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## **Westernport Water**

Draft Water Supply Demand  
Strategy 2012

November 2011



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# 1. Context

## 1.1 What is a Water Supply Demand Strategy

The purpose of Westernport Water's Water Supply Demand Strategy (WSDS) is to identify the optimum mix of supply options and demand reduction measures to maintain a balance between the demand for water and the water available for supply within Westernport Water's region now and into the future. Each urban water authority in Victoria is required to develop a WSDS as detailed in their Statement of Obligations under the Water Industry Act 1994.

## 1.2 Previous Water Supply Demand Strategies

Westernport Water's first WSDS was released in March 2007 (Westernport Water, 2007). This strategy identified demand management actions and options for securing additional water in the context of the drought conditions at the time. Following the development of this strategy, a number of the options considered in this strategy were implemented. This included the connection of new supplies from Bass River and groundwater bores located in the Corinella aquifer to the system, and a series of water conservation actions.

In 2009, Westernport Water undertook an internal review of the 2007 WSDS. This process reviewed the balance between demand and supply following the upgrades to the Westernport Water supply system, and the impacts of the demand management actions that had been implemented. This review found that further action was required to ensure Westernport Water could meet demand under ongoing drought conditions. Following this review Westernport Water has developed a business case to support an upgrade to the capacity of Candowie Reservoir.

## 1.3 Strategy Development

The 2012 WSDS has used the 2009 WSDS review 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 to develop the strategy. Westernport Water has used these guidelines as the basis for the strategy development process.

To date the development of the strategy has involved:

- ▶ Review of the strategic aims of Westernport Water, including the level of service it will provide customers with;
- ▶ Updating water demand forecasts based on current information about water consumption trends;
- ▶ Updating water supply forecasts (system yield) based on current and upgraded Westernport Water supply infrastructure, and updated climate information;
- ▶ Consideration of demand management and additional supply options that will allow Westernport to meet its strategic objectives; and
- ▶ Consultation with the Westernport Water community through an open forum and the Customer Consultative Panel and other stakeholders about the issues being addressed in this strategy.



Following the submission of this draft strategy for review by DSE, the strategy will be finalised and 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 the technical supplement (GHD Document Number: 200543).

#### **1.4 Overview of Westernport Water**

Westernport Region Water Corporation (Westernport Water) provides water and wastewater services - wherever economically, environmentally and socially practicable - to properties and communities throughout its district. Westernport Water provides services to approximately 13,000 customers (60,000 in peak holiday periods) in an area covering 300 square kilometres encompassing Phillip Island and the district stretching from The Gurdies to Archies Creek.

Westernport Water has access to a diversified water supply shown in Figure 1. Water can be sourced from various Westernport Water managed supplies including:

- ▶ The Tennent Creek catchment via Candowie Reservoir;
- ▶ The Bass River; and
- ▶ Groundwater bores in the Corinella Aquifer.

Water from all of these sources is stored in Candowie Reservoir, before being treated at the Ian Bartlett Water Purification Plant. Following treatment the water is pumped to San Remo basin for distribution to Westernport Water customers.

From July 2012, Westernport Water will have access to the Melbourne supply system (Melbourne Headworks). Westernport Water will be allocated a volume each year that it can elect to take from the Melbourne system.

In addition to traditional water supply and wastewater services, Westernport Water also sells recycled water from its treatment plant at Cowes and is upgrading the plant to supply Class A recycled water for dual-pipe systems and other uses.

