



Water Price Review 2013: Rural Demand Forecasts

**A REPORT PREPARED FOR THE ESSENTIAL SERVICES
COMMISSION**

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PART A: Overview

1. Introduction

In Victoria there are 3 rural government owned businesses that will provide rural water services in the Water Plan 3 regulatory period¹. The services provided vary from business to business but typically include irrigation water delivery, domestic and stock water delivery and bulk water / storage services.

As monopoly providers these businesses are subject to economic regulation which is administered by the Essential Services Commission (ESC). The ESC is currently conducting a price review to regulated prices for the period. Demand forecasts are a central component of the price review. Demand forecasts have a direct impact on:

- Capital expenditure estimates — particularly where growth is a major driver of system augmentations.
- Operating and maintenance expenditure — particularly for expenditures that are volume related.
- Revenue and prices — for both fixed and volumetric charges.
- Service standards — ensuring that supply-demand balance is achieved, water pressure requirements are met and supply continuity is provided.

Therefore, it is important to ensure that demand forecasts are as accurate as possible in order to reduce regulatory risk and promote efficient regulatory outcomes.

1.1 Objective of the review

Frontier Economics has been engaged by the ESC to undertake a review and assessment of the demand forecasts prepared by the Victorian rural water businesses.

The businesses have prepared these forecasts for inclusion in their water plans for the five years 2013-14 to 2017-18. The ESC is currently undertaking the Water Price Review 2013 that will assess the reasonableness of the proposals set out in the businesses' water plans.

¹ Grampians Wimmera Mallee Water will not be providing irrigation water services and is decommissioning the Wimmera irrigation system following the sale of the Wimmera irrigation entitlement to the Commonwealth in December 2012.

The outcome of Frontier's review of the demand forecasts will be an input into the ESC's consideration of the businesses' water plans.

Frontier has been asked to review the forecasts against the following criteria:

- are based on appropriate forecasting methodologies
- reflect reasonable assumptions about the key drivers of demand
- use the best available information, including historical demand trends and relevant Water Supply and Demand Strategies
- are statistically unbiased
- account for different or changed tariff structures and elasticities.

1.2 Structure

This report is structured to provide a broad summary of Frontier's findings as well as providing a more detailed business specific examination of each of the businesses proposed forecasts. The report is structured as follows:

- Part A: Overview
 - Chapter 1 — Introduction
 - Chapter 2 — Frontier's approach
 - Chapter 3 — The context of rural demand forecasts
 - Chapter 4 — Key assumptions for rural demand forecasts
 - Chapter 5 — Rural considerations
- Part B: Business specific demand assessments.
 - Chapter 1 — Goulburn-Murray Water
 - Chapter 2 — Lower Murray Water (Rural)
 - Chapter 3 — Southern Rural Water.

2. Frontier's approach

In this chapter, we set out the framework that we have used to assess the key assumptions that most businesses have applied to develop their demand forecasts and provide our view on the validity of these assumptions over the next regulatory period. Our views on these assumptions are then used to assess each business's forecasts and the methodology and assumptions used in developing their forecasts (reported in the respective sections of Part B).

2.1 The review process

This report presents Frontier's final advice to the Essential Services Commission regarding the appropriateness of the Victorian water businesses' demand forecasts. The report is the final stage in a process that involved both analysis on the part of Frontier and managed consultation with the water businesses.

The initial analytical task was to review the information provided by the businesses in their submitted water plans and information templates. This initial review concentrated on establishing the completeness of the data provided by the businesses and identifying any underlying trends or anomalies in the data that required further investigation. In particular, Frontier identified:

- sudden changes in long-term trends that are unexplained
- changes in trends that are inconsistent with expectations
- inconsistencies with the data requirements of ESC.

Where any preliminary issues were identified during our initial scan they were addressed through an information/clarification request that was distributed to the relevant businesses. The requests outlined the issue identified and gave guidance on how the businesses should respond.

Where necessary Frontier directly liaised with the businesses on their initial submitted data and their responses to the information requests to ensure that any issues or perceived issues were not due to misunderstanding or basic error in the original submission.

Frontier then undertook a detailed assessment of the demand forecasts based on the information provided in the original water plan and the subsequent responses by the water businesses to information requests. Frontier provided the ESC with a draft report that outlined the approach Frontier had adopted in undertaking its assessment, the initial findings of its review and the recommended amendments to any forecasts deemed inappropriate.

