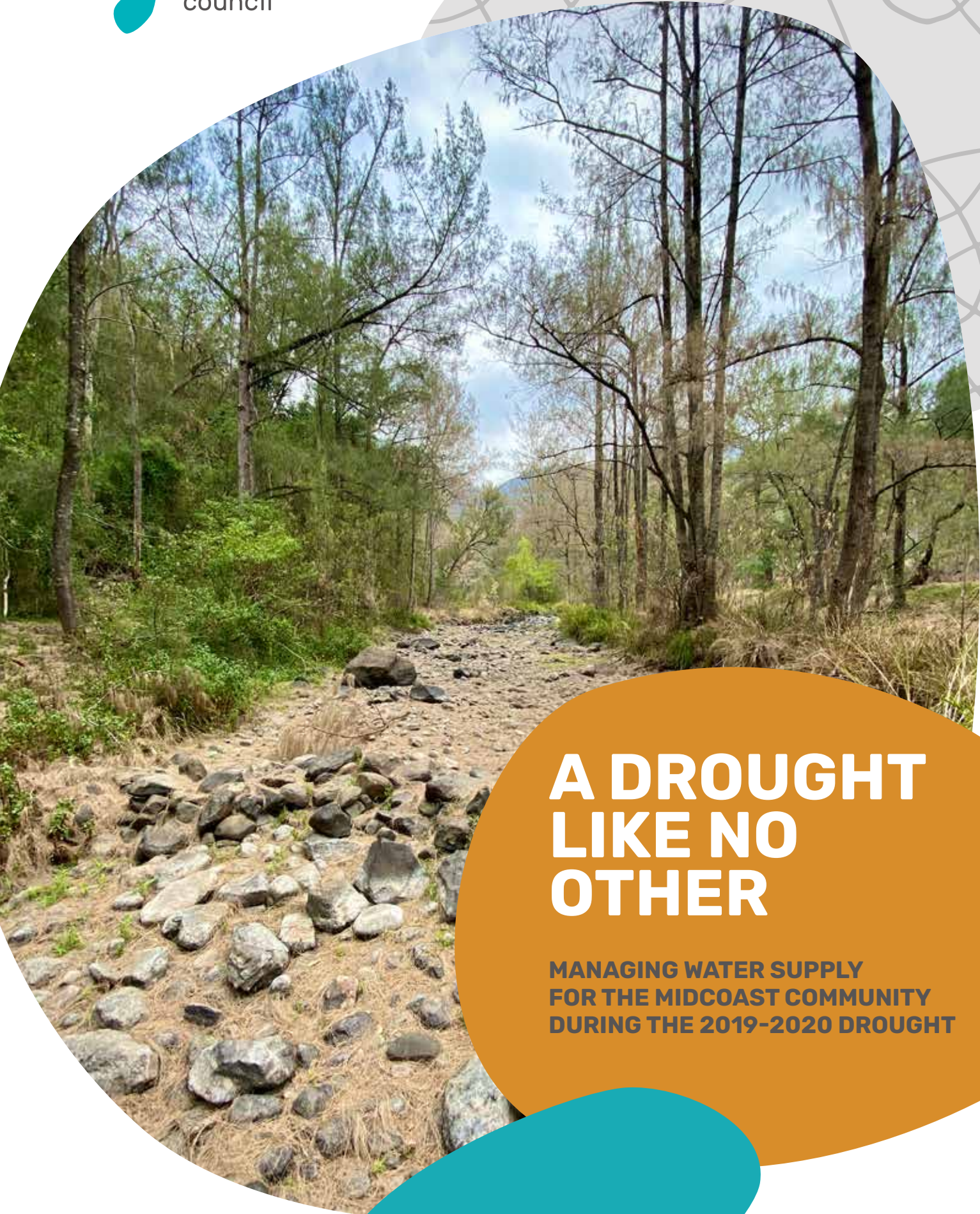




MIDCOAST
council



A DROUGHT LIKE NO OTHER

**MANAGING WATER SUPPLY
FOR THE MIDCOAST COMMUNITY
DURING THE 2019-2020 DROUGHT**

ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the traditional custodians of the land on which we work and live, the Gathang-speaking people, and pay our respects to all Aboriginal and Torres Strait Islander people who now reside in the MidCoast Council area. We extend our respect to elders past and present, and to all future cultural-knowledge holders.

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NO ORDINARY DROUGHT

INTRODUCTION

The MidCoast experienced its worst drought on record throughout late 2019 and early 2020. Faced with this unprecedented event and the ongoing impacts of the 'Black Summer' bushfire crisis, we embarked on a drought response strategy that aimed to reduce water use across the region while also ensuring the community could continue to access its most precious resource. A range of measures were implemented, including water restrictions, a communication/ community education campaign, the increased use of recycled water, water carting to the region's most affected townships, and the fast tracking of key projects such as the Nabic borefield expansion.

In the aftermath, we have conducted a comprehensive review of our drought response strategy and detailed the impacts the drought has had on future planning for water security in the region.

While extended dry periods have long been a feature of the Australian landscape, the 2019-2020 drought proved to be unprecedented on the MidCoast. The duration and severity of the drought could be measured both by the impact it had on the region's natural resources, and the level of response required from ourselves and other agencies to ensure water could continue to be supplied to the community. At the same time, catastrophic bushfires across the region in late 2019 placed an additional burden on the MidCoast's water supply and added a significant level of complexity to the challenge of managing the drought.