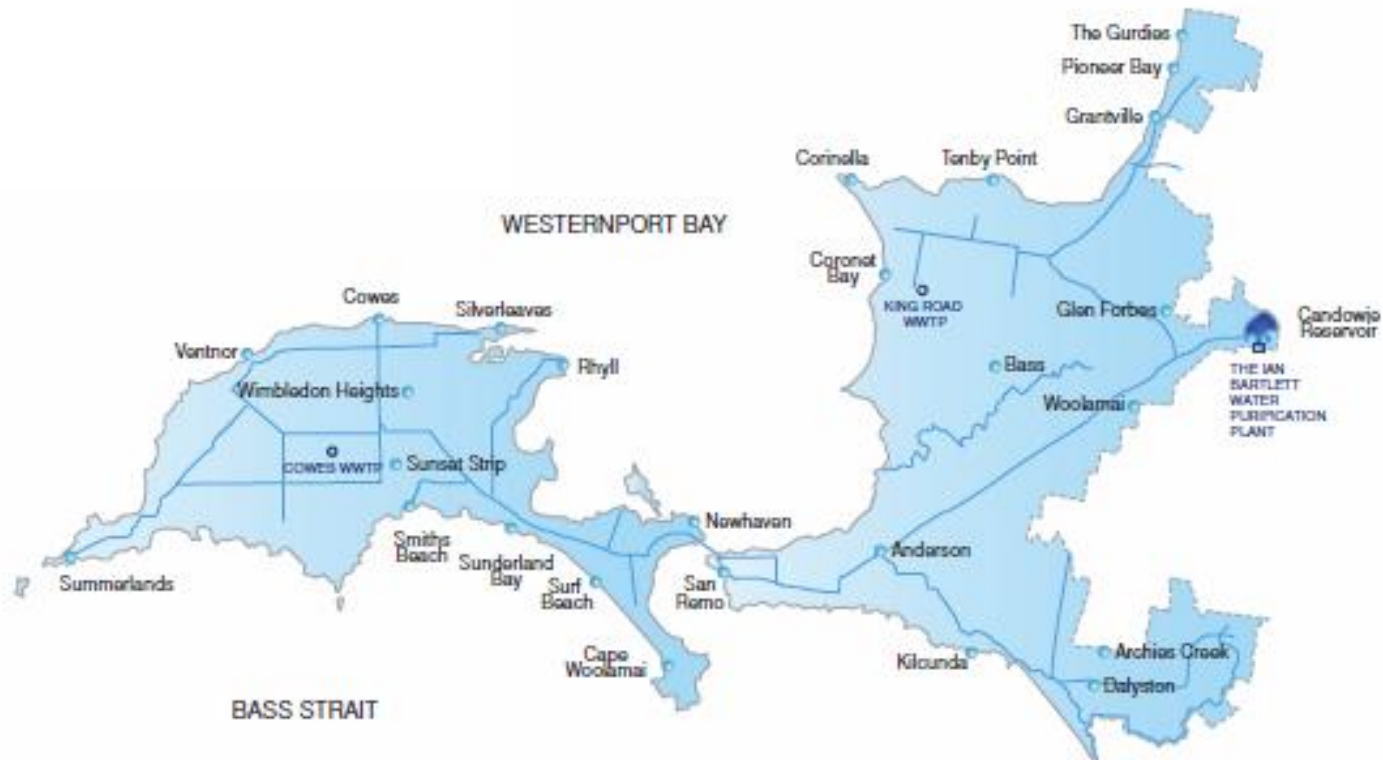


Figure 1 Westernport Water's water supply system (Westernport Water, 2011)

## 2. Water Supply Demand Strategy Objectives

### 2.1 WSDS Strategic Objective

The strategic objectives of Westernport Water's WSDS are to:

- ▶ Balance supply and demand at the lowest practical cost; and
- ▶ Provide Westernport Water customers with a reliable supply of water.

#### 2.1.1 Balancing supply and demand at the lowest practical cost

Westernport Water has access to a range of local water supplies infrastructure available to source water from as previously detailed. Each of these water supplies has a different cost associated with it. The cost of water from the Melbourne supply system is currently under negotiation, however, it is expected to be more expensive than water sourced from local assets managed by Westernport Water. To cost effectively balance supply and demand Westernport Water intends to maximise the use of water available from local sources managed by Westernport Water.

