Water for life

Your say on South East Queensland's water future

2015 – 2045

seqwater
WATER FOR LIFE

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Translation and interpreting assistance

Seqwater is committed to providing accessible services to people from culturally and linguistically diverse backgrounds. Please contact us and we will arrange an interpreter to share this publication with you.

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Water **for life**

Water gives and sustains life. It supports healthy communities and a prosperous South East Queensland (SEQ). It is an essential service that is delivered to 3.1 million people across our region every day.

As the region's bulk water supply authority, we are committed to water for life. We are charged with delivering safe, secure and cost-effective water and catchment services to our customers and communities today and in the future. In SEQ we live in a climate of extremes – from times of drought to floods – and we need to be ready to adjust our water use and management when conditions change.

Our research tells us that apart from a severe drought or a sharp increase in demand, we have enough water to supply our region for about 15 years. But after that, we will need new water sources to meet growing demand.

We need to plan now for a sustainable water future that meets the needs of all South East Queenslanders. This plan is our Water Security Program.

Water security means the reliable availability of an acceptable quantity and quality of water for the community delivered within an acceptable level of risk.

The Water Security Program sets the blueprint for our water future for the next 30 years. The full program, Water for Life – South East Queensland's Water Security Program 2015–2045, can be found at yourseqwater.com.au

yoursay

The first version of the Water Security Program is the starting point for planning water security for our region. It builds on previous work and discusses many factors surrounding the delivery of bulk water to SEQ – the risks and influences we need to manage, the many options available to us and how we can make the best choices.

To help us build a plan that's right for our region, we're inviting you to have your say.

How water works now

How water **works now**

The Millennium Drought (2001-2009) exposed the vulnerability of SEQ's water supplies. It was the longest and most severe drought in the region since European settlement and came at a time when our population was growing more quickly than ever before.

THE IMPACT OF THE MILLENNIUM DROUGHT

The severity of the drought, combined with a rapidly increasing population and high water use, put enormous pressure on the region's water supplies. Major dam levels were declining, and we were faced with serious challenges, so we had to change the way we view and manage water.

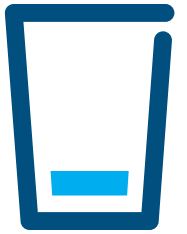
The community and industry did a great job in reducing consumption. At the same time, an interconnected bulk water supply system (called the water grid) was built to allow us to move water around the region to where it's needed. This included a 600 km pipeline network and climate-resilient water sources, including a desalination plant and a recycled water scheme.

The Millennium Drought taught us that we need to plan future water supply well in advance to prevent a crisis from developing.

WHERE WE HAVE COME FROM

50%
COMBINED DAM CAPACITY AVAILABLE (2005)

20%
COMBINED DAM CAPACITY AVAILABLE (2007)



15%
LARGEST DAM CAPACITY AVAILABLE (WIVENHOE) (2007)

POPULATION GROWTH
1985 TO 2015:

- 2.6% per annum
- 1.79 million more residents

Pre-drought residential water consumption
300 LITRES
per person per day

Water was managed by
17 COUNCILS

NO REGIONALLY INTEGRATED SYSTEM
Water was not shared across the region

Total yield from available sources 2001
305,000 ML/ANNUM

WHERE WE ARE NOW

99%
COMBINED DAM CAPACITY AVAILABLE (1 JUNE 2015)

99%
LARGEST DAM CAPACITY AVAILABLE (WIVENHOE) (1 JUNE 2015)

CURRENT CONNECTED POPULATION **2015:**

- 3.1 million residents

Urban water is managed by **ONE BULK WATER SUPPLY AUTHORITY** (Seqwater) and five water retailers

WATER SHARED
The water grid and climate-resilient infrastructure means water can be moved to where it's needed

NOW
Residential water consumption
169 LITRES
per person per day

NOW (2015)
Total yield possible from the water grid
415,000 ML/ANNUM

INTO THE FUTURE

POPULATION GROWTH FORECAST **2015 TO 2045:**

- 1.6% per annum
- 1.98 million more residents

FUTURE (estimated)
Residential water consumption
185 LITRES
per person per day

FUTURE (2045)
Total yield required from the water grid
516,000 ML/ANNUM

ABOUT SEQWATER

Seqwater supplies treated bulk water in SEQ. We also provide untreated irrigation water to about 1200 rural customers.

SOURCE

We manage mainly open catchments around our dams, which cover 70% of our region. People live, farm and enjoy outdoor activities on and around our drinking water storages.

STORE

We own and operate 26 dams, 51 weirs and 2 borefields.

SUPPLY

We own and operate 37 water treatment plants, 22 bulk water pump stations and 18 bulk water reservoirs, 600 kilometres of bulk water supply pipelines, the Gold Coast Desalination Plant and the Western Corridor Recycled Water Scheme.

DID YOU KNOW?

← 600 km →

A 600 kilometre bulk supply pipeline network moves water around the region. Two-way flow pipelines allow us to move bulk water in any direction between Noosa in the north and Coolangatta in the south.

HOW WE MANAGE WATER

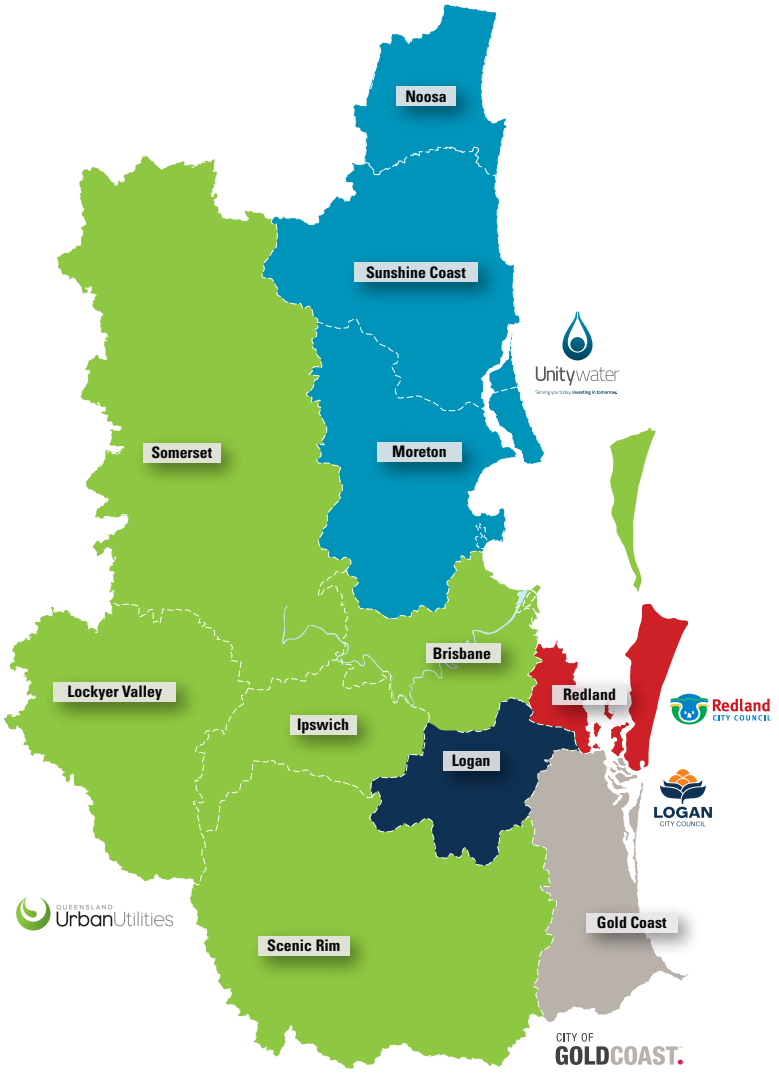
Seqwater sources, stores and supplies bulk water to the water retailers, Unitywater, Queensland Urban Utilities and the water businesses of the Redland, Logan and Gold Coast city councils.