CONSEQUENCES OF THE DROUGHT

The exceptional nature of the 2019-2020 drought was illustrated in the unique situation it delivered to the MidCoast, including:

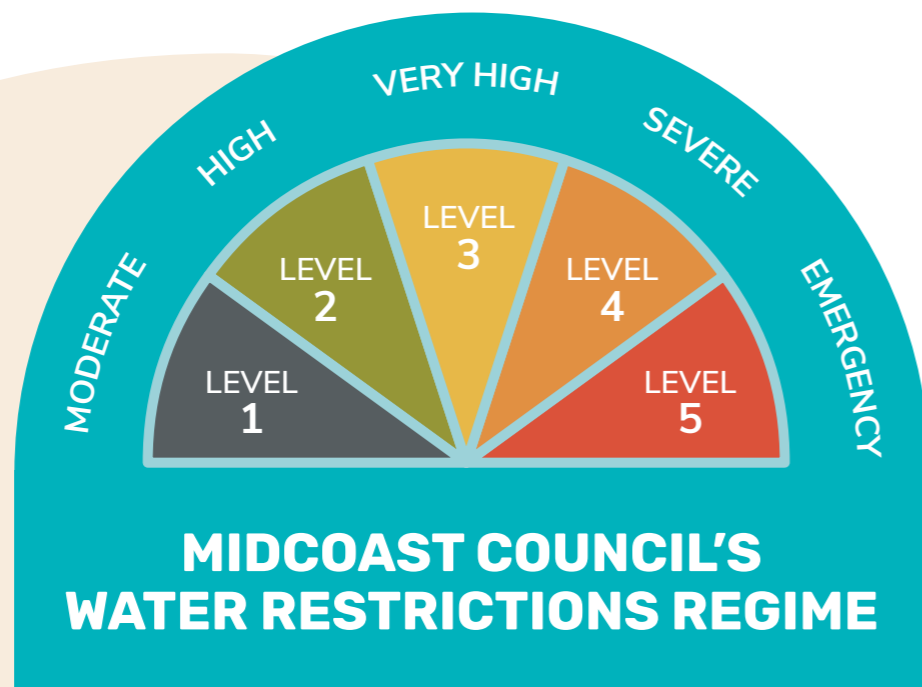
Water restrictions

Historically, the introduction of water restrictions on the MidCoast has been rare. Prior to 2019, they had only been implemented in the region on four previous occasions – 1994, 2002, 2014 and 2018. Of these, only the 2002 restrictions required an increase from Level 1 to Level 3. Likewise, the 2002 restrictions were in place for a total of eight weeks – the longest continuous period of water restrictions in the region.

All this changed in 2019. Following a dry summer, Level 1 restrictions were implemented in February for a period of five weeks across the Gloucester, Manning and Great Lakes areas, and six weeks in Bulahdelah and Stroud, with restrictions increasing to Level 3 in Stroud for the last two weeks. Level 1 restrictions were then implemented across the region again in early September, before being increased to Level 3 on 11 November, and Level 4 on 25 November (except Hawks Nest/Tea Gardens, which remained on Level 3). These restrictions remained in place until 7 February 2020, when significant rainfall saw restrictions scaled back to Level 2 across the region, before they were lifted entirely on 21 February.

In all, water restrictions were in place across the MidCoast for a period of five months and 20 days, exceeding the previous record by more than three months. It was also the first time Level 2* and Level 4 restrictions had been implemented in the region.

*We have previously avoided implementing Level 2 restrictions, as the measure doesn't result in a marked reduction in water use from Level 1. However, on this occasion Level 2 was deemed as an appropriate intermediary level because it reflected the improvement in our water supply situation while acknowledging that the community saw it as irresponsible to move directly from Level 4 to Level 1.



River flow and extraction

Rivers are the lifeblood of the MidCoast's water supply, with only the communities of Tea Gardens and Hawks Nest not relying on a river system as their primary water source. However, the extreme lack of rainfall throughout 2019 and early 2020 saw all four of the region's supply rivers severely impacted by the drought.

Under ordinary circumstances, water is pumped from the Manning River into the 2,200 million litre Bootawa Dam, which supplies 90 per cent of our water customers. However, pumping ceased in October 2019 due to a lack of flow in the river and the dam was unable to be refilled for a record 86 days. During this time, the water level in the dam dropped to around 30 per cent – the lowest it had reached since the dam was constructed in the 1960s.

Flow levels in the Karuah River, which supplies the communities of Stroud and Stroud Road, also became too low to continue pumping in October. The river stopped flowing altogether on 10 November.

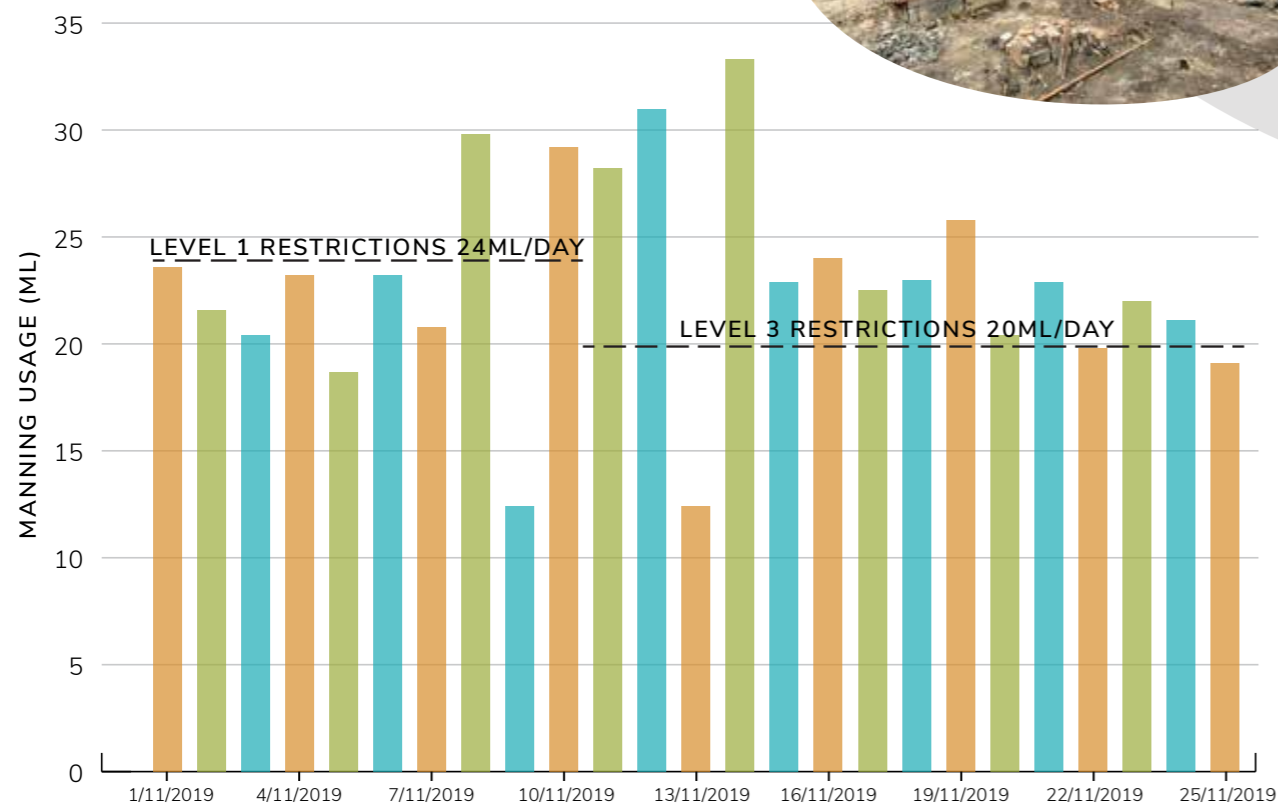
In late December, the Barrington River ceased to flow for the first time in 75 years of records. Previously it had proven a reliable water source for the towns of Gloucester and Barrington and had not been known to flow at a level lower than six million litres per day.