***Westernport Water's target is to provide the lowest practical cost of water to its customers.***

#### 2.1.2 Providing Westernport Water customers with a reliable supply of water

Westernport Water understands that a key element of meeting the needs of its customers is to provide a reliable supply of water. A reliable supply is one where customers can be confident of accessing the volume of water they require. Westernport Water intends to maintain the supply demand balance at a level where the need to restrict access to water by implementing water restrictions is minimised to an agreed level.

It is important to note that achieving a reliable water supply has cost implications. By spending more money, Westernport Water could increase its access to water, and provide a more reliable, but more expensive, water supply. Therefore a balance between cost and reliability is required.

***Westernport Water has adopted a target of maintaining a supply demand balance to ensure, on average, water restrictions are not required 95% of the time.***

Measures for reporting against these targets are discussed in Section 4.3.



## 3. Current Demand – Supply Balance

### 3.1 Demand Forecasting

#### 3.1.1 Uncertainty associated with demand forecasting

As part of the development of this WSDS, Westernport 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 Westernport Water's control. The major determinants of demand are population growth, climate and customer behaviour. In general water use is higher in hotter drier years than it is in cooler wetter years. To reflect the uncertainty in forecast demand, Westernport Water has developed a baseline demand forecast with an upper and lower bound to reflect a probable range of demand growth. These forecasts are based on historic water consumption, population growth projections for the area and recent trends in water use.

### 3.2 Supply Forecast

#### 3.2.1 Uncertainty associated with supply forecasting

Forecasting the available water supply is no easier than forecasting water demand. The major influence on water availability is climate, although 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.

The Westernport Water region, like all of Victoria, has experienced the impact of extremes in climate on its water supply. During the Millennium Drought (1997 – 2006) Westernport Water imposed Stage 4 water restrictions from December 2006 to April 2007. A decrease in water availability of this size had not been foreseen in any previous planning work, and therefore Westernport Water had little choice but to implement Stage 4 water restrictions.

Since this time, Westernport Water has adopted a conservative 'return to dry' supply forecasting scenario as the basis for their planning. The 'return to dry' supply forecasting scenario applies the climatic conditions experienced during 1997 – 2009 over the full historic record. This scenario considers the supply situation experienced during the Millennium Drought to be the new norm, and forecasts supply based on similar climatic conditions.

#### 3.2.2 System yield: how available water is described.

For the Westernport region system yield is the highest volume of water that can be extracted from the system without the imposition of restrictions more frequently than agreed. Yield is a function of system inflows, storage capacity and demand. System yield generally reflects the amount of supply available to meet demand in drier years. In average and wet years, more water will be available, while in very dry years (with restrictions) less water will be available.



### **3.3 Current Demand and Supply Balance**

#### **3.3.1 Basis for demand and supply balance**

The demand forecast has been developed using current demands as a starting point, and shows water consumption for the region increasing 1% a year to 2060. This accounts for a 2% growth in population however water consumption trends suggest that new developments have a 50% lower water consumption. The upper and lower bounds have been developed to illustrate a probable range of demand growth.

Westernport Water has forecast supply based on a supply system which includes an upgrade to Candowie Reservoir, and access to 1,000 ML of water from the Melbourne system. This system has been modelled under a conservative climate scenario replicating the Millennium Drought period of 1997 to 2006.

To reflect Westernport Water's aim of maximising the use of water from local resources managed by the corporation, the supply forecast has been explained in two parts: the supply available from locally managed resources, and the total supply available to the region (which includes the contribution of the Melbourne supply system).

#### **3.3.2 Current balance**

The current demand and supply balance for the Westernport Water system is shown in Figure 2. This balance reveals that Westernport Water has sufficient supply to meet demand over the 50 year planning period, and that the supply from Westernport Water managed resources should be sufficient to meet demand for the next 30 years (based on the baseline demand scenario).