The water retailers deliver drinking water to households and businesses, and provide sewerage services. Together, we work to provide a safe, secure and cost-effective water supply to customers.

As partners, we work cooperatively so that the region's water is planned for, delivered and managed as an integrated and efficient system at the least cost to SEQ.

The bulk water supply system is made up of the water grid and 16 standalone community water supply schemes. The water grid supplies 3.1 million South East Queenslanders. About 53,000 people are supplied by standalone schemes.

The program does not cover people who source their own water from bores, rainwater tanks etc.



SEQWATER MAJOR ASSETS

Legend

- Northern Pipeline Interconnector
- Western Corridor Recycled Water Scheme
- Southern Regional Water Pipeline
- Eastern Pipeline Interconnector
- Network Integration Pipeline
- Other bulk water pipelines connecting the SEQ water grid
- Local government boundary
- Reservoirs
- Water treatment plants
- Western Corridor Recycled Water Scheme
- Desalination plant

Water Treatment Plants (WTP)

1 Amity Point WTP[2]
2 Atkinson Dam WTP[1]
3 Banksia Beach WTP
4 Beaudesert WTP[2]
5 Boonah Kalbar WTP[2]
6 Borumba Dam WTP[1]
7 Canungra WTP[2]
8 Capalaba WTP
9 Dayboro WTP[2]
10 Dunwich WTP[2]
11 East Bank (Mount Crosby) WTP
12 Enoggera WTP
13 Esk WTP[2]
14 Ewen Maddock WTP
15 Hinze Dam WTP[1]
16 Image Flat WTP
17 Jimna WTP[2]
18 Kenilworth WTP[2]
19 Kilcoy WTP[2]
20 Kirkleagh WTP[1]
21 Kooralbyn WTP[2]
22 Landers Shute WTP
23 Linville WTP[2]
24 Lowood WTP[2]
25 Maroon Dam WTP[1]
26 Molendinar WTP
27 Moogerah Dam WTP[1]
28 Mudgeeraba WTP
29 Noosa WTP
30 North Pine WTP
31 North Stradbroke Island WTP
32 Petrie WTP
33 Point Lookout WTP[2]
34 Rathdowney WTP[2]
35 Somerset Dam (Township) WTP[2]
36 West Bank (Mount Crosby) WTP
37 Wivenhoe Dam WTP[1]

The Western Corridor Recycled Water Scheme

38 Bundamba Advanced Water Treatment Plant (AWTP)
39 Gibson Island AWTP
40 Luggage Point AWTP

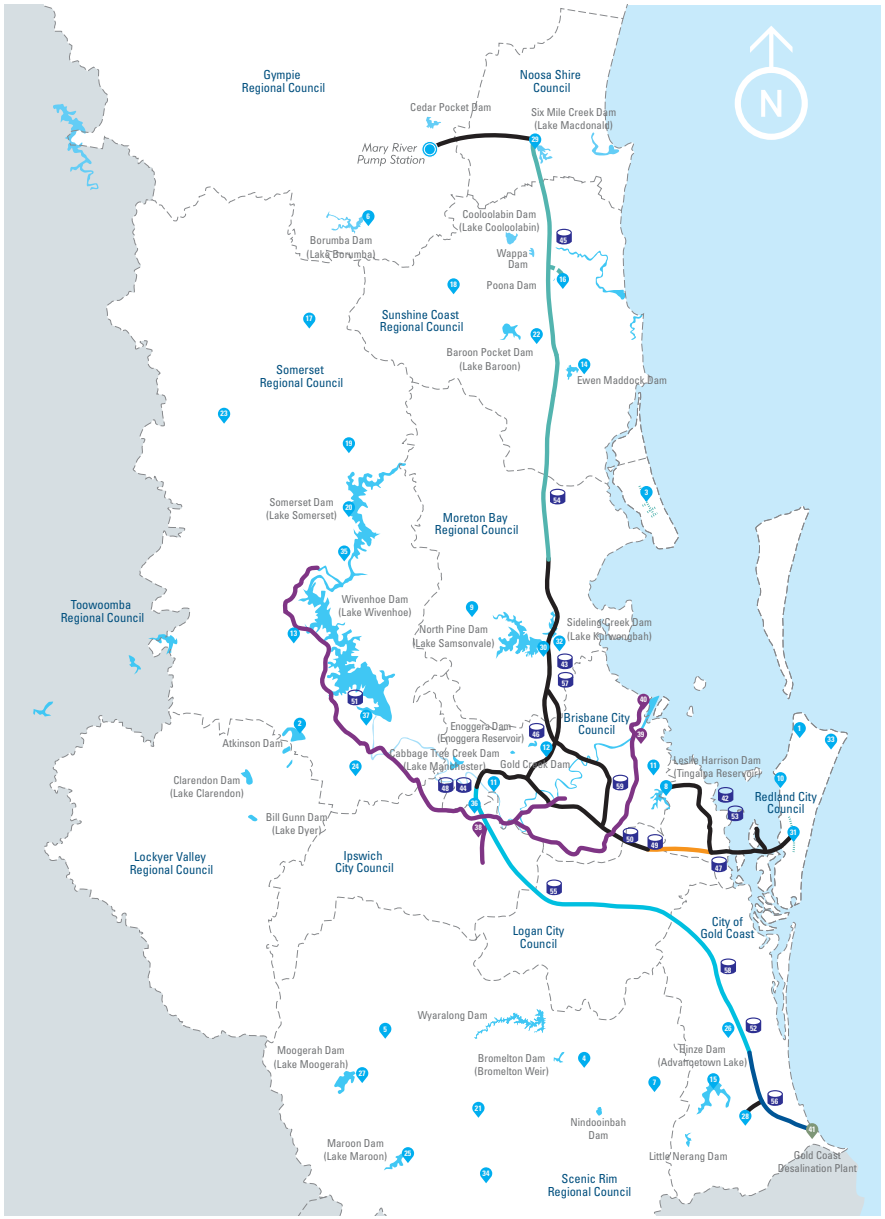
Desalination Plant

41 Gold Coast Desalination Plant

Reservoirs

42 Alexandra Hills Reservoirs
43 Aspley Reservoir
44 Camerons Hill Reservoir
45 Ferntree Reservoir
46 Green Hill Reservoirs
47 Heinemann Road Reservoirs
48 Holts Hill Reservoir
49 Kimberley Park Reservoirs
50 Kuraby Reservoir
51 Lumley Hill Reservoir
52 Molendinar Reservoir
53 Mt Cotton Reservoir
54 Narangba Reservoirs
55 North Beaudesert Reservoirs
56 Robina Reservoir
57 Sparkes Hill Reservoirs
58 Stapylton Reservoir
59 Wellers Hill Reservoirs

[1] *Recreation water treatment plant*
[2] *Standalone community water treatment plant*

