



Water for life

South East Queensland's Water Security Program
2017 Annual Report



2017 RECAP

In 2017, South-East Queensland (SEQ) experienced long hot spells, a failed wet season and two significant rainfall events.

The wet season brought into stark contrast how rainfall patterns can differ significantly across the four main sub-regions which make up SEQ.

The northern sub-region, particularly on the Sunshine Coast, experienced its second consecutive failed wet season – this is uncommon. Our largest dam on the Sunshine Coast, Baroon Pocket, experienced record low inflows.



Hinze Dam spillway after ex-Tropical Cyclone Debbie in April 2017.

At the same time, our dams in the central sub-region also experienced extended dry spells.

In contrast, our Gold Coast dams – Hinze and Little Nerang – have been at, or close to, capacity for much of 2017. During ex-Tropical Cyclone Debbie in March, Hinze Dam received record inflows.

In October, we recorded the highest monthly rainfall totals in our drinking water catchments since 2010. Overall, the resulting inflows into our dams added about three months to our water supply. Baroon Pocket Dam received an increase of more than 30% to lift its levels to almost 80% by the end of December 2017. Continued rain is resulting in good inflows into the dam, creating a better situation as we approach the 2018 drier winter months.



Baroon Pocket Dam at 46% capacity in March 2017.

OPERATING THE WATER GRID

The SEQ Water Grid enables us to transport treated water around the region.

However the grid has limits to the amount of water it can move. It can supplement but not completely replace local water supplies. Each sub-region is reliant on its local water storages to help maintain water supply. Our reliance on the Water Grid was evident in 2017.

Each of the sub-regions – northern, central, eastern and southern – are centred on a specific water storage, to balance cost effectiveness and water security. The sub-regions are defined in the SEQ Water Grid map.

The grid provides greater water security into the future. If one dam isn't receiving good inflows, the Water Grid can be operated to allow other water sources to supply some of this shortfall.

In 2017, we used the grid in this way when Baroon Pocket Dam experienced record low inflows. During this time, water was provided from the central sub-region via the Water Grid to supplement the northern sub-region. At the start of 2018, we were still operating the grid this way.



The Water Grid provides greater water security for SEQ into the future.

Approximately 3.1 million South East Queenslanders are serviced by the SEQ Water Grid. Seqwater also supplies drinking water to approximately 55,000 people living in 16 **off-grid** communities – rural towns that are not connected to the Water Grid, but form part of the bulk water supply system.

BEING PREPARED FOR DROUGHT

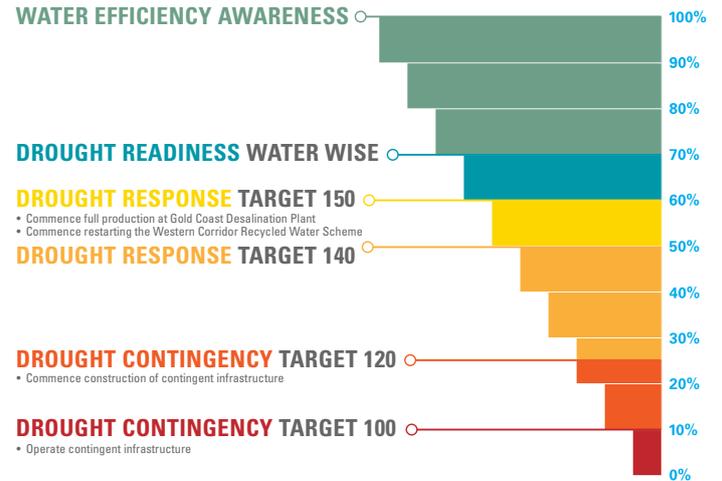
Twice in 2017, the combined storage levels of South East Queensland drinking water dams neared 70%.

When the 70% level is reached, the region enters into a 'drought readiness' phase - which means drought is on the horizon and it's time for the community to start preparing.

Although rain in March and October meant our combined dam levels never reached 70%, we worked with Water Service Providers, and other key stakeholders on drought preparedness and raising awareness of water efficiency.

Seqwater's Water Security Program details how the region will respond to drought.

