

## 3 Demand Forecasts

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This section documents Umgeni Water's water demand forecast review that was completed in September 2011. The review process:

- Reviewed the figures for the financial year ending in June 2011 (2010/2011).
- Assessed and revised the short-term forecast for the financial year ending in June 2012 (2011/2012);
- Compiled short-term forecasts for the financial years ending in June 2013 (2012/2013), June 2014 (2013/2014) and June 2015 (2014/2015); and
- Extended these short-term forecasts to a long-term forecast (30-year forecast) to the end of June 2042 (2041/2042).

All data presented has been updated to include the October 2011 sales figures and all statistics and trends have been based on the moving annual average and year-on-year growth figures as determined at 31 October 2011.

### 3.1 Review of 2010/11 Sales

The initial forecasted water sales value for the financial year ending in June 2011 (2010/11), as determined in September 2009, was 1 193 MI/day. Sales volumes at the end of 2009/10 were marginally lower than what had been forecast and it was anticipated that the decreasing trend in water sales would intensify into the near future especially as a result of a significant anticipated reduction in non-revenue water in the eThekweni Municipality area. Hence the forecasted 2010/11 value was revised downward to 1 175 MI/day as part of the sales forecasting process that occurred in September 2010. Water sales started to noticeably decrease from July 2010 and continued with the same trend in subsequent months, such that the forecasted value was revised once again in March 2011 to 1 137 MI/day.

Total sales recorded for the 2010/11 financial year averaged 1 129 MI/day (412 200 MI), falling below the March 2011 revised value, and well below the September 2010 revised value. This reduced actual sales volume can primarily be attributed to 'better than initially expected' results achieved by eThekweni Municipality with their various water demand management initiatives.

Total average water sales for the 2009/10 financial year was 1 167 MI/day (425 848 MI), and hence the 2010/11 sales are a 3.2% year-on-year decrease on the 2009/10 financial year. This can be compared to the 2.4% positive growth that was realized in the previous financial year.

After eight consecutive years of positive growth in Umgeni Water's sales, the 2010/11 sales reflect a negative growth and a break in this trend. Since June 2002, when the annual sales amounted to 315 370 MI, sales had increased by an average of 3.84% per annum up until June 2010. Annual sales over the past five years still reflect an average annual positive growth rate of 2.7% (down from 3.9% last year). **Figure 3.1** shows the 12-month moving average of Umgeni Water's total average daily water sales for the past 10 years.

Bulk water sales to eThekweni Municipality constituted by far the largest percentage (75.3%) of Umgeni Water's total water sales for 2010/11. Their portion of the total sales has decreased from 77.1% in the previous year, due primarily to their lower water purchases that were facilitated by the successes achieved in their non-revenue water programme. The Msunduzi Municipality is Umgeni Water's second largest customer, accounting for 15.1% of the organisation's total sales. This is an increase of 1.4% on the previous year and is primarily due to the growth in water consumption experience by the municipality over the year. The remaining customers make up the balance of the sales. **Figure 3.2** illustrates the average daily sales volume distribution per customer for the financial year 2010/11.

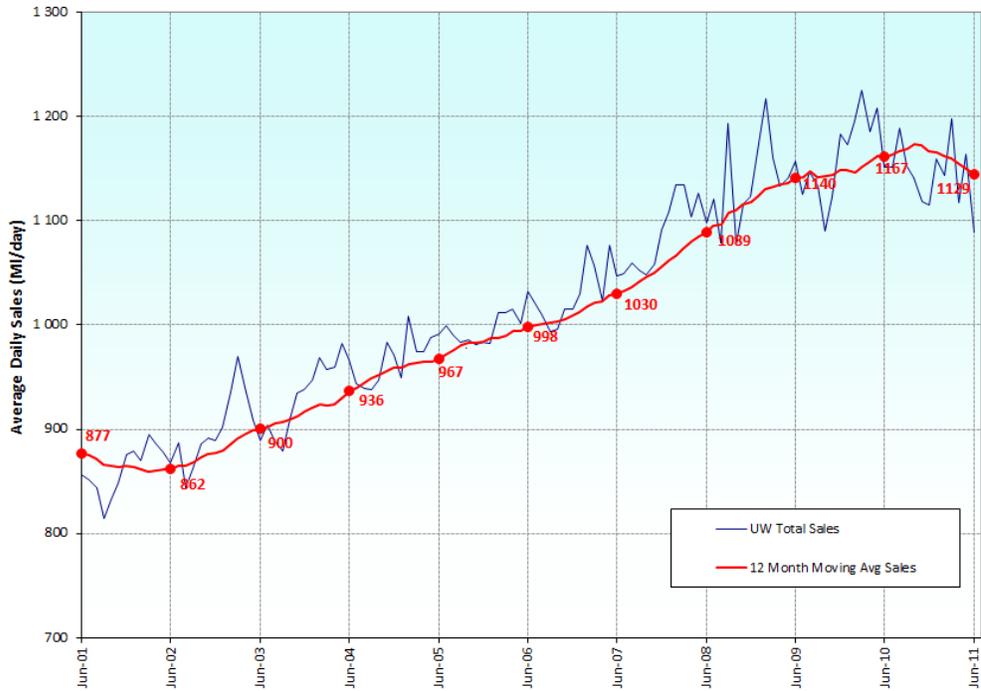


Figure 3.1 Umgeni Water Total Average Daily Sales.

