency Implementation Plan (WEIP)* for the Clarence Valley and Coffs Harbour Regional Water Supply Strategy (RWSS) build on the initiatives and successes of the 2007 and 2013 WESPs to continue to deliver comprehensive and effective water conservation programs throughout the region. These programs are part of wider strategies being implemented by Clarence Valley Council (CVC) and Coffs Harbour City Council (CHCC) such as Integrated Water Cycle Management (IWCM) to ensure water supply security across the region.

The RWSS was adopted in 1997 with the plan to secure raw water supply to the region (Coffs Harbour, Grafton, Maclean and Yamba and rural and coast communities). Water efficiency measures were adopted as an integral component of the RWSS. A Water Efficiency Plan (WEP, MWH, 2000) was developed with the aim of deferring the next major water source development from 2021 to 2046. The WEP included increased use of water efficient devices and technologies, community education, regulations and pricing to encourage water conservation. The WESP was reviewed in 2007 (Sustainable Futures, 2007) and again in 2013 (CVC and CHCC, 2013) following community, council and government agency consultation.

The 2020 WESP (this document) details the revised water efficiency strategies including project drivers and the conceptual framework, partnerships, demand indicators and targets. The WEIP (separate document) provides the actions required to implement the 2020 WESP. The Background Document (Hydrosphere Consulting, 2020) provides detailed information to support the WESP and WEIP. An Executive Summary (separate document) provides an overview of the WESP and WEIP (Figure 1).

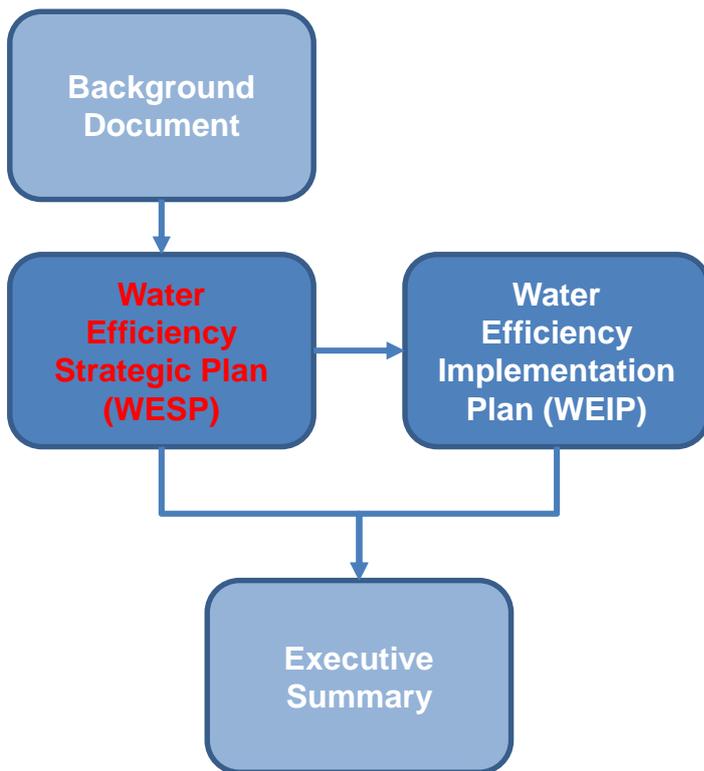


Figure 1: Regional water efficiency strategic planning document structure

The WESP will be reviewed and updated in four years (by June 2025).

2. WATER EFFICIENCY DRIVERS

Although the RWSS has provided increased water supply security for the region, the current (2019/20) drought has highlighted the need for an increased understanding of water usage patterns and strengthened water conservation measures. This WESP aligns with current demand management trends, community desires for water conservation, extraction licence requirements and best-practice management to achieve a range of demand management objectives.

An effective demand management program has far-reaching economic, social and environmental benefits. A key driver of this WESP is the economic benefit of deferring new water supply works. By reducing total water demand, the costs of building new water supplies and transferring and treating water are reduced and any capital investment required to meet the needs of growing communities can be deferred. An effective demand management strategy also has the potential to achieve reductions in the required capacity of new water supply infrastructure. This WESP will build on the achievements of past demand management actions in reducing water demand and deferring the need for new water supply sources.

Demand management programs also benefit the environment by reducing the need for, or lessening the footprint required for water supply infrastructure and the need for extraction from rivers and aquifers leading to increased river flow and improved river health.

The drivers for water efficiency in the Clarence Valley and Coffs Harbour region are summarised in the following table.

