2022 Water Security Program Annual Report

DECEMBER 2022

seqwater
WATER FOR LIFE

Seqwater acknowledges the Traditional Custodians of the land, catchments and waterways on which we live, work and play.

We pay our respects to Elders past, present and emerging; and acknowledge their continued connection to the land, water and culture of South East Queensland.

Contents

Introduction

Seqwater is responsible for long-term planning, including drought response, for a reliable and sustainable water supply in South East Queensland (SEQ). This planning is outlined in the 30-year Water Security Program, "Water for Life 2016-2046" that was released in March 2017. This report can be found at: http://www.seqwater.com.au/waterforlife

Seqwater is required to prepare and report on water security for SEQ annually. This report assesses changes in water security compared to the 2017 Water Security Program over 2022. While the Water Security Program to 2046 is under review to incorporate the latest demand forecasts, optimisation of the existing grid and future supply options, it remains current. The updated Program will be published online once the review is finalised.

Highlights

The highlights for 2022 include:

- continued supply of a safe, reliable and high-quality bulk water supply despite the challenges presented by flooding and ongoing impacts of the COVID-19 pandemic.
- the region exited drought response with water grid storage levels now at 82.3% (6 December 2022)
- supply of more than 3,000 megalitres (ML) of purified recycled water to industrial customers, offsetting water demand from Wivenhoe Dam
- supply of more than 12,000 ML of water from Gold Coast Desalination Plant to support the operation of the SEQ Water Grid
- progressing planning and development of drought contingency water supply options
- ongoing engagement with the Department of Regional Development, Manufacturing and Water (DRDMW) and our SEQ Retailer Customers (City of Gold Coast, Logan City Council, Redland City Council, Unitywater and Urban Utilities) on water security planning.

Water supply security situation

Seqwater regularly monitors and responds to the water security situation in SEQ. Please refer to the latest report for information about the current water security situation. https://www.seqwater.com.au/waterforlife

Seqwater improved the water security situation this year by:

- completing, in collaboration with the SEQ Retailer Customers, a thorough review of recent drought activities
- adaptively managing the Water Grid to balance water security and cost efficiency drivers – which has been driven by both drought and floods in 2022.
- progressing planning and development of drought contingency water supply options.

Water Grid

Seqwater has continued to progress drought preparedness throughout 2022, including further strategic planning collaboration with the SEQ Retailer Customers (https://www.seqwater.com.au/waterforlife).

Ongoing rainfall has seen most of the water grid storages fill throughout 2022. The water grid storage level is 82.3% (6/12/22).

Seqwater is currently undertaking its Dam Improvement Program. The program will deliver infrastructure upgrades at a number of Seqwater dams and ensure ongoing safety and security of bulk water supply well into the future. Whilst the program is underway, Wivenhoe, Somerset and North Pine Dams are operating at a reduced full supply level.

The temporary changes mean Wivenhoe Dam storage will be maintained at 90% full supply level, Somerset Dam 80% full supply level and North Pine 68% full supply level until upgrades are completed.

The temporary full supply levels mean the SEQ Water Grid at full supply is approximately 88%.

Ahead of the 2022-23 summer period, the Minister for Water directed Seqwater (under Section 390 of the *Water Supply (Safety and Reliability) Act 2008*) to implement a further temporary full supply level for drinking water at Wivenhoe Dam (bringing it down from 90% of the dam, to 80% or lowering by 1.3 metres) until 28 February 2023. This will allow the extra capacity created to be used for temporary flood storage as required throughout the wet season.

Seqwater continues to closely monitor the supplies. When the region enters drought in the future Seqwater will implement the adaptive drought response plan as detailed in the Water Security Program to respond to the situation in collaboration with the SEQ Retailer Customers, Government and other key stakeholders.

Off-Grid communities

Drought response has not been triggered in any of the off-grid communities in 2022.

Seqwater continues to work in collaboration with the responsible SEQ Retailer Customer for each off-grid community in preparation for the next drought.

Changes to Water Security Program planning assumptions

There were no changes to the key planning assumptions for Water Security Program this year.

Demand

Demand data in this report is for the 2021/22 financial year. Reporting based on financial year is consistent with all other demand related reporting, enabling ease of comparison.

