



South East Queensland Water Strategy Annual Report 2011



Cover photo: North Pine Dam (courtesy of the Department of Environment and Resource Management).

Prepared by:

Queensland Water Commission

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Message from the Commissioner

I am pleased to present the South East Queensland Water Strategy Annual Report for 2011. This is the first annual report on the implementation of the South East Queensland Water Strategy, which was released in July 2010. The Strategy is an adaptive planning approach to provide for long-term water security through preparedness, conservation and efficiency.

In the 12 months since the Strategy's release, there have been some significant events affecting water supply planning in South East Queensland (SEQ). The Hinze Dam raising is complete and work commenced on stage two of the Northern Pipeline Interconnector. The region experienced the highest rainfall since 1974, filling all dams and culminating in extensive flooding over the summer. The community has also continued to use water efficiently with average residential use maintained below the target of 200 litres per person per day.

Continuing regional growth, together with the drought of 2001–2009 and the recent extreme wet weather, demonstrates why we must maintain our commitment to long-term water supply planning and our preparedness to respond to circumstances and challenges as they emerge. We must be vigilant in capturing and building upon our knowledge and experiences to ensure that safe, secure and sustainable water supplies are available for the SEQ community both now and for the future.

The high volume of water stored in the region's dams, coupled with the continuing efficient usage by the SEQ community, means that water supplies are secure in the short term. Current modelling indicates that, even with the worst inflows on record, the region should not reach the 40 per cent water restrictions trigger in the next five years. We can take time to consider when we need to bring on new infrastructure to make the most of the existing water supplies. This will include a review of the timing for the construction of the Wyaralong water treatment plant and its associated connecting pipelines. Some of SEQ's manufactured water assets have also been able to be put into standby mode to reduce operating costs, while retaining access to the water when it is required.

Implementation of the key actions identified in the Strategy is progressing well. Preparation of the first drought response plan for SEQ has commenced. This is a critical document to ensure SEQ is well prepared for any future droughts. Work has progressed on all but one of the key activities in the Strategy, and two activities have been completed. We are continuing to investigate the best mix of demand management options for SEQ, including the long-term role of Permanent Water Conservation Measures. Sub-regional total water cycle management planning has commenced in several of the key growth areas in the region. The Rural Water Advisory Group was established and is considering options to improve availability and reliability of water for rural production.

Looking forward into 2012, the final report from the Queensland Floods Commission of Inquiry will be released in February and work will continue on the associated Wivenhoe and Somerset Dams optimisation study. This may have implications for the management of some of SEQ's key water storages. If required, we will adjust our work plan to respond to any relevant recommendations and outcomes, but in the interim, work will continue as planned.

Building on the foundations set down in the Strategy—a drive for efficient water use, good planning, and a well-managed SEQ Water Grid—the community of SEQ can look forward to a safe and secure water supply into the future.

Mary Boydell
Commissioner
Queensland Water Commission

Table of contents

1	Purpose	1
1.1	The Annual Report	1
1.2	The South East Queensland Water Strategy	1
	Outcomes sought	1
	Means to achieve outcomes	1
2	Scope of this report	2
2.1	Process	2
2.2	Context	2
	Weather impacts	3
	Lowering Wivenhoe Dam's full supply level	3
	Institutional arrangements	3
	Operation of the SEQ Water Grid	3
	Water resource planning and other regulatory arrangements	3
3	Demand	4
3.1	Water use	4
	Regional water production – all uses	4
	Residential water use	5
	Non-residential water use and system losses	6
3.2	Demand assumptions	6
	Population	6
	Water use	6
4	Supply	7
4.1	Current infrastructure	7
4.2	Modelling assumptions	9
	Infrastructure	9
	Desired Level of Service objectives	9
	Inflow sequence	9
	Climate and weather	10
5	Supply security	10
5.1	Short term security	10
5.2	Long term security	11
6	Significant activities	12
6.1	Conserve water	12
6.2	Be prepared	13
6.3	Manage efficiently	13

7	Implementation of key actions	14
8	Summary	18
8.1	The next 12 months	18
8.2	Regional water security program	19

1 Purpose

1.1 The Annual Report

This is the first annual report on the South East Queensland Water Strategy¹. The principal objectives of this report are to:

- review the fundamental planning assumptions adopted by the Strategy. These assumptions include population growth, regional water consumption trends, effects of embedded efficiency, climate and weather impacts, the operation of the South East Queensland Water Grid and government policy decisions
- report on the progress of the 84 key actions identified in the Strategy
- review priorities for the ongoing implementation of the Strategy
- describe the focus in the next 12 months for implementation of the Strategy and develop recommendations for the timing of the next review of the Strategy.

The focus of this annual report is the 12-month period since the release of the Strategy from July 2010 to June 2011.

1.2 The South East Queensland Water Strategy

The South East Queensland Water Strategy was released by the Queensland Government on 15 July 2010 as an adaptable blueprint for maintaining water security in South East Queensland (SEQ) into the future.

In general, it is expected the Strategy will be reviewed on a five-year cycle, aligned with the review of the South East Queensland Regional Plan 2009-2031. The next review of the SEQ Regional Plan is due in 2014.

Implementation and monitoring of the Strategy is to be reported and published yearly through an annual report. The Strategy forms the basis of the Queensland Water Commission's (QWC) advice to government on water supply and demand management options for SEQ.

Outcomes sought

The Strategy enhances the transparency of planning for, and the operation of, the SEQ Water Grid. It ensures sufficient water is available to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment.

The Strategy's vision is expressed in terms of achieving the desired Level of Service (LOS) objectives, which relate to the expected frequency, duration and severity of restrictions during future droughts. The LOS objectives mean that appropriate investments will be made so that sufficient water is available from the grid to meet average regional urban demand of up to 375 litres per person per day (for all uses), of which 230 litres per person per day is attributed to residential uses. Infrastructure will be planned and delivered so that the frequency of restrictions will be no more than once every 25 years on average. These restrictions will be much less severe than those imposed during the recent drought of 2001–2009.

Means to achieve outcomes

The Strategy adopted a new approach to planning based on the LOS objectives, the introduction of drought storage reserves and pre-defined trigger levels to drive prepared responses if water storage levels become critical, regardless of the reason. Figure 3.1 from the Strategy, which is reproduced on page two, schematically presents some of the key elements of the Strategy's planning methodology.

The Strategy's vision and the LOS objectives will be delivered through a demand management framework, appropriate infrastructure investment and efficiencies gained through the operation of the region-wide grid.

The Strategy is based on the three key themes which have been adopted by government:

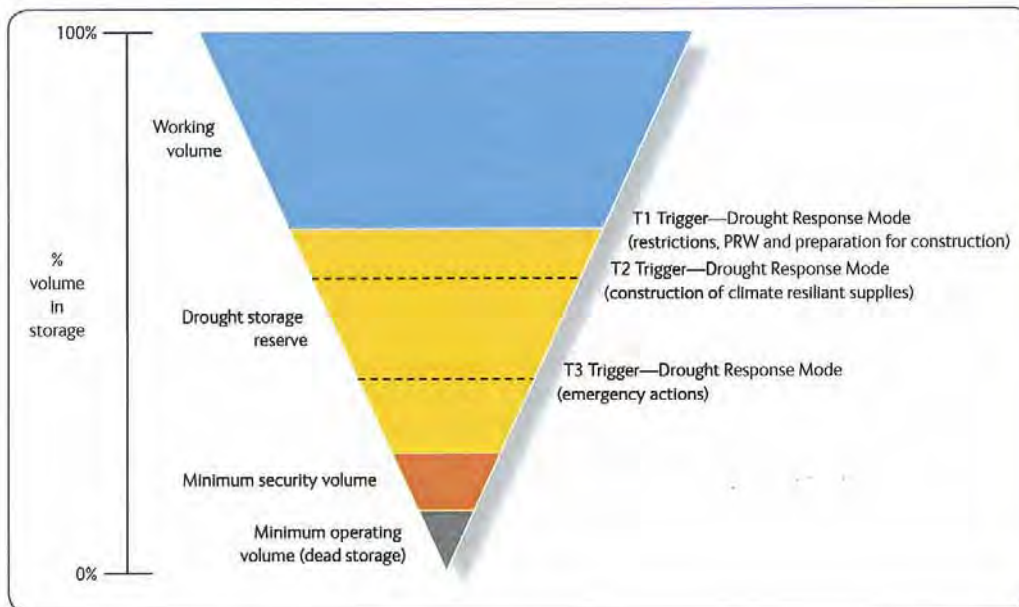
- **Conserve water:** The Strategy outlines options for residents, business and industry to maintain efficient and responsible water consumption. It challenges the residents of SEQ to use no more than 200 litres

¹ The Strategy is available at <www.qwc.qld.gov.au>.

per person per day of water (Target 200) compared to the planning assumption of 230 litres per person per day.