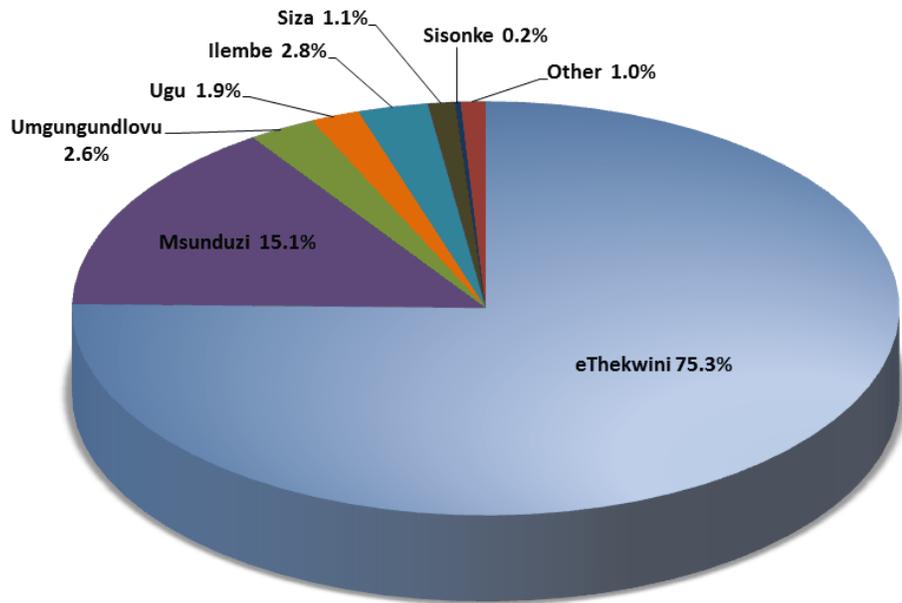


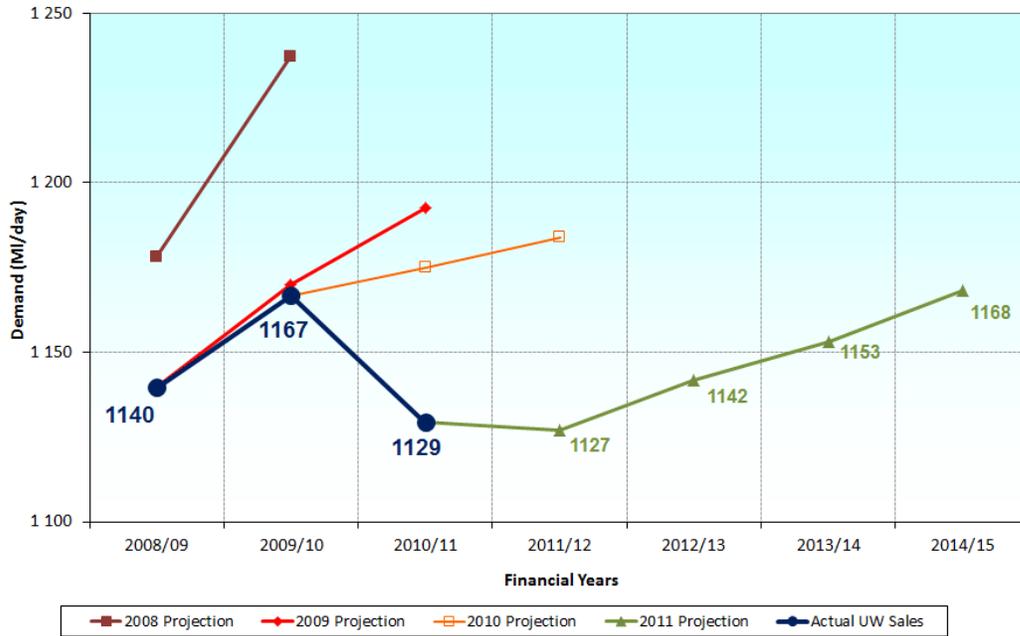
Figure 3.2 Distribution of Sales Volumes for 2010/2011.

## 3.2 2011 Short-Term Bulk Water Sales Forecasts

The economy has shown slow growth following the recent economic slowdown and recession and has yet to recover fully, therefore economic growth (and its corresponding translation into growth in water demands) for the Umgeni Water area of supply is not expected to be significant over the next few years. eThekwini Municipality's current water demand management (WDM) initiatives have also had a marked influence on Umgeni Water's bulk water sales, and these initiatives are expected to influence future sales in the short-term.

In September 2010 the Umgeni Water short-term bulk water sales forecast for 2011/2012 was estimated to be 1 184 MI/day and later revised to 1 146 MI/day when it became evident that sales would fall well short of the projected value due to the unforeseen success being achieved by eThekwini Municipality's WDM initiatives.

Whilst eThekwini Municipality do not expect to achieve the same level of success with their WDM initiatives during the next year or two, the retarded economic growth over this same period is expected to result in a negative overall growth for 2011/2012 and then turn into an improving situation in the following years as the economy recovers further. Hence, the Umgeni Water short-term bulk water sales forecast for 2011/2012 and 2012/2013 is estimated to be 1 127 MI/day and 1 142 MI/day respectively (**Figure 3.3**). This represents a 0.22% year-on-year decrease in growth from 2010/2011, which is an improvement on the previous year, and is again primarily determined by the forecast provided by eThekwini Municipality.