The Crawford River, which supplies the township of Bulahdelah, also experienced a significant drop in flow levels. Under ordinary circumstances, water is drawn from a pool created by a small weir across the river. However, an emergency water supply pump had to be installed in January 2020 after the pool became too low to continue extracting water.

Bushfires

The bushfire crisis that impacted the MidCoast in late 2019 challenged the community's efforts to conserve water in a number of ways. This can be seen most readily in the Manning Water Supply System's daily usage rates between 8-14 November, when fires threatened lives and properties at numerous locations across the region. During this period, water use far exceeded targets set under the water restrictions on five of the seven days. This increased use was directly attributable to fire fighting and property protection efforts.

Additionally, we provided emergency water fill points at five fire-affected locations across the region in the months following the fires. This water was made available to community members who could no longer readily access clean drinking water because of the impacts of the fires. During the 81 days these fill points were in operation, more than 3.5 million litres of water was supplied to the community free-of-charge.



Water carters

With many rural property owners depleting their own water supplies during the drought, an additional strain was placed on our water storage levels as commercial water carters were called upon to supply drinking water around the region. These water carters draw water from our network at designated standpipes and pay a quarterly account for the water they use. It is thought the increased demand for water carters during the drought was one of the reasons why the community didn't always meet water restriction targets.

DROUGHT RESPONSE TEAM

In October 2019, with the water security situation worsening and no rain predicted on the long-term forecast, we formed an internal response team to manage the impacts of the drought and coordinate our actions.

Comprised of managers and senior staff from across the organisation, as well as representatives from the NSW Department of Planning, Industry and Environment and the NSW Water Directorate, the team was responsible for:

- Preparing and coordinating council's drought response strategy
- Developing and implementing internal water-saving initiatives to demonstrate positive leadership
- Developing and implementing initiatives that worked with targeted sections of the community to improve awareness of water conservation, increase drought resilience and better manage economic impacts
- Ensuring drought response emergency projects were ready to be implemented should they be required
- Revising the Drought Management Plan

Throughout November and December 2019, as bushfires burnt out of control across the region and water levels continued to decline, the team met weekly with the NSW Regional Town Water Supply Coordinator, NSW Health and the Office of Emergency Management to discuss updates on current conditions, bushfire recovery, options for town water supplies, and government programs. Through this process, the team was able to finalise its drought response plan and set about implementing strategies to ensure water could continue to be supplied to the MidCoast community.

REDUCING WATER USE

A key element of the Drought Response Team's strategy was to reduce water use across the MidCoast. This would ensure the region's water supplies would last longer and give the team more time to implement alternative arrangements to meet the community's needs.

To achieve this, a range of measures were introduced to help all members of the community cut down on their water use.

WATER RESTRICTIONS

Level 1 water restrictions were implemented across the MidCoast on 2 September, limiting outside water use. These restrictions aimed to reduce consumption across the region by 10 per cent and keep demand in the Manning Water Supply System under 24 million litres per day.

Level 3 water restrictions followed on 11 November, further limiting outside water use and banning the use of all irrigation systems. These restrictions aimed to reduce consumption across the region by 20 per cent and keep demand in the Manning Water Supply System under 20 million litres per day.

Level 4 water restrictions were then implemented for all members of the community except those in Hawks Nest and Tea Gardens on 25 November, banning outside water use completely and communicating a need to limit the non-essential use of water inside. These restrictions aimed to reduce consumption across the region by 30-40 per cent and keep demand in the Manning Water Supply System under 17 million litres per day.

COMMUNICATION/COMMUNITY EDUCATION

To ensure the implementation of water restrictions across the MidCoast was effective and the community was aware of its responsibilities to conserve water, we embarked on an extensive and multifaceted communication/community education campaign in August, before water restrictions were introduced, and continued to keep the community updated via a variety of methods throughout the remainder of the drought. These methods included:

- Mailouts with council invoices
- Social media updates
- Variable Messaging System boards on major road approaches to urban areas
- Media releases
- Printed items for holiday accommodation providers
- Corflute signage
- TV, newspaper and radio advertising
- Business fact sheets
- School newsletter updates
- Weekly radio interview updates
- Website banner and information page
- Weekly email newsletter
- Phone-on-hold messaging
- Water account messaging
- Updated FAQ sheet on website

Maintaining our long-standing relationship with large irrigators on the Barrington and Manning rivers was also important and we were in regular communication with them about ceasing to pump on a voluntary and compulsory basis.



COMPLIANCE

To ensure water restrictions were complied with, an education-first approach was taken. This was done to accommodate the often accidental nature of breaches and to ensure any community members who had breached restrictions understood what was required of them before they were penalised. Any subsequent breaches would then attract penalties. An additional ranger was employed during this time, partly to deal with water restriction compliance.

Around 22 reports of misuse were investigated while restrictions were in place and a total of 20 official cautions were handed out during the Level 4 water restriction period. Encouragingly, no Penalty Infringement Notices were issued, demonstrating the community understood the extreme nature of the drought.