SEQ Retailer Customers

Water demand is influenced by many factors including weather conditions, population growth, consumption behaviour and system shocks such as the COVID-19 pandemic where water demand patterns change. SEQ Retailer Customer water demand (urban demand) for 2021/22 reduced by 3.6% compared to the 2020/21 demands. This reduction is likely to have been driven by COVID-19 related impacts and climatic conditions. Analysis of consumption data received and processed to date has indicated that water consumption (particularly in the non-residential sector) dropped at the start of the pandemic, and while there are signals of some recovery the continued decline in overall consumption indicates some sector impacts appear to be persistent.

Figure 1 shows a historical annual water consumption growth trend of around 3% per annum since 2010/11 (excluding 2020/21 and 2021/22). In 2021/22 water consumption dropped by 3.6% (Table 1), the underpinning population assumption used for forecasting assumed population increased by around 2.1%.

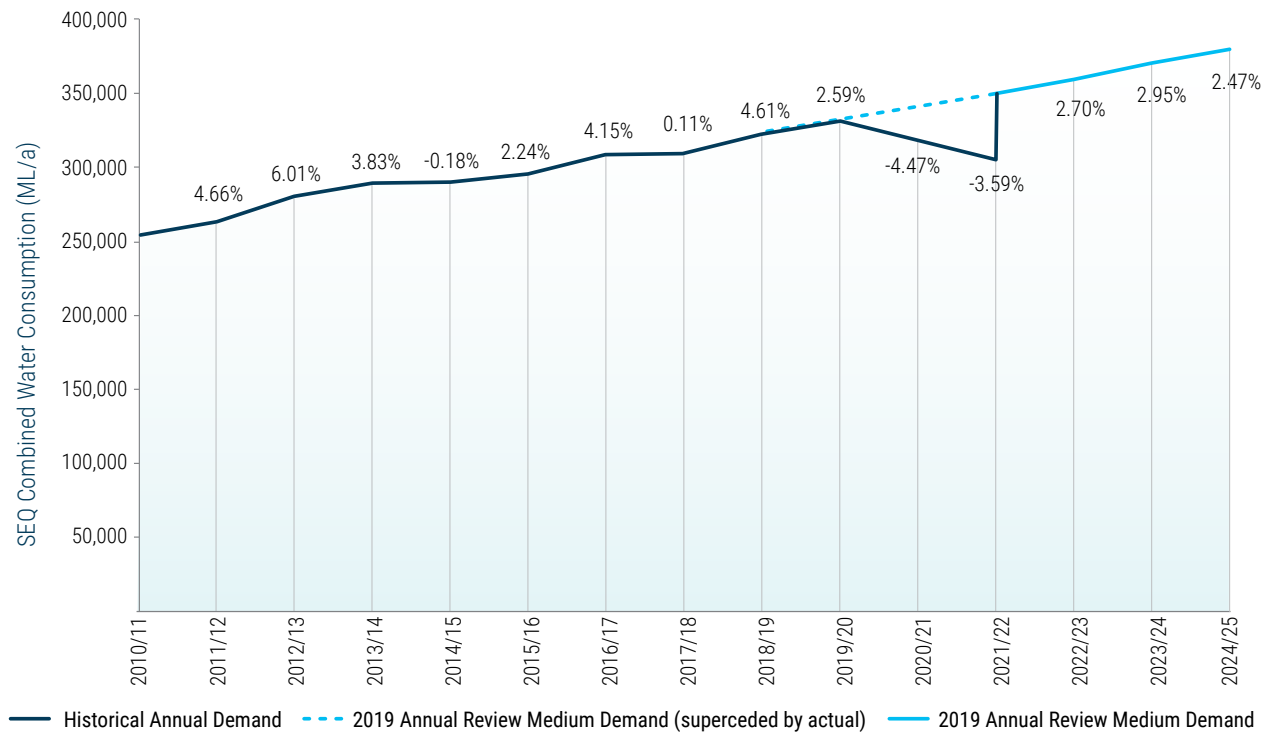


Figure 1: SEQ historical water demand and 2019 Annual Review water demand forecast

Table 1. 2020/21 and 2021/22 Water supplied to SEQ Retailer Customers (ML/a) and (L/p/d)

Region	2020/21	2021/22	% change[#]
SEQ Water Supplied (ML/a)	315,978	304,619	-3.6%
Total water consumption (residential and non-residential) (L/p/d)	252	233	-7.3%

[#]This percentage change is based on forecast population at the time. The actual population may be lower due to COVID-19 impacts. A change in population will impact the percentage change shown in Table 1.