**Figure 3.3 Total Average Daily Sales Volumes - Annual short-term forecast comparison.**

### 3.2.1 eThekwini Municipality

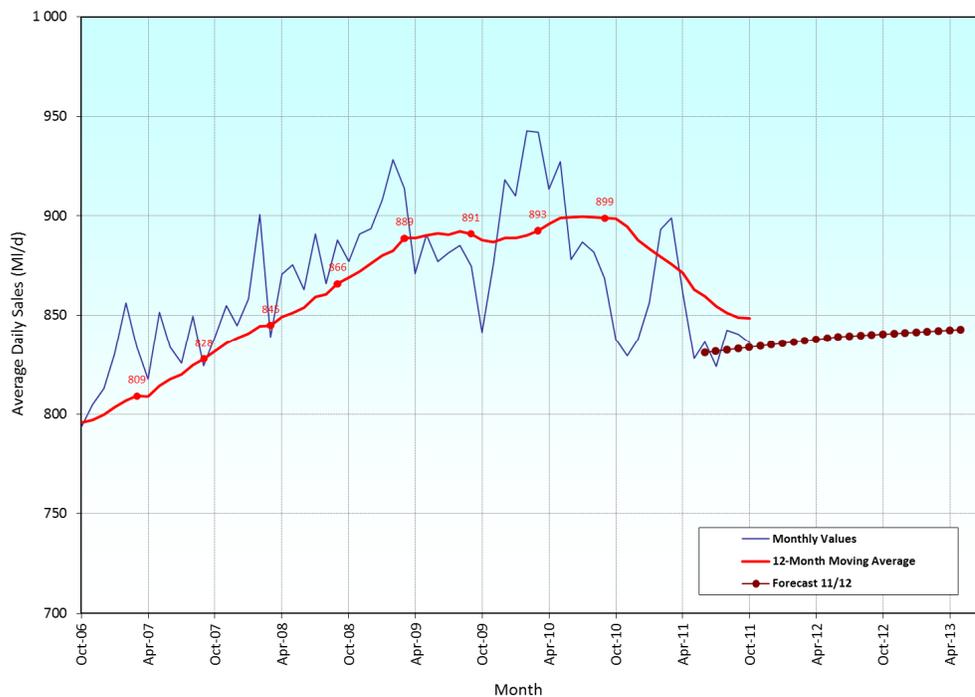
In the 2009/2010 financial year the year-on-year growth in sales to eThekwini Municipality increased by 1%.

In 2010, it was predicted that substantial growth would still occur in the northern eThekwini area with the proposed development of formal housing projects and the industrial development of the Dube Trade Port. eThekwini Municipality did, however, predict that their continuing water demand management initiatives would completely offset the expected growth in the northern areas. The impact of the water demand management initiatives, implemented over the last year, caused a greater than expected reduction in sales to eThekwini Municipality. This is shown in **Figure 3.4**, where the twelve-month moving average of sales decreased from 900 MI/day in July 2010 to 860 MI/day in June 2011 and further to 848 MI/day in October 2011.

As at October 2011, the total sales to eThekwini were approximately 830 MI/day. eThekwini Municipality do not believe that their water demand management initiatives will further reduce these sales and have predicted an increase in demand from 830 MI/day to 839 MI/day over

the 2011/2012 financial year and to 843 MI/day in 2012/2013. The historical sales and future demand projection for eThekweni Municipality are presented in **Figure 3.4**.

eThekweni Municipality have predicted an increased demand from the Hazelmere WTP, due to proposed development on the KwaZulu-Natal North Coast. If possible, this demand will be shifted to the Durban Heights WTP. This load shift will occur via the eThekweni Northern Aqueduct and the Hazelmere to Verulam Pipeline.



**Figure 3.4 eThekweni Municipality Total Volumes - Annual short-term forecast.**

### 3.2.2 The Msunduzi Municipality

The water sales to Msunduzi Municipality increased by 10% from 157.24 MI/day in the 2009/2010 financial year to 173.8 MI/day in 2010/2011. This significant increase can be attributed to the following factors:

- Increase in meter readings at the Masons Industrial. This increase is as a result of “under readings” during much of the 2008/2009 financial year. The corrected readings has resulted in a stepped increase of approximately 5 MI/day;
- Double-digit percentage increase in demand in Sweetwaters and Vulindlela.

From discussions with The Msunduzi Municipality held on 29 July 2011, it was agreed that this extent of growth is not expected to be maintained over the short-term forecast period. The projected demands for 2011/2012 and 2012/2013 are expected to increase by 0.8% and 1.1% respectively. This equates to sales forecasts of 175.20 Ml/day (63 948 Ml/pa) and 177.14 Ml/day (64 656 Ml/pa) 2011/2012 and 2012/2013 respectively. The following significant factors influenced this short term forecast:

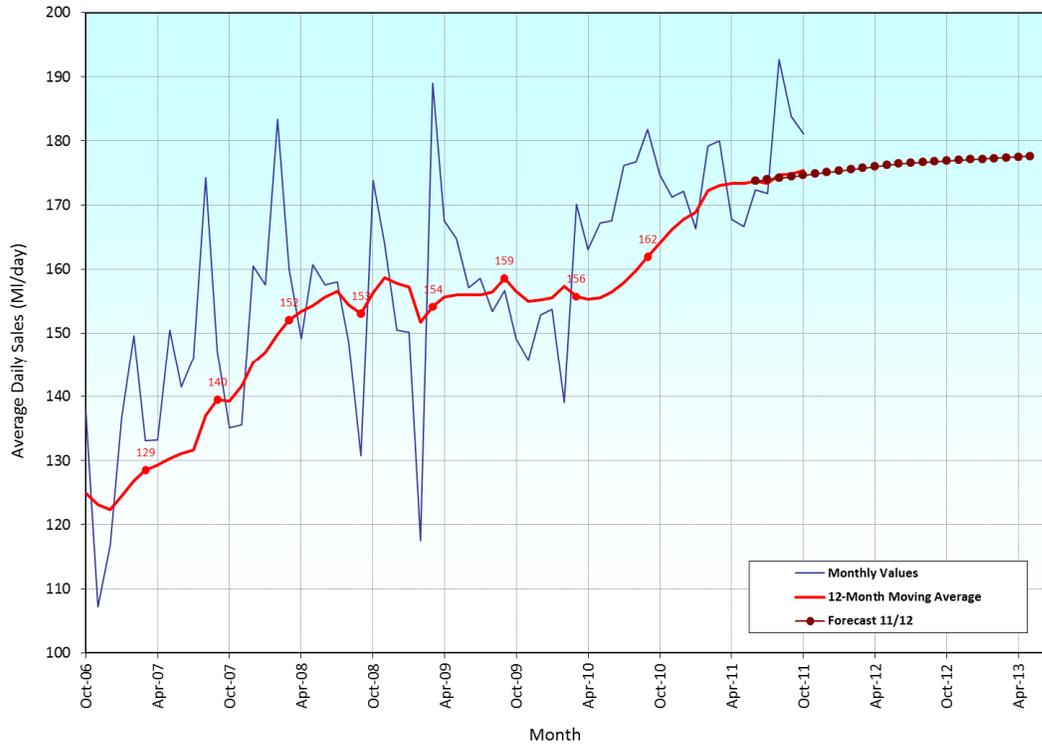
- Demand growth has been negligible since March 2011. This is evident in **Figure 3.5** which indicated a flat 12 month moving average over this period.
- There are no significant developments (housing, commercial and industrial) that will result in a steeper increase.
- Msunduzi Municipality has embarked on an aggressive water demand strategy that will offset the natural growth that will take place in the region.

Msunduzi municipality have recently appointed a service provider to initiate a range of water demand management (WDM) initiatives throughout the entire municipal area. The initiatives include, *inter alia*, reducing operating pressures, replacing ageing pipelines and investigating and repairing leakages. Much of the reconnaissance work has been conducted and the service provider is now moving into the implementation phase. The programme anticipates making significant gains into reducing water losses in Msunduzi Municipality. This requires that these demand projections be reviewed at least every six months so that revisions can be made, based on the anticipated success of the WDM project.

The shopping centre in Edendale represents the major commercial development in Pietermaritzburg. It has been operational since the end of 2011. This development, however, will not contribute to a stepped increase in demand because it is not considered a high water consumption activity.

It is anticipated that WDM initiatives together with natural growth in demand will have the net effect of reducing demand growth to around 1% for the 2011/2012 financial year.

The projection for Msunduzi Municipality is reflected in the following graph:



**Figure 3.5 Msunduzi Municipality Total Sales Volumes - Annual short-term forecast.**

### 3.2.3 Umgungundlovu District Municipality

The total sales to the Umgungundlovu District Municipality (UMDM) increased by 1% from 10 959 MI in the 2009/2010 financial year to 11 039 MI in 2010/11.

During the 2011/2012 financial year the following stepped increases are expected:

- 1.1 MI/day starting November 2011- supply to Manyavu.
- 0.3 MI/day starting March 2012 – supply to Ogagwini and Umacalagwana in Greater Eston.

Apart from the stepped increase, a 1% growth rate is anticipated. The projected sales for 2011/2012 and 2012/2013 are expected to be 31.2 MI/day (11 382 MI/annum) and 32.2 MI/day (11 751 MI/annum) respectively.