- Be prepared: The Strategy utilises the regional water balance to understand when future water supplies are required to meet demand growth in the region and also as a response to future severe droughts. Preparation of a drought response plan and maintenance of a portfolio of future supply options will underpin any major expenditure decisions in the future.
- Manage efficiently: Construction of the grid allows supplies in the region to be managed on an integrated basis in a way not previously possible.

Partitioning of key SEQ Water Grid storages



Source: SEQ Water Strategy (figure 3.1), Queensland Water Commission.

2 Scope of this report

2.1 Process

The process undertaken to prepare this report was aimed at achieving the objectives described in section 1.1. The work was broadly conducted by:

- reviewing water use across the region from July 2010 to June 2011
- reviewing and updating the regional water balance model for SEQ including the input assumptions
- documenting the progress of the key action items from the Strategy, including a review of priorities
- developing recommendations for the next review of the Strategy.

2.2 Context

In the 12 months since the release of the Strategy there have been a number of significant events which either directly or indirectly affect the Strategy and its implementation. These include:

- weather impacts improving the region's short-term water security position
- the temporary lowering of Wivenhoe Dam's full supply level in response to the 2011 flood and undertaking work to support recommendations of the Queensland Floods Commission of Inquiry
- changes to institutional arrangements for water in SEQ
- changes to the infrastructure in the grid and how it is operated
- changes to water resource planning and other regulatory arrangements.

Weather impacts

In 2010, Queensland had its wettest year on record and Brisbane had its highest rainfall since 1974. Between July 2010 and June 2011, Brisbane recorded 158 per cent of its average annual rainfall, the Gold Coast recorded 153 per cent and Tewantin recorded 170 per cent.

On 1 July 2010, the Grid Twelve²—made up of the 12 key dams which contribute to the SEQ water supply system—was at 95.7 per cent of capacity. By 13 October 2010 all major storages were spilling, with the Grid Twelve holding 117.9 per cent of water storage capacity. Then, in December 2010 and January 2011, SEQ experienced extraordinary rainfall culminating in significant flooding in the region, including much of Brisbane.

Wivenhoe, Somerset and North Pine Dams' full supply level

As a result of the extraordinary rainfall and flood events, on 13 February 2011 the Government announced that Seqwater would make releases from Wivenhoe Dam to lower the full supply level to 75 per cent for the duration of the wet season (until 31 March 2011). On 3 March 2011, following the lowering of Wivenhoe Dam, the Grid Twelve had dropped to their lowest levels for 2010/11, holding 86.8 per cent of storage capacity. By 30 June 2011, the Grid Twelve was holding 90.6 per cent of its combined capacity.

An independent Commission of Inquiry is being conducted into the floods that affected most of Queensland in the summer of 2010/2011. The Commission of Inquiry released an interim report on 1 August 2011. The final report on the inquiry findings will be delivered on 24 February 2012. Recommendations 2.2 to 2.5 of the interim report related to the temporary alteration of the full supply level of Wivenhoe, Somerset and North Pine Dams. Any decisions made in relation to these recommendations, or any final recommendations made by the Commission of Inquiry, will be reflected in the 2012 annual report on the Strategy. Any findings from associated activities, such as the Wivenhoe and Somerset Dams optimisation study, will also be considered in the next annual report.

Institutional arrangements

On 5 December 2010, the government announced that SEQ's two bulk water supply authorities Seqwater and WaterSecure would merge on 1 July 2011, to form a single bulk water supply provider for SEQ. WaterSecure was responsible for supplying manufactured water to the region through desalination and the production of purified recycled water, and Seqwater was responsible for managing surface water storages and their associated water treatment plants. The new merged entity retained the name Seqwater.

On 7 April 2011, the State Government announced it would allow the local governments of SEQ to split from the three distributor-retailers that had been formed in 2010, as part of the institutional reform of the SEQ water industry.

It is not expected that there will be any significant impact on water security or on the implementation of the Strategy resulting from changes to these arrangements.

SEQ Water Grid operations

On 5 December 2010, the State Government announced that the desalination plant at Tugun would be placed into standby mode with the ability to come on line on short notice. It also announced that the Gibson Island Advanced Water Treatment Plant (AWTP), and one of the Bundamba AWTPs from the Western Corridor Recycled Water Scheme, would both be placed in standby mode. These changes were designed to support more efficient delivery of bulk water at a time of strong security. The QWC intends to introduce requirements into the System Operating Plan (SOP) for the grid, to ensure manufactured water can contribute to the region, when required. An example of this occurring was during the SEQ floods when the desalination plant ran at 100 per cent capacity to ensure SEQ had adequate high-quality drinking water.

Water resource planning and other regulatory arrangements

The State Government's Mary Basin Resource Operations Plan 2011 was approved on 2 September 2011. The plan will implement the Water Resource (Mary Basin) Plan 2006 and help enhance certainty and security for water users in the plan area.

² The Grid Twelve is made up of the following 12 dams which contribute to the SEQ water supply system: Wivenhoe, Somerset, North Pine, Hinze, Baroon Pocket, Leslie Harrison, Ewen Maddock, Cooloolabin, Lake Kurwongbah, Lake Macdonald, Little Nerang and Wappa.

The drinking water quality management plans (DWQMP) and recycled water management plans (RWMP) required by the *Water Supply (Safety and Reliability) Act 2008*, were prepared during the 2010/2011 year. The Wivenhoe and Mt Crosby DWQMPs and the Western Corridor Recycled Water Scheme RWMP have been approved. This approval is critical to allowing purified recycled water to be supplied to Wivenhoe Dam when key grid storages reach 40 per cent capacity. The Office of the Water Supply Regulator is currently proceeding with assessment of the other DWQMPs and RWMPs.