Table 2 illustrates consumption, both residential and non-residential, (ML/a) has reduced across all Local Government Areas (LGA), in particular Ipswich and Lockyer Valley where consumption dropped by 10.11% and 21.14% respectively in 2021/22 compared to 2020/21. Table 3 illustrates the same demand data in litres per person per day (L/p/d).

Table 2. 2020/21 and 2021/22 Water supplied to SEQ Retailer Customers by LGA (ML/a)

Region	Water supplied (ML/a)*		% change[#]
	2020/21	2021/22	
Brisbane	126,921	123,727	-2.52%
Gold Coast	61,606	59,985	-2.63%
Ipswich	17,276	15,529	-10.11%
Lockyer Valley	2,869	2,263	-21.14%
Logan	23,906	23,092	-3.41%
Moreton Bay	32,800	31,147	-5.04%
Noosa	5,814	5,595	-3.77%
Redland	13,550	13,269	-2.08%
Scenic Rim	1,776	1,667	-6.15%
Somerset	2,341	2,230	-4.77%
Sunshine Coast	27,118	26,117	-3.69%

* Total water consumption (residential and non-residential)

#This percentage change is based on forecast population at the time. The actual population may be lower due to COVID-19 impacts. A change in population will impact the percentage change shown in Tables 2 & 3.

Table 3. 2020/21 and 2021/22 Water supplied to SEQ Retailer Customers by LGA (L/p/d)

Region	Water Supplied (L/p/d)*		% change#
	2020/21	2021/22	
Brisbane	279	265	-4.80%
Gold Coast	273	254	-7.01%
Ipswich	207	168	-18.91%
Lockyer Valley	280	208	-25.56%
Logan	205	189	-8.12%
Moreton Bay	199	181	-8.84%
Noosa	353	333	-5.86%
Redland	240	229	-4.44%
Scenic Rim	259	222	-13.99%
Somerset	456	408	-10.59%
Sunshine Coast	246	224	-9.14%

* Total water consumption (residential and non-residential)

#This percentage change is based on forecast population at the time. The actual population may be lower due to COVID-19 impacts. A change in population will impact the percentage change shown in Tables 2 & 3.

In the current financial year (2022/23), the year-to-date annual demand growth as of November 2022, is still tracking well below the average annual 3% historical growth trend. The system shock that commenced in 2020 combined with the impact of well above average rainfall is likely to have contributed to the observed below average forecasted water demand.

Neighbouring Communities

Under the bulk water supply agreement with Toowoomba Regional Council up to 10,000 ML/a can be transferred from Wivenhoe Dam to Cressbrook Dam to supplement drinking water supplies in the Toowoomba region. Table 4 shows that Toowoomba Regional Council did not access the full contract volume in 2021/22, taking only 6,868 ML over the year due to the replenishment of its local storages in February 2022.

Table 4. 2020/21 and 2021/22 Water supplied to Toowoomba (Wivenhoe to Cressbrook transfer) (ML/a)

Customer	2020/21	2021/22	% change
Toowoomba Regional Council (ML/a)	10,000	6,868	-31.3%

Power Stations

Under bulk water supply agreements Tarong and Swanbank power stations can take up to a combined total of 29,500 ML/a. Table 5 shows the volume of water supplied (combined total of raw and purified recycled water) to power stations in 2021/22 was nearly 50% less compared with 2020/21.