SOUTH EAST QUEENSLAND DROUGHT RESPONSE



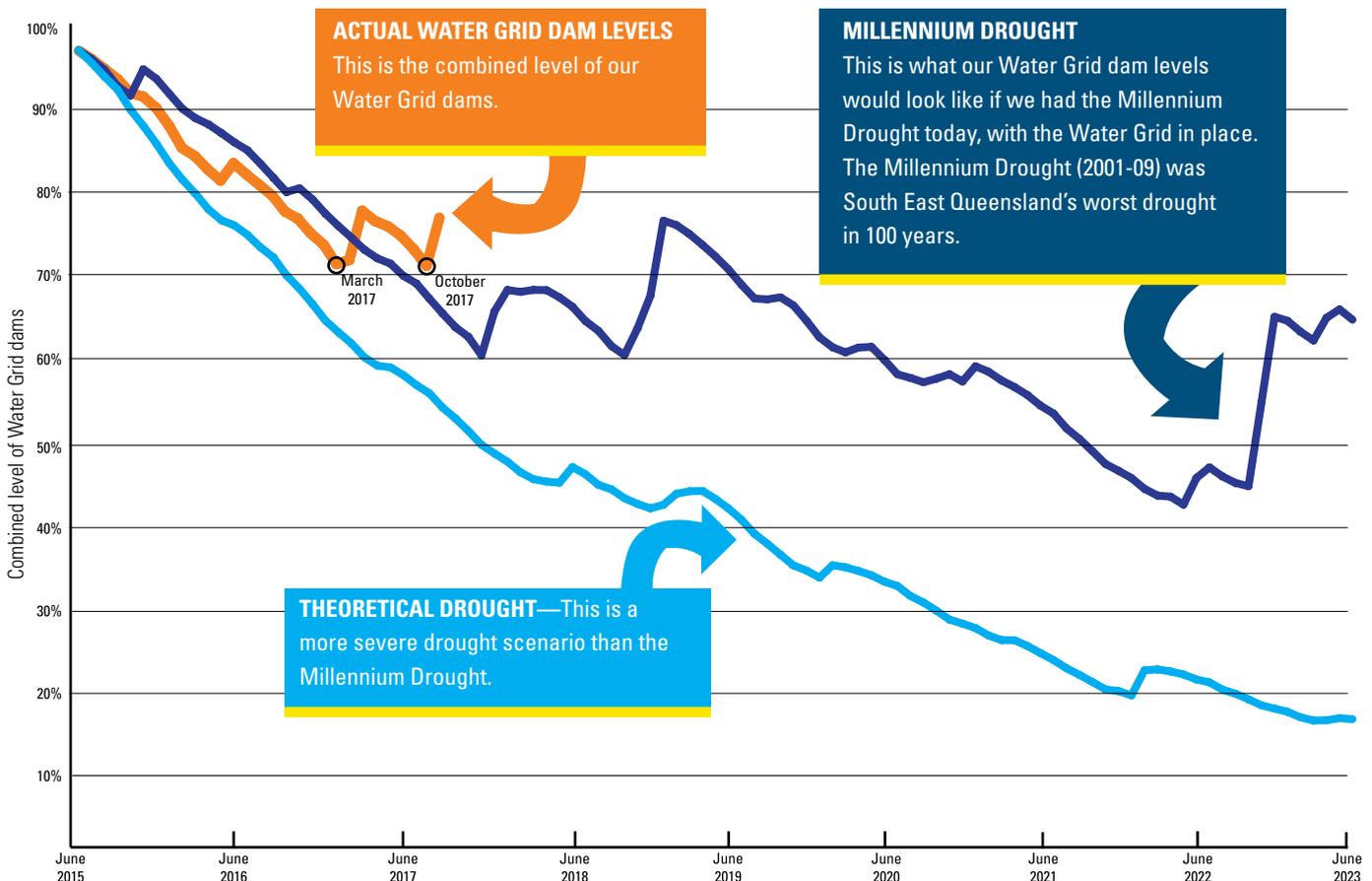
TRACKING OUR DAM LEVELS

We track how our combined dam levels are comparing against the most recent drought we experienced (the Millennium Drought) and a theoretical drought modelled on little inflows into our dams (see graph below). During the Millennium Drought, our combined dam levels dropped to approximately 20%.

As you can see, the October rain has boosted our dam levels, and with the region experiencing a La Niña weather event this

summer (which can mean wetter than average conditions), our downward trajectory has stalled. However, weather conditions can change so we remain vigilant and ready to act.

While we are one region, we may need to further tailor our operational response to particular sub-regions, given the combinations of water sources they have and the ability of the SEQ Water Grid to move water to that sub-region.



ONE REGION, MANY DIFFERENCES

Our focus was drawn to the northern sub-region this year after it experienced a second failed wet season, which was unusual.

For water supply purposes, South East Queensland is broken up into four sub-regions, described in the map overleaf.