Table 1: Water efficiency drivers

Driver	Details	Considerations for the WESP
Water resource management	The 2000 WEP was originally developed with the aim of deferring the next major water source development to 2046.	Water efficiency measures will continue to support the sustainable use of existing water resources and deferral of water source development.
Climate change	CVC and CHCC recognise the predicted impact of climate change and the expected reduction in water availability in the future.	
Community expectations	<p>The development of the original WEP in 2000 included community input which highlighted a high level of water conservation and willingness to participate in further conservation measures.</p> <p>The natural environment of Clarence Valley and Coffs Harbour region is highly valued by the community. The community expects that water resources will be used sustainably.</p>	<p>CVC and CHCC will support community efforts to reduce water consumption through provision of resources, education programs and incentives to encourage uptake of water efficiency measures.</p> <p>The councils will provide leadership and incorporate water efficiency measures in their operations.</p>

Driver	Details	Considerations for the WESP
Extraction licence conditions	<p>A licence for water extraction from Shannon Creek Dam was issued to CVC in 2006 under the <i>Water Act, 1912</i>. The licence includes conditions relevant to demand management including:</p> <ul style="list-style-type: none"> • Maximum volume of water to be supplied to residential customers. • Preparation of a WEIP. • Inclusion of water efficiency targets for geographical areas supplied with water by CVC. • Compliance of constituent councils with the WESP and WEIP. • Annual reporting. • Publication and distribution of annual reports. • Compliance assessment. 	The WESP and WEIP will include water efficiency targets and implementation actions to address the licence requirements.
Integrated Planning and Reporting (IPR)	The CVC and CHCC Community Strategic Plans, Delivery Programs and Operational Plans recognise the community desire for sustainable use of water resources.	The delivery of the WEIP actions will be supported through the IPR process.
NSW Government Best-Practice requirements	Demand management requirements include demand monitoring, forecasting, planning and implementation.	The WESP and WEIP incorporate the best-practice requirements (refer Appendix 1).

3. WATER EFFICIENCY GOALS

Water demand management in the region is undertaken to support and maintain an effective, flexible and adaptable approach to efficient water use and water supply security. The aim of the WESP is to outline economically, socially and environmentally sound measures to achieve defined outcomes in water efficiency and conservation and water loss minimisation over the long term. CVC and CHCC will implement a cooperative and positive approach to delivery of this WESP and the WEIP.

Demand management also has a strong community engagement focus. As water demand education and awareness activities promote the uptake of water efficiency measures and highlight water wastage, they also engage the community to be better advocates for water conservation and protection, with the expectation that water is supplied, delivered and used efficiently.

The water efficiency goals from the 2013 WESP are considered to remain relevant and have been adopted with slight modifications based on outcomes of the 2020 review process (Table 2)

Table 2: Water efficiency goals

2020 WESP Goal	2020 WESP considerations
Goal 1: A cooperative and coordinated regional approach.	Resource sharing and council partnerships are strengthened through the WESP.
Goal 2: Regulatory measures to support efficient and careful water use.	Council regulations and policies reflect the individual community aspirations and characteristics and are not always identical within the council areas. However, where required to improve effectiveness, the WESP includes common measures for both councils.
Goal 3: Sustainable use of surface water resources.	The WESP will support environmental health through reducing water use and therefore the level of required water extraction and associated infrastructure and environmental impacts.
Goal 4: Cost effective and environmentally appropriate water efficiency measures.	<p>The water efficiency measures will assist in securing the long-term future of the region's water supplies and to defer and/or downsize future water source investments.</p> <p>The success of previous demand management measures has resulted in security of the RWSS beyond 2021. Secure yield studies and water source development is being addressed through separate council strategic planning.</p>
Goal 5: Effective and efficient management of water supply systems.	<p>The WESP focusses on ongoing water conservation during normal climate conditions. Drought restrictions and management measures are addressed in the separate council drought management plans and water restriction policies.</p> <p>The WESP includes strategies to reduce demand attributed to water losses and leakage from council infrastructure.</p> <p>The WESP includes effective mechanisms to monitor, report and evaluate the success of the demand management initiatives. CVC and CHCC will continue to develop a comprehensive understanding of water demand trends to inform demand management planning through reporting, monitoring and evaluation and alignment with best-practice guidelines.</p>
Goal 6: Consumer water use is efficient and environmentally sound.	<p>Water supply pricing is likely to be a highly effective demand management tool but will be addressed separately to this WESP as part of each council's financial planning. Each council has implemented a water supply pricing structure that supports the demand management measures in this WESP.</p> <p>Education and increasing community understanding of consumption patterns is a key component of the WESP. CVC and CHCC will continue to further develop the region's water conservation culture to stimulate the community, particularly high water users, to take action.</p> <p>The WESP reflects current best-practice and emerging technologies.</p>
Goal 7: Incentives and rebates support efficient, environmentally sound water use.	<p>Water supply pricing will reflect the individual Council financial considerations and will reflect the best-practice tariff structure.</p> <p>Rebates and other incentives will continue to feature in the WESP/WEIP to promote increased use of water efficient products and implementation of water conservation projects.</p>
Goal 8: A heightened awareness for efficient and careful water use.	Community involvement in water efficiency planning will continue through the Water Efficiency Working Group. Community education will be strengthened through the WESP/WEIP actions.