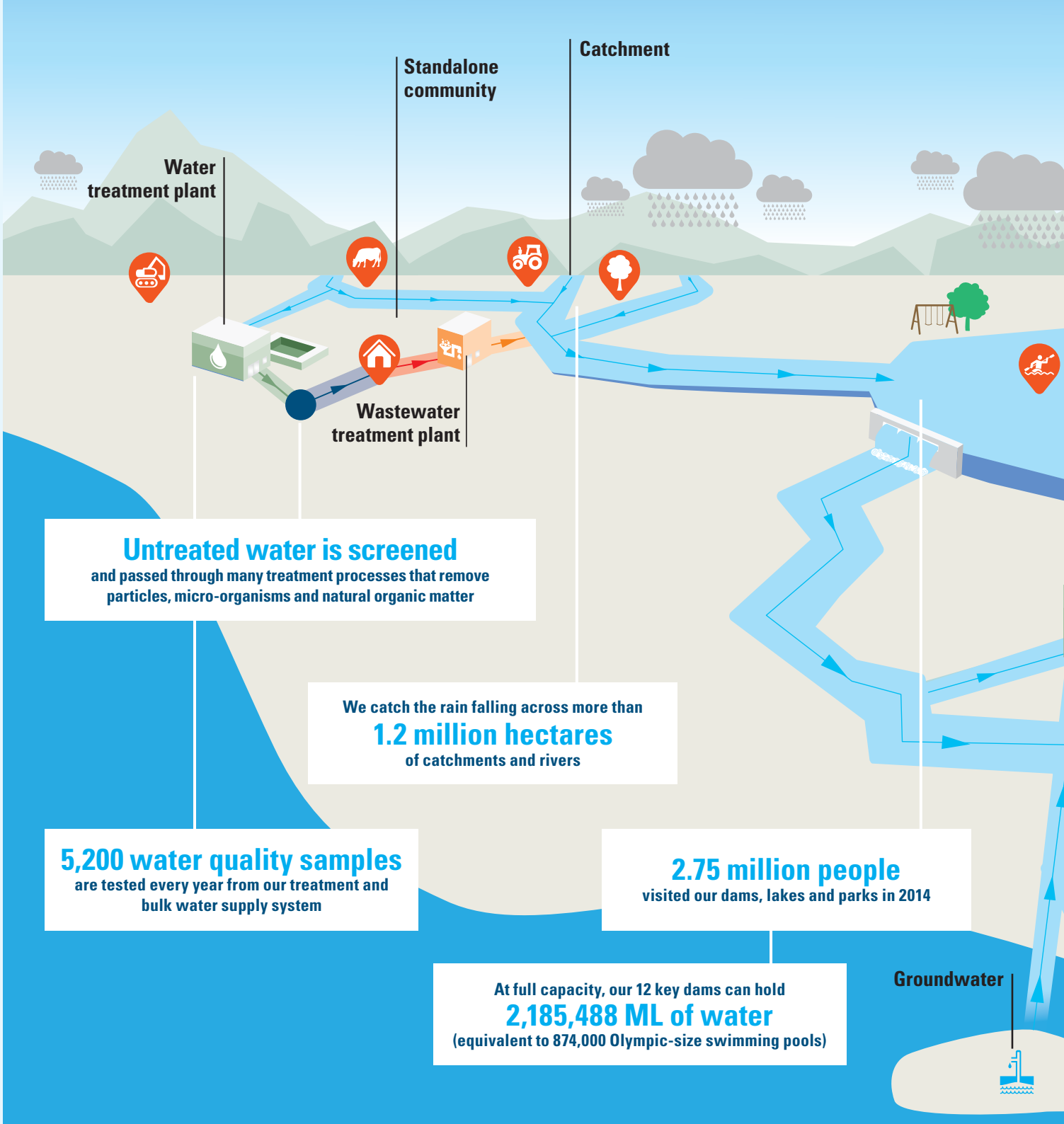


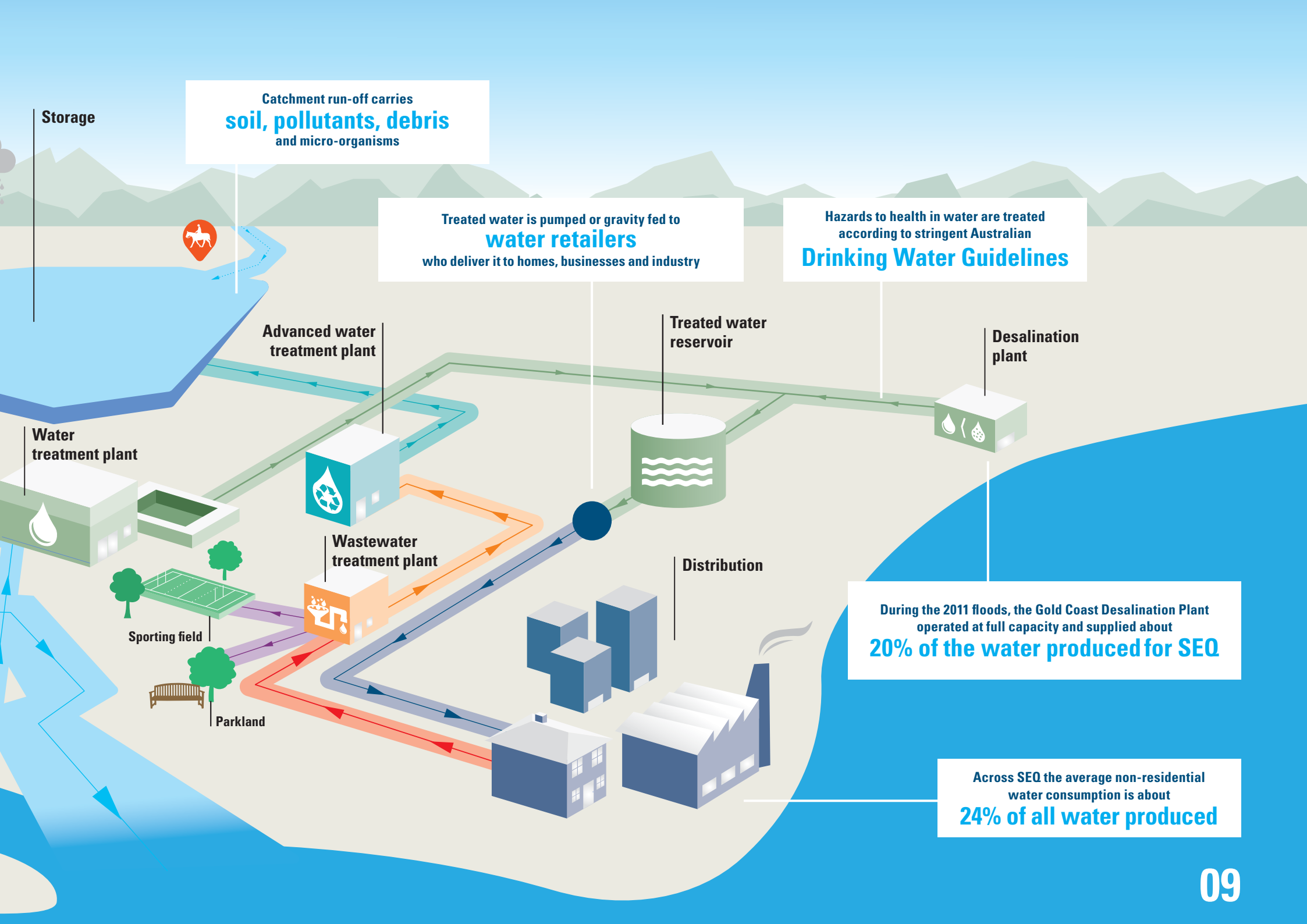
CATCHMENT TO TAP

Most of our water comes from rainfall run-off that occurs over 1.2 million hectares of catchment land flowing into creeks, rivers and our dams. Water may then either flow or be pumped to a water treatment plant. A small amount of our water also comes from groundwater (from bores that draw from underground aquifers). The Gold Coast Desalination Plant also supplies the water grid, sourcing sea water from the Coral Sea to produce drinking water for SEQ.