Where Frontier believed the businesses' underlying assumptions were inappropriate we provided the ESC with reasonable, alternative forecasts that reflect more robust assumptions. These alternative forecasts were accompanied by an explanation of the reasoning supporting the alternative estimate, along with a description of the approach adopted by Frontier to generate the estimates.

Frontier's draft report was circulated to each of the businesses for comment. Frontier then undertook a round of consultation where businesses were invited to either meet with Frontier consultants on a face to face basis or to teleconference with the Frontier consultants. This round of consultation allowed the businesses to highlight any issues or concerns they may have with Frontier's findings and recommendations.

This final report takes into consideration all the information provided with the businesses' water plans and initial information requests along with the businesses responses to the Frontier's initial findings as laid out in the draft report.

2.2 Assessment of forecasts

The ESC has requested that the demand forecasts be assessed against five criteria:

- Forecasts are based on appropriate forecasting methodologies.
- Forecasts reflect reasonable assumptions about the key drivers of demand.
- Forecasts use the best available information
- Forecasts are statistically unbiased
- Forecasts account for different or changed tariff structures and elasticities.

Frontier has interpreted these criteria in the context of the scope and nature of the review.

- Appropriate forecasting methodologies — businesses have adopted methods for forecasting that are capable of providing reliable forecasts. They may be consistent with sector practice, been previously subject to regulatory review or broadly acknowledged as appropriate.
- Forecasts should reflect reasonable assumptions about the key drivers of demand — the base assumptions underlying the forecasts should be credible and defensible.

- Forecasts should use the best available information, including historical demand trends and relevant Water Supply and Demand Strategies — all forecasts should not only reference historical data but should also be based on the most recent available data.
- Forecasts are statistically unbiased —Frontier has interpreted this criteria to mean the methods adopted by businesses do not evidence any inherent systemic bias at a broad level.
- Forecasts should account for different or changed tariff structures and elasticities. Where businesses are proposing to amend their tariff structures the associated demand forecasts should also be amended to be consistent. For example, any business proposing to move from a three tier variable tariff to an two tier variable tariff will need to consider the impact of the tariff change on demand. Businesses will also need to consider how they have applied elasticity estimates to their forecasts.

On the basis of the information templates and the responses to information requests supplied by the businesses, Frontier has reviewed the businesses' proposed forecasts against the above criteria. In providing this advice we have had regard to:

- guidance issued by the ESC with respect to how it will assess the businesses' proposed demand forecasts
- the information set out in the businesses' Water Plans (and accompanying information templates), any explanations provided and their responses to our information requests
- comparison of proposed forecasts against historical trends
- comparisons of different businesses' forecasting methodologies, assumptions, and resulting forecasts
- relevant third party information such as Victorian Government policies which impact on demand and any readily available data and information on key demand drivers.
- Frontier's own experience in preparing and assessing the veracity of forecasts of demand for rural and urban water services in Victoria and other Australian States.

A more detailed framework for Frontier's assessment is set out in Box 1. It should be noted that our review of the proposed demand forecasts was high level in nature, in that it focused on the comparisons against historical trends and on the identification and validation (or otherwise) of the major assumptions

underlying the forecasts. The review did not constitute a bottoms up detailed audit of the mathematical integrity of each businesses forecasting model.

Box 1: Assessment Template

STEP 1 assessment of forecasting methods:

- the method's track record — historical ability to produce forecasts that are consistent with actual outcomes.
- the logical validity of the approach
- the acceptance of the approach within the broader sector
- the method's internal consistency

STEP 2 comparison against historical trends

- identify historical trends
- compare proposal against trends
- identify material deviations from trend
- identification of underlying assumptions

STEP 3 comparison across similar businesses

- comparison of assumptions against those referenced by businesses with similar characteristics

STEP 4 consideration of third party evidence

- comparison of assumptions against those relevant evidence provided by third parties

STEP 5 amendment of forecasts where appropriate

- where Frontier has identified incomplete or inappropriate forecasts we will amend forecasts to better reflect more robust assumptions
- Frontier takes the approach that any amendments recommended to forecasts should be robust and defensible and based on observable evidence

2.2.1 Comparison against historical trends

In the first instance Frontier assessed the scale and causes of any variances between the proposed forecasts and the observable trends based on historical data. This step will involved identifying trends in consumption/deliveries based on historical data. Forecasts were then compared to historical trends to enable the identification of instances where businesses are assuming step changes in consumption or material deviations from historical trends.