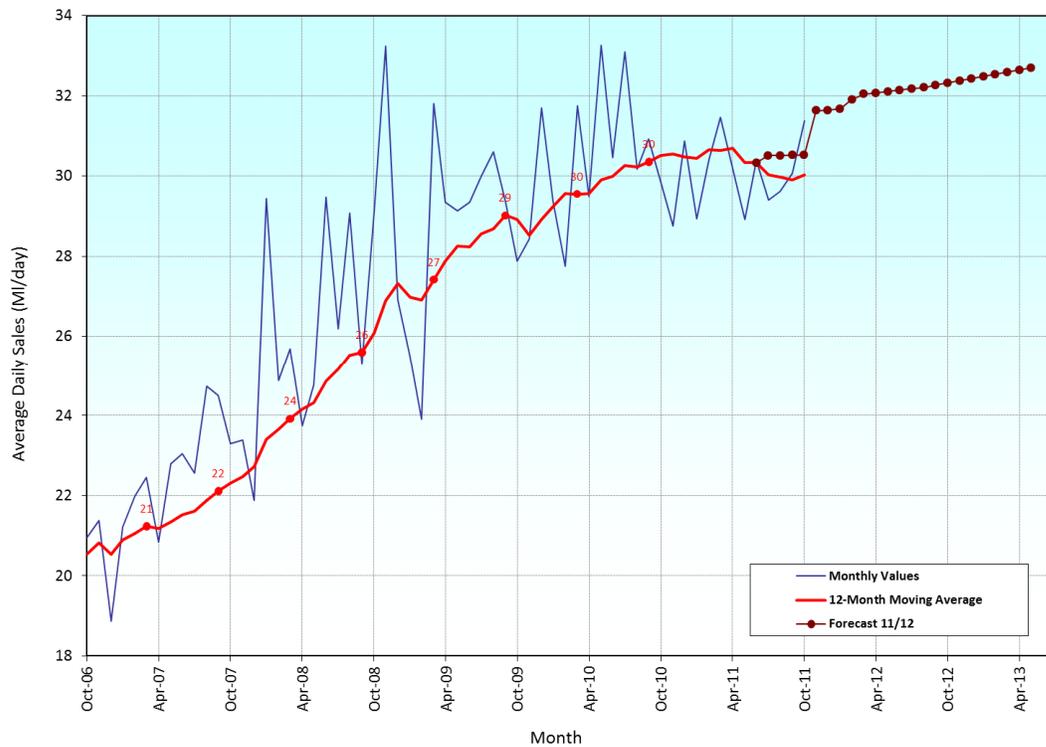
The water demand in the uMshwati Local Municipality is constrained by the limited capacity of the existing Umgeni Water infrastructure to support further developments. The projection for

uMshwati Municipality, which is supplied from DV Harris WTP, has therefore been restricted to a 1% annual growth.

The major potential for increased water demand in uMngeni Local Municipality is in a low-cost housing development of 1500 units (Khayelisha) located next to Mpophomeni. Implementation of Phase 1, which will consist of 500 units, has begun. The impact of Phase 1 will only be realised in about 2 years. It has therefore not been factored into this demand forecast.

Umgungundlovu District Municipality have recently embarked on a water demand management (WDM) project. The project is in its conceptual stage with the appointed consultants currently busy with desktop work. WDM initiatives are not expected to influence projections for this municipality over this forecast horizon.

The projection for Umgungundlovu District Municipality is reflected in **Figure 3.6**.



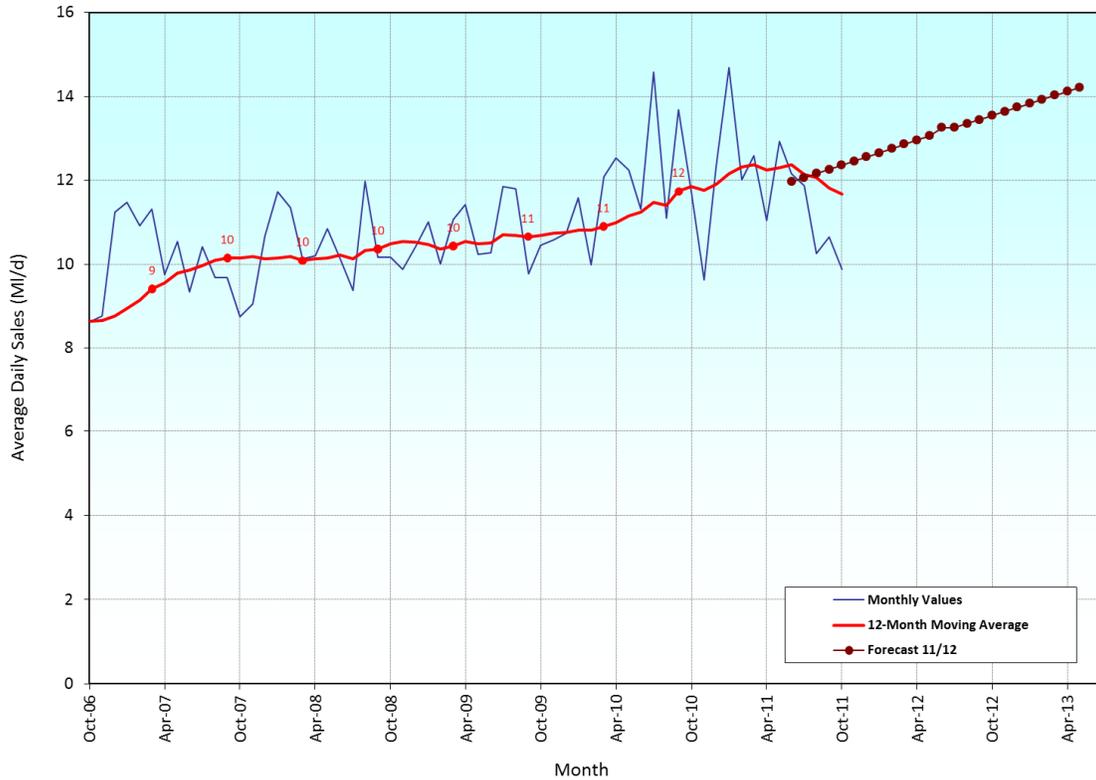
**Figure 3.6 Umgungundlovu District Municipality Total Sales Volumes - Annual short-term forecast.**

### 3.2.4 Ilembe District Municipality (including Sembcorp SizaWater)

Sales to Ilembe District Municipality can be described as follows:

- Sales to the Coastal Area of Ilembe through Sembcorp Siza Water.
- Sales to the Coastal Area of Ilembe through Ilembe District Municipality.
- Sales to Ilembe District Municipality through schemes owned by the municipality and managed by Umgeni Water.