When we implement restrictions, the shortage of water in our environment is particularly obvious. This tends to increase the level of general compliance as people can see and understand what we are trying to do.

REDUCED INTERNAL WATER USE

In order to demonstrate positive leadership in the community, we incorporated a number of water-saving initiatives into our everyday operations. These included halting some planned works programs when Level 1 water restrictions were implemented and limiting water main flushing to essential hygiene and health purposes. We also purchased an ultraviolet disinfection trailer, which can be used to disinfect water mains after breaks or construction with a minimal volume of water.

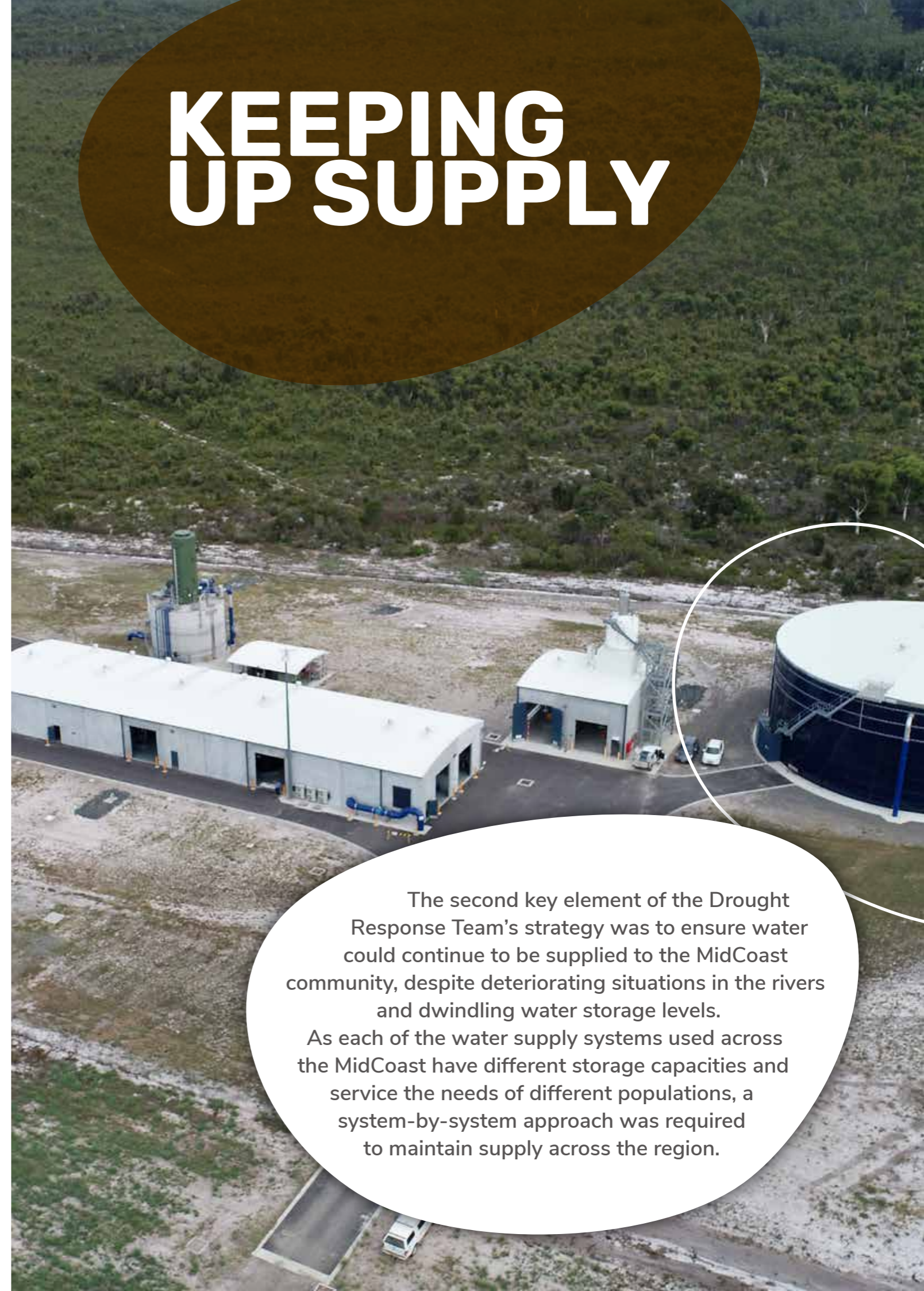
AUDITS OF LARGE WATER USERS

Smart Advice WaterMark was engaged to conduct onsite water efficiency audits across the MidCoast in December 2019, with 26 of the area's largest water users taking part. These included caravan parks, aged care facilities, hospitals, industrial sites, bowling clubs and shopping centres.

Findings from the audits included practical recommendations each business could implement to reduce their demand, such as diverting grey water to irrigation, reducing flow rates in showers and taps, installing pool covers, and the installation of water efficient appliances and amenities.



KEEPING UP SUPPLY



The second key element of the Drought Response Team's strategy was to ensure water could continue to be supplied to the MidCoast community, despite deteriorating situations in the rivers and dwindling water storage levels. As each of the water supply systems used across the MidCoast have different storage capacities and service the needs of different populations, a system-by-system approach was required to maintain supply across the region.

MANNING WATER SUPPLY SYSTEM

The Manning Water Supply System services around 90 per cent of our total water customers. Water is drawn from the Manning River and stored in Bootawa Dam, near Wingham, before being pumped to reservoirs across the Manning and Great Lakes for distribution into homes and businesses in each area.

With worst-case estimates indicating the system could run out of water as early as March 2020, and water carting considered unviable for such a large and geographically dispersed population, the Drought Response Team needed to investigate a range of alternative options to ensure water could continue to be provided to the community.

The following alternatives were employed during the drought:

Nabiac borefield expansion

The \$34.6 million Nabiac Water Supply System was opened in February 2019 to supplement the Manning System by drawing water from an inland dune aquifer near Nabiac.