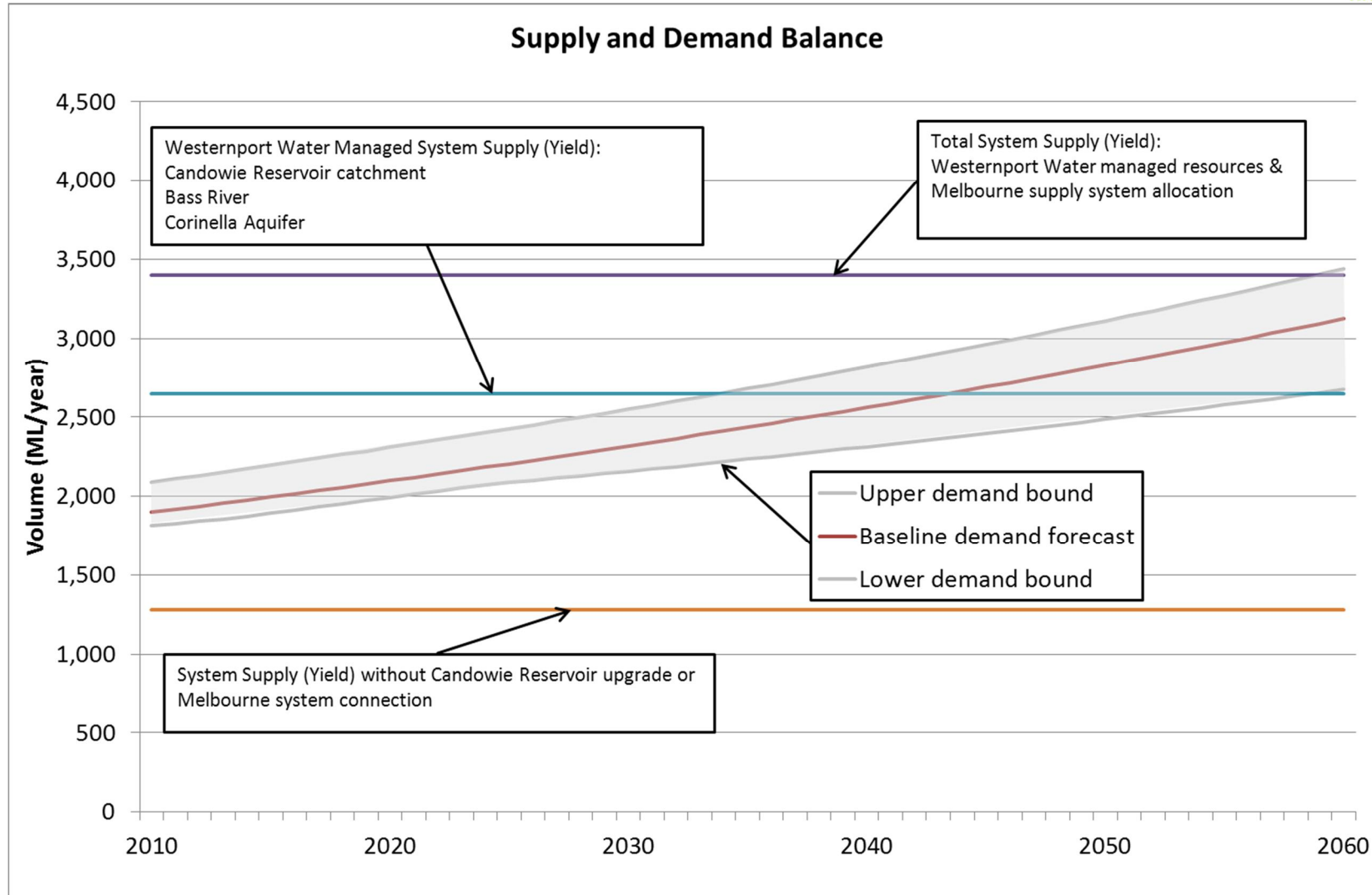


Figure 2 Current demand and supply balance

## 4. Actions to Maintain the Supply and Demand Balance

### 4.1 Why action is required

The demand and supply balance shown in the previous section shows that Westernport Water has sufficient water to meet demand for the short to medium term. 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 Westernport 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.