Table 5. 2020/21 and 2021/22 Actual Power Station Demands (ML/a)

Customer	2020/21	2021/22	% change
Power stations (ML/a)	17,172	8,533	-50.3%

Assessment of the projected regional average demand

A review of the demand forecast was completed in late 2022. The outcomes of this review were:

- The existing demand profile used for planning functions (2019 Annual Review Demand) has performed within an acceptable range. Actual demands for 2021/22 were 9.28% below forecast, 0.72% from the established 10% target threshold.
- Over the next year it will be prudent to closely monitor the persistency of the system shock that has resulted in the reduced performance of the projected demand. Further analysis of individual sector behaviour will need to be undertaken to understand whether there is evidence of sector recovery, or whether consideration should be given to a revision to the demand forecast for long term water security assessment purposes.
- An assessment was undertaken in early 2022 to understand the key drivers for observed reductions in SEQ water consumption. This assessment used bulk water production data combined with account level SEQ Retailer Customer water consumption data. Account level SEQ Retailer Customer data was only complete to March 2021.
- This analysis showed a material drop in non-residential water consumption between the January 2019 to March 2020 period compared to consumption in April 2020 to March 2021, particularly in the commercial and public sectors. Material but smaller reductions were recorded in the heavy industry and tourism sectors. The analysis undertaken showed that in most LGAs these sectors were starting to show signs of recovery. However, analysis of Ipswich data showed no signs of recovery, particularly by the heavy industry and industry sectors.
- As of November 2022, observed total production remains well below forecast (-11.33%).
- Updated demand forecasts are being sought from SEQ Retailer Customers. Further analysis will be undertaken once the most recent billing data is available and processed, which will assist with understanding the persistence of observed consumption trends and support robust review of the SEQ Retailer Customer provided forecasts.

Seqwater continues to work with the SEQ Retailer Customers to understand longer-term demands and potential demand management options.

Off-grid community demand projection assessment

In the majority of off-grid communities, 2021/22 financial year demands were lower than in the previous financial year. The 2021/22 demands fell slightly further below the long-term demand forecasts compared to the previous year. Updated demand forecasts are being sought from SEQ Retailer Customers to input into future planning.

Water Supply

Seqwater has provided water as follows (Table 6) in 2021/22:

Table 6. Water supplied 2021/22 (ML/a)

Sector	Total volume for 2021/22 (ML/a)
SEQ Region – total production of treated water to supply SEQ Retailer Customers	304,619
Subregions – total treated water supplied to each sub-region	
Northern (Moreton Bay, Sunshine Coast and Noosa council areas)	62,859
Central (Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset Council areas)	145,415
Southern (Gold Coast and Logan council areas)	83,077
Eastern (Redland City Council area)	13,269
Bulk water grid storages - Raw water extracted for water treatment (excludes environmental, flood releases and water for irrigators)	
Wivenhoe Dam and Brisbane River downstream of Wivenhoe (exclusive of pipelines)	128,928
Somerset Dam	1,498
North Pine Dam	41,245
Hinze Dam	62,326
Baroon Pocket Dam	30,697
Leslie Harrison Dam	2,582
Ewen Maddock Dam	3,561
Cooloolabin Dam and Wappa Dam	4,214
Sideling Creek Dam (Lake Kurwongbah)	Not applicable
Lake Macdonald	2,464
Little Nerang Dam	15,955
Climate-resilient water sources	
Gold Coast Desalination Plant Production	12,714
Western Corridor Recycled Water Scheme Production (PRW sent to power stations)	3,459
Other water sources	
North Stradbroke Island (Minjerribah) – water used for water treatment (Herring Lagoon and North Stradbroke Island Bore fields, 15 Bores)	7,223

Sector	Total volume for 2021/22 (ML/a)
Off-grid communities[1] - total water produced at the water treatment plant	
Amity Point	103
Beaudesert	711
Boonah-Kalbar	460
Canungra	120
Dayboro	177
Dunwich	144
Esk	226
Jimna	5
Kenilworth	51
Kilcoy	1,303
Kooralbyn	213
Linville	7
Lowood	2,929
Point Lookout	280
Rathdowney	21
Neighbouring communities – total water supplied	
Toowoomba Regional Council	6,883
Power Stations – total water supplied	
Total raw water intake	5,816
Total purified recycled water intake	2,717

Note: Whilst the data used for this reporting is from the same base data source as the Resource Operations Licence/Water Licence reporting because the focus of the reporting is different, the figures will not be consistent. For example, the Resource Operations Licence/ Water Licence reporting is reported by off-take/water allocation, whilst the water security reporting is based on the dam source.

1 Treated Water Volume

Changes to the Bulk Water Supply System

In 2022 numerous capital works projects were progressed to support the operation of the SEQ Water Grid. Some of the more significant projects include the progression of the South West Pipeline, the Mt Crosby Treatment Plant filtration upgrade and the Mt Crosby Weir Bridge upgrade.