Legend

- Untreated (raw) water
- Bulk treated (drinking) water
  Regional pipeline (drinking water)
- Bulk supply point (from Seqwater to water retailers)
- Retail distribution to customers
- Untreated wastewater
- Treated wastewater
- Recycled water (non-potable)
- Purified recycled water (potable)




Storage
Catchment run-off carries
soil, pollutants, debris
and micro-organisms
Treated water is pumped or gravity fed to
water retailers
who deliver it to homes, businesses and industry
Hazards to health in water are treated
according to stringent Australian
Drinking Water Guidelines
Advanced water
treatment plant
Treated water
reservoir
Desalination
plant
Water
treatment plant
Wastewater
treatment plant
Distribution
Sporting field
Parkland
During the 2011 floods, the Gold Coast Desalination Plant
operated at full capacity and supplied about
20% of the water produced for SEQ
Across SEQ the average non-residential
water consumption is about
24% of all water produced

Influences

Water security is influenced by a range of local and global factors that we can't always predict.

As our communities grow, water and all other natural resources are declining and becoming more expensive to source, treat and distribute.

Understanding the influences on water supply is important to fully appreciate the complexity faced by decision-makers in predicting future water demand and evaluating the benefits and costs of different water supply sources, measures to manage demand, and operating strategies for the water grid.

Our Water Security Program needs to consider these and other possible influences. One thing is sure – influences will change over time, but because it's not possible to predict exactly how they will change, our program must be flexible and able to adapt.

SOCIETY

- Population growth
- Non-uniform urban development in the region
- Smaller households and ageing population
- Attitudes to water and consumption behaviour

WHAT THIS MEANS FOR WATER FUTURES

- Increased future water demand in concentrated development areas with localised supply solutions
- Planning for water security must be integrated with other sectors
- Water futures will need to be adaptive to meet societal changes
- Water use behaviour must be monitored and considered in future demand modelling

CLIMATE

- Higher temperatures
- Less rainfall
- More severe droughts and floods
- Higher proportion of intense cyclones
- Sea levels rise

WHAT THIS MEANS FOR WATER FUTURES

- More evaporation from dams, therefore increased supply risk if relying solely on surface water
- Increased risk of poor water quality as a consequence of sediment carried in flood waters and bushfires in catchments during drought
- Water supply infrastructure must be suitably located and robust enough to withstand environmental and other impacts
- Bulk water supply system must include climate-resilient sources

ENVIRONMENT

- 70% of SEQ is in a drinking water catchment; Seqwater owns only 4% of that land
- Catchment land use and stream bank condition impact sediment and nutrient run-off
- Water supply infrastructure options have different environmental impacts

WHAT THIS MEANS FOR WATER FUTURES

- Water quality trends influence planning and costs for water treatment plant upgrades
- Investment in catchment land improvement can help prevent a decline in raw water quality
- Environmental impacts of water supply infrastructure must be considered in planning

ECONOMY

- Economic fluctuations such as balance of trade, value of the Australian dollar, demand for products and services, employment levels
- Diversity and availability of finance sources, including private sector
- Water pricing, cost recovery models and customer willingness to pay
- Price on, or market, for emission control mechanisms

WHAT THIS MEANS FOR WATER FUTURES

- Local, national and global economies need to be considered in planning
- Emerging markets will impact long-term water demand
- Financing models will form part of detailed planning for future infrastructure or demand management options
- Future cost of bulk water supply requires planning with other agencies to integrate multiple socio-economic drivers for total community benefit

RESOURCE COMPETITION

- Growing water demand for regional food production
- Peak season water demand spikes from tourist visitation
- Increased focus on liveability in cities and multiple values for water
- Diversification in energy sources and associated water requirements

WHAT THIS MEANS FOR WATER FUTURES

- Urban water security may come come under greater pressure from agricultural or horticultural water needs
- Tourism demand for water will need to be incorporated into long-term planning
- Liveability in cities may drive alternative water uses for amenity, local farming and urban cooling
- Future changes to the energy mix will affect water demand

TECHNOLOGY

- Rapidly advancing technology in production efficiency and energy savings
- Continual improvements in automation and monitoring of water supply systems
- Advances in water-efficient appliances and devices

WHAT THIS MEANS FOR WATER FUTURES

- Different supply options may emerge as viable in the future as a result of better or more affordable technology
- Operational efficiency and responsiveness of the bulk water supply system may improve via advances in monitoring and automation
- Demand for water can change over time as a result of increasingly efficient devices
- Greater automation can increase the risk of cyber attack