4. WATER EFFICIENCY STRATEGY

4.1 Existing Water Efficiency Measures

The water efficiency measures implemented to date are discussed in the Background Information (Hydrosphere Consulting, 2020) and summarised in Table 3.

Table 3: Existing water efficiency measures

Component	Measure	Summary
Pricing	Best-practice pricing	Best-practice pricing (user pays) has been implemented in the region.
Regulatory measures	NSW Government Building Sustainability Index (BASIX)	Water and energy reduction targets are mandatory in NSW for new residential dwellings and developments in excess of \$50,000.
	Water Efficiency Labelling and Standards (WELS)	National scheme requiring standardised testing and labelling of appliances to indicate the product's efficiency.
	Development controls	Development control plans and guidelines ensure developments incorporate best practice water sensitive urban design techniques.
	Permanent water conservation measures	Basic restrictions on water use during periods of normal water security are permanently in effect in each Council area.
Council policies	Integrated Planning and Reporting	Objectives, targets and actions support the continuation of water efficiency programs in the region.
	Concealed leak policies	CVC and CHCC will adjust water accounts due to concealed leaks under certain circumstances.
	Sustainability policies	CVC and CHCC have adopted policies recognising the need to use water efficiently in buildings and operations.
Water loss management	Leak detection and repair	The councils participated in a water loss management program in 2011 but there has been limited investment in recent times.
	Infrastructure renewal	The councils implement ongoing infrastructure renewal programs (e.g. water mains) which would result in reduced leakage and also replace older and potentially inaccurate water meters.
Rebates	Residential rebates	CHCC and CVC offer showerhead and toilet rebates. CVC also offers a rainwater tank rebate.
Education	General	Information on water saving measures is available on the council websites. Tours of water and sewer facilities are provided by CVC and CHCC for community groups and schools.
	Schools	CHCC and CVC have partnered with the NSW Department of Education, Kempsey Shire Council, Cascade Environmental Education Centre and more recently Bellingen Shire Council to deliver the Waterwise Schools program which provides teaching and learning opportunities for primary schools.

Component	Measure	Summary
Recycled water	Urban reuse (potable water substitution)	CHCC and CVC recycle treated wastewater from their sewage treatment plants in urban open space areas and continue to assess new opportunities to expand the reuse schemes. The councils also recycle water for agricultural uses.
Consultation	Water Efficiency Working Group (WEWG)	The WEWG includes councillors, community representatives and industry representatives. The WEWG meets on an annual basis and oversees the development and implementation of the WESP.
Data collection and reporting	Water extraction, production and demand data	The councils collect and report demand data on an annual basis as part of best-practice requirements.
	Annual reporting	CVC and CHCC provide annual reports in November each year including progress against WEIP actions, expenditure and supply and consumption data. These reports are presented to the WEWG at the annual meeting.

The existing water efficiency measures have been reviewed and modified as required to achieve the WESP goals. New measures have also been introduced.

Demand hardening will reduce the ability to achieve any further significant reduction in per capita consumption as the easier and more cost-effective measures have already been implemented. To address this, the WESP will include:

- Increased communication, promotion and customer engagement to increase uptake of the programs.
- Improved data collection and reporting processes to support the available resources for delivery of the actions.
- A stronger regional focus to achieve improved implementation and commitment to the actions.
- Staged implementation of digital technology to enhance the success of other actions.