3 Demand

3.1 Water use

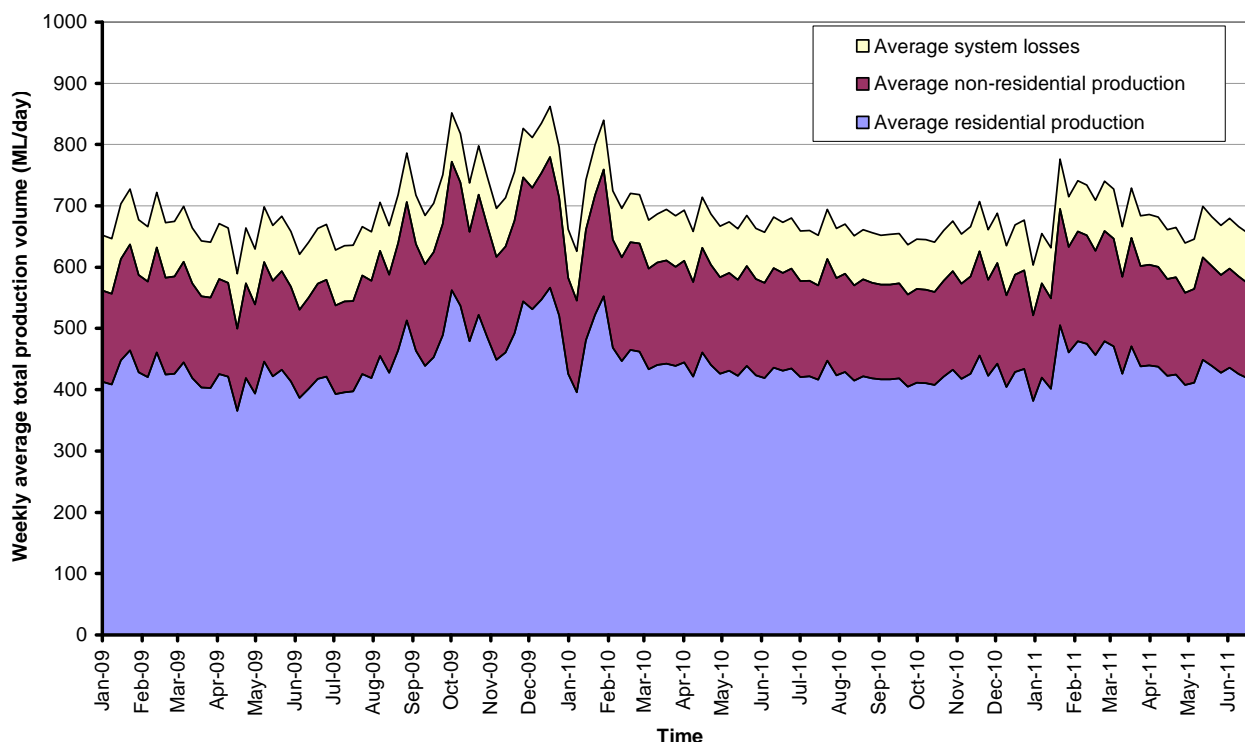
This section provides information on residential and non-residential (including industrial) water use as well as system losses. Figures presented for water use are based on customers in SEQ with reticulated water supplies.

Regional water production – all uses

In December 2009, restrictions on water use that were introduced to manage the recent drought, were lifted and replaced with permanent water conservation measures. Figure 1 shows the average total water production across all SEQ from January 2009 until July 2011. This production includes water for residential and non-residential uses as well as system losses³. Since 11 April 2009 a voluntary residential water use target of 200 litres per person per day (Target 200) has been in place.

For the 12 months from July 2010 to June 2011, total water production across SEQ was around 261 000 megalitres, which averages 716 megalitres per day, equivalent to 254 litres per person per day (for all uses). This is well below the Strategy planning assumption of 375 litres per person per day (for all uses).

Figure 1 – Weekly average total production for SEQ



³ System losses are the difference between the amount of water extracted from water supplies and the amount delivered to water users. The difference may be due to approved activities, such as fire fighting, or unapproved, such as theft, or due to other unmetered use, leakage losses or meter error. The system losses may occur at any point in the system, from extraction and production to bulk transport and local distribution.

Residential water use

Figure 2 shows the average of residential water use in SEQ from January 2009 to July 2011 (as a four-week rolling average). It compares water usage with the weather indicators of total weekly rainfall and the maximum daily temperature (as a four-week rolling average).

Figure 2 illustrates how residential water use is affected by weather factors, with residential water use tending to be greater at higher average daily temperatures. It also highlights that SEQ residents have maintained water consumption below the voluntary Target 200 since it was introduced on 11 April 2009. This result is likely to be due to a range of factors including regular rainfall, the introduction of Permanent Water Conservation Measures in December 2009 and responsible water use by the community.

Figure 2 – Average daily SEQ residential consumption and variation in weather conditions

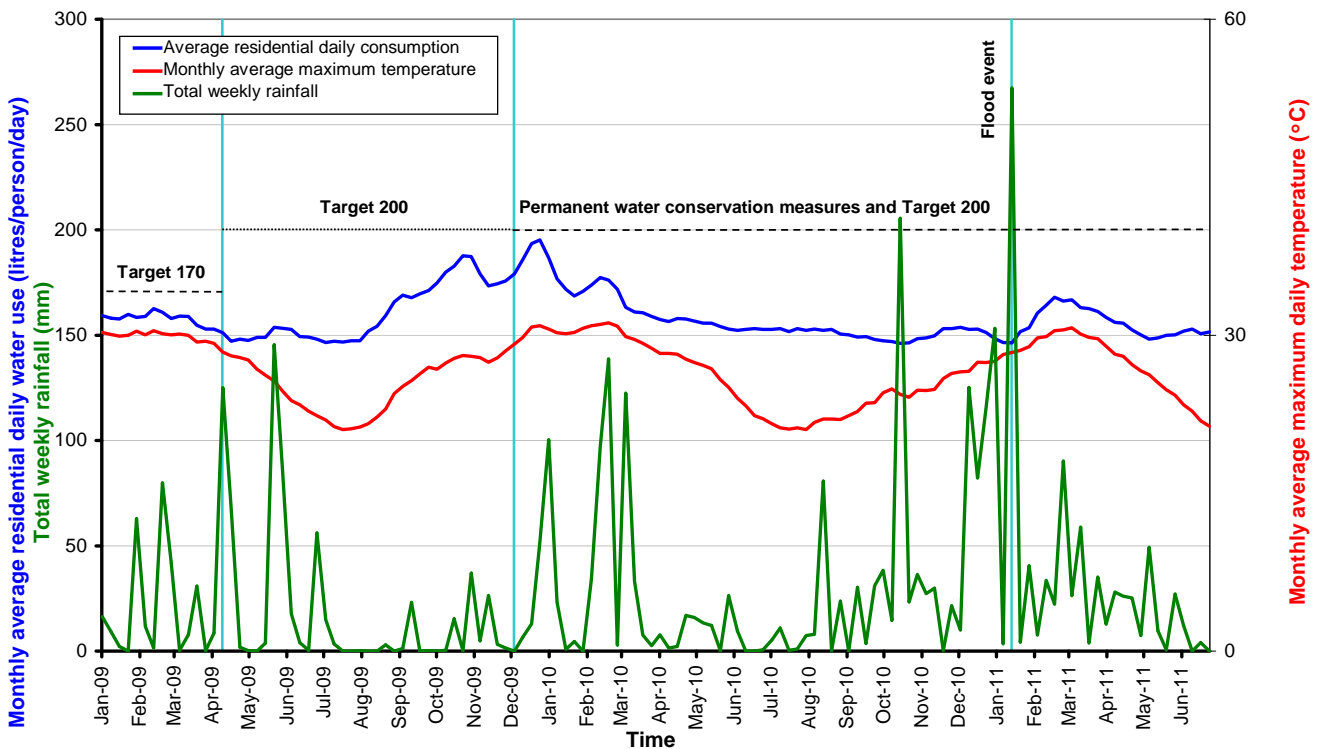


Table 1 contains the regional average daily residential water use for different zones in SEQ for the 12 months from July 2010 to June 2011. It shows there was significant variation in water use throughout the region, with average daily residential water use for the 12-month period ranging from 115 litres per person per day in the Scenic Rim to 183 litres per person per day at the Gold Coast.

Table 1 also illustrates that the water use can fluctuate significantly within a zone, with the average daily residential water use ranging over 100 litres per person per day in each zone.

Table 1 – Daily average residential water use in different regions across SEQ

	Average daily residential water use per zone (litres per person per day) July 2010 to June 2011					
	All SEQ	Central SEQ ¹	Gold Coast	Scenic Rim	Redland	Sunshine Coast
Average	163	139	183	115	172	179
Low	109 (Wed, 12-1-11)	79 (Wed, 12-1-11)	99 (Fri, 31-12-10)	89 (Wed, 23-2-10)	110 (Sat, 25-12-10)	144 (Mon, 1-11-10)
High	211 (Sat, 15-1-11)	225 (Sat, 15-1-11)	267 (Wed, 9-2-11)	184 (Thurs, 30-9-10)	225 (Fri, 31-08-10)	239 (Thurs, 13-1-10)

¹ Central SEQ includes Brisbane, Ipswich, Logan, Lockyer, Moreton and Somerset councils.