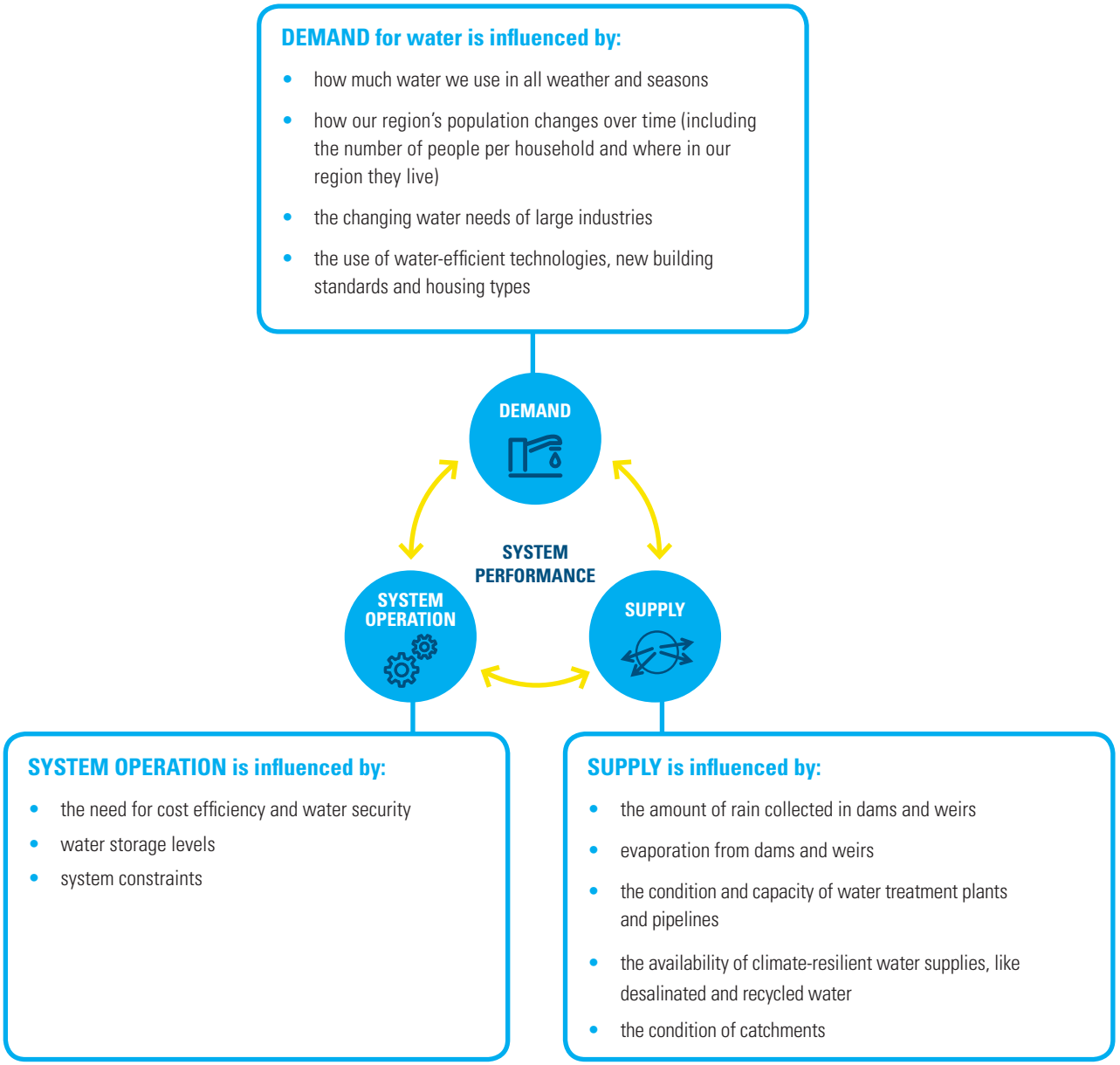
Planning for **water security**

Knowing we live in a climate of extremes, and that our population continues to grow, the Water Security Program aims to manage the influences on system performance by considering demand, supply and system operation. We call these our system performance 'levers'.

We can alter the performance of the water grid by changing how we manage these three interdependent levers.

By adjusting how the three levers work together, we can operate the water grid to deliver water in different conditions. Operating the water grid efficiently and managing demand means we can delay building expensive new water supply infrastructure.

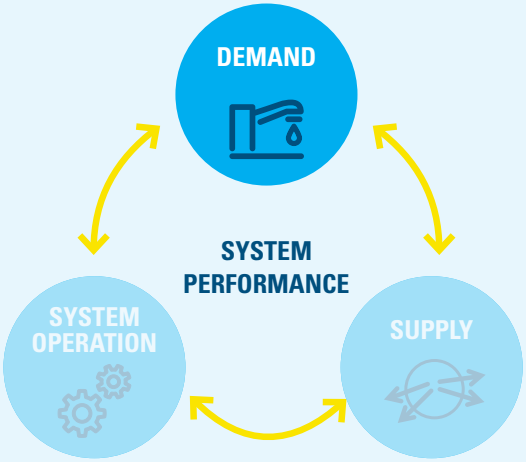
There are dozens of variations of supply, demand and system operation options to achieve a secure water future for SEQ. Each option and combination of options perform differently under different circumstances, so they all have advantages and disadvantages that we need to consider to decide on the best water future.



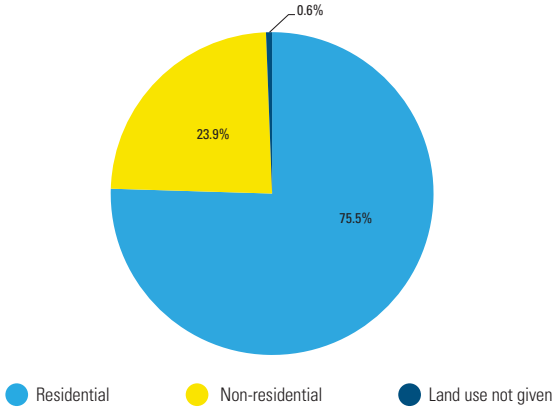
Demand for **drinking water**

Demand for water can change how the water supply system performs, because it drives supply and operating strategies.

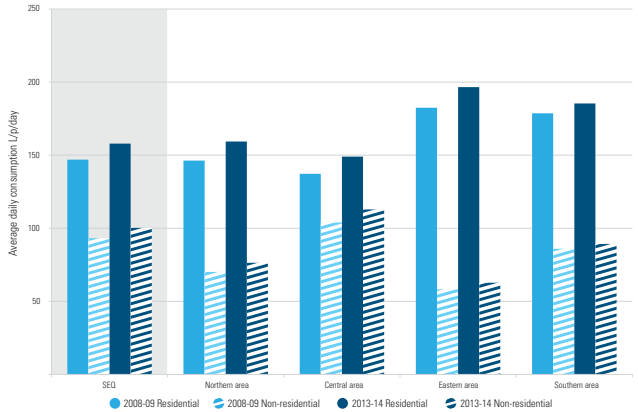
If demand for water in one area of SEQ increases more rapidly than expected, we need to be prepared to meet this demand. The two main factors that will influence the total future regional demand are population growth and average residential consumption rates.



WHO IS CONSUMING WATER?



Households use three-quarters of all the water consumed in SEQ, so everyone can play their part in water security.



Total SEQ water consumption by region has remained at relatively low levels since the drought. This graph compares consumption soon after the drought broke in 2008-09 compared against with 2013-14.

RESIDENTIAL WATER USE

2004
PRE-MILLENNIUM DROUGHT
300 LITRES PER PERSON PER DAY

2007
LOWEST CONSUMPTION DURING DROUGHT
124 LITRES PER PERSON PER DAY

2015
NOW
169 LITRES PER PERSON PER DAY

The average daily residential water consumption across SEQ is now 169 litres per person per day (L/p/day). Successful water conservation programs during the Millennium Drought have resulted in sustained reduced consumption well under the 300 L/p/day we were using before the drought.

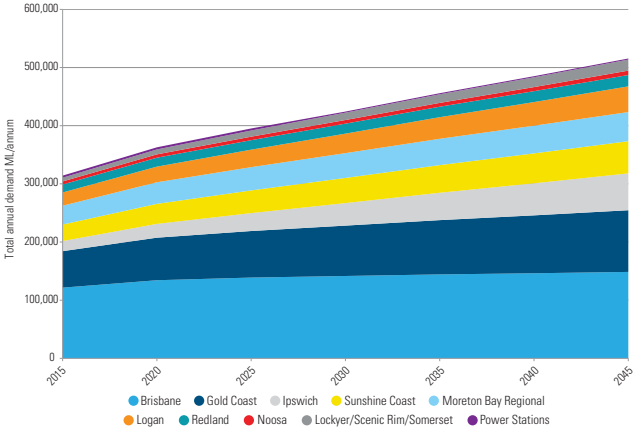
yoursay

There are ways for each and every one of us to save water in our daily lives. These efficiencies could help delay the need for new water sources.

When we asked the SEQ community about their current water practices in the household, 70% of respondents said they were already trying to use less water. So where can we find savings?