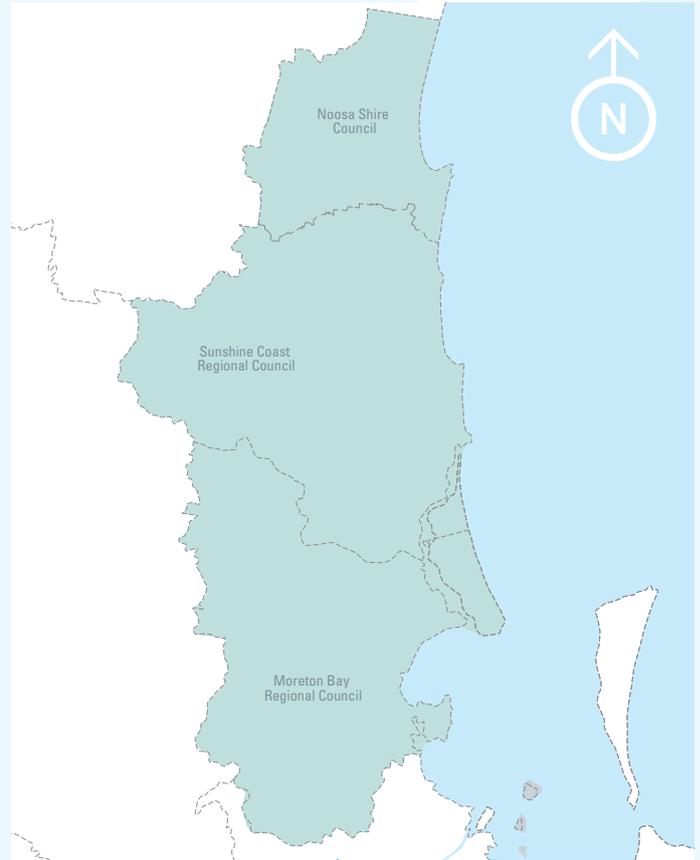
The two main major storages in the northern sub-region are Baroon Pocket Dam and North Pine Dam. Since 2015, Baroon Pocket Dam and North Pine Dam have progressively drawn down as rainfall was insufficient to fully replenish them.

The northern sub-region also relies on Ewen Maddock, Cooloolabin, Wappa and Lake Macdonald dams.

- Baroon Pocket Dam is a relatively small storage with a volume of 61,000ML (equivalent to only 5% of the Wivenhoe Dam storage volume). The catchment that contributes flows to Baroon Pocket Dam has been a reliable source, historically using about 60% of its capacity each year.
- The size and nature of Baroon Pocket Dam means that extended drought conditions can result in a decline of water levels and very limited time to implement contingency measures.
- North Pine Dam has a larger storage with a volume of 214,000ML compared to Baroon Pocket Dam (equivalent to 18% of the Wivenhoe Dam storage volume).

A key consideration for water supply in the northern sub-region is the time required to implement contingency measures in the event of extended drought conditions.

The southern sub-region can access the Gold Coast Desalination Plant, while the central sub-region can use the Western Corridor Recycled Water Scheme.



The northern sub-region experienced a second failed wet season in 2017.

The recent dry period has highlighted the vulnerability of the water storages in the northern sub-region to drought without appropriate water transfers from the central to the northern sub-region via the SEQ Water Grid. In 2017, the grid was used to transfer water to the Northern sub-region, supplementing the sub-regions local water supply. Seqwater continues to operate the grid in this manner.

While the grid is able to provide water to this sub-region, its capacity is limited and cannot meet total demands without input from local water supplies.



Lake Macdonald Dam, on the Sunshine Coast, at 52% capacity in early March 2017.

MEETING SEQ'S WATER NEEDS

We talk about 'demand' when determining how much water South East Queenslanders use. In 2017, the average person used **176 litres** per day.