Non-residential water use and system losses

From July 2010 to June 2011, regional non-residential water use, including system losses, averaged 257 megalitres per day, which is equivalent to 91 litres per person per day. System losses includes water used for approved activities such as fire fighting, or unapproved, such as theft or due to other unmetered use, leakage or meter error. These may occur at any point in the system, from extraction and production to bulk transport and local distribution.

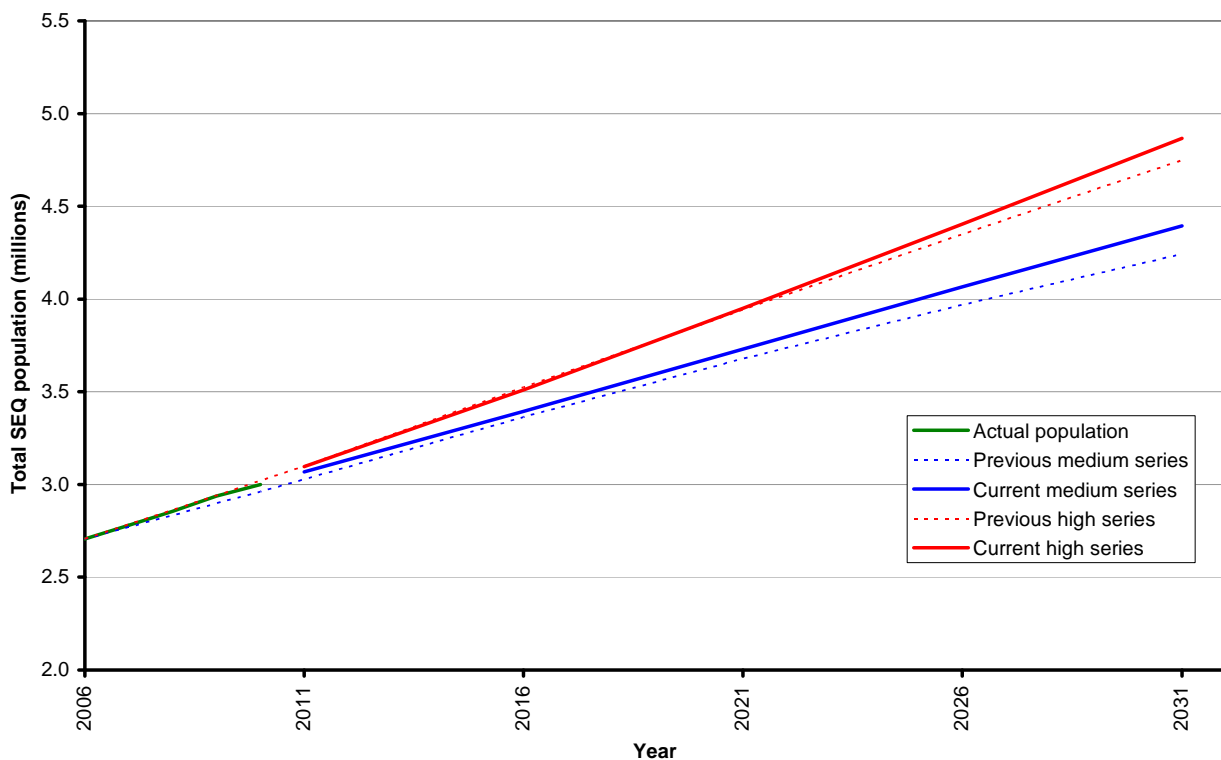
Non-residential water use alone (not including system losses) averaged 170 megalitres per day, which is equivalent to 60 litres per person per day. System losses accounted for approximately 12 per cent of SEQ's total water production and non-residential use accounted for approximately 24 per cent.

3.2 Demand assumptions

Population

Figure 3 shows the most recent (May, 2011) population forecasts for SEQ compared to the population forecasts from 2008, which were a key input assumption to the water balance for the Strategy. These population forecasts are prepared by the Office of Economic and Statistical Research in Queensland Treasury. There is less than a 3.4 per cent difference between the two population forecasts, with the recent forecasts being slightly higher than the previous.

Figure 3 – Updated population forecasts compared to the Strategy assumption



Water use

As discussed in section 3.1, average residential water use has been consistently below Target 200 for the 12 months from July 2010 to June 2011, and the total water production has been well below the Strategy planning assumption of 375 litres per person per day (for all uses). In consideration of this ongoing low water use, a scenario utilising a regional average residential water use of 180 litres per person per day has been presented in section 5.2 as well as a scenario with a rebound to 200 litres per person per day.

The Strategy assumed that non-residential water use, including system losses, will be 145 litres per person per day out of the total 375 litres per person per day. The current regional average non-residential water use,

including system losses, is 91 litres per person per day. This reduction can be partially attributed to reduced water use by power stations from an assumed 29 500 megalitres per year to approximately 6 900 megalitres per year due to the shut down of part of the Swanbank Power Station and changes to their water requirements. The reduced demand from power stations leads to a reduction in the regional average non-residential water use down to 130 litres per person per day (compared to 145 litres per person per day presented in the Strategy). An analysis was also done assuming a low rebound to an average non-residential water use of 100 litres per person per day.

The three demand scenarios presented in section 5.2 are provided in Table 2 below. In all cases, when comparing current and projected demand, it was assumed that the rebound period is five years.

Table 2 – Demand scenarios

Scenario	Predicted population growth ¹	Residential water use (litres per person per day)	Non-residential water use ² (litres per person per day)
Low demand	Medium series	180	100
Base demand	Medium series	200	130
High demand	High series	230	145

¹ Population forecasts were obtained from the Queensland Government population projections, 2011 edition prepared by the Office of Economic and Statistical Research, Queensland Treasury.

² Non-residential water use includes system losses.

As discussed in section 5.2, water use affects the regional water balance, thereby potentially altering the timing for the need for new bulk water supply infrastructure to meet growth in demand. Water use will continue to be monitored, including the effect of weather conditions and possible rebound in water use. When the Strategy is reviewed, the planning assumption of 375 litres per person per day (for all uses) may be updated based on the best information available.

4 Supply

4.1 Current infrastructure

The SEQ Water Grid is a series of connected surface water supplies, associated water treatment plants and manufactured water supplies. The interconnection of the region's water supplies has improved water security by allowing water to be shared and more fully utilised. Figure 4 shows a schematic representation of the current bulk water supplies and associated key connections in the grid.

Throughout 2010/2011 significant milestones were completed for grid infrastructure, including the following:

- Practical completion was achieved for the South East Queensland (Gold Coast) Desalination Project (located at Tugun) in September 2010.
- The Western Corridor Recycled Water Scheme, Luggage Point advanced water treatment plant achieved practical completion in July 2010.
- Commissioning testing for the Western Corridor Recycled Water Scheme, Gibson Island advanced water treatment plant was completed in December 2010 and outstanding issues are being addressed prior to the plant reaching practical completion.
- Hinze Dam Stage three achieved practical completion in December 2010.
- Wyaralong Dam achieved practical completion in May 2011.
- Construction of the Northern Pipeline Interconnector Stage Two was 75 per cent complete by June 2011, and was on track for completion by 31 December 2011. The project works include reverse flow capability in both the Northern Pipeline Interconnector Stage One and Stage Two.