Climate-resilient water assets

Seqwater has two climate-resilient water supplies – the Gold Coast Desalination Plant (GCDP) and the Western Corridor Recycled Water Scheme (WCRWS). These assets are operated based on the adaptive drought response strategy in the Water Security Program. The desalination plant is also able to support operational requirements.

Desalination

The GCDP is a key asset for the provision of water security in SEQ. The plant is used to provide supply resilience and to enable planned maintenance to other assets within the water grid. The plant is a critical drought water supply asset. It can also play an important role supplementing the SEQ Water Grid during flood events, as it did in 2022 when raw water quality issues reduced production at water treatment plants.

When not in production, the GCDP is maintained in a 'hot standby' mode to maintain the condition of its membranes and can be operational at a rate of 33% capacity within 24 hours and up to the maximum production capacity of 133 ML/d within 72 hours (45,625 ML/a based on 125 ML/d operation capacity that includes maintenance and down time).

Desalination plants are not dependent on rainfall into catchments for source water but can be impacted by source water limitations such as exceptionally high tides or seaweed blooms that can produce high turbidity source water.

Purified recycled water

The WCRWS is a scheme consisting of three advanced water treatment plants (AWTP) and over 220 km of connecting pipelines between the AWTPs, industrial customers (including the power stations) and Wivenhoe Dam. This scheme has an average annual capacity to produce 59,130 ML/a of purified recycled water once recommissioned to full capacity.

The WCRWS includes three AWTPs:

- Bundamba AWTP, average production capacity of 19,710 ML/a
- Gibson Island AWTP, average production capacity of 16,425 ML/a
- Luggage Point, average production capacity of 22,995 ML/a.

Three treatment units (or trains) at Luggage Point AWTP are currently operational to produce purified recycled water. The peak capacity of the three treatment units is 70 ML/d, however this is limited by the current balance of plant capacity of 46 ML/d. This water is currently used to flush the pipeline and supply industrial customers.

Operation of climate-resilient water assets

Gold Coast Desalination Plant ceased operating for drought at the end of 2021, but has continued operation in 2022 to support grid operations for maintenance work and in response to flooding events (Table 7).