Urban and peri-urban growth across Sembcorp Siza Water's concession area has caused a corresponding increase in water demand with the growth for the 2010/2011 financial year being 10%. Sembcorp Siza Water expects that further developments in this area will increase the demand from 12.3 MI/day in 2010/2011 to 13.3 MI/day in 2011/2012 and 14.3 MI/day in 2012/2013. This prediction is not matched by the sales between June 2011 and October 2011 where the demand for water decreased to 10 MI/day, however, it is expected that demand will again increase during the summer season. The historical and future predicted increase in demand for Sembcorp Siza Water is presented in **Figure 3.7**.

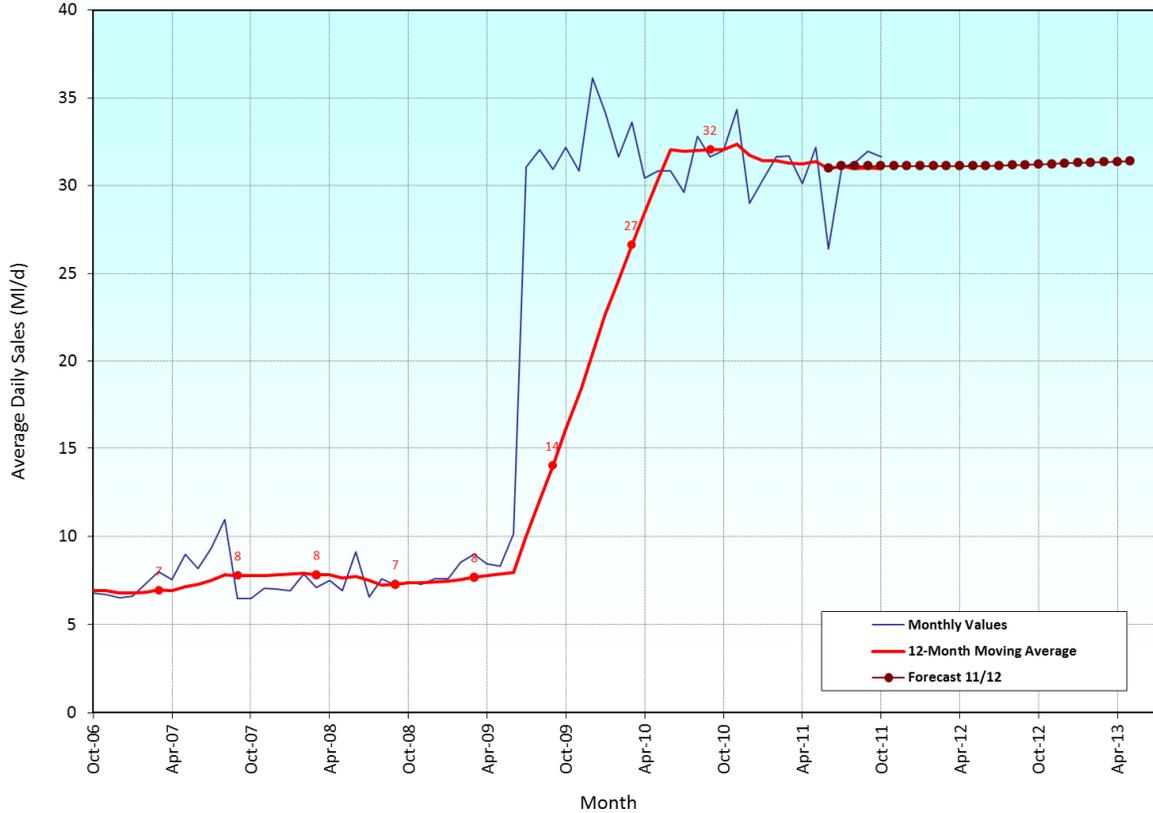


**Figure 3.7 Siza Water Total Sales Volumes - Annual short-term forecast.**

The remaining water sales to Ilembe District Municipality for 2011/2012 include:

- approximately 9 MI/day sales to the coastal areas from Umgeni Water’s Hazelmere WTP;
- 16 MI/day sales to KwaDukuza (Stanger). Supply to the town of KwaDukuza includes 15 MI/day from the Mvoti WTP and a further augmentation of 1 MI/day from the Hazelmere System via an emergency pipeline from Honolulu Reservoir to the Mvoti Balancing Reservoirs; and
- 6 MI/day sales to 36 inland rural schemes owned by Ilembe District Municipality and operated by Umgeni Water.

Ilembe District Municipality is implementing a number of water demand management (WDM) initiatives within the town of KwaDukuza (Stanger) and they estimate that savings from these initiatives will offset the growth in sales for the area. They therefore predict a zero percent growth rate in 2011/2012 (31 MI/day) with an increase in demand of 1.5 MI/day in 2012/2013. Historical and predicted future sales to Ilembe District Municipality are presented in **Figure 3.8**.