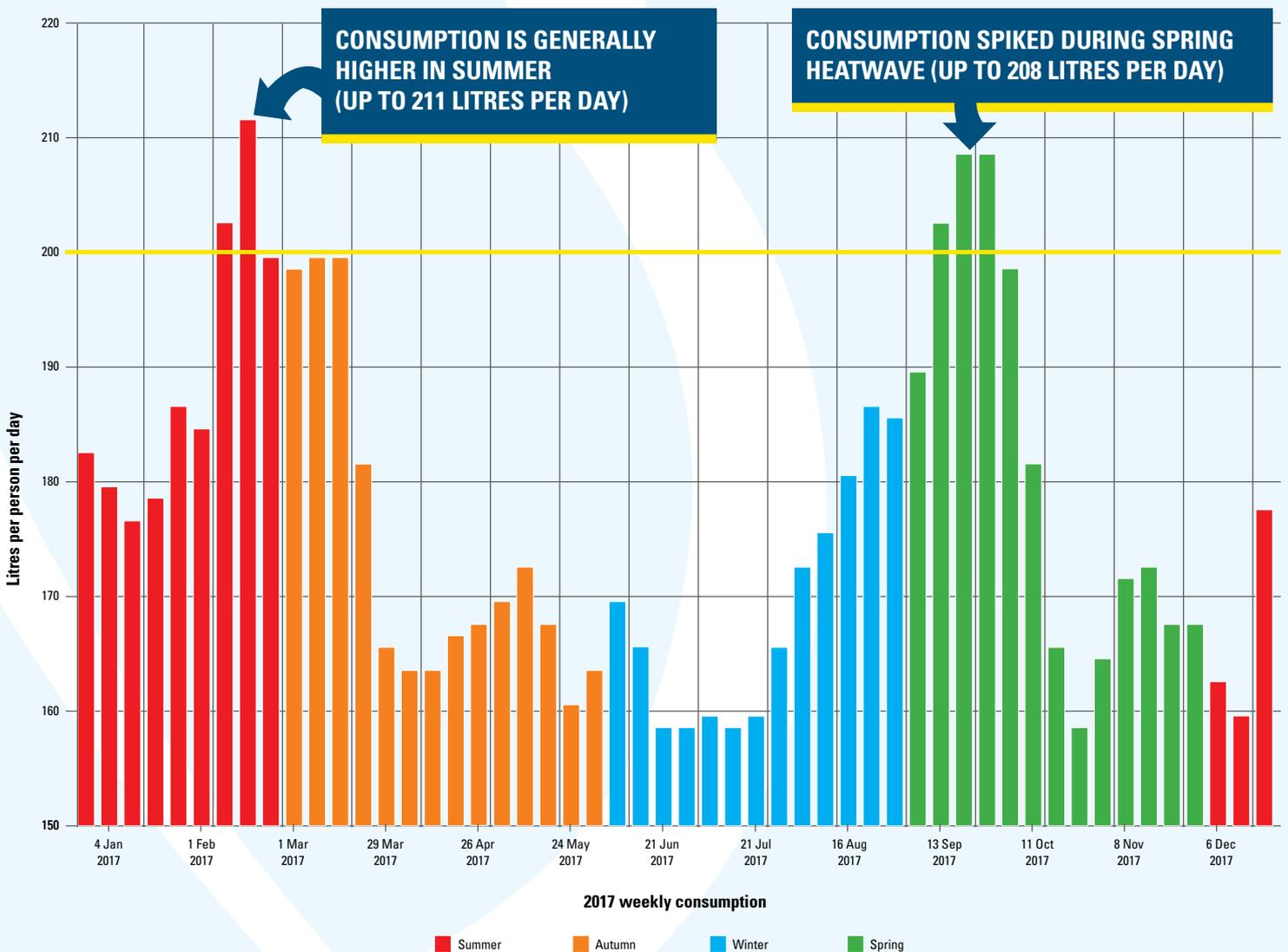
Demand is significantly impacted by climate, population growth, weather and changes in how communities consume water.

We saw the impact of the climate on demand in 2017, with water use spiking during hot dry spells. On average, 2016-17 demand rose by 4.4% compared to 2015-16, which was in line with our projections.

Seqwater continues to work with Water Service Providers to understand longer-term demand management options. Seqwater will continue to closely monitor water demand.



The average South East Queenslander used about 176 litres a day in 2017.



SOUTH EAST QUEENSLAND'S BULK WATER SUPPLY

Seqwater sources the bulk water needed to supply South East Queensland from dams, weirs and our climate-resilient sources.

The need for a new water source is driven by the capacity of the existing system to source, treat and supply enough water to meet demand. It is also dependent on climatic conditions and how the Water Grid is operated.

During 2017, we brought the Ewen Maddock Water Treatment Plant back online to treat water from Ewen Maddock Dam to supply water to the northern sub-region.

For most of the year, the levels in the majority of our dams were declining. Rain in October, November and early December resulted in a welcomed increase in all major water storages.

Future water sources

Seqwater uses many different modelling projection methods to get a sense of how much water the region will need in the future. Our modelling is underpinned by decades of data about rainfall inflows into our dams, weather patterns and water demand scenarios.

Future modelling will include the latest scientific data on climate change and may result in changes to the date the next major bulk water source for SEQ is required. Based on modelling to date, outside a severe drought or sharp increase in water consumption, the next bulk water source for SEQ will be required before 2040.