Figure 4 – SEQ Water Grid



Source: Department of Employment, Economic Development and Innovation

4.2 Modelling assumptions

Infrastructure

As part of developing this report, the regional water balance model for SEQ has been reviewed and updated with current (as at 30 June 2011) water allocations, and current and committed water supply infrastructure. The Strategy was based on the existing and planned infrastructure for the grid as at 2010, and it included the following key assumptions which have now changed:

- The construction of stage one of the Wyaralong water treatment plant⁴ would be completed in 2012.
- The connection of the Wyaralong water treatment plant to the SEQ Water Grid via the Southern Regional Water Pipeline would be in place in 2012.
- The connection of the Karawatha Reservoir to the Southern Regional Water Pipeline by the end of 2012.

As there is sufficient supply in the SEQ Water Grid at present, the construction of the Wyaralong water treatment plant and connecting pipelines has been deferred for commencement no earlier than 2014/15. The timing for construction of this infrastructure is being regularly reviewed by the QWC. The regional water balance model will assist in determining the most appropriate timing for future infrastructure, including the Wyaralong water treatment plant.

In the future, the regional water balance model will directly reflect the infrastructure identified in the Regional Water Security Program for south-east Queensland (RWSP). The RWSP was last updated in March 2010 and is due to be amended to reflect the current estimates for infrastructure timing. The QWC is currently preparing advice to the government on these matters.

Desired Level of Service (LOS) objectives

The Strategy identified desired LOS objectives for SEQ. These are now reflected in the RWSP. Recent updates to the regional water balance model have improved understanding of the effect of the various LOS objectives on water security. All of the LOS objectives have an associated frequency of occurrence except the following objectives:

- Sufficient investment in the water supply system will occur so that regional water storages do not reach five per cent of combined storage capacity.
- Sufficient investment in the water supply system will occur so that Wivenhoe, Hinze and Baroon Pocket Dams do not reach minimum operating levels.

It is proposed that the frequency of occurrence of 'not more than once every 10 000 years on average' be assigned to each of the above LOS objectives. This frequency is consistent with values used for other modelling in the Strategy, such as the determination of climate-resilient yields in the grid⁵. The QWC expects to provide advice on this to the government in 2012.

Inflow sequence

The regional water balance modelling presented in the Strategy was based on historical inflow records from 1890 to 2007. The inflow data set did not contain the recovery period exiting the 2001-2009 drought nor the recent flood event experienced in SEQ. The 2009–2011 inflow data is expected to have an effect on the stochastic data set that feeds into the water balance model that is used to determine the LOS system yield. This in turn could affect the model's prediction of when future water supplies are likely to be required in the region.

Work has commenced with the Department of Environment and Resource Management (DERM) to secure the most up-to-date inflow data for SEQ. The improved data set will underpin the regional water balance results expected to be presented in the 2012 annual report.

⁴ Also known as the Cedar Grove Water Treatment Plant.

⁵ Climate-resilient yield is discussed in section 3.1.6 of the South East Queensland Water Strategy.

Climate and weather

The Strategy presented a scenario of 10 per cent reduced inflows to surface water storages to take into account possible impacts from climate change. Further work is being undertaken to improve understanding of climate change impacts, including a project being done by the Urban Water Security Research Alliance to assess the effect of climate change on water availability in SEQ. Until results from this work are available, the 10 per cent reduction in inflows will continue to be used as a conservative estimate to assess the possible impact of climate change. A scenario using this assumption is presented in section 5.2.

5 Supply security

5.1 Short term security

Section 2.2 of this report discusses the recent wet weather experienced in SEQ. The effect of such weather has been to significantly increase the volume of water held in storages in SEQ. The increased water stored in dams, combined with continued water use below Target 200, has ensured a high level of water security for SEQ in the short term. However, on its own, the high level of water stored in the system now will not have an enduring effect on the region's long-term water security position.

Figure 5 shows what would happen to the volume of water stored in the Grid Twelve if there was another severe drought with inflows similar to what was experienced from 2001 to 2007, and the demand was equivalent to the base demand profile outlined in Table 2. It is possible that the 40 per cent water restrictions trigger could be reached as early as April 2017. At this point, augmentation of Wivenhoe Dam with purified recycled water would be triggered to contribute to maintaining continuity of supply in the region.

Figure 5 – Draw down curve of the Grid Twelve

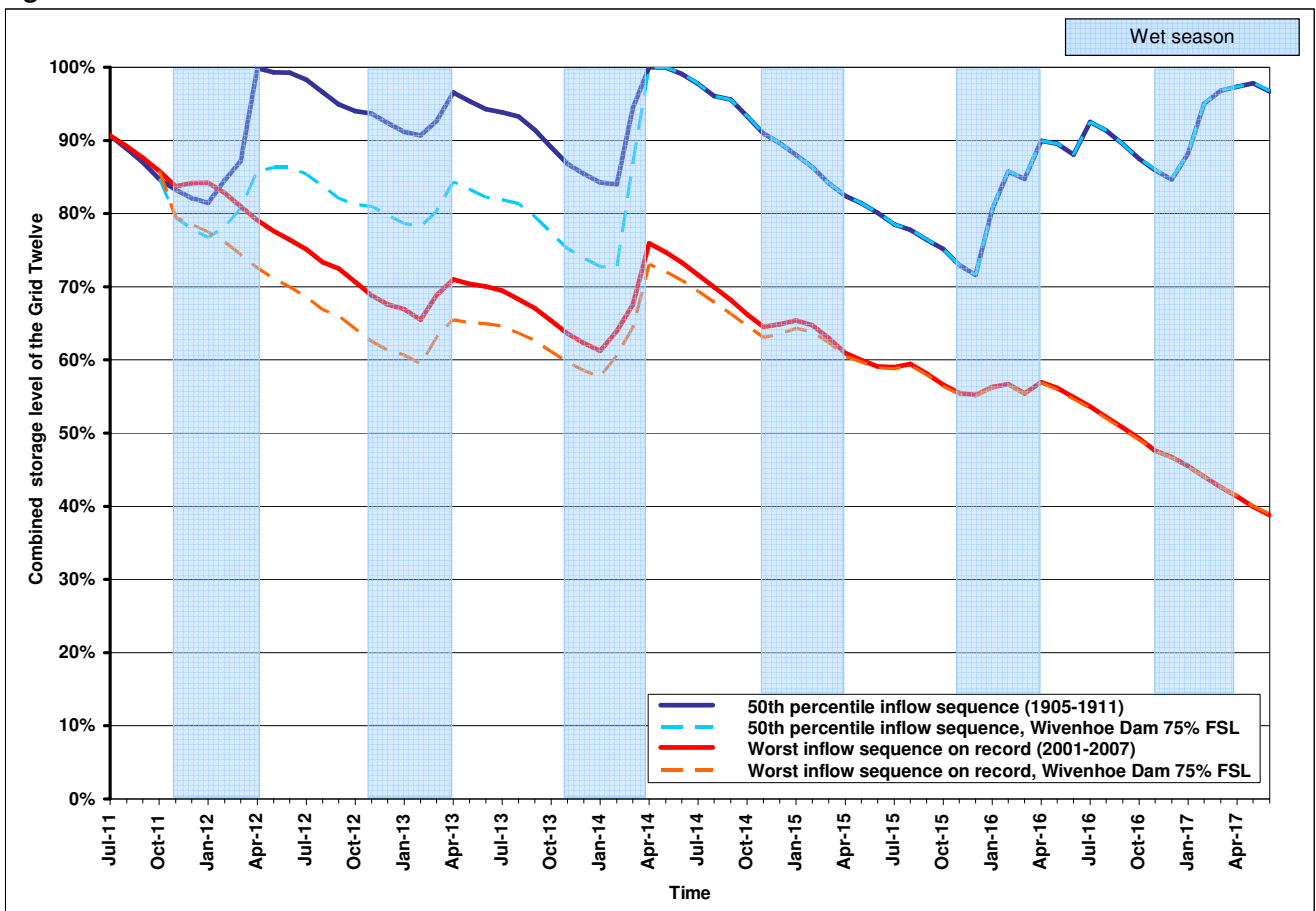


Figure 5 also shows what would happen to the volume of water stored in the Grid Twelve if there were 50 percentile inflows based on records from 1890 to 2007 and a demand equivalent to the base demand profile outlined in Table 2. The significance of this line is that in half of the inflow sequences recorded, there would have been more water stored in the Grid Twelve than what is shown by the 50 percentile line. In none of these cases would the 40 per cent water restriction trigger have been reached before June 2017.