2.2.2 Comparisons across similar businesses

To aid in this assessment Frontier compared and contrasted the assumptions and methodologies adopted by different businesses. Of particular importance in the assessment of the forecasts is the identification and reasonableness of the underlying assumptions regarding the impact of weather on volumetric demands.

2.2.3 Consideration of third party evidence

Frontier also assessed the businesses' forecasts against evidence available from third parties or independent sources. Where possible, we identified independent third party views on:

- availability of water resources
- trends in technology and water use
- demand for commodities and commercial products produced by commercial water users.

2.3 Approach to adjusting forecasts

We have adjusted the businesses' forecasts where the information provided did not support the assumptions businesses' had used, or where information has not been forthcoming from the business. In most cases, we have adjusted the forecasts to bring them into line with the assumptions used by the other businesses, and/or the evidence available from third party sources. In doing so, we gave consideration to local conditions and modified the final assumption used to develop a revised set of forecasts.

Underlying Frontier's approach is a requirement that any amendments recommended to forecasts should be robust, defensible and based on observable evidence. There were instances throughout the review where Frontier expressed concerns regarding certain aspects of forecasts, however reliable alternative information upon which to base an adjustment was not available. In such

instances we adopted a precautionary approach and accepted the businesses forecast subject to qualification.

3. The context of rural demand forecasts

Demand forecasts should reflect reasonable assumptions about the key drivers of demand, irrespective of the method adopted. There are many variables that can potentially impact on demand forecasts for rural water use. The materiality of these variables and their influence on demand will change over time.

For example, regulatory price reviews over the preceding five years have focused on the variables associated with drought, such as the availability of water resources and storage conditions. Given recent rainfall, forecasts of water deliveries over the next five years are likely to be less affected by these factors unless drought returns. For some businesses, namely Goulburn-Murray Water, these drought conditions also triggered significant investment in irrigation networks that will change system characteristics in the Water Plan 3 period and beyond.

4. Key assumptions for rural demand forecasts

Many rural water businesses, and their customers, faced significant variability in water demand during the previous price review due to drought, flood and water-related policy change. In developing their demand forecasts for this price review, each of the rural water business has made assumptions in regard to:

- Customer numbers — future changes in customer numbers and how these customers connect to the water infrastructure network
- Climate and water availability — natural rainfall patterns have a direct impact on the demand associated with agricultural and outdoor residential use. For the rural businesses it will also impact on the level of water allocations available for water entitlement holders.
- Water availability and use — future water resource availability and utilisation of this resource for irrigation deliveries
- Infrastructural change — future implementation of announced Commonwealth and Victorian policy changes and how their customers will respond (most relevant to businesses operating in northern Victoria)

- Tariff restructuring — implementation of new/consolidated tariffs and demand forecasts for these new pricing structures.

5. Rural considerations

There are a number of issues that are specific to rural water businesses. In this section we set out our approach to assessing the assumptions used by the rural water businesses and set out some high level draft findings from our review. Our draft analysis of each rural water business's assumptions is set out in appendix to this report.

To assess the assumptions used by the businesses, we have used the following principles as our starting point:

- customer behaviour will remain broadly consistent with historical observations unless there is likely to be changes affecting key drivers
- Despite the significant uncertainty regarding future weather patterns, neither extreme of recently observed drought or floods represent expected conditions going forward. Estimates of future water resource availability should be informed by the full record of historical observations with climate change assumptions clearly set out.

We recognise that there may be local considerations that make it reasonable for a rural water business to use different assumptions from other businesses to develop its forecasts. We also worked closely with the businesses to understand the approaches that have been applied.

Key elements of the demand forecasts are forecast changes to delivery shares and service points. These are not driven by the forecast behaviour of customers, but rather the infrastructure management decisions of the businesses. For example, SRW have assumed most customer numbers and connection types will remain constant through the Water Plan 3 period. In comparison, G-MW has assumed water shares (associated with land) in their districts, delivery shares and service points will be reducing throughout Water Plan 3 due to impacts of the Basin Plan and the G-MW Connections Project.

Forecasts of water deliveries could not rely solely on extrapolating observations from Water Plan 2 given the extremes of drought and flood that occurred during these years. In addition to forming a view on a more representative level of demand for average conditions, businesses in northern Victoria are also affected by the Commonwealth Government's buyback program to support the Basin Plan as well as recent changes to carryover arrangements.

Rural water business forecast that the number of irrigation and domestic and stock customers would remain constant over the regulatory period. This is consistent with expectations.