### 4.2 Actions

#### 4.2.1 Demand Side Actions

Efficient use of water is continually being pursued by Westernport Water through community education programs, the promotion of permanent water savings rules and leakage reduction programs. Westernport Water is also developing a Class A recycled water treatment plant to promote greater use of recycled water.

Given 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. Instead Westernport Water demand side actions will focus on reducing the uncertainty related to the demand forecast.

***Westernport Water will undertake community consultation to better understand the water use behaviours and attitudes of its customers. It will aim to determine the uptake of water conservation behaviours and appliances throughout the community to better understand the scope for demand management actions in the future.***

#### 4.2.2 Supply Side Actions

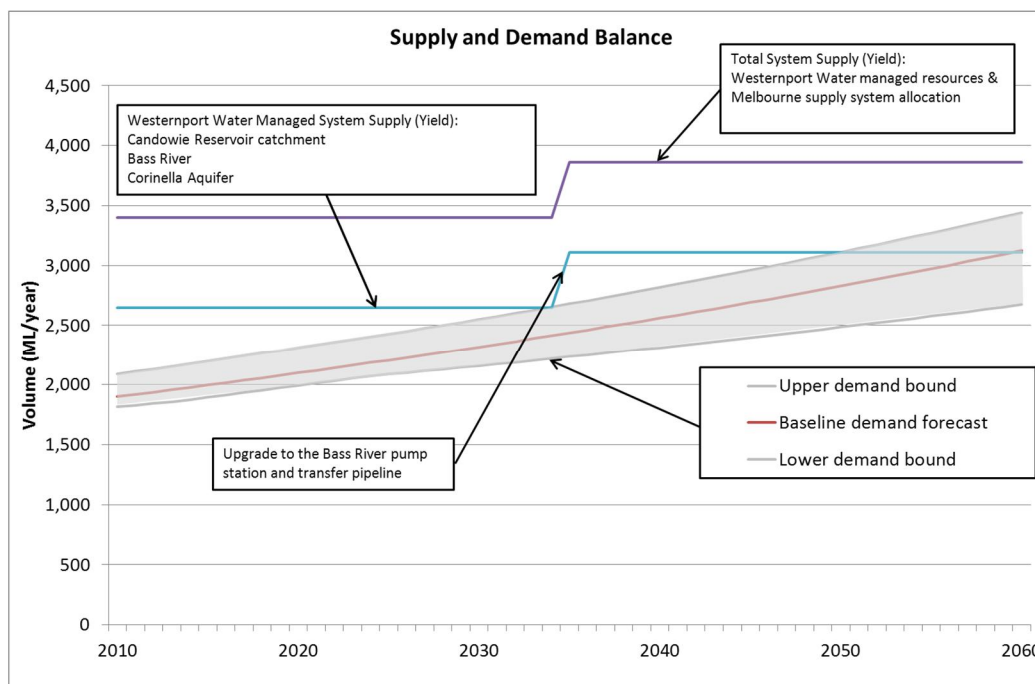
The demand and supply balance presented in Section 3.3.2 indicates that the Westernport Water supply system requires no augmentation in addition to those already included in this strategy in the short to middle term. However, previous planning work undertaken by Westernport Water has indicated that upgrading the capacity of the Bass River pump station and transfer pipeline would improve the system yield by a significant volume.

To allow Westernport Water to supply its customers with the most cost effective water supply, the corporation is aiming to maximise its use of locally managed resources. Therefore Westernport Water has adopted a supply and demand balance that incorporates the upgrade of the Bass River pump station when the local resource may no longer be sufficient to meet demand. Based on the baseline demand scenario this may occur in approximately 2035.

Westernport Water is entitled to divert up to 25 ML a day of water from Bass River, up to a total of 3,000 ML per year. The current Bass River pump station and transfer pipeline can divert approximately 15 ML per day of water from the Bass River, which limits Westernport's ability to diver the full 3,000 ML a year. Upgrading the pipeline capacity would allow Westernport to maximise its use of this entitlement.