**Figure 3.8 Ilembe District Municipality Total Sales Volumes - Annual short-term forecast.**

### 3.2.5 Ugu District Municipality

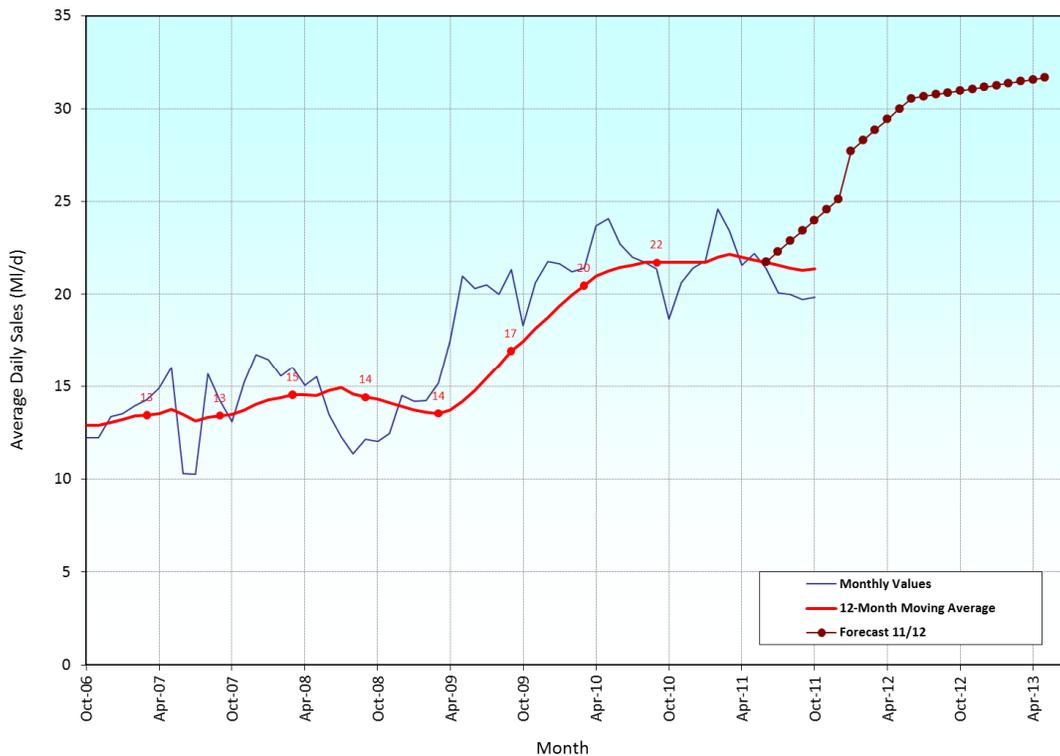
Total sales to the Ugu District Municipality increased by 0.7% from 7 871 MI (21.56 MI/day) in the 2009/2010 financial year to 7 923 MI (21.71 MI/day) in 2010/2011. The low increase, in comparison to the projection for this period, was primarily due to the water restrictions that were imposed as a result of the sharp drop in water levels of the Umzinto and E. J. Smith dams from May 2010 until October 2010. A number of infrastructure projects are being implemented by Umgeni Water in order to mitigate the future risk of non-supply.

Ugu District Municipality is currently constructing a pipeline from their Hazelwood Reservoir to the Greater Vulamehlo area to supply water from the Umzinto WTP supply system to this area resulting in an expected growth rate of 6.8%.

The expected growth in sales to the Ugu District Municipality (as confirmed by them) is estimated at 13.08% in the 2011/2012 financial year and 8.51% in 2012/2013. This equates to total sales for 2011/2012 and 2012/2013 of 8 959 MI and 9 722 MI respectively (**Figure 3.9**). Ugu District Municipality highlighted the growth potential of the Middle South Coast area if additional water becomes available and prompted the step increase towards April 2012 when Phase 2a of the South Coast Pipeline (SCP-2a) is commissioned.

This expected growth is a result of the Ugu District Municipality's proposed initiatives towards the reduction of backlogs and the rapid growth in water sales in the inland rural areas of the municipality, specifically in the Greater Vulamehlo, Ifafa and Mathulini areas.

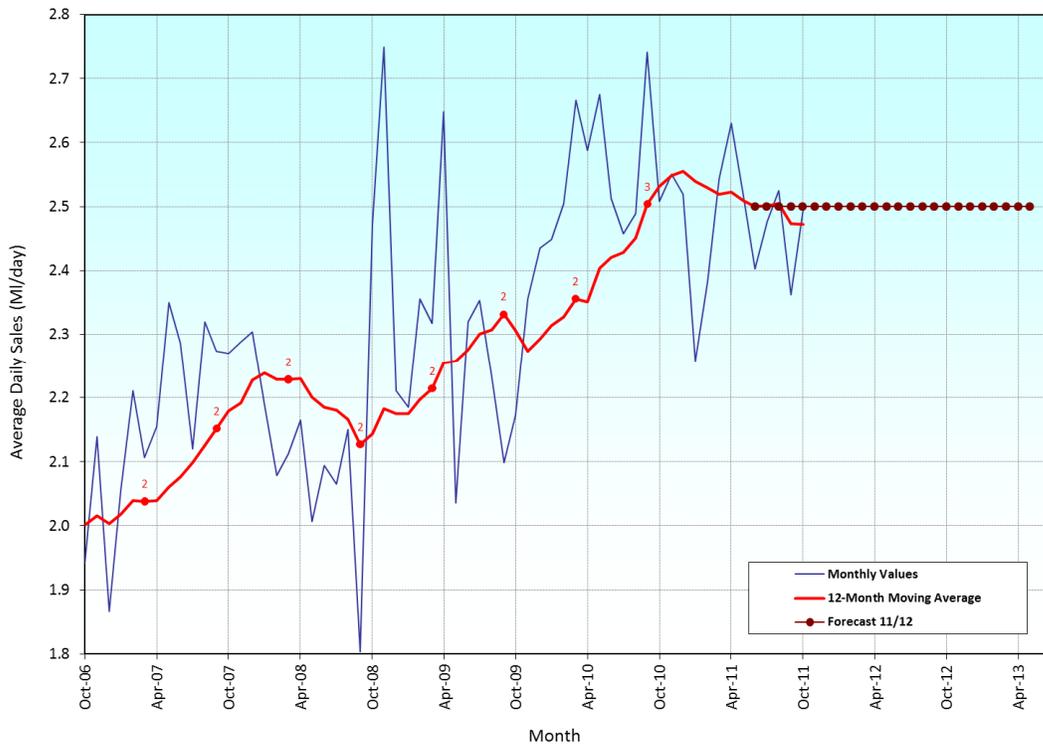
Ugu District Municipality has embarked on a number of water demand management (WDM) initiatives. However, these are mainly in the Lower South Coast region and not in the Umgeni Water area of supply and hence they do not expect to have an impact on the projected water demand growth rates.