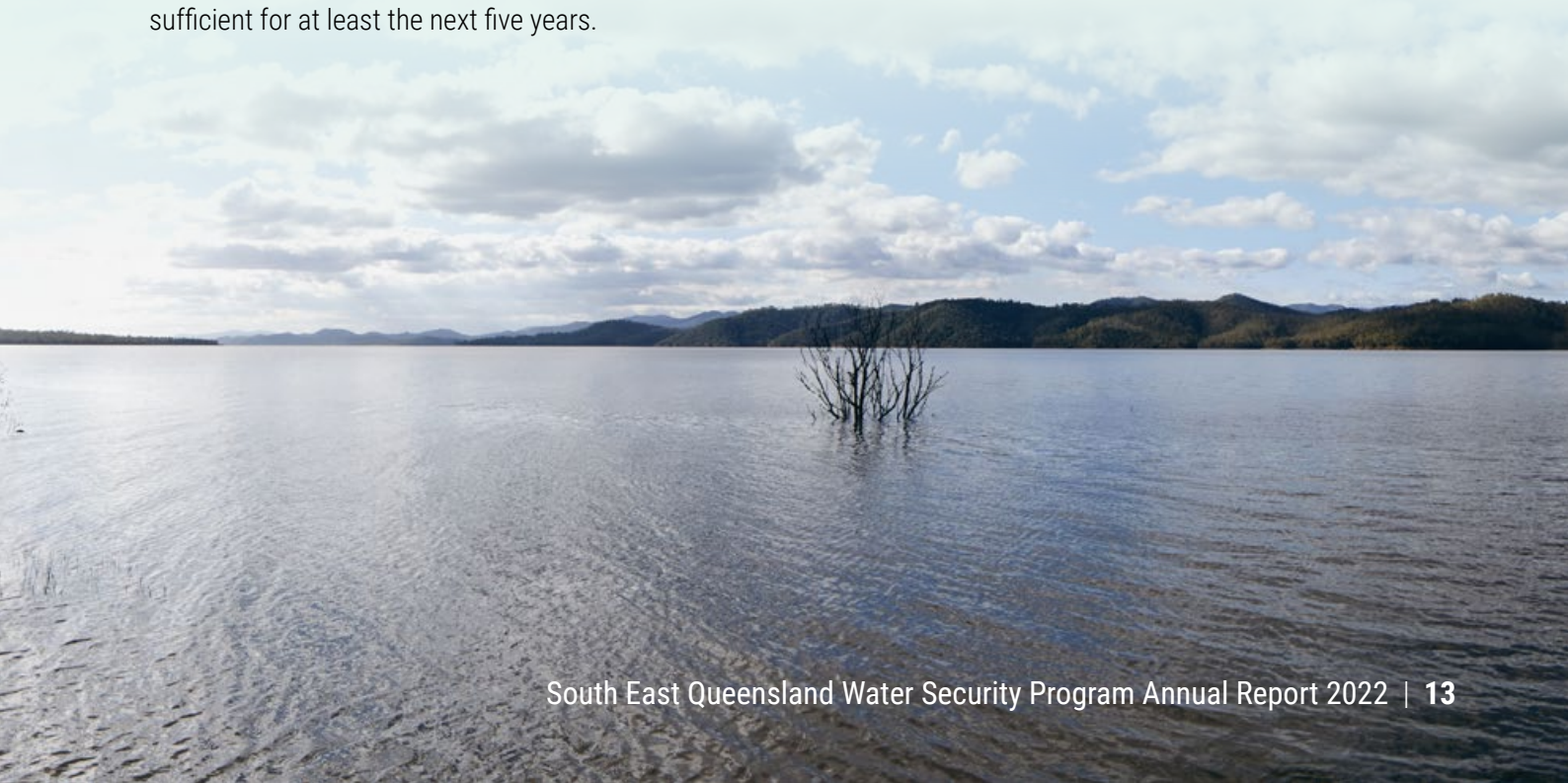
The WCRWS ceased operating for drought in early 2022, however continues operating at limited capacity to maintain the system and supply industrial customers.

Table 7. Operation of climate-resilient water sources due to drought response and to support grid operations from 2020 to 2022

Date/s	Climate-resilient water operation
November 2020 – 10 January 2022 (Drought operation)	Luggage Point AWTP commenced supply of purified recycled water in 2020, with approximately 8,169.23 ML of purified recycled water supplied to industrial customers in response to the recent drought up until 10 January 2022.
15 September 2020 – 21 December 2021 (Drought operation)	Gold Coast Desalination Plant was operating for drought response due to low levels in Wivenhoe Dam, up until 21 December 2021, supplementing water grid levels with 25,233ML of manufactured water.
22 December 2021– 30 June 2022 (Supporting grid operations outside of drought)	Gold Coast Desalination Plant has operated throughout 2022 to support grid operations, including during the flooding events in South East Queensland in February and May. Production volume 6,122 ML (22/12/2021 to 30/06/2022).

Assessment of regional water balance

Seqwater has considered the regional water balance based on current yield and demands and assessed it to be sufficient for at least the next five years.



Drawdown scenarios

The February 2022 floods replenished the Water Grid Storage level to full capacity. On October 13, 2022, the Premier of Queensland announced that water would be released from Wivenhoe Dam to bring its level down to 80% over the course of two weeks, to prepare for the storm season. This temporary full supply level will remain in place until 28 February 2023.

The region's Water Grid storage level was at 82.3% as of 6 December 2022, significantly higher than 63.4% at the same time last year (15/12/2021).

Seqwater provides access to the Water Grid storage levels and individual dam levels drawdown data at: https://www.seqwater.com.au/historic-dam-levels

When storages are restored to full capacity, tracking against modelled drought drawdowns restarts. Figure 2 shows recorded storage levels (including the drawdown over the second half of October when water was released from Wivenhoe Dam) against the drawdown. The design drought drawdown, which assumes the worst inflows in the stochastic dataset over a 10-year period (i.e. less than a 1 in 10,000 chance of occurring), is also presented in Figure 2 for comparative purposes. Note, both the Millennium and design drought drawdowns were assumed to commence when storages were last full (February 2022).