Climate assumptions

One of the key factors that the businesses need to consider when developing demand forecasts is their expectations about water availability (mostly driven by rainfall) over the next regulatory period. Water availability affects consumption in both the short and long term. This will affect different businesses in different ways.

Rural water deliveries can be highly volatile because they are highly dependent on seasonal conditions. Many of the customers of rural water businesses receive a share of the available supply which they can choose to use, trade or carryover. This means that when supply increases so too does their demand for water deliveries from rural businesses. Compared to urban water businesses, rural water businesses will be more directly affected by any change in water availability.

Climate change assumptions used by rural water businesses included using the CSIRO median 2060 climate modelling for their region, and using 2011-12 and 2012-13 observed conditions as the best estimate given these years has been 'the most average' years in the recent history.

Infrastructure modernisation

Water conservation in the context of rural water businesses includes the rationalisation and modernisation of delivery infrastructure. In many cases, rural water businesses have made different assumptions regarding these factors to reflect the different issues in their regions. For example, some have their network infrastructure will remain constant through the regulatory period while another has assumed significant rationalisation/reconfiguration.

PART B: Business Specific Analysis

1. Goulburn-Murray Water (G-MW)

1.1 Introduction

This appendix contains the businesses specific analysis undertaken by Frontier as part of the review of demand forecasts for the Water Price Review 2013.

1.2 Water Plan proposal

Table 1: G-MW Water Plan proposal

Consumption parameter	Proposed average growth rate (% per annum)
Irrigation service points	-3.9%
Irrigation delivery share	-1.1%
Irrigation deliveries	-1.3%
D&S connections	0.0%
D&S deliveries	0.0%
Bulk Water HRWS and LRWS	0.0%
Drainage connections	0.0%
Drainage area	0.0%
Drainage volumes	-1.1%
Groundwater diversion licences	0.0%
Surface water diversion licences	0.0%
Surface water diversion deliveries	0.0%

Notes: n.a. Not applicable

Source: G-MW 2012 Water Plan

1.3 Irrigation

Customers, connections and capacity

G-MW sources 85-90% of revenue from fixed charges. Therefore, one of the most important elements of G-MW's proposal is its customer forecasts to determine the volumes of entitlement held in irrigation areas following system modernisation and buybacks under the Basin Plan, and how these customers connect to the irrigation network.

The key elements of the demand forecast are forecast changes to delivery share and service points. These are not driven by the forecast behaviour of customers, but rather the infrastructure management decisions of G-MW. The large-scale infrastructure changes occurring in northern Victorian are the result of the implementation of Stage 1 and Stage 2 of the G-MW Connections Project (formerly referred to as NVIRP).

G-MW reported that the forecasts for Water Plan 3 period are consistent with the confidential Business Cases for Stage 1 and Stage 2 of the G-MW Connections Project, but noted that judgement was required to attribute the high level changes to particular districts and through time. Discussions with G-MW identified the basis for disaggregating irrigation service point and delivery share forecasts:

- For delivery shares:
 - No significant changes were forecast in Shepparton since this district was already modernised in 'Future Flow' program. Similar for Central Goulburn (CG1-4).
 - In other regions delivery share was forecast to reduce. The Water Plan sets out a 15% reduction in total delivery share (for all of G-MW). This was assumed to be secured from the districts in line with the NVIRP business case criteria based on distance from backbone.
 - The forecasts were reconfirmed in September when G-MW and NVIRP merged and the modernisation was now to occur under the Connections Program.
- For service points
 - As with delivery shares, the broad outcomes are reported to be in line with the modernisation Business Case.
 - G-MW staff have made judgement decisions about how these broad outcomes would be achieved — i.e. timing and distribution, and mix of service points.

- G-MW staff also noted that the G-MW tariff strategy is changing (currently under review) and progress has been made since the submission of the water plan and template data.

Given that G-MW is under a Revenue Cap, actual prices for 2014-15 onwards will be developed during the annual Water Plan 3 price setting process. These annual processes will take into account updated information about progress in buyback and modernisation at the time.

Volumes

Volumes of irrigation water deliveries will be affected by the above changes to volumes of entitlement held in irrigation areas as well as significant changes to the operating environment (including climate change and carryover policies) and uncertainty about how customers will respond after the long drought followed by floods.

G-MW have used an underlying assumption that future delivery volumes will be equal to volume of irrigator-owned high reliability water share (HRWS). This was the case in 2011-12 when the volume delivered was similar to the volume of high reliability water shares held by irrigators at that time. The approach taken by G-MW allows this assumption to vary in response to prevailing water availability.