The northern sub-region has experienced an uncommon weather pattern in the last few years. In our Water Security Program, our current projections indicate that the next new water source will need to be in the northern sub-region.



Ewen Maddock Water Treatment Plant was brought back online in 2017 to supplement water supply to the Sunshine Coast.

Legend

-  Water Treatment Plants (WTP) – connected to grid
-  Advanced Water Treatment Plants (AWTP) – connected to grid
-  Desalination plant – connected to grid
-  Water Treatment Plants (WTP) – off grid
-  Bulk water supply pipeline network

Water Treatment Plants (WTP)

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

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

WATER SERVICE PROVIDERS are the organisations that take bulk water that Seqwater has sourced and stored, and deliver it to your home. In South East Queensland these are Queensland Urban Utilities, Unitywater, and the water businesses of the City of Gold Coast, Logan City Council and Redland City Council.

THE SEQ WATER GRID

Constructed during the Millennium Drought, the SEQ Water Grid is an interconnected bulk water supply network which allows us to move treated drinking water around the region.

NORTHERN SUB-REGION

- 7 dams
- Supplies Sunshine Coast, Noosa and Moreton Bay
- Connects to central sub-region
- No climate-resilient supply

EASTERN SUB-REGION

- 1 dam, 2 aquifers
- Connects to central sub-region
- Can be supported by climate-resilient supply in southern and central sub-regions

CENTRAL SUB-REGION

- 2 dams
- Supplies Brisbane, Ipswich, Logan and Beaudesert
- Climate-resilient supply (purified recycled water)

SOUTHERN SUB-REGION

- 2 dams
- Supplies Gold Coast
- Climate-resilient supply (desalination)

Although the region is interconnected, the Water Grid is operated to a large extent at a sub-regional level. Each of the sub-regions – northern, central, eastern and southern – is centred on a specific water storage to balance cost effectiveness and water security.

LOOKING AHEAD

2017 illustrated why South East Queenslanders must plan for every possible scenario to ensure we have enough water to meet all the community's needs. In one year, we saw an extended dry spell followed by periods of heavy rainfall. As we move into 2018, Seqwater is working on projects around the region to improve the region's water security.

- We will spend \$20 million making upgrades to the Water Grid to improve our ability to move water from Wivenhoe and Somerset to the northern sub-region, and use water from North Pine Dam to supplement supply on the Sunshine Coast.
- To provide for the region's overall water security, we are assessing the safety of our dams. Cooloolabin Dam upgrades will continue in 2018, alongside Leslie Harrison and Sideling Creek dam upgrades.
- Detailed design is ongoing for the implementation of upgrades to Lake Macdonald and Ewen Maddock dams in 2019. Planning is also underway for the upgrades of Somerset and Wivenhoe dams.
- We'll double our investment to \$10 million in catchment protection, improving the quality of water coming into our dams.
- Planning work is progressing on a new pipeline connection from Beaudesert to the SEQ Water Grid. This new supply will meet demand in the short term. As demand increases, supply will be supplemented by the development of a new Wyaralong Water Treatment Plant located at Cedar Grove. Together, these two projects will provide long-term water security for the Beaudesert and South Logan area.
- The Petrie Water Supply Upgrade involves four construction projects during 2017-18 including a new 2.4 kilometre pipeline and decommissioning the old water treatment plant in Petrie. About 100,000 more residents in the Moreton Bay region will be connected to the SEQ Water Grid for the first time in 2018 once the upgrade is complete.
- We will open the upgraded Canungra Water Treatment Plant, which has doubled its treatment capacity to cater for population growth in the region.
- Seqwater is working with local government, Water Service Providers and key stakeholders to investigate new water supply options for the northern sub-region, including climate-resilient sources, to respond to both drought and long-term demand and population growth.



Seqwater Project Manager, Peter Wall, consulted with community members during SEQ Water Grid upgrades.

About Seqwater

Seqwater delivers a safe, secure and cost-effective water supply to South East Queensland. We manage up to \$12 billion of water supply assets. This includes dams, weirs, conventional water treatment plants and climate-resilient sources of water through the Gold Coast Desalination Plant and the Western Corridor Recycled Water Scheme. This also includes the Water Grid, a 600 kilometre reverse flow pipeline network enabling drinking water to be transported around the region.

One of Seqwater's core functions is long-term strategic planning for a reliable and sustainable water supply. We call this plan our Water Security Program. In March 2017 we released the second version of this plan.

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