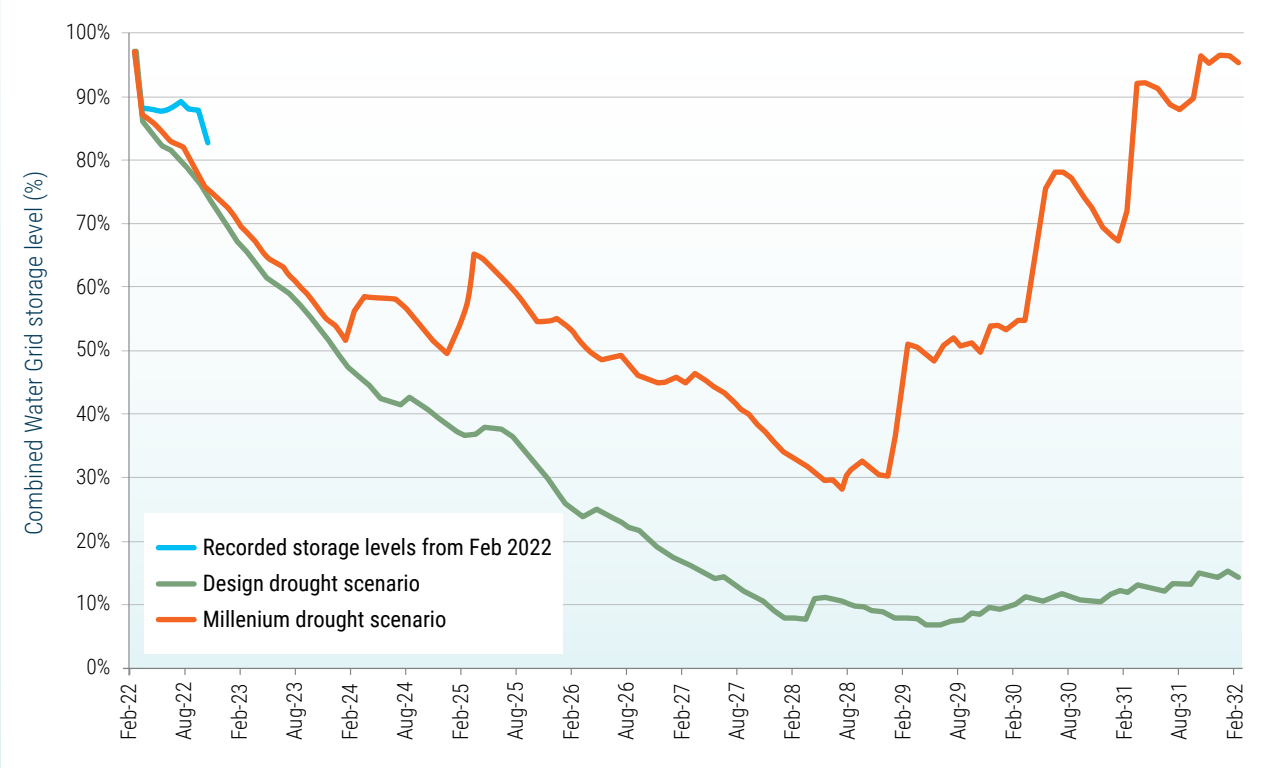


Figure 2: Design and Millennium Drought inflow draw downs and recorded water grid storage levels from February 2022