- The forecast of 2013-14 deliveries are in the order of 10% above HRWS and this assumption is based on current high water availability (high levels in storages). This elevated forecast is all to account for refinements to Victorian carryover rules that will reduce the amount that can be carried over and, on balance, is expected to cause an elevated volume of deliveries as irrigators seek to “use it” rather than “lose it” during the 2012-13 and 2013-14 seasons.
- Forecast deliveries for 2014-15 and 2015-16 are equal to the expected volume of high reliability water share held by irrigators. These years are beyond the two-year horizon used for water resource planning and are after the transition to the refined carryover rules.

Given that G-MW is under a Revenue Cap, actual prices for 2014-15 onwards will be developed during the annual Water Plan 3 price setting process. These annual processes will take into account updated information about changes in demand and with knowledge of storage levels at the time.

Issues

For the draft review, it was difficult to assess the demand forecast assumptions related to service points and delivery shares given that the Business Case has not

been available and that staff judgement has been used to disaggregate the Business Case proposals across time and between districts.

The information that G-MW provided in response to the draft review allowed the confirmation that forecast changes to irrigation service points and delivery shares are broadly in line with the business case proposals, in terms of forecast being within the overall business case targets. However, information provided by G-MW was not sufficient to establish confidence that the particular timelines of forecasts were (or were not) consistent with the business cases for Stage 1 and 2. For example:

- Service points:
 - The Water Plan assumes that 3000 service points will be rationalised from 2013-14 to 2015-16 (p.69).
 - The G-MW template forecasts 2338 irrigation service points will be rationalised from 2012-13 to 2015-16. (And 2668 from 2013-14 to 2015-16)
 - The revised Stage 1 Business Case includes the number of service points that will be rationalised from 2012-13 to 2015-16. Further rationalisation is expected beyond 2015-16.
 - The Stage 2 Business Case does not set out equivalent information regarding the timing of expected rationalisation. Some of the rationalisation under Stage 2 is expected to occur beyond 2015-16.
 - The G-MW template forecasts of service point rationalisations are within the total number of connection meters to be rationalised by Stage 1 and Stage 2 in the NVIRP area over the life of the project 2008-09 to 2017-18.
- Delivery shares:
 - The Water Plan assumes a 15% reduction in the delivery shares progressively over the period to 2019. Assuming this statement refers to 15% of the delivery shares held in the non-backbone, this is approximately 1135ML/day.
 - The G-MW template forecasts 618ML/day of delivery share will be terminated from 2012-13 to 2015-16.
 - The Business Case for Stage 1 does not envisage significant termination of delivery share (it focuses on the transfer of delivery share from the non-

backbone to the backbone). G-MW noted the revised expectation of a small value.

- The Business Case for Stage 2 envisages significant termination of deliver share, but does not specify the expected timing of this reduction.
- The G-MW template forecast reductions to delivery share are within the total expected under Stage 1 and Stage 2 of modernisation.

In response to the draft review, G-MW identified errors in the delivered volumes reported in the template for 2014-15 and 2015-16. These had been calculated by reducing the 2013-14 forecast deliveries (in the order of 110% of irrigator HRWS) by the forecast percentage reduction in water share volumes. G-MW provided revised values for 2014-15 and 2015-16 so that the volumes are the same as the forecast water share volumes.

Forecast delivery volumes in the template for 2012-13 were significantly below the year-to-date observations for 2012-13. This was the result of high water availability and dry summer conditions. Given that these may be considered unique circumstances and the forecast methodology is based on HRWS held by irrigators, this has not been identified as requiring revision.

Finding

Delivery volumes revised for 2014-15 and 2015-16 so that the volumes are the same as the forecast water share volumes.

1.4 Drainage

Drainage volumes declined slightly due to forecast declines in irrigation deliveries. Consultation with G-MW identified that reductions in entitlement volumes and deliveries will flow through to drainage volumes. There is a conversion factor, since not all water is applied to land that is drained and not all land that is drained is Division 1.

The draft review proposed that no revisions are required unless water delivery volumes are revised.

Finding

Revisions are required to be consistent with the above revisions to 2014-15 and 2015-16 water delivery volumes.

1.5 Domestic & Stock

There is no change in the forecast of number of customers.

Issues

The demand forecast for domestic and stock connections could alternatively be assumed to increase through the regulatory period due to rural-residential expansions and sub-division. However, determining the rate of this increase would be difficult and, given the low charges associated with these services, the risk of some growth does not have significant revenue implications.