**Westernport Water will maintain the upgrade of Bass River pump station and transfer pipeline as a supply side augmentation option should monitoring of the supply and demand balance indicate it is required.**

This upgrade has been previously estimated to improve the yield of the supply system by 460 ML per year (under the conservative supply scenario adopted for this strategy), resulting in the supply and demand balance shown in Figure 3.



**Figure 3 Demand and Supply balance with Bass River pump station and transfer pipeline upgrade**

### 4.3 WSDS Monitoring and Reporting

Westernport 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 1 Measures for monitoring the supply and demand balance**

Measure	What this may indicate
Actual demand compared to the forecast demand.	If demand is exceeding the forecast, and therefore action is required.
Actual Candowie Reservoir 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
Annual use of water from Corinella Aquifer and Melbourne system.	Increasing use of these resources indicate that the supply from Tennent Creek and Bass River may not be sufficient to meet demand
Volume of water stored in Candowie Reservoir	Indication of the volume of water currently available to meet supply in the short term (1 – 2 years).



An indicative template for reporting against these is shown in Appendix A. The results of this reporting will be used to determine which, if any actions from the WSDS or the Drought Response Plan are required. This reporting will also form that basis of Westernport Water's Water Security Outlook.

***Westernport Water will report against the assumptions that underpin the WSDS annually to monitor deviation from the demand and supply balance presented in this strategy.***

#### **4.4 Updating this Strategy**

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

#### **4.5 Having your say**

This Draft WSDS presents proposed supply and demand actions for the Westernport region to provide Westernport Water customers with a cost effective and reliable water supply.

Westernport Water welcomes submissions on this draft strategy from Westernport Customers and stakeholders. Submissions should be made to Geoff Russell on 03 5956 4140 or [grussell@westernportwater.com.au](mailto:grussell@westernportwater.com.au)



## 5. 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 (2011) Draft Water Supply Demand Strategy 2012 Technical Supplement (GHD Document Number: 200543), prepared for Westernport Water Corporation, November 2011

Westernport Water (2011), Westernport Water 2010 Annual Report, Westernport Water, August 2011



Appendix A  
Indicative WSDS Reporting



# Water Supply Demand Strategy – Monitoring & Reporting

<b>Objective:</b>	To balance supply and demand as closely as possible over time, and minimise deviation from forecast.																																																																																											
<b>Responsible:</b>	Steven Porter																																																																																											
<b>Performance measures:</b>	<p>Difference between forecast and actual demand</p> <p>Quarterly averaged inflows to Candowie Reservoir compared to 10% percentile</p> <p>Storage level in Candowie Reservoir</p> <p>Volume of water used from Corinella Aquifer and or MHW connection</p>																																																																																											
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<b>Commentary:</b>	<p>Demand has persisted higher than forecast. Likely to be due to local growth rates being higher than anticipated. Visitor/holiday maker numbers higher due to warm weather.</p> <p>Inflows have been declining over the past year.</p>																																																																																											



<b>Issues:</b>	As a result of low inflows storage levels are now at Trigger level 3. As a result water is being drawn from both Corinella and MHW connection in volumes greater than forecast.
<b>Impacts:</b>	Use of significant volumes from Corinella and MHW connection will impact water cost by approximately \$480,000 for the 12 months to Q2 201x.
<b>Actions:</b>	Implement Drought Response Plan actions: <ul style="list-style-type: none"><li>- Implement Stage 1 Water Restrictions.</li><li>- Implement voluntary water conservation campaign.</li></ul>
<b>Accountability:</b>	Merryl Todd (General Manager - Customer Relations)

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<sup>i</sup> Data provider: Customer Meters - Kylie White; Bulk Meters – Geoff Allum

Data sources: Metering and billing information from customer meters; and bulk meters at WTP etc.

Frequency of reporting: Quarterly

Accuracy: Metering ±3%





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0	H Clarke	V Ahuja		V Ahuja		10/11/11