Water Security outcome statement status

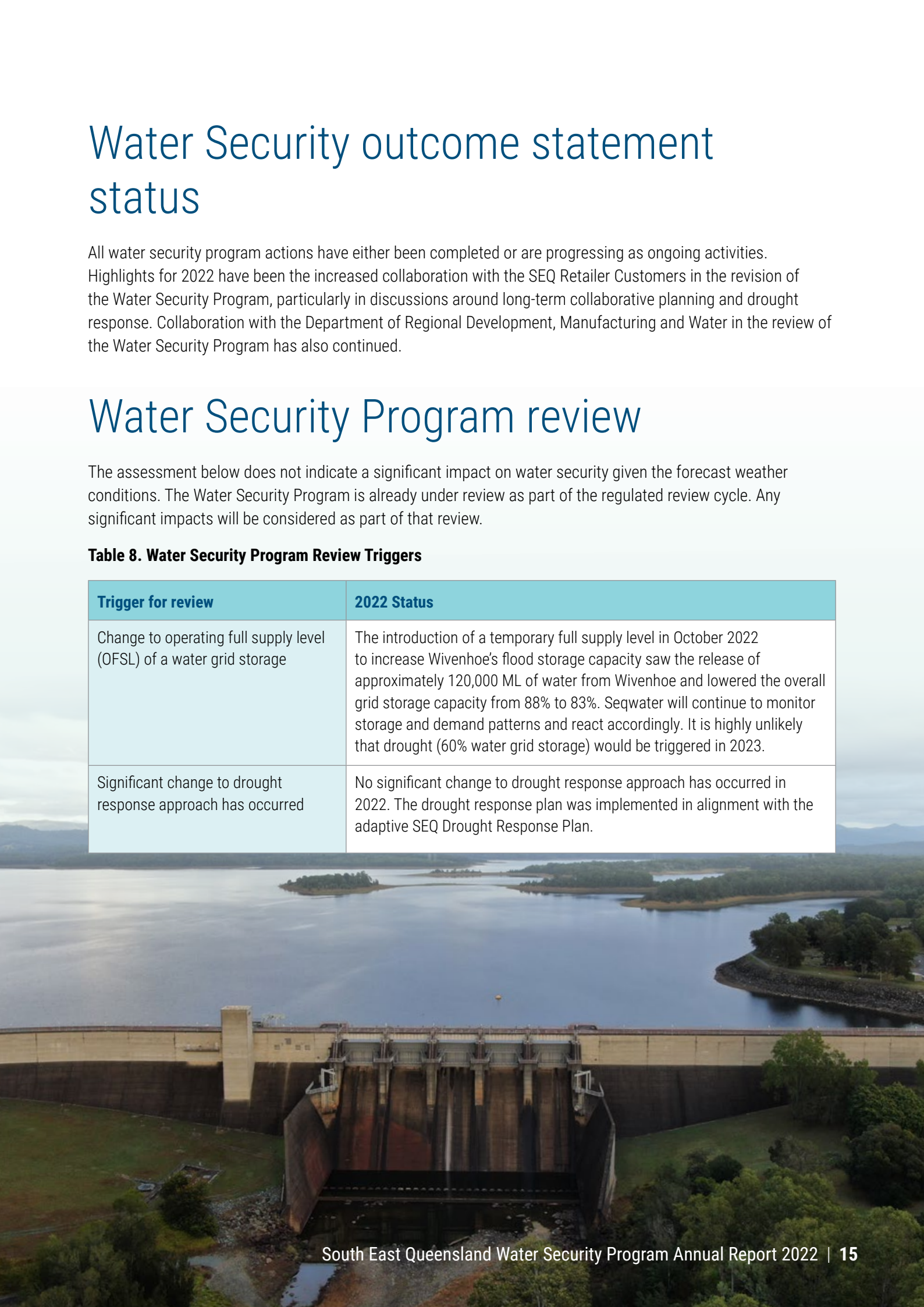
All water security program actions have either been completed or are progressing as ongoing activities. Highlights for 2022 have been the increased collaboration with the SEQ Retailer Customers in the revision of the Water Security Program, particularly in discussions around long-term collaborative planning and drought response. Collaboration with the Department of Regional Development, Manufacturing and Water in the review of the Water Security Program has also continued.

Water Security Program review

The assessment below does not indicate a significant impact on water security given the forecast weather conditions. The Water Security Program is already under review as part of the regulated review cycle. Any significant impacts will be considered as part of that review.

Table 8. Water Security Program Review Triggers

Trigger for review	2022 Status
Change to operating full supply level (OFSL) of a water grid storage	The introduction of a temporary full supply level in October 2022 to increase Wivenhoe's flood storage capacity saw the release of approximately 120,000 ML of water from Wivenhoe and lowered the overall grid storage capacity from 88% to 83%. Seqwater will continue to monitor storage and demand patterns and react accordingly. It is highly unlikely that drought (60% water grid storage) would be triggered in 2023.
Significant change to drought response approach has occurred	No significant change to drought response approach has occurred in 2022. The drought response plan was implemented in alignment with the adaptive SEQ Drought Response Plan.

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