The draft review proposed that no revisions were required.

Finding

No revisions required.

1.6 Bulk Water

The water shares over which bulk water service are charges are generally expected to remain constant through the regulatory period. There is some expected reallocation from water shares that are associated with land to water shares that are not associated with land (due to Commonwealth water recovery under the Basin Plan).

There was an assumed reduction in Bullarook Basin HRWS.

Issues

Discussions with G-MW identified that the minor change in the Bullarook HRWS is driven by a pro-rata approach to recovery of water for the environment by the Commonwealth.

Although outside the scope of this review, we note there are significant differences between the G-MW charges for entitlement storage fees with and without land. This would suggest that some costs are being recovered from G-MW customers with water shares associated with land in G-MW districts that are not being recovered from water share holders without land (i.e. the NWU types identified above — individual, water corporations and environmental water holders).

The draft review proposed that no revisions were required.

Finding

No revisions required.

1.7 Revisions to forecasts

Table 2: Revisions to forecasts

	2013-14	2014-15	2015-16
Infrastructure Use Fee			
Shepparton:	143,026	139,152	135,278
Central Goulburn	292,832	285,083	277,335
Rochester	138,668	134,955	131,242
Loddon Valley	149,645	145,609	141,573
Murray Valley	217,929	212,118	206,306
Torrumbarry	263,129	256,188	249,246
Infrastructure Use Fee - revised			
Shepparton	143,026	124,054	121,536
Central Goulburn	292,832	252,223	245,303
Rochester	138,668	120,925	119,135
Loddon Valley	149,645	129,452	126,475
Murray Valley	217,929	188,090	183,323
Torrumbarry	263,129	227,067	221,276
Water Use Fee			
Shepparton	47,951	46,653	45,353
Central Goulburn	180,309	176,780	173,250
Rochester-Campaspe	74,020	72,822	71,624
Loddon Valley	7,268	7,072	6,877
Murray Valley	99,465	97,439	95,413
Torrumbarry	133,096	129,586	126,075
Water Use Fee - revised			
Shepparton	47,951	41,590	40,746
Central Goulburn	180,309	155,304	151,043
Rochester-Campaspe	74,020	72,822	71,624
Loddon Valley	7,268	6,287	6,143
Murray Valley	99,465	85,846	83,670
Torrumbarry	133,096	114,855	111,926

Source: ESC template and Frontier revisions.

1.8 Summary

This review of G-MW's demand forecasts found:

- Forecasts were generally based on appropriate forecasting methodologies.
- Forecasts reflect reasonable assumptions about the key drivers of demand.
- Forecasts used the best available information and are broadly in line with existing business cases of infrastructure modernisation. Some identified data errors were revised.
- Forecast approaches are not expected to be biased and it was considered appropriate to base forecasts on historical observations and expected investment paths.
- Forecasts do not account for price elasticity, however, given the relative inelasticity of water demand to changes in water delivery charges and the lack of material price changes, this review did not identify this as an issue of concern.

2. Lower Murray Water (Rural)

2.1 Introduction

This appendix contains the businesses specific analysis undertaken by Frontier as part of the review of demand forecasts for the Water Price Review 2013.

LMW and its rural customers have faced extremely volatile seasonal conditions in recent history and also face significant uncertainty into the future. During the Water Plan 2 period, allocations reached unprecedented lows and this has led customers to use less water due to the lower allocations, along with some customers drying off all or sections of their land.

In 2009-10 customers also left the land by accepting the Small Block Irrigators Exit Grant. As part of the conditions of the grant, customers had to sell their water to the federal government, remove all irrigation infrastructure and not irrigate the land for five (5) years. In contrast 2010-11 saw extremely high rainfalls in the districts which in turn caused very little water to be used by customers. 2011-12 saw milder weather in comparison to previous years which has also led to water usage at levels much lower than the 2008 Water Plan.

2.2 Water Plan proposal

Table 3: LMW (rural) Water Plan proposal

Consumption parameter	Proposed average growth rate (% per annum)
Irrigation service points	0%
Irrigation delivery share	0%
Irrigation deliveries	0.51%
D&S connections	0%
D&S deliveries	n.a.
Drainage connections	0%
Drainage volumes	0%

Notes: n.a. Not applicable Source: LMW (Rural) 2012 Water Plan

2.3 Irrigation

Fixed elements

After the structural change observed during the Water Plan 2 period (i.e. customers drying off land and accepting the Small Block Irrigators Exit Grant), the infrastructure access and delivery shares observed in 2012-13 have been used as the level for all years in the Water Plan 3 period.