In October 2019, as storage levels in Bootawa Dam continued to drop and predictions from the Bureau of Meteorology showed the dry conditions were likely to persist, the Drought Response Team identified opportunities to increase the amount of water being extracted from the Nabiac borefield. This was supported by the NSW Government, who subsequently provided a \$1 million funding grant to allow the project to begin immediately.

The first stage of the project involved lowering the pumps within the existing production bores to maximise their yield. Following a successful trial, the pumps in all 12 production bores were lowered by up to a metre, resulting in an additional two million litres per day being extracted from the borefield.

This was followed by the commissioning of four additional production bores that had been installed for future use during the initial construction phase of the Nabiac System. With much of the infrastructure already in place, all that was required to commission these bores was to purchase, install and test four new pumps, as well as obtain approval for the production licences from the National Resources Access Regulator. The pumps were ordered in October 2019 and commissioned in December, increasing the amount of water supplied by the system by another 2.4 million litres per day.



With a series of test bores already in place from the development phase of the Nabiac System, a decision was made to fast track a planned expansion of the borefield to further increase the system's production capacity during the drought. Following some investigation, it was established that five of the test bores could be turned into additional production bores without having to upgrade the system's high voltage power supply network. A specialist contractor was then engaged to drill and install the production bore casings, with work beginning in January 2020. This work was not finished before the drought broke and water restrictions were lifted, but it was determined the project should be completed for future drought security. The five new production bores are now fully operational and can produce four million litres per day, bringing the Nabiac System's production capacity up to around 12 million litres per day during a drought event.

Critical spares

To ensure the Nabiac System could continue to produce water, particularly if it became the sole source for communities across the Manning and Great Lakes, a range of critical spare parts were ordered to ensure no major interruptions were experienced. Additional temporary generators were also hired and commissioned to protect against power failures. These were subsequently decommissioned in late February 2020 once the drought emergency had ceased.

Recycled water use

To reduce the demand on the Manning System, high quality recycled water was trucked from the Tuncurry Recycled Water Treatment Plant to various rural properties from mid-January to February 2020 to ensure the health of livestock. A comprehensive Recycled Water Management Plan and standard operating procedure were developed, and site inspections were undertaken to ensure the recycled water was used safely. Around 4.7 million litres of water was delivered during this period.





The following alternatives for the Manning Water Supply System were investigated but not employed during the drought:

Temporary desalination plant

In late 2019, investigations began into the option of installing a temporary desalination plant at Nabic, drawing water from the Wallamba River estuary. With the aim of producing 5.5 million litres of water per day, the desalination system together with water from the Nabic Water Supply System would have been enough to continue supplying the community under Level 4 water restrictions. This meant we would not run out of water even if the drought continued. Ultimately our commitment to this project avoided the need to drive significant water consumption savings through emergency level restrictions, especially during the peak holiday period.

Council approved the project on 18 December 2019 and physical work began in the first week of January 2020.

This was a complex project that involved the purchase of materials and equipment, the hiring of specialist desalination treatment equipment, and the construction of permanent infrastructure for harvesting and distribution of flows. The total cost to establish and operate the system for six months was estimated to be around \$14 million. This cost was insignificant compared to the potential impact of emergency water restrictions on the economy, which would have led to some major industries potentially having to shut down, possibly never to recommence operation again.

Due to the urgent nature of the project, much of the infrastructure and equipment was hired or bought and the necessary contractors and consultants were engaged before the final designs and approvals had been obtained. To condense the project timeline, design, approval, procurement and construction was all happening simultaneously. This would ensure the plant could be put into operation as soon as possible.

While obtaining the regulatory approvals was considered the greatest risk to the project, if the time came where the desalination system was ultimately required there would have been few other options than to use it.

The project faced early opposition from commercial fishing businesses and internal stakeholders over the adopted discharge location of the reject water from the desalination process. The concern was this water would increase the salinity in the estuary, damaging marine life. These concerns were highlighted during the drought after the salinity levels in the estuary rose naturally due to a lack of freshwater inflow.

The discharge site was ultimately chosen because it could be constructed in the limited time available. If more time had been available, an ocean discharge would have been preferred.

Following a significant rain event in late January, the project was cancelled to limit costs. The total expenditure was finalised at \$4.7 million. Much of the equipment and infrastructure purchased for the project was either repurposed for other projects or installed for future use. Likewise, contracts for work that would allow the project to be continued in the future were fulfilled, while others were negotiated to end early with the relevant parties.

Overall, a temporary desalination plant was considered a difficult but necessary option to avoid emergency water restrictions and protect our economy. When the decision was made to proceed with the project, the amount of effort required for the overall planning, investigation and design was considered enormous. We proceeded with our limited resources as failing to deliver was not an option.

In the future, a temporary or permanent desalination plant still remains as a viable option for an alternative water supply source. Since the drought, work has progressed on the next stage of the Nabic Water Supply System. This is a much more cost effective option compared to temporary desalination and will be operational by 2023. This will allow up to 18 million litres of water per day to be produced from the existing bores and treatment system. It will provide around another 100 days of drought security for the region and potentially negate the need to implement temporary desalination in the future.

Based on our experiences in the drought, we know that desalination is an option. While we are actively implementing other more viable options, if a severe drought should occur in the interim and desalination is deemed necessary, we are well prepared to ensure that appropriate time, planning and consultation is undertaken to deliver the best outcome for the whole community. Furthermore, we have publicly committed to an ocean outlet for the reject water from the reverse osmosis process.

Bootawa deep water access

With water levels in Bootawa Dam at an all-time low, a specific operational procedure was required to access the lower levels of the dam using a decommissioned pump station. However, this risked interrupting water supply from the dam and also posed the threat of water contamination.

To reduce these risks, a large valve was installed and significant works were undertaken on the switchboard and motors at the decommissioned pump room. A 1.2 MVA generator with SCADA connection for auto start was also connected and a spare motor was reconditioned to serve as a backup in the case of a failure.

Although deep water extraction from the dam was ultimately not required, these works ensured it could be carried out in future drought events if necessary.





GLOUCESTER WATER SUPPLY SYSTEM

With no water storage in place, the Gloucester Water Supply System relies solely on water from the Barrington River to supply the communities of Gloucester and Barrington.