Figure 5 also shows both of the above cases with a reduced full supply level in Wivenhoe Dam of 75 per cent at the commencement of the 2011 wet season. It illustrates that a temporary reduction of the full supply level of Wivenhoe Dam for the coming wet season should not significantly alter the combined storage level of the Grid Twelve, nor SEQ's future water security position.

5.2 Long-term security

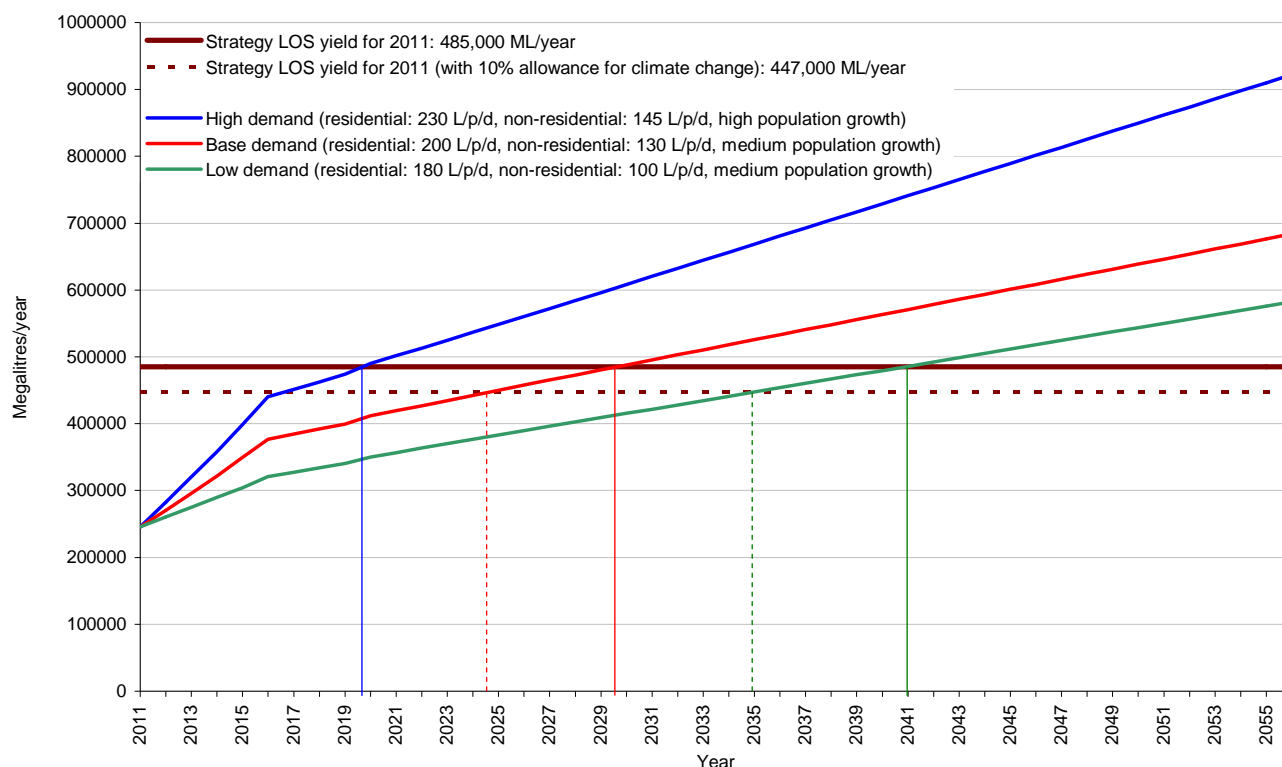
Long-term water security, as defined by the desired LOS objectives, is determined by the balance between water supply and demand. Water demand is a function of population and residential and non-residential water use. The available water supply is a function of the supply infrastructure, rainfall, inflows and the security objectives described by the desired LOS objectives.

As discussed in previous sections, recent weather events have resulted in the Grid Twelve storing near their full supply volumes. Section 3.1 discusses water usage in SEQ from July 2010 to June 2011, noting in particular that average water use across the region has been about 254 litres per person per day (for all uses), well below the Strategy planning assumption of 375 litres per person per day (for all uses). If total water consumption in SEQ continues to remain lower than expected, there will be a positive effect on long-term water security and the timing for future infrastructure to maximise the benefits of existing supplies, as well as any future new water supplies.

The regional water balance model will continue to be updated to incorporate the most up-to-date data for demand and supply. Work is currently in progress to update the inflow data set that underpins the regional water balance model. The Strategy was produced using historical inflow records from 1890 to 2007. It is planned to update the data set to include the recovery from the drought and the January 2011 floods. This is expected to be complete in time for reporting in the 2012 annual report.

In the interim, Figure 6 presents the regional water balance using the demand scenarios discussed in section 3.2 and the LOS system yield presented in the Strategy. It is assumed that rebound will occur over a period of five years. Given the variation between the demand scenarios, at this time there is no materially improved information available on when new water supplies will be required in the region. It is still considered reasonable to say that new water supplies are not expected before 2027, as identified in the Strategy. As highlighted in section 8.1, the regional water balance model will be further refined in the coming 12 months to provide an updated LOS yield for water supply in SEQ and a revised estimate of when new water supplies may be required to meet growth in demand.

Figure 6 – Current regional water balance



6 Significant activities

A brief overview is provided below on significant projects the QWC has been working on since the Strategy was released. These projects include:

- demand management, including the impact of Permanent Water Conservation Measures and other significant demand management outcomes
- drought response planning
- sub-regional planning activities including desalination studies and sub-regional total water cycle management planning
- the progress of the Rural Water Advisory Group and its priority projects
- the Wivenhoe and Somerset Dams optimisation study and other activities associated with the Queensland Floods Commission of Inquiry.

The information is presented in the following sections according to the three key themes of the Strategy.

6.1 Conserve water

The QWC is undertaking a review of structural, operational and behavioural water efficiency measures in the context of demand management, including permanent water conservation measures. The outcomes of this review, which will be presented in the 2012 annual report, will influence the demand management measures proposed by the QWC in the advice it gives State Government on regional water security options.

The development of local water supplies is an integral part of the Strategy to help reduce the amount of water that needs to be supplied from the grid. The QWC has continued to assist with the planning and development of the Fitzgibbon Stormwater Harvesting Scheme and has contributed to the successful implementation of the South Bank Stormwater Harvesting and Recycling Centre, which has improved water efficiency and reduced reliance on grid water across the South Bank Parklands in Brisbane. These demonstration projects contribute to understanding how such projects can be implemented and the outcomes they can achieve.

The Urban Water Security Research Alliance (UWSRA) is undertaking a number of research projects relating to decentralised water supply systems. One project is looking at the volume of 'grid water' that is saved by using rainwater tanks. Preliminary results indicate that the effect of rainwater tanks is dependent upon factors such as

rainfall, tank volume, connected roof area and water efficient appliances in the home. Another project is looking at the factors that influence the energy required to supply rainwater for use in dishwashers, washing machines, toilets and handheld irrigation. These projects are expected to be finalised in mid-2012.