4.2 Target Customer Sectors

The 2020 WESP and WEIP will target the major customer sectors to ensure a broad focus and the highest water users to ensure maximum water savings:

- Residential customers – as the largest customer group.
- Water losses – to reduce avoidable wastage.
- High residential water users – to assist residents to improve water efficiency and reduce water/sewer bills.
- High non-residential water users – to assist businesses and community groups to improve water efficiency and reduce water/sewer bills.
- Council water uses – to reduce council demand and provide leadership.
- Schools – to promote water efficiency measures to future generations.

4.3 Water Efficiency Targets

Clear and achievable targets can improve community understanding of water efficiency requirements as well as provide a measure of success to be monitored. The WESP will include CVC, CHCC and regional targets for:

- Non-Revenue Water (NRW, % and volume).
- Residential consumption.
- Total demand.
- Key Performance Indicators (KPIs) to provide a measure of the success of the outcomes of the WEIP actions.

The targets (Table 4) have been initially developed from the available data (refer Background Information) but may be adjusted as data collection improves over the life of the WESP. Effective mechanisms will be included to monitor, report and evaluate the success of the demand management initiatives.

Table 4: WESP targets

Indicator	Current (3 year average) - CVC	Current (3 year average) - CHCC	Current (3 year average) – RWSS	2024 RWSS target (4 year average)	2027 RWSS target (4 year average)	Comments
NRW (% of treated water production)	21%	12%	16%	14%	11%	<p>In 2017/18 the median NRW for LWUs with >10,000 properties was 11% (calculated from data in NSW Government, 2019). This is considered to be the minimum target for the region to achieve. The medians are expected to reduce as other LWUs implement demand management measures.</p> <p>Water loss is a critical component of the WESP and the targets reflect the need to be pro-active and committed to water loss reduction. A target of 2% reduction in NRW over 4 years and 5% reduction over 8 years is included but timely implementation of actions will be required to achieve this.</p> <p>The % and volume of NRW are dependent on the total volume of water supplied and consumed each year and are therefore indicative.</p>
NRW (ML/a)	1,291	707	1,999	1,670	1,270	
Residential consumption per connection (kL/a)	158	162	160	157	155	<p>In 2017/18 the median consumption for LWUs with >10,000 properties was 174 kL/a and the median for large coastal LWUs was 159 kL/a. The coastal LWU median is considered to be the minimum targets for the region to achieve. The medians are expected to reduce as other LWUs implement demand management measures.</p> <p>The majority of potable town water consumption in the region (69% of water sales) is from residential use and actions are proposed to target this sector.</p>
Total demand per connection (kL/a)	273	230	251	248	243	The demand is expected to reduce due to demand management measures implemented.
Residential demand per person (L/d)	181	148	160	155	150	The demand is expected to reduce due to demand management measures implemented.

4.4 Partnerships

Partnerships with other councils, the NSW Government and the community are important to ensure successful implementation of water efficiency measures as well as improve cost effectiveness. The WESP will include:

- Review and update of partnerships with external bodies:
 - Smart Approved WaterMark is Australia’s water conservation label, identifying and certifying water-efficient products and services and assisting households and businesses to select water efficient products and services. As part of their advisory role Smart Approved WaterMark provides members including businesses, water utilities and councils with a range of educational, interactive water saving resources. Smart Approved WaterMark also leads the Water Services Association of Australia (WSAA) Water Efficiency Network (WEN). The WEN takes an active role, reviewing water efficiency materials and programs and looking for improvements and opportunities to create an effective and robust national water efficiency framework.
 - Cascade Environmental Education Centre (NSW Department of Education) – as a delivery partner in the Waterwise Schools Program.
- Increased CVC and CHCC resource and responsibility sharing to increase knowledge and minimise duplication in roles and activities.
- The Water Efficiency Working Group (WEWG) will continue to provide a consultative role in the development and implementation of the WESP and WEIP. WEWG community representatives are appointed by the councils after calling for nominations of eligible persons from the community. Council representatives are appointed by their respective councils. Committee membership will be re-advertised in conjunction with the newly elected councils in 2021. The WEWG will review the draft WESP and WEIP in mid-2020.
- Community consultation and education through ongoing engagement with links to clear indicators and targets.
- Identification of potential new partnerships e.g. opportunities to undertake research in collaboration with a local university.

4.5 WEIP Actions

The WEIP will continue to include education components, rebates and water loss management. The opportunities for recycled water use will continue to be investigated by CVC and CHCC water businesses but will not be included as an action in the WEIP. Revised actions in the WEIP will include increased customer engagement and investment where warranted using modern technology and best-practice methods. Some actions will overlap with the responsibilities of other council business units and funding has been assumed for some actions that are not specific demand management responsibilities.