Although the Barrington River had not stopped flowing in 75 years of records, water carting to the Gloucester Water Treatment Plant was trialled in November 2019 as a contingency plan for the system. The trial was successful and investigations into regular water carting by road and rail proceeded in the weeks that followed, with the access road to the treatment plant upgraded in preparation for the number of trucks that would be required to supply Gloucester with water on a daily basis.

Water carting to Gloucester began on 27 December, after the river ceased to flow, and continued until the end of January 2020. The water was carted by road from the Tea Gardens Water Supply System. The average demand under Level 4 restrictions for the Gloucester System at the time was 538 thousand litres per day. To meet this demand, water carting was undertaken 24 hours a day over two shifts.

A total of 15.2 million litres of drinking water was carted to Gloucester during the drought at an approximate cost of \$513,000.

STROUD WATER SUPPLY SYSTEM

The Stroud Water Supply System draws water from the Karuah River to service the communities of Stroud and Stroud Road, supplying the two townships with around 350 thousand litres of water per day.

In September 2019, as levels in the Karuah River continued to drop, an emergency water supply pump was hired to draw from the river after the raw water pump was no longer able to extract water. Pumping then stopped altogether when the river flow dropped below 3.5 million litres per day on 8 October. Pumping is no longer allowed at this level under environmental flow rules.

On 10 November, the Karuah River ceased to flow entirely, becoming the first river in the region to do so.

With the Stroud System holding off-stream storage of 40 million litres of usable water at full capacity, along with eight million litres of in-river weir storage and a small amount of storage in the system's three reservoirs, there was enough water to continue to meet the community's needs for a number of months.

However, when off-stream storage levels dropped below 55 per cent at the end of January, leaving approximately 54 days worth of water under Level 4 restrictions, a decision was made to begin carting water from Tea Gardens to Stroud. With water carting to Gloucester no longer required, water carters were redirected to Stroud from the end of January until 7 February, allowing for the existing contract to be completed.

A total of 5.8 million litres of water was carted to Stroud over this period, at a cost of \$145,000.

Stratford Mine dam option

The option of using 1,000 million litres of good quality water from a storage dam at the Stratford Mine site was investigated during the drought. The concept involved pumping water from the dam and discharging it into the Manning catchment via the Avon River and a local creek. The planning pathway was identified, and water quality testing was undertaken. The water was found to meet all but one of the drinking water quality parameters and would have required pH correction should the project have proceeded. Ecological studies and further testing would have also been required, as well as approvals from the NSW Environment Protection Authority and a federal agency for discharge into the Manning catchment. These approvals would have required significant investigation and reporting, which wasn't viable at the time.

Manning River pools

Investigations were undertaken to determine whether it would be viable to pump water from several pools located in the Manning River, upstream of the Bootawa raw water intake. Bathymetric surveys were performed to determine the volume in each pool.

Although it was established that the pools would not supply a large or ongoing volume of water, the option was considered viable for emergency use.

BULAHDELAH WATER SUPPLY SYSTEM

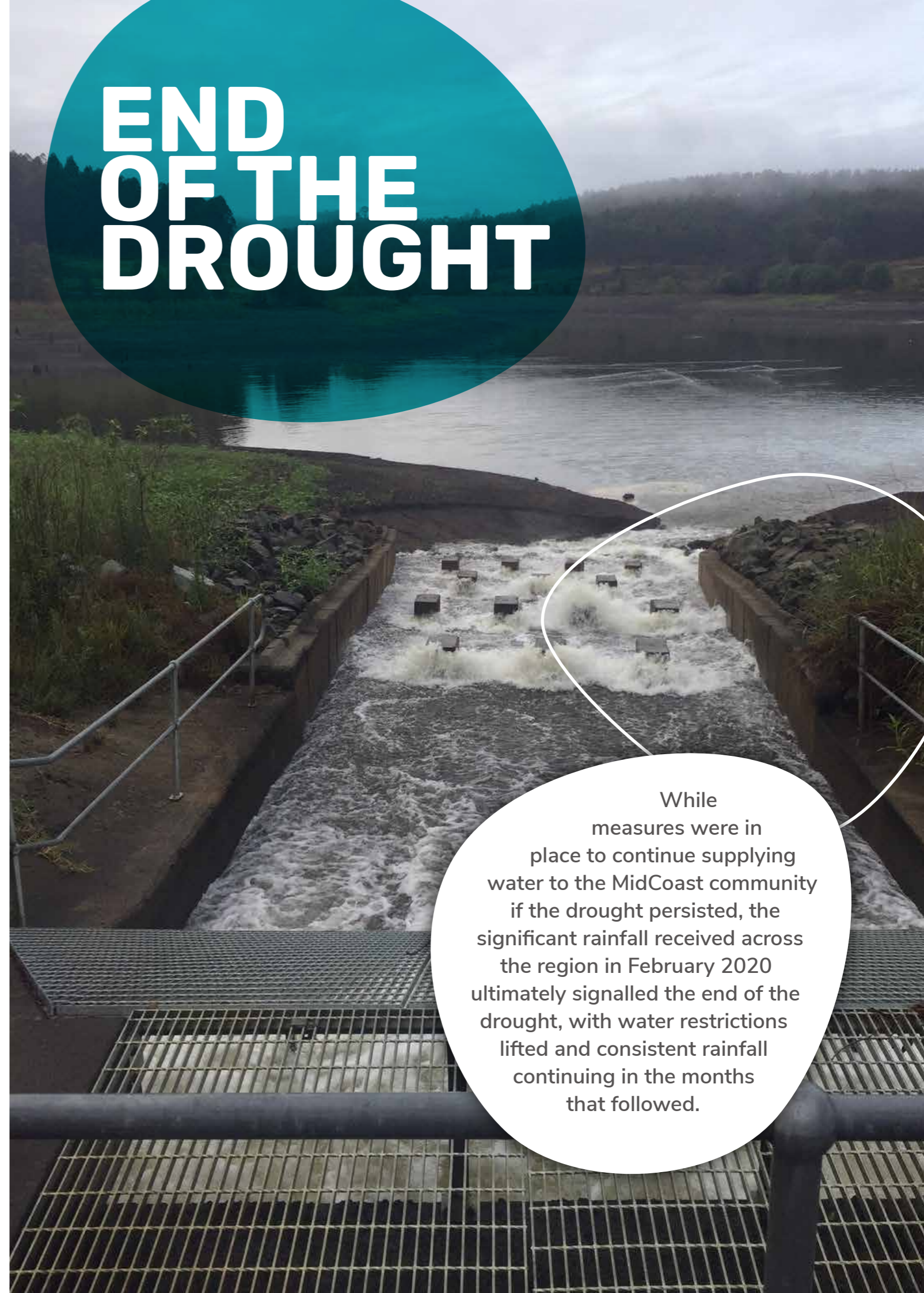
The Bulahdelah Water Supply System draws water from the Crawford River to service more than 550 homes and businesses in Bulahdelah.