**Figure 3.9 Ugu District Municipality Total Sales Volumes - Annual short-term forecast.**

### 3.2.6 Sisonke District Municipality

The Ixopo WTP supplies the Greater Ixopo area. Average daily sales from the WTP currently amount to approximately 2.5 MI/day. There has been an inexplicable decreasing demand trend since December 2010. The projection for Sisonke District Municipality has been kept at a 0% growth using the 2.5 MI/day base (**Figure 3.10**).



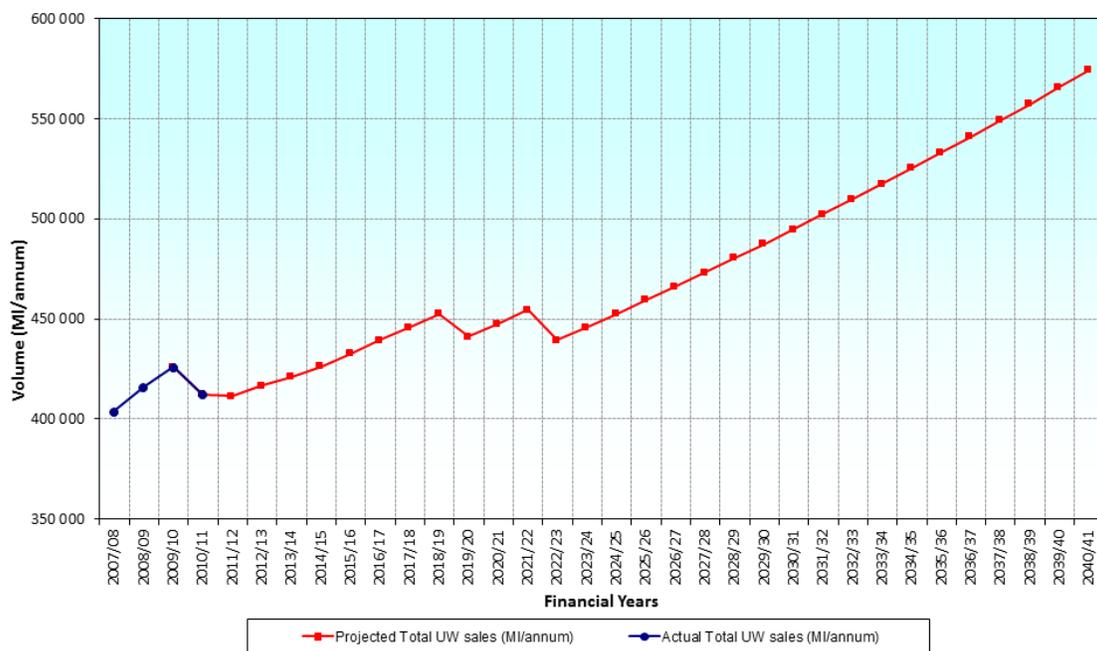
**Figure 3.10 Sisonke District Municipality Total Sales Volumes - Annual short-term forecast**

### 3.3 Long-Term Forecast

The 30-year long-term sales forecast for Umgeni Water’s supply area (**Figure 3.11**) has been based on the anticipated natural growth from the existing supply system, plus bulk sales from new supply infrastructure that would extend the area supplied. The base projection has been developed from the short-term forecasts described in **Section 3.2** of this report and then extended at a compounded 1.5% per annum growth rate until 2040/2041. This growth rate has been agreed to by the major water users in the region and is considered acceptable for this long-term forecast as it closely

matches the forecast that was independently derived as part of the “Water Reconciliation Strategy Study for the KwaZulu-Natal Coastal Metropolitan Areas” recently completed by DWA, which used a population projection technique to estimate demand forecasts.

The drop in sales in the 2019/2020 and 2022/2023 financial years, as shown in **Figure 3.11**, is as a result of the anticipated commissioning by eThekweni Municipality of their Northern and KwaMashu wastewater re-use plants which are anticipated to produce 50 MI/day and 60 MI/day respectively. These plants intend to feed potable water directly into their bulk supply network, thereby reducing the requirement from Umgeni Water.



**Figure 3.11 Umgeni Water Long-Term Bulk Water Sales Forecast.**