The success of the demand management initiatives also relies on accurate reporting of customer demand. The collection of regionally consistent and meaningful data to gauge the success of the actions relies on consistent definition and monitoring of customer and demand data across the region. Strategies to standardise the collection of data and the evaluation of demand across the region will be included to increase confidence in the information that is used to inform demand management planning.

Actions will consist of the following components:

1. Improved data collection and monitoring – development of a standard procedure for reporting of WEIP action status and KPIs (including format, responsibilities and timing), standardised definitions of connection types, reporting of customer data, consumption and water balance data. Adopted procedures will complement existing state/federal government reporting requirements.

Data collection actions will focus on the components of demand that are not well understood and would help to direct appropriate investment. Examples include: consumption patterns and drivers, the number of non-efficient households and high water users to provide improved understanding of water demand in terms of temporal and spatial differences, customer sectors and uses, short and long-term climate influences and other drivers of demand.
2. Targeting high water consumers – through an audit service focused on industries/customers that are committed to change and where there is cost effective water saving options available. Council facilities may be used as a case study (leading by example). Voluntary water audits, water efficiency plans and rebates will be directly offered to high residential and non-residential water users. Delivery will be supported by a recognition program and increased engagement.
3. Rebates – review and update existing programs, improve take-up through increased attractiveness (increased value and indexed each year) and marketing/promotion to target high residential and non-residential users. Based on the cost-benefit analysis (refer Background Information), rebates for showerheads and dual-flush toilets will continue to be offered. Rainwater tank rebates will continue to be offered by CVC due to the broad community support despite the limited cost-effectiveness. Broadening the rebates offered to include outdoor products would target outdoor water use and potentially reduce wastage and discretionary water use. CVC and CHCC will purchase certified products in bulk and sell these to customers at a subsidised price or refund a component of the cost of a certified product purchased by the customer.
4. Permanent water conservation measures – review and improve consistency including commercial, industry and council water use.
5. Water loss management – improved understanding of components of water losses through monitoring and analysis and development of targeted measures to reduce water leakage.
6. Smart metering - progressive development and implementation of digital technology to improve data capture, maximise the accessibility and distribution of data, improve timeliness of data provision and improve data analysis and problem-solving. A smart metering program will be developed and optimised as this is a potentially highly effective technology to identify leaks and high consumption. While this will be the initial focus for digital integration, the wider benefits such as cost efficiencies due to task automation, improved service reliability and increased customer understanding and involvement across the full range of council services will be further investigated over the longer term.
7. Water efficiency improvements for council operations such as flushing mains, open space irrigation and facilities maintenance. Analysis of water use and procedures is required prior to development of an improvement plan. Water efficiency improvements will be showcased (e.g. water efficient landscaping) to demonstrate leadership and encourage customer water efficiency.
8. Community engagement and education – the information available to customers (e.g. through council websites and water bills) will be reviewed with links to centralised information (e.g. from Smart Approved WaterMark), improved consistency and reduction in duplication between CVC and CHCC. Regular information will be provided through cost-effective methods such as social media. Community engagement will be improved through customer audits, competitions, school programs and innovative water efficiency ideas.

9. Schools education – expansion of existing program to target water consumption in school facilities with potential expansion to secondary schools. CVC and CHCC will review the delivery of the program with the other delivery partners with the aim of reducing administration and travel costs.

Complementary actions that are expected to continue in parallel with the WEIP include BASIX, WELS, best-practice pricing, development controls and council sustainability policies. CVC and CHCC will also continue the investigation and implementation of opportunities to increase potable water substitution through treated effluent reuse.

The ongoing monitoring and evaluation of WEIP actions will continue to inform the direction for demand management in the region. The actions will be designed to be flexible to adapt to changing circumstances such as demand patterns, community behaviour, technological advances and the availability of alternative water supplies as well as increased knowledge of demand management indicators and trends.

The demand management actions are detailed in the WEIP.

REFERENCES

CVC and CHCC (2013) *Regional Water Efficiency Strategic Plan*.

Hydrosphere Consulting (2020) *Water Efficiency Strategic Plan: Clarence Valley and Coffs Harbour Regional Water Supply - Background Information*

MWH (2000) *Clarence Valley/Coffs Harbour Water Efficiency Strategic Plan – Investigation Phase*.