Despite the Bulahdelah System holding a relatively large volume of on-river storage for the population it serves, water levels in the Crawford River continued to drop throughout the drought. After the level in the system's weir dropped below 35 per cent – meaning there was no longer sufficient flow to supply the raw water pumps – an emergency water supply pump was installed on 14 January to ensure water could continue to be extracted from the river. This remained in place until 17 January, when the river rose considerably following a minor flooding event the previous day.

TEA GARDENS WATER SUPPLY SYSTEM

The Tea Gardens Water Supply System draws water from an aquifer borefield north-west of Tea Gardens to supply the communities of Tea Gardens and Hawks Nest.

Despite the Tea Gardens System being used to supply additional customers in Gloucester and Stroud from late December 2019 to early February 2020, the only discernible effect the drought had on the aquifer was a reduction in groundwater levels. Encouragingly, this wasn't accompanied by a reduction in water quality and monitoring showed the system remained a reliable source of water throughout the drought.



**END
OF THE
DROUGHT**

While measures were in place to continue supplying water to the MidCoast community if the drought persisted, the significant rainfall received across the region in February 2020 ultimately signalled the end of the drought, with water restrictions lifted and consistent rainfall continuing in the months that followed.

LESSONS LEARNED AND ONGOING ACTIONS

The unprecedented nature of the 2019-2020 drought challenged our ability to manage such a prolonged and potentially disastrous event. While maintaining water supply to the community was the most significant challenge presented by the drought, there were a host of related challenges that arose as a result of the extreme dry spell.

In the aftermath, a comprehensive review of our response to the drought was conducted to identify how we could better manage such an event in the future. Among a raft of lessons learned, the following points have been identified as the most significant takeaways from the 2019-2020 drought.

Formation of Water Resilience Team

Prior to the 2019-2020 drought, there was no dedicated team in place to coordinate our response to a drought event. This changed in October 2019 when a Drought Response Team was formed to manage the impacts of the worsening water security situation. However, as the emergency wore on it became increasingly clear that we needed to broaden our focus from drought response to water resilience to ensure the MidCoast was better equipped to deal with future drought events.

In the immediate aftermath of the drought, a decision was made to continue the work of the Drought Response Team as the Water Resilience Team. This multi-disciplinary team meets on a monthly basis to identify and plan both short- and long-term solutions to improving the region's water security. The team is also responsible for developing drought response emergency projects that are ready to implement in future drought events and ensuring our response is coordinated, well-planned and takes in the diverse needs and interests of the MidCoast community.

The formation of a team dedicated to improving the region's water security marks a significant improvement in our drought response strategy and ensures we will be far better equipped to manage water scarcity in the future.

Comprehensive review of Integrated Water Cycle Management Strategy

Throughout the 2019-2020 drought it became apparent that the Integrated Water Cycle Management Strategy (IWCM) and Drought Management Plan – which provided the strategic frameworks for our response – had underestimated the potential for such a severe and lengthy dry spell. As a result, it was decided the IWCM (and the Drought Management Plan, which is contained within the IWCM) would undergo a comprehensive review in the immediate aftermath of the emergency.

The IWCM is an adaptable 30-year strategy which aims to ensure water is managed responsibly and sustainably, with a focus on providing an adequate supply of quality drinking water to the community both now and into the future. A new IWCM is prepared every eight years and reviewed every four years; however, given the severity of the 2019-2020 drought and the shortcomings identified in our existing strategy, a new IWCM is currently being prepared.

The new IWCM, and specifically the Drought Management Plan, will account for more extreme future drought events and ensure our strategies for implementing higher level restrictions are clearly defined, which was one of the issues identified during the 2019-2020 drought. The Drought Management Plan will essentially serve as a comprehensive how-to guide for dealing with future drought events.

More broadly, the IWCM will identify measures to increase the region's long-term drought resilience. This will include planning for major infrastructure projects that increase water security across each of the MidCoast's water supply systems. The details of these infrastructure projects will be established following extensive investigation and community consultation and may include options such as off-stream storage, temporary or permanent desalination, and recycled water for drinking and non-drinking purposes.

Community impact and collaborative action

The water restrictions that were imposed across the MidCoast during the 2019-2020 drought had a significant impact on the community. Businesses that relied on outdoor water use were particularly affected once Level 4 restrictions were introduced, with some having to halve their use and others forced to not use water outside altogether, depending on the requirements of each business. This forced many businesses to change their daily practices, often at a significant financial cost.

However, some businesses were also observed diversifying their operations to accommodate the challenging circumstances. For example, car washes expanded their use of alternative water supplies. Customers also changed their buying habits, with nurseries reporting a rapid increase in demand for water efficient products such as wicking beds.

Overall, the community adapted well and is to be congratulated on its effort to reduce water use, especially given the already low water demand we have on a per household basis (the MidCoast community has the second lowest usage rate in NSW compared to other water utilities of more than 10,000 connections). It is thought that the considerable improvements residents have made in lowering their water use over the past two decades made it hard for the community to meet the daily targets set under higher level water restrictions during the drought.

In order to achieve further savings in the future, we have created a number of roles that specifically focus on influencing water use at both an individual and commercial level.

A Water Resilience Officer has been employed to help businesses and other large users across the region identify cost-effective measures to save water. This is considered a highly effective and mutually beneficial way to reduce the demand on our water supply in the short term, as large commercial users account for a significant proportion of the MidCoast's daily water use.