Volumes

To forecast usage LMW looked at the number of outlets taking water in previous years and compared this to 2011-12 to determine which customers have ceased taking water. These customers were then excluded going forward. 2005-06 volumes were used as a base due to it being the last year of 'normal allocations'. The outcomes of this approach were validated against the Sunrise 21 report *2009-10 Irrigation Status Report Pumped Irrigation Districts*.

In order to forecast forward, LMW took into account signs of replanting within the districts and after consultation with its Customer Service Advisory Committees considered it reasonable to show growth in the districts as some properties will come back into production.

Issues

There is large uncertainty in future conditions and therefore, the assumptions used by LMW are considered valid. Future seasonal conditions will be the major driver of actual usage, as seen in the historical data.

The methodology surrounding the adjustments made after consultation with the Customer Service Advisory Committees is not transparent. However, this approach is likely to lead to a better understanding of the locally relevant factor and so prove valuable. In the context of forecasting usage under significant uncertainty about the future we consider this a reasonable approach.

Our draft review found that no revisions were required and Lower Murray Water accepted this finding.

Finding

No revisions required.

2.4 Drainage

LMW has converted Areas Use Licences (AUL) to water rights for drainage.

There is a large step change in the forecast for Mildura in Table 24 of the Water Plan.

Issues

Subsequent consultation with LMW provided more information on the basis of the forecast Mildura changes. LMW noted that:

- In 1998 FMIT was absorbed into LMW. However as part of the process, LMW had to adhere to the previous FMIT's Water Plan as determined by the ESC. For this next regulatory period LMW is rationalising FMIT's charging to fall in line with LMW's pumped district charging.
- The Mildura (Ex FMIT) drainage area was based on AUL rights held for the current regulatory period. Drainage in the other three districts (Merbein, Red Cliffs and Robinvale) is charged on the basis of Delivery Shares (as for Water). The change is bringing Mildura into line with the other pumped districts so the basis for charging is the same between all four districts.

The draft review found that no revisions were required. Lower Murray Water accepted this finding

Finding

No revisions required.

2.5 Domestic & Stock

Little change is forecast in Domestic and Stock (D&S) water supply connections and volumes.

The demand in relation to the Mildura D&S high pressure levy drops to zero because the Mildura D&S High Pressure Levy is being wound into the High Pressure usage charge for the next regulatory period. This means that the D&S will no longer be separated from irrigation charges and they will face the same tariff.

There is a forecast step reduction in the number of unmetered Garden fee customers over the Water Plan 3 period. This is because LMW has a program whereby it is working towards metering all unmetered outlets. When these customers become metered they become irrigation customers.

Issues

LMW forecast most D&S connections and volumes to remain at constants levels over the Water Plan 3 period. This is considered to be a valid assumption in the given circumstance. After consultation with LMW, those forecasts that did deviate from a constant level appear to be justified (as described above) and hence the assumption used are considered reasonable.

The draft review found that no revisions were required. Lower Murray Water accepted this finding.

Finding

No revisions required.

2.6 Revisions to forecasts

No revisions have been made to the demand forecasts as per the template submitted to the ESC.

2.7 Summary

This review of Lower Murray Water's rural demand forecasts found:

- Forecasts were based on appropriate forecasting methodologies.
- Forecasts reflect reasonable assumptions about the key drivers of demand.
- Forecasts used the best available information.
- Forecast approaches are not expected to be biased and it was considered appropriate to base forecasts on historical observations informed by local consultation.
- Forecasts do not account for price elasticity, however, given the relative inelasticity of water demand to changes in water delivery charges and the lack of material price changes, this review did not identify this as an issue of concern.

3. Southern Rural Water

3.1 Introduction

This appendix contains the businesses specific analysis undertaken by Frontier as part of the review of demand forecasts for the Water Price Review 2013

3.2 Water Plan proposal

Table 4: SRW Water Plan proposal

Consumption parameter	Proposed average growth rate (% per annum)
Bulk water services	0%
Irrigation water shares	0.62% (in Macalister/Thomson System)
Irrigation service points	0%
Irrigation delivery share	0%
Irrigation deliveries	0%
D&S connections	0%
D&S deliveries	n.a.
Groundwater licences	0%
Groundwater volumes	0%

Notes: n.a. Not applicable

Source: SRW 2012 Water Plan

3.3 Irrigation

Macalister/Thomson System High Reliability Water Shares (HRWS) are forecasted to increase through the Water Plan 3 period. This is due to the sale of new entitlements (water shares) resulting from water savings realised from modernisation works. Southern Rural Water (SRW) estimated these new entitlements will be allocated/auctioned as follows:

- Water shares for auction — 588ML to auction in each of 2012-13, 2013-14 and 2014-15 (these shares would provide service in following year)

- Water shares that will be available from new water saving projects (leading works) — 2,500ML expected to be audited and available for 2016-17 delivery.