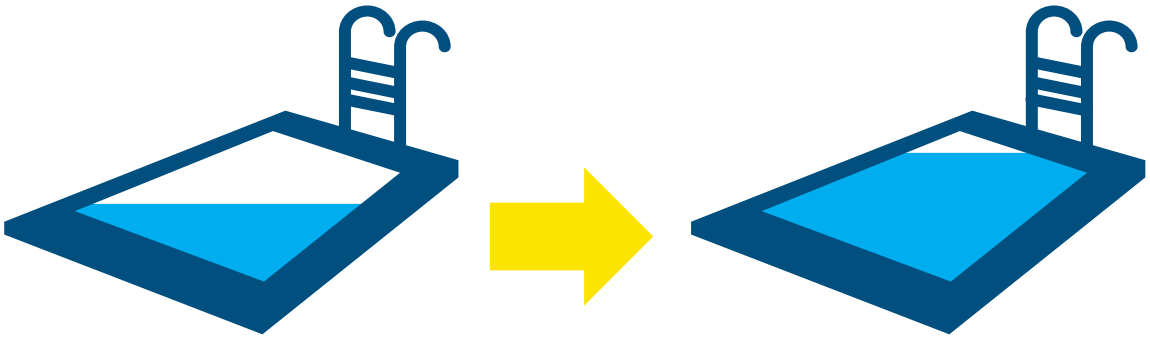
WHAT DO YOU CURRENTLY DO TO BE WATER-EFFICIENT?

- ☐ I have a water-efficient shower
- ☐ I only water the garden when necessary
- ☐ I mulch my garden
- ☐ I don't water my lawn
- ☐ I have water-efficient taps
- ☐ I have a water-efficient washing machine
- ☐ I have a water-efficient dishwasher
- ☐ I monitor my water use through my water bills
- ☐ I regularly use the water meter to check for water leaks on my property
- ☐ I only run the washing machine and dishwasher when there is a full load
- ☐ I don't worry about saving water, I use as much as want



Looking ahead over the next 30 years, this graph shows the estimated forecast for the likely average daily demand for each SEQ local government area.

Total regional demand is expected to increase from 314,730 megalitres a year in 2015 (that's 125,892 Olympic sized swimming pools) to 516,377 megalitres a year in 2045 (or 206,551 Olympic sized swimming pools).



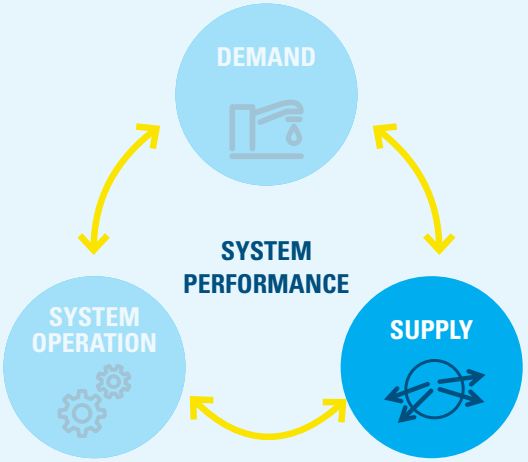
314,730 MEGALITRES
A YEAR IN 2015

516,377 MEGALITRES
A YEAR IN 2045

Supply of **drinking water**

The type, amount and availability of water supply sources influences our operating strategies and how easily demand for water can be met under different conditions.

Seqwater owns and operates a bulk water supply system with diverse sources of supply. We treat and transport water from these sources to meet demand and influence system performance under normal, drought and flood conditions.



THE PAST – VULNERABLE

Before the Millennium Drought, dams and weirs provided 98% of SEQ's bulk water. The drought forced us to think differently about water use and supply, and highlighted the need for water efficiency and diverse climate-resilient sources.

The drought reduced dam water supply storages to such low levels that we were at risk of running out of water. It demonstrated that if we continued to rely on such climate-dependent supplies, we would continue to be at risk in the future.

We have always been vulnerable to floods. Floods can cause sudden changes in river and dam water quality as a result of increased sedimentation, making water harder to treat.

THE PRESENT – HIGH WATER SECURITY

Today, the vast majority of our water still comes from dams and weirs. Water security is high, with the combined capacity of our 12 key dams at 99% (1 June 2015). However, if we enter a drought and need to operate the water grid at full capacity, about 79% of our water would come from dams and weirs, a small amount from groundwater, and the remainder from more climate-resilient sources, including desalinated water and purified recycled water.

The mix of sources also changes during flood events, with desalinated water providing a more reliable contribution (about 20%) of water to our supplies during floods. Our ability to supply water from more resilient sources means we have greater flexibility to respond to flood events.

With our current supply infrastructure, our system can supply 415,000 ML/annum and meet our service obligations.

DID YOU KNOW?

There is a fixed amount of water on Earth, but only 3% is fresh and drinkable. The other 97% is mostly in seas and oceans.

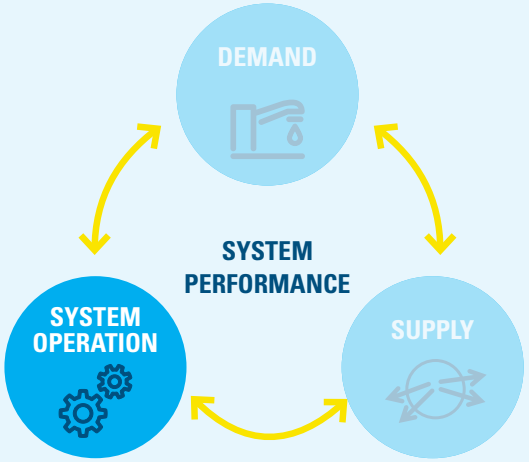
To ensure future water security, the Western Australian State Government announced in 2013 that it could no longer rely on rainfall into surface water supplies. Groundwater replenishment using recycled water will become Perth's new climate-independent water source, and add to existing desalination plants.

Only 12% of our rainfall in Australia collects in river basins. The rest is used by vegetation, evaporates or is held in natural storages such as lakes, wetlands and aquifers.

Efficiently **operating the system**

Changing the way we operate the bulk water supply system affects the balance between demand and supply of water.

The ability for system operation to influence performance is greatest for integrated systems – like SEQ's water grid.



ONE REGION, ONE WATER SUPPLY

To operate the water grid, we consider cost efficiency and water security, which can sometimes be in competition with each other. We have developed operating rules that guide us. These rules include triggers for action that are based on dam water storage levels and other factors that affect the system, including:

- cost
- water security
- demand
- storage inflows
- system and infrastructure constraints.

HOW THE SYSTEM OPERATES

With sufficient capacity in the water grid to meet current demand when in good conditions, our system operation focuses on minimising costs while meeting water quality and reliability guidelines. This mode of system operation involves:

- maximising the use of the most efficient water treatment plants
- minimising the use of the Gold Coast Desalination Plant, but maintaining short-term capability (i.e. hot standby mode of operation) so that it is able to respond rapidly to operational issues and maintain a reliable supply
- using the regional pipelines to balance supply and demand across the region.

The operation of the Western Corridor Recycled Water Scheme will not be required unless a drought occurs, so the scheme has been placed in care and maintenance mode.

The way we operate each of our dams and water treatment plants directly influences the operation and maintenance costs of the water grid.