A Water Education and Communication Officer has also been employed to promote more efficient water use inside the home. A range of education programs and behavioural change initiatives are being developed as a part of this role to target the individual behaviours of current and future water users in the region. Although this measure is unlikely to significantly reduce demand on our water supply in the short term, it will result in more sustainable use in the long term and promote a greater sense of community stewardship towards our water resources.

By acknowledging the considerable effort the community has made to conserve water in the region, and by working with the community to implement further water-saving behaviours, we believe MidCoast residents can be better prepared for future drought scenarios, making the adjustment between everyday water use and use during extended dry periods less disruptive.



Increased use of smart meters

Following the events of the drought, a business case is being developed to expand the use of smart water meters across the region. It is believed this technology will assist water-conscious users further cut down on their water use.

Smart water meters installed on residential properties have been shown to reduce water consumption by up to five per cent. This is due to the increased attention residents pay to instantaneous water use inside the home and the higher likelihood of finding leaks. Currently, around 1,000 smart water meters are being used across the MidCoast. This equates to around 2.5 per cent of our customers. We hope to see this number increase considerably once an appropriate program has been rolled out as a part of our Integrated Water Cycle Management Strategy.

We believe giving residents real-time information on their water use will not only positively influence the behaviour of individuals inside their homes, it will allow us to consider other options to reduce water use during drought events besides traditional water restrictions. It makes sense to apply new technology to current problems rather than the same thinking that has existed since town water supplies were established nearly a century ago.



INNOVATIONS

The extreme and unprecedented nature of the 2019-2020 drought required an unprecedented response, with a host of previously unused measures employed throughout the emergency.

Water carting

While water carting had long been identified as a contingency plan for the Gloucester Water Supply System, it hadn't previously been required until December 2019. To cart more than 500 kilolitres of water per day from Tea Gardens to Gloucester was a major logistical undertaking, as was the need to actively manage the quality of the water. Thankfully, the partnership we developed with McColl's Transport allowed us to focus on water quality while they drew on their extensive logistical experience to continuously deliver water throughout the emergency.

This successful partnership was then used to deliver water from Tea Gardens to the Stroud Water Supply System.

Variable messaging system boards

Initially trialled at Stroud, which has traditionally been a hard-to-reach market for our communications, the Variable Messaging System boards proved invaluable for informing residents and visitors about water restrictions. As a result, they were placed at numerous town entrances around the MidCoast after Level 3 restrictions were implemented in November. The boards were considered a very effective tool in keeping communities up to date on water restrictions and providing daily feedback on usage.



TV and radio advertising

Advertising campaigns were introduced across three TV stations and one local radio station when Level 4 water restrictions were implemented. These remained in place for two months and were designed to raise awareness about the importance of conserving water.

Tourism industry campaign

Approximately 10,000 printed items were distributed to holiday accommodation providers (excluding AirBnB) for display in bathrooms, amenity blocks and rooms. These printed materials proved very effective in helping visitors understand and moderate their use of water while staying in the area. They also helped reduce concern among residents about the strain visitors placed on our water supply.

Updated frequently asked questions webpage

This resource proved highly valuable as it listed answers to the most common questions the community had about water restrictions. It also provided people with a reliable channel to direct their queries, rather than Facebook or other social media platforms where misinformation and hearsay can be problematic.

Weekly radio interviews

Council's Director of Infrastructure and Engineering Services, Rob Scott, was interviewed each Friday morning on local radio station 2RE throughout the drought. While our staff are frequently interviewed by media outlets, this regular slot provided a convenient communication channel to keep people updated about how the community was going with its daily usage and if there had been any changes with water restrictions.

COSTS

The total cost of our response to the 2019-2020 drought is estimated to be just over \$8.4 million. However, this cost has effectively been offset through various funding grants supplied by the NSW Government.

A \$1 million state government grant was provided during the drought to initiate the Nabiac borefield expansion, while a further \$551,000 was made available to subsidise the cost of water carting to Gloucester and Stroud.

In July 2020, a further \$8.5 million was provided by the NSW Government to acknowledge the planning and effort that went into our drought response and to help improve water security in the region. This offset the remainder of our drought response costs and has also helped accelerate further expansion of the Nabiac System, with additional bores added and additional process equipment installed at the water treatment plant.

A \$1.47 million grant from the Federal Government has also been directed towards the next stage of the Nabiac project, with works there designed to take the plant's current water supply capacity during a drought from 12 to 18 million litres per day. This would effectively cover the entire daily usage needs of communities dependent on the Manning Water Supply System during Level 4 restrictions.

The financial support shown by the NSW Government - and to a lesser degree, the Federal Government - during and after the drought reflects the confidence they had in our ability to manage such an event, and their satisfaction with the response we ultimately provided to our community.



Action	Cost (\$)	Volume per day (ml)
Water restrictions, and community education, communication		
Signage, cards, printing and posters	8,000	-
VMS boards	7,000	-
TV and radio advertising	15,500	-
Compliance		
Water audits of large water users	80,000	Unknown
Stock watering from Tuncurry RTP	91,000	4.7 ML total
Water carting		
Trial and investigation	7,500	-
Gloucester	513,000	15.2 ML total
Gloucester WTP road upgrade	150,000	-
Stroud	145,000	6.4 ML total
Nabiac Borefield expansion		
Lower pumps	10,000	2 ML/d
Install four pumps in existing bores	140,000	2.4 ML/d
Install five new bores and pumps	1,700,000	3.5 ML/d
Bootawa deep water access, large valve and generator	97,000	-
Emergency water supply pumps for Gloucester, Stroud & Bulahdelah	6,000	-
Emergency desalination	4,700,000	3 – 5.5 ML/d if completed
Nabiac WTP Operational contingency	165,000	-
Critical spares for Nabiac WTP	165,000	-
Emergency power works	397,000	-
Stratford Mine Dam	2,000	-
Manning River pools (pumping investigation)	3,000	-
Total	\$ 8,402,000	



MIDCOAST
council

Yalawanyi Ganya
2 Biripi Way
PO Box 482
Taree 2430
Mon-Fri 8.30am - 4.30pm
Tel: (02) 7955 7777