NSW Government (2019) *LWU performance monitoring data and reports*

<https://www.industry.nsw.gov.au/water/water-utilities/lwu-performance-monitoring-data>, accessed October 2019

Sustainable Futures (2007) *Regional Water Efficiency Strategic Plan*.

GLOSSARY AND ABBREVIATIONS

BASIX – Building Sustainability Index

CHCC – Coffs Harbour City Council

CVC – Clarence Valley Council

kL/a – kilolitres (1,000 litres per annum)

KPI – key performance indicator

L/d – litres per day

LWU – local water utility

ML/a – megalitres (1,000,000 litres per annum)

NRW – non-revenue water

RWSS – Regional Water Supply Scheme

WEP – Water Efficiency Plan (now WESP)

WEIP – Water Efficiency Implementation Plan

WELS – Water Efficient Labelling Scheme

WESP – Water Efficiency Strategic Plan

WEWG – Water Efficiency Working Group

Appendix 1. BEST-PRACTICE CHECKLIST

Table 5: Water conservation and demand management checklist – Appendix C of Best-Practice Management Guidelines

Topic	Outcome Achieved	CVC	CHCC
1. Demand Monitoring	A. Bulk water production metered and recorded on a daily basis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	B. All new free standing and multi-unit residential developments (both strata and non-strata) approved after 1 July 2004 must be separately metered	Recent properties with multiple tenancies are individually metered although consumption for multi-residential properties is not readily reported.	
	C. All free standing residential premises must be separately metered by 1 July 2007	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	D. LWUs should encourage separate metering of existing multi-unit residential developments, where cost-effective	Some properties with multiple tenancies are individually metered although consumption for multi-residential properties is not readily reported.	
	E. Customer water consumption billed at least three times a year (and preferably quarterly)	<input checked="" type="checkbox"/> Quarterly	<input checked="" type="checkbox"/> Quarterly
	F. Customers classified in accordance with the categories defined in the latest NSW Water Supply and Sewerage Performance Monitoring Report and consumptions reported annually	Classifications generally include residential and non-residential categories (commercial, industrial, rural, institutional, bulk sales, public parks, unbilled) as required. Total residential and non-residential consumption is reported annually.	
	G. If facing augmentation of the peak day capacity of your system, monitor and record service reservoir levels on a daily basis in high demand periods	N/A	
2. Demand Forecasting	A. Historical records corrected for influence of climate	To be undertaken as part of separate studies.	
	B. Data records screened for errors		
	C. Demand forecasts prepared for each customer category as well as for leakage and unaccounted for water (UFW)		

Topic	Outcome Achieved	CVC	CHCC
3. Demand Management Planning	A. Examined a range of long-term demand management measures including: retrofit programs, rebates for water, efficient appliances, rebates for rainwater tanks, rebates for garden mulch, effluent and stormwater re-use programs	<input checked="" type="checkbox"/> WESP Background Document.	
	B. Completed benefit/cost analysis of demand management measures that includes benefits from reduced capital works and lower operating costs.	<input checked="" type="checkbox"/> WESP Background Document.	
	C. Completed investment schedule/plan for implementing cost-effective demand management measures	<input checked="" type="checkbox"/> WEIP.	
4. Implementation	A. Subsidised and promoted at least two of the identified demand management initiatives, referred to in 3. above	<input checked="" type="checkbox"/> WEIP.	
	B. Examined the implementation of permanent water saving measures to minimise wastage, in accordance with Item 91 (iii) of the National Water Initiative	<input checked="" type="checkbox"/> Permanent water saving measures will be actively promoted.	
	C. Implemented a cost-effective leakage reduction program to reduce system water losses	<input checked="" type="checkbox"/> Water loss management plan to be documented	<input checked="" type="checkbox"/> Water loss management plan to be documented
	D. Ongoing customer education campaign focussing on the importance of conserving our valuable water resources	<input checked="" type="checkbox"/> WEIP.	
	E. If average residential water use per property exceeds that for the median NSW utility (290 kL/a in 2002/03) by over 20%, the LWU must show progress towards achieving a reduction in average residential use by 1 July 2007	<input checked="" type="checkbox"/> The average residential water use per property is below or similar to the NSW median. Regional targets for average residential water use have been included in the WESP. Local targets will be developed.	
	F. Monitoring program for reviewing the effectiveness of the implemented demand management measures	<input checked="" type="checkbox"/> WEIP.	

Source: DWE (2007). The outcome has been achieved. The outcome has not been achieved.