6.2 Be prepared

A key theme of the Strategy is to be prepared to ensure that the grid can meet demand, independent of climatic conditions. A number of projects to improve the region's readiness have progressed, including the following:

- An independent review of the priority and reserve desalination sites confirmed that the assumptions and findings are still appropriate. The findings of the independent review are currently being assessed and considered by the QWC. Further work will be done to determine the viability of the options before preserving the relevant sites. These activities will contribute to the timely construction of a climate-resilient bulk water supply when needed.
- Sub-regional total water cycle management plans are being prepared for the key development precincts of Caboolture West, Ripley Valley and the combined Caloundra South and Palmview areas. These plans will help ensure the integration of land use and infrastructure planning in these areas. A Stakeholder Technical Advisory Group has also been established for each of the planning areas. It is made up of representatives from local government, water grid entities⁶, the distributor-retailer and relevant technical experts.
- A cooperative water planning group has been established to identify preferred options for meeting demands in both Canungra and Beaudesert.
- The QWC has begun preparation of the SEQ Drought Response Plan. This plan will outline what needs to occur in the lead up to, during and after any future drought in SEQ. Community engagement on the plan is scheduled for early 2012. The drought response plan will provide:
 - guidance on the types of restrictions and demand management measures that should be considered and how these can be best implemented
 - reference to the plans and processes in place to safely deliver manufactured water from the desalination plant at Tugun directly into the grid and purified recycled water indirectly to the grid via Wivenhoe Dam
 - the process that will need to be followed if it is necessary to build additional climate-resilient water supplies to maintain security during a severe drought
 - individual drought response plans for communities with reticulated water supplies that are not connected to the SEQ Water Grid and that have lower than desired local supply reliability
 - the activities and events that will occur as part of a drought exit.

6.3 Manage efficiently

The Strategy identified a need to consider the balance between water supply and flood mitigation capacity for Wivenhoe Dam. This work took on special significance following the January 2011 floods in SEQ. The QWC has undertaken an analysis of the water security implications of various operating scenarios for Wivenhoe Dam, and this advice was provided to the Queensland Floods Commission of Inquiry. Further work is planned on this in conjunction with other government agencies and water grid entities. Water security implications will be a critical factor when determining the appropriate balance between drinking water storage and flood reserve in Wivenhoe Dam.

One of the key actions identified in the Strategy is the formation of a Rural Water Advisory Group to oversee planning for rural water supplies in SEQ. The group's membership is comprised of irrigators from the Upper Mary, Mid-Brisbane, Logan, Lockyer Valley and Warrill Valley Water Supply Schemes as well as representatives from the Queensland Farmers Federation, the QWC, DERM and Seqwater. The Rural Water Advisory Group identified two priority projects for action last year. One of these was to undertake a prefeasibility study on the potential to supply recycled water to irrigators in the Logan River area. The second project was to apply to amend the Interim Resource Operations Licence for the Warrill Valley Water Supply Scheme, to enhance the reliability of supply to irrigators as a priority. A consultative project was conducted and DERM is currently considering the application.

⁶ The water grid entities are Seqwater, Linkwater and the SEQ Water Grid Manager.

7 Implementation of key actions

The Strategy identified 84 key actions to be undertaken in the next 10 years to achieve the goals of the Strategy. As a number of the actions are related to each other this list has been consolidated to 26 'group' activities. The list below still refers to each of the key actions identified in the Strategy.

As indicated in Table 3, work is proceeding well on most of the Strategy's key activities. Two key activities have been completed and a number of activities have been reprioritised and timeframes adjusted accordingly. Work has commenced on all but one of the key activities. No new key activities have been included in the table.

Table 3 – Progress of key activities of the South East Queensland Water Strategy

Key

Key activity completed
Key activity being progressed
Key activity not yet commenced

Strategy key activity number	Key activity	Responsible agency	Timeframe	Summary of status
OVERARCHING ACTIVITIES				
4, 5	Report on the status of implementation and provide updated regional water security options to the Minister.	QWC	As required	To be undertaken following the completion of the annual report.
74	Report on the annual market rules review.	QWC	No later than 30 November each year or by such other time as the Minister may determine.	Ongoing. Currently on schedule to be completed by 30 November 2011.
73	Review the SEQ System Operating Plan as required.	QWC	As required	The SEQ System Operating Plan has been amended twice in the past year to reflect and enable current policy and infrastructure arrangements, such as the revised operating arrangements for the manufactured water infrastructure.
6, 8, 13	Publicly report on the implementation of the Strategy and currency of key assumptions.	QWC	Annually	Meetings on the Strategy have been held with major stakeholders, including key community groups such as Healthy Waterways and Communities Against Desalination, as well as with local councils. The first annual report on the Strategy is to be released in November 2011.
9	Review the Strategy as required and prior to a decision regarding the next major supply.	QWC	At least once every five years, aligned with the SEQ Regional Plan.	The first major review of the Strategy is proposed to be released in 2015.
CONSERVE WATER				

Strategy key activity number	Key activity	Responsible agency	Timeframe	Summary of status
7	Develop a triple-bottom-line assessment framework for potential demand management measures and potential water supplies.	QWC	Short term	Complete. The results will be integrated with the demand management report (discussed next).
16, 17, 18, 19, 23, 33, 79	Review the approach and priorities for demand management, including the effectiveness of Permanent Water Conservation Measures.	QWC, distributor-retailers, DERM, UWSRA and other stakeholders	Ongoing	A review is being undertaken on the approach and priorities for demand management and is due to be finalised late 2011. There are several UWSRA projects being undertaken, including a water end use study, due to be completed in 2012.
15, 20, 21, 27, 32	Develop options to improve water use efficiency, including delivery of information and education campaigns.	QWC, Department of Local Government and Planning, Department of Education and Training and the UWSRA	Ongoing	The UWSRA is undertaking a number of projects to investigate potential efficiencies, due to be completed in 2012. A case study for an education program on water saving target options for local government and developers was developed. Material, such as Permanent Water Conservation Measure magnets, is distributed through relevant SEQ events and organisations such as retailers, schools and information centres.
28, 29, 30, 31, 62, 63	Investigate and facilitate the use of local water supplies to provide alternative water supplies, including the use of rainwater tanks and stormwater harvesting.	QWC, local government and UWSRA	Ongoing	The UWSRA is undertaking a number of projects that are due for completion in 2012, including the investigation of pathogen survival in rainwater tanks, analysis of greenfield stormwater harvesting opportunities in SEQ and options to increase energy efficiency of household rainwater tanks.
55, 56, 57, 71	Investigate the potential of water recycling opportunities, including using recycled water for rural irrigation purposes, and the consequences of wastewater discharge.	QWC with distributor-retailers	Medium term	A prefeasibility study on the potential to use recycled water for irrigation in the Redland area has been completed and another is underway for the Logan area. The SEQ Water Grid Manager and Queensland Urban Utilities have completed a market assessment for the take-up of PRW by industry.
BE PREPARED				
12	Undertake hydraulic modelling to better address the potential impact of climate change on the inflows of major dams.	UWSRA, QWC, DERM	Medium term	Downscaled modelling data (from 200km ² to 15km ²) has been used to simulate the Grid 3 storages. Further refined data (8km ² scale) will be analysed and consideration given to the effects on the operation of SEQ Water Grid.