All other connection/customer numbers are forecast to remain constant at 2012-13 levels for the regulatory period.

Volumetric charges are only levied in the Macalister/Thomson System, where SRW has forecast all volumes to remain at 2012-13 levels.

Issues

The forecast assume most consumption parameters will remain at 2012-13 levels. This is considered to be a valid assumption given SRW irrigation infrastructure characteristics — no large scale network rationalisations are planned and customer characteristics are likely to remain unchanged.

However, we do not consider it reasonable to forecast no change to delivery volumes in the Macalister/Thomson System given the forecast increase in HRWS.

To address this, we consider that the delivery volume forecast in the Macalister/Thomson System should be revised to account for the forecast increase in HRWS.

In our draft review we proposed to do this by adding the incremental change in HRWS to the standard Water Usage volumes.

In response to the draft review, SRW acknowledged that the new water shares will generate additional usage. SRW proposed a more conservative assumption — that usage will be, on average, 70% of the new water shares.

Finding

We have revised the delivery volume forecast in the Macalister/Thomson System to account for the forecast increase in HRWS by assuming that usage will be, on average, 70% of the new water shares.

3.4 Groundwater

All groundwater licence/customer numbers are forecast to remain at 2012-13 levels.

All groundwater volumes are forecast to remain at 2012-13 levels.

Issues

The assumption that all groundwater consumption parameters will remain at 2012-13 levels is considered to be a valid since groundwater management arrangements are not changing.

Hence, no revisions have been proposed.

Finding

No proposed revisions.

3.5 Storage on behalf of bulk entitlement holders

The number of Bulk entitlement customers are forecast to remain stable over the regulatory period at 2012-13 levels.

Issues

The assumption that bulk entitlement customer will remain at 2012-13 levels is considered to be a valid. Since bulk water arrangements are not changing.

Hence, no revisions have been proposed.

Finding

No proposed revisions.

3.6 Surface water diversions

All surface diversion licences/customer numbers are forecast to remain at 2012-13 levels.

Surface water diversions volumes in unregulated systems are forecast to 'step up' in 2016-17 and remain for 2017-18 (as compared to 2013-14, 2014-15 and 2015-16 volumes) due to announced government policy. The Gippsland Sustainable Water Strategy has allocated 6,000ML in the Mitchell basin for allocation to irrigators, and SRW have estimated that the licence volume will increase from 2016-17 by this amount.

All other surface diversion volumes are forecast to remain at 2012-13 levels.

Issues

The forecast for demand values to remain at 2012-13 levels is considered to be a valid assumption since surface water management arrangements are not changing (with the exception of the Gippsland Sustainable Water Strategy announcement which has been incorporated into the forecasts).

Hence, no revisions are proposed.

Finding

No proposed revisions.

3.7 Revisions to forecasts

Forecasts that have been revised (as per discussions above) are presented in Table 2.

Table 5: Revised draft forecast

Row Labels	2013-14	2014-15	2015-16	2016-17	2017-18
Macalister/Thomson System					
Delivery Share - Water Usage Fee - Standard	142000	142000	142000	142000	142000
Delivery Share - Water Usage Fee – Standard (revised)	142412	142824	143236	144986	144986

Source: ESC template and Frontier revisions.

3.8 Summary

This review of Southern Rural Water’s demand forecasts found:

- Forecasts were generally based on appropriate forecasting methodologies. However, a revision was made to ensure that forecast volumes are consistent with forecast changes to water shares.
- Forecasts reflect reasonable assumptions about the key drivers of demand.
- Forecasts used the best available information.
- Forecast approaches are not expected to be biased and it was considered appropriate to base forecasts on historical observations.

- Forecasts do not account for price elasticity, however, given the relative inelasticity of water demand to changes in water delivery charges and the lack of material price changes (and in many cases volumetric charges are not applicable), this review did not identify this as an issue of concern.

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