OPERATIONAL PLANNING PROCESS

Operational planning for the water grid occurs at different levels to meet varying operational requirements. The primary aim is to plan for an appropriate balance between least cost operation and water security. We plan for the long, medium and short term:

- Long-term operational planning – we are developing a 30-year Operational Plan. This plan allows for comparison of future options for the bulk supply system. This plan will guide investment in water supply infrastructure.
- Medium-term operational planning – we are developing an annual operating strategy. This strategy aims to review and develop sub-regional and regional operating triggers annually. While the immediate focus is on a 12-month operating window, the assessment considers a five-year outlook to understand the possible effects of drought in the formulation and review of triggers.
- Short-term operational planning – we plan the day-to-day operation of the water grid, taking into account the longer term plans.

yoursay

In planning for future water security, we need to balance supply, demand and system operations.

Do you feel efforts should be mostly allocated towards:

- ☐ Reducing demand for water
- ☐ Increasing the supply of water
- ☐ Focus equally on reducing demand and increasing supply

Do you think your preferences would change when water is scarce?

DID YOU KNOW?

In 1866, Enoggera Dam was the first major dam built in Queensland and the second in Australia. The water from Enoggera Dam was not filtered until 1912, when the first water treatment plant (also at Enoggera) was completed.

Cloud seeding attempts to change the amount or type of rainfall by dispersing substances into the air. A cloud seeding trial was undertaken in SEQ during the Millennium Drought but was inconclusive.

Between its connection in 2009 and late 2014, the SEQ water grid has transported more than 21,000 ML from the Brisbane area to the Sunshine and Gold Coasts to supply residents and businesses.

Water stored and released from reservoirs is measured in megalitres. A megalitre is a million litres.

Urban stormwater contains detergents, oils, paints, soil, animal droppings, and litter, so it needs to be treated to a level that minimises risk to human health. The quality and availability of stormwater varies. It is difficult and expensive to treat and is not generally used for drinking water.

The Gold Coast Desalination Plant is in hot standby, supplying about 25 ML to the water grid every week, with the ability to become fully operational in 48 hours and supply up to 125 ML/day at full capacity if we need it.

Following the Millennium Drought, more than half of all homes in SEQ now have a water-efficient shower rose.

Some of our water treatment plants are more expensive to operate and are placed in care and maintenance until they are needed during a drought or if regular water supply is disrupted.

About four times as much energy was required to produce desalinated water in 1980 compared to now. Global research into desalination will further improve the efficiency of this climate-resilient option.

Where to from here?

Water futures

We need to plan our water future to achieve the greatest value for South East Queenslanders.

HOW WE PLAN

To plan ahead 30 years, we look to the future and try to balance demand, supply and system operation and how our infrastructure plays a part in the system's performance.

By taking an integrated approach to planning, we explore the most efficient water supply sources for SEQ by looking at how different combinations work together to meet our long-term objectives. We need to weigh up a number of competing factors and consider the unknown impact of climate variability into the future. For example, desalination isn't affected by climate and provides drought security, but it is considered expensive compared to other sources when used in normal weather conditions. On the other hand, dams and weirs are relatively inexpensive to operate, but are dependent on rainfall so they can make us vulnerable to drought.

To plan for our water supply we try to balance future demand, which is influenced by the amount of water we each use and by population growth, with supply (existing and new water sources), and operation of our water sources, treatment plants and major pipelines to meet future needs.

We will continue to review planning outcomes to look after the water supply needs of SEQ now and into the future.

WHAT WE DID TO GET HERE

- Considered service obligations developed by the Department of Energy and Water Supply
- Updated a long-term 30 year SEQ demand forecast in consultation with water retailers
- Completed more than 2500 demand, supply and economic modelling runs
- Developed modelling tools to consistently compare the costs of supply and demand options
- Developed a preliminary adaptive drought response framework
- Evaluated all possible supply and demand management options, including 131 supply options and 177 demand management options
- Assessed supply and demand management options based on a set of criteria in consultation with water retailers
- Evaluated the bulk water supply system performance and ability to meet future demand, including peak demand
- Identified and tested demand, supply and system operations options individually and in combination
- Tested ideas, approaches and evaluation results with an Independent Review Panel
- Completed Version 1 of the Water Security Program

WHAT WE ARE DOING FOR THE NEXT VERSION OF THE WATER SECURITY PROGRAM

- Consulting stakeholders and the community about Version 1 of the Water Security Program
- Developing drought response options
- Continuing planning for standalone communities
- Further exploring options for decentralised schemes and other non-structural options
- Exploring land availability for the future

The Water Security Program enables us to proactively and rigorously plan for the short, medium and long term. The first version establishes a blueprint for water security until 2045, and shows that, with the exception of a severe drought occurring, urban water demand in SEQ can be met comfortably over the next 15 years with careful management of the existing water grid and some minor upgrades to existing assets.

We will engage South East Queenslanders and, after further work, will deliver the next version of the Water Security Program anticipated in early 2017.

FROM NOW TO 2030: IMPROVEMENTS

Based on our assessments, we know there are improvements we can make to existing infrastructure in the short-term that make sense and will delay major investment in new infrastructure. We expect that making these improvements will maintain water security objectives for at least 15 years, based on various assumptions. We plan to:

- Build a new off-take from the Northern Pipeline Interconnector.
- Reconfigure the Aspley pump station using additional pipework to transport bulk water in a northerly direction from the Mount Crosby water treatment plants.

Both of these minor system upgrades will improve the ability of the water grid to transport water from the central part of the region to the north and meet the growing demand, delaying a new major supply source until about 2030.

However, our system does not have the ability to treat and supply water to meet any higher-than-normal consumption periods during this time. To make this happen, upgrades to two existing water treatment plants are also planned. These two plant upgrades will likely be coupled with the closure of some older plants that would cost too much to upgrade and continue to maintain.

The options for improving existing assets, if progressed, present the first phase of a potential water future for SEQ. Given their efficiency, this combination of supply options has been included in all assessments of what we might do next. Although these upgrades, combined with demand management, can delay the need for new infrastructure, there will come a time when building new sources of water supply or extending parts of the existing bulk supply system will be necessary to secure water for our growing population.

BEYOND 2030: POSSIBLE WATER FUTURES

There are dozens of variations of supply, demand and system operation choices that can be made to achieve the region's water security objectives.

No one option can efficiently meet SEQ's long-term water security needs. Supply, demand and system operating options must be combined to meet the long-term needs of the region. Combinations of these options represent different water futures. Due to the large number of options that exist, a range of combinations is available.

Each combination has its own costs and benefits, which respond differently to a range of local and global influences. As the influences change, so may the most appropriate combination of options.

No one combination of options is perfect and not everyone will agree on our water future. We all have to carefully weigh up the trade-offs of the different options.

Beyond 2030 and after improving existing infrastructure, there is a range of possible water supply options that we are seeking your thoughts on:

1. Surface water options (harvesting water from the Mary River with and without raising Borumba Dam wall, and using Wyaralong Dam with the construction of a water treatment plant).
2. Desalination plant options (northern, central and upgrading of the Gold Coast Desalination Plant).
3. Water treatment plant upgrade options (Noosa, Mount Crosby and Molendinar).
4. Recycled water options.

There are also options for managing demand and operating the system. And, we need to do further investigations in the decentralised schemes, groundwater supplies and non-structural options.

Building our **water future**

As demand for water continues to grow, the amount of water that our system can supply will need to increase.

By about 2030, based on most likely demand, a new water supply source will be required to meet the water needs of a growing SEQ.

Our water can come from a range of sources. All possible sources have been considered in planning for our water future.