Strategy key activity number	Key activity	Responsible agency	Timeframe	Summary of status
14, 24	Monitor residential and non-residential consumption trends and refine future demand profiles as appropriate.	QWC	Ongoing	Water consumption data is analysed as it is received. The annual report provides details of refining the demand profiles.
34, 35 & 36	Implement the water supply works in accordance with the regional water security program for south-east Queensland.	Responsible entities	As specified in the regional water security program (based on QWC's recommendation)	The Northern Pipeline Interconnector Stage 2, Wyaralong Dam and Hinze Dam Stage 3 have been constructed in accordance with the regional water security program. The construction of the Wyaralong water treatment plant and the Cedar Grove Connector have both been deferred.
10, 11, 60 & 61	Prepare a drought response plan for the SEQ Water Grid, including towns with stand-alone sources of supply.	QWC	Short term	To be finalised in 2012.
37, 38, 40, 41, 42, 43, 44, 45, 46, 47	Undertake preparatory work and detailed investigations into potential desalination facilities, including preserve sites and associated pipeline corridors and establish baseline conditions for those sites.	QWC, LinkWater, SEQ Healthy Waterways Partnership and the Co-ordinator General	Short term	An independent review of the priority and reserve desalination sites has been undertaken and the findings are being assessed by the QWC. A report on the route selection for pipeline corridors has been drafted and will be finalised in 2012.
39, 76, 77, 78, 80	Undertake land use planning and develop appropriate catchment management controls to ensure appropriate development controls and management of water quality risks.	Local councils, Seqwater, DERM, QWC, UWSRA and Department of Local Government and Planning	Medium term	Discussions held with local council on land use planning around Tugun desalination plant; a land use master plan to be prepared in 2011 by Gold Coast City Council.
48, 49, 51, 52, 58, 59, 84	Undertake detailed investigations to optimise the use of existing dams and weirs, including through augmentation and supplementing supplies with stormwater, purified recycled water (PRW) or water harvesting.	QWC, DERM, UWSRA, Seqwater, distributor-retailers, and local government	Ongoing	Investigations into potential supply options for the Logan and Albert River catchments are underway and recommendations are expected to be made early 2012. Scoping of investigations for potential supply options for the Mary River is being undertaken with key stakeholders.
50	Review the operation of the Brisbane River system to optimise the balance of the flood and water supply storage volume requirements.	QWC and Seqwater	Short term	Detailed modelling of the Brisbane River system is being undertaken to enable advice to be made to government on Wivenhoe Dam's water supply yield.

Strategy key activity number	Key activity	Responsible agency	Timeframe	Summary of status
53, 54	Enhance community access to information regarding PRW, including publishing annual water quality reports from the Western Corridor Recycled Water Scheme.	Seqwater	Ongoing	A water quality report for PRW from Bundamba Advanced Water Treatment Plant with results from between 1 December 2008 and 30 June 2010 was published in October 2010.
MANAGE EFFICIENTLY				
22	Implement standardised water billing requirements across SEQ.	Distributor-retailers	Short term	Completed. The QWC developed a Customer Water and Wastewater Code which came into effect 1 January 2011. It sets out customer service standards and billing practices which the distributor-retailers are expected to make best endeavours to follow.
1, 2, 3	Develop sub-regional total water cycle management plans for key development areas, including in Beaudesert and Sunshine Coast Regional Council areas.	QWC in partnership with DERM and key stakeholders	Medium term	A framework for the development of sub-regional total water cycle management plans has been developed. Development of sub-regional total water cycle management plans commenced for Caloundra South and Palmview, Ripley and Caboolture West.
65, 67, 68, 71	Establish a rural water advisory group to oversee planning for rural water supply initiatives in SEQ and help prioritise rural water projects to be undertaken in SEQ.	QWC	Short term	The Rural Water Advisory Group has had five meetings since its inception. Significant progress has been made on its two priority projects: applying to amend the operating arrangements in the Warrill Valley to provide greater water security, and investigating the potential to provide recycled water in the Logan River area.
66, 69, 70, 72	Develop a framework and investigate opportunities to make water from the SEQ Water Grid temporarily available (e.g. for rural production or purposes outside SEQ), when not required for urban supply.	QWC, DERM, SEQ Water Grid Manager and Seqwater	Short term	The SEQ Water Grid Manager completed a feasibility study into distributing PRW through Seqwater's existing infrastructure to the Lockyer Valley. The QWC is considering options for the development of the Category B framework. A framework is expected to be drafted in 2012.

Strategy key activity number	Key activity	Responsible agency	Timeframe	Summary of status
75, 81, 82, 83	Investigate water treatment process options within the SEQ Water Grid, including the potential for a common residual disinfection standard across SEQ.	QWC, UWSRA, Seqwater, SEQ Water Grid Manager and water service providers	Short term	The SEQ Water Grid Manager is investigating the costs and benefits of a common residual disinfection standard across SEQ. The UWSRA is undertaking a number of projects to investigate the effects of particular water treatment processes. The results of these projects should be finalised mid-2012.
25, 26	Investigate opportunities to optimise the operation of the SEQ Water Grid, including minimising leakage.	SEQ WGM, QWC, Linkwater and distributor-retailers	Medium term	A number of variables, such as peaking factors and system leakage targets are being reviewed.
64	Develop a policy position regarding the provision of reticulated water supplies to communities that currently rely on drinking water from rainwater tanks and groundwater bores.	QWC, distributor-retailers and local governments	Long term	Not commenced.

8 Summary

Implementation of the South East Queensland Water Strategy is now well underway. Using the methods and models of the Strategy, coupled with a drive for efficient water use, continuous good planning and a well-managed SEQ Water Grid, the SEQ community can look forward to a safe and secure water supply into the future.

Implementation of the key actions identified in the Strategy is progressing well. The Rural Water Advisory Group was established and is considering options to improve the availability and reliability of water for rural production. Sub-regional total water cycle management planning has commenced in several of the key growth areas in the region. The QWC is also continuing to investigate the best mix of demand management options for SEQ including the long-term role of Permanent Water Conservation Measures.

With the current volumes of water stored within the SEQ Water Grid, SEQ's water supplies are secure in the short term. Even if SEQ was to experience another drought as severe as 2001 to 2009, the region would not expect to enter restrictions for at least five years and if introduced, they would not be as severe as the previous regime.

8.1 The next 12 months

Looking forward to 2012, the final report from the Queensland Floods Commission of Inquiry will be released in February. This may have implications for management of some of the key water storage dams in SEQ.

The QWC's focus for 2012 will include:

- preparation of the first drought response plan for all of SEQ, which is expected to be presented to the community for comment in early 2012. This is a critical document to ensure SEQ is well prepared to respond to any future droughts.
- undertaking further desalination studies to confirm the viability of priority and reserve sites so that appropriate preparatory work can be undertaken to facilitate readiness for timely construction of climate-resilient bulk water supply when needed.

- developing a demand management framework to support the achievement of the desired LOS objectives in the long term, including providing improved clarity to the scope of Permanent Water Conservation Measures.
- finalisation of the sub-regional total water management plans that are currently being prepared for Caboolture West, Ripley Valley and combined Caloundra South and Palmview areas.
- further refining the regional water balance model for SEQ to incorporate the most up-to-date data, including the recovery from the recent drought and the January 2011 floods. The updated model will then be used to refine calculations for the current LOS yield for water supply in SEQ.
- preparing advice to the government on water regional water security options, including the desired LOS objective, water supply and demand management for SEQ.

The QWC is on schedule for the first review of the Strategy to be released in 2015. This will allow consideration of outcomes of the review of the SEQ Regional Plan, which is due to be completed in 2014.

8.2 Regional water security program

A revised regional water security program for SEQ (RWSP)⁷ was made by the Minister on 5 March 2010. The RWSP describes:

- the desired LOS for the region
- water supply or sewerage works to achieve the desired LOS objectives
- demand management for water in the region
- modification to existing works or construction of works required to be implemented to achieve the desired LOS objectives
- cost sharing and pricing arrangements.

The recent increase in water stored in dams coupled with the continuing efficient usage by the community means time can be taken to consider when to bring on new infrastructure to make the most of existing water supplies. Included in these considerations will be a review of the timing for the construction of the Wyaralong water treatment plant and the two bulk connections to the Southern Regional Water Pipeline.

The QWC is currently reviewing and preparing advice to government on future water supply and demand management options for the region. It is expected that QWC will present advice to government in early 2012, with a possible revision of the RWSP to follow.

⁷ The RWSP is available at <www.derm.qld.gov.au>.