Surface water – sourced from rainfall, stored in dams and the most common source in SEQ. Surface water is more vulnerable to changing climate and catchment conditions. It is less expensive and takes less energy to treat but can produce more solid waste than other sources.

Groundwater – sourced from aquifers through borefields, groundwater generally requires less treatment than water from sources due to its higher quality. Groundwater availability can be hard to predict. The use of groundwater can impact on groundwater dependent ecosystems. In SEQ, there is only a very small amount of groundwater available.

Desalination – sourced from seas and oceans, desalination is the process of removing salt from seawater to produce fresh water suitable for drinking. This process uses more energy than other sources and is the most expensive to operate, but supply is reliable.

Purified recycled water – sourced from water we have already used and extensively treated through many processes to provide a climate-resilient supply. While not as resilient as desalination, it is less expensive to produce and can reduce the waste discharged to waterways.

Decentralised schemes – sourced locally through stormwater harvesting, sewer mining, water recycling and rainwater tanks, decentralised schemes provide water for local use (generally not for drinking). Decentralised schemes are often more costly than bulk supply sources and vulnerable to climatic conditions, however they can reduce demand on the bulk water supply system and the waste discharged to waterways.

Unconventional supplies – a range of different and often unusual sources, including options such as covering surface water storages to reduce evaporation and cloud seeding. These options are generally high in cost, require further research and produce less water than others.

Non-structural options – largely focused on changing policies or regulations that can impact on system performance. Examples of non-structural options for supply sources include recycled water policies, environmental flows and water trading.

Any supply option on its own or in combination responds differently to different influences and has its own costs and benefits. We call these trade-offs. We have developed criteria to assess the trade-offs. For water supply options, we have assessed these trade-offs under the broad categories of cost, available yield, environmental impacts and resilience. Social impacts, like our values, cultural heritage and equity, are found in all options and will be determined by the community's level of acceptance.

Based on our assessment, here's how the water supply options ranked from most to least against cost, yield, environmental impact and resilience.

	LEVELISED COST	AVAILABLE YIELD	ENVIRONMENTAL IMPACT	RESILIENCE
Most favourable	Surface water	Desalination	Decentralised schemes	Desalination
	Groundwater	Purified recycled water	Purified recycled water	Purified recycled water
	Purified recycled water	Surface water	Desalination	Decentralised schemes
	Desalination	Decentralised schemes	Groundwater	Surface water
Least favourable	Decentralised schemes	Groundwater	Surface water	Groundwater

This assessment is a general assessment based on the average performance of each type of supply source for long-term supply in SEQ. The results may differ when assessed for drought, in addition to taking into account scheme and site-specific conditions.

The decentralised options presented consider supply options only. There are also demand-related decentralised options.

Unconventional options, by their very nature, are often based on emerging and relatively unproven technologies and processes. There is limited ability to assess the cost, yield and other associated attributes as a group.

Non-structural options include changes to policy and regulation and may facilitate the availability and implementation of options. Non-structural options are wide ranging and can impact all three levers of supply, demand and system operation.

yoursay

New water sources take time to plan and to deliver. Importantly, these sources must be resilient enough to operate in a climate of extremes. With the knowledge you have about future forecasts and demands on our water supply, what are the trade-offs you consider to be most important – household needs, the natural environment or impacts to the economy?

yoursay

In planning for our water future, we assessed our options against many factors such as how we live, what is important to us, and how our actions affect our natural and social environment.

To help you assess these water source options and weigh up your preferences, here are a few questions to consider:

- ☐ Does it offer a fair and affordable water supply for all users?
- ☐ Is it able to operate in times of drought, flood and fair weather?
- ☐ Does it protect the natural environment?
- ☐ Are there cost efficiencies not just for now, but for future generations?
- ☐ Does it show innovation, flexible use of technology and improved efficiency?
- ☐ Will it impact land use next to water sources or treatment plants?
- ☐ Could it limit greenhouse gas and waste emissions?
- ☐ Does it need to provide a shared space for recreation?
- ☐ Does it consider indigenous values and cultural heritage?

Your **say**

Seqwater knows water. We work with it every day, giving us specialised knowledge and expertise that we have brought to the Water Security Program.

To provide independent advice on the approaches being taken and the progress of our work, we assembled a panel of seven esteemed industry professionals. The panel played a very important role in challenging our thinking and sharing experiences of similar water security planning in other large cities in Australia and overseas. We also sought the advice of our water service provider partners and the Department of Energy and Water Supply.

But now we need your ideas and feedback. Your say is the beginning of the ongoing conversation we hope to have with you about the best way to achieve an adaptive and secure water future for all.

Our plan will be regularly updated as our region grows and changes to deliver on our commitment – water for life.

HOW TO GET INVOLVED

Unless we have a severe drought, water demand in SEQ can be met until 2030. This gives us time to work together to achieve a water future that represents the best possible value for our region and that considers your views.

We will keep improving the Water Security Program based on community and stakeholder input, more targeted planning, further research, and by keeping a close watch on the external influences.

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Visit yourseqwater.com.au to register your interest

Neighbourhood events

FAQS

What is Water for life?

Water for life starts the conversation about planning for our water future.

Seqwater has released the Water Security Program – a blueprint for managing water over the next 30 years. It builds on previous work and discusses the many factors surrounding the secure delivery of bulk water to SEQ – the risks and influences we need to manage, the many supply, demand and system operation options available to us, and how we make the best choices for SEQ.

The program was developed with extensive research, input from stakeholders including SEQ water retailers, and oversight from a panel of independent experts.

Our job now is to develop a more detailed version of Water Security Program that considers community feedback on the right water future for South East Queenslanders and includes more detailed options for responding to drought, and meeting the water needs of communities which are not connected to the water grid.

We're inviting you to have your say. Your views and ideas will be considered in the updated Water Security Program, to be published in early 2017.

Why do we need the Water Security Program?

Following Seqwater's establishment on 1 January 2013, we assumed the responsibility for long-term water security planning for SEQ. The *Water Act 2000* requires Seqwater to develop a Water Security Program to meet service obligations for water security in SEQ for the next 30 years.

What does Version 1 of the Water Security Program outline?

Version 1 of the Water Security Program is the first step to delivering a blueprint for our water future. Version 1 outlines what we must consider from a demand, supply and operational perspective. It also starts the conversation with the community about preferences for our water future.

Will there be more versions of the Water Security Program?

Seqwater has delivered Version 1 of the Water Security Program to meet the guidelines set by the Department of Energy and Water Supply. But, we still have work to do on drought response and standalone communities. Alongside your feedback on Version 1, this work will contribute to Version 2 of the Water Security Program.

What if our needs change over the 30 years to 2045?

The Water Security Program is adaptive and our modelling considers changes to the planning environment, so we will review it at least every five years.

What is a water future?

There are dozens of variations of supply, demand and system operation choices that can be made to meet our water needs. No one option alone can meet SEQ's long-term water security needs. Supply, demand and system operating options must be combined to meet the long-term needs of the region. Combinations of these options represent different water futures.

What are the next steps?

There is still much to do to achieve a secure water future. We will be seeking community feedback on the work we have already done in preparing Version 1 of the Water Security Program. We will start planning for upgrades and improvements to our existing infrastructure.

For more information
visit yourseqwater.com.au

seqwater
WATER FOR LIFE