

Tropical Cyclone Alfred:

Seqwater's preparation and response

CASE STUDY
December 2023



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Standing strong through Tropical Cyclone Alfred

The Bureau of Meteorology (BOM) issues a stark warning: the coming cyclone season carried a higher-than average risk of severe tropical systems.

Communities across South East Queensland are on notice.



TC Alfred reaches Category 4 intensity, with winds and rain building momentum as it tracks closer to the Queensland coast.

LATE 2024

28 FEBRUARY

21 FEBRUARY



A tropical low begins to swirl in the Coral Sea. Within days it strengthens, and on 23 February, BOM officially names it Tropical Cyclone Alfred (TC Alfred).



Cover image: Brisbane CBD skyline



Seqwater CEO Emma Thomas addresses the press.



Seqwater activates its Flood Operations Centre and Emergency Management Team, which would both remain in operation until 14 March, guiding the management of the South East Queensland Water Grid.



5 MARCH

3 MARCH

Seqwater teams begin detailed scenario planning - tracking forecasts, monitoring rainfall and catchment conditions, and modelling potential inflows into the region's dams.



8 MARCH

TC Alfred makes history by becoming the first cyclone to cross into South East Queensland in more than 50 years.

Though it arrived as a ex-tropical cyclone, its impact was anything but diminished – unleashing torrential rain, flash flooding, damaging winds and devastating coastal erosion across the region.

A data-driven disaster response

Behind the data, systems and decisions were dedicated people - working through long days and nights to protect South East Queensland's water supply and keep communities safe from harm.

Response in numbers:

150,000 +



Hours worked by staff
between 5-14 March

430 +

Number of
staff **on call**



599

Technical
model runs

10 DAYS

23:59

we operated
for 24 hours

Communication efforts during TC Alfred (3-14 March):

1 MILLION +



EWN SMS
messages sent

91

Social media
posts



147,700

Social media
engagements



24

Media releases
and interviews

11



Key stakeholder
briefings



20

Webpage
updates

7

All-employee
emails



70

Dam release
notifications

200

Media
enquiries



@seqwater

810

Media
mentions



3,500+

App downloads

25 MILLION+



Overall
audience reach

Preparation: Planning for the storm

Long before TC Alfred crossed the coast, Seqwater prepared to protect the South East Queensland Water Grid and the communities who rely on it. Every detail mattered. Every team played a role.

Across the region, teams carried out detailed reviews at every critical site. From remote pumping stations to major treatment plants, no asset was left unchecked.

To keep essential services running through the worst of the storm, Seqwater developed around-the-clock rosters. Teams prepared to stay and work at key sites for days at a time, knowing that roads could be cut off by floodwaters or debris.

Supplies were stocked, backup equipment was tested, and chemical stores were carefully audited to ensure operations could continue safely and without interruption.

Technology teams double-checked the resilience of Seqwater's online systems and distributed satellite phones to remote crews.

Water quality specialists prepared for the challenges ahead, anticipating the surge of dirty runoff water likely to flow into catchments.

They readied additional testing equipment and employees to safeguard the quality of drinking water during and after the cyclone.



Other teams prepared too:

- Emergency management specialists coordinated with disaster partners to deliver a coordinated regional response.
- Communication teams created templates and protocols to ensure clear, timely updates were provided to employees and communities.
- Workplace Health and Safety officers suspended non-critical travel and checked in regularly with field teams, putting people's safety first.

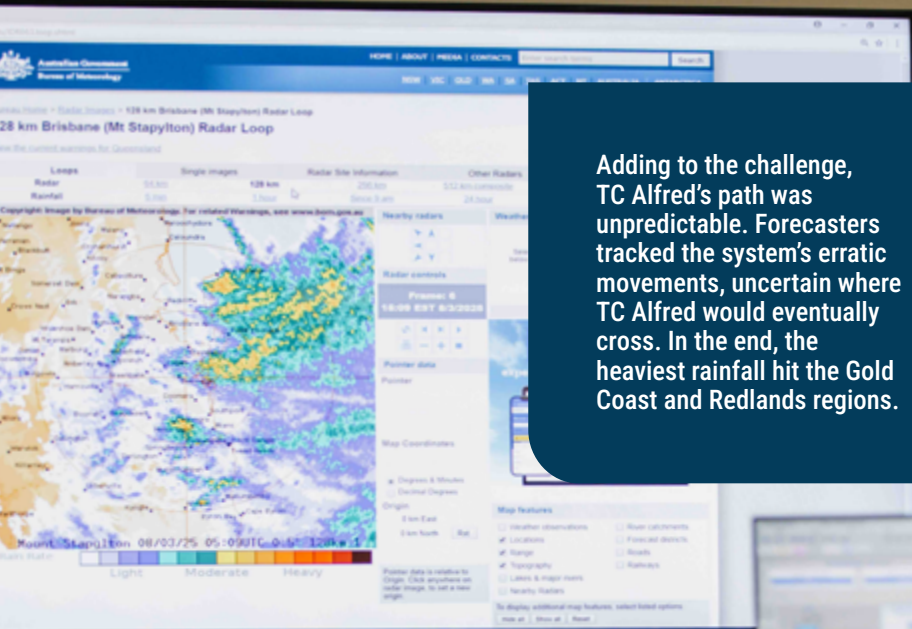


Water quality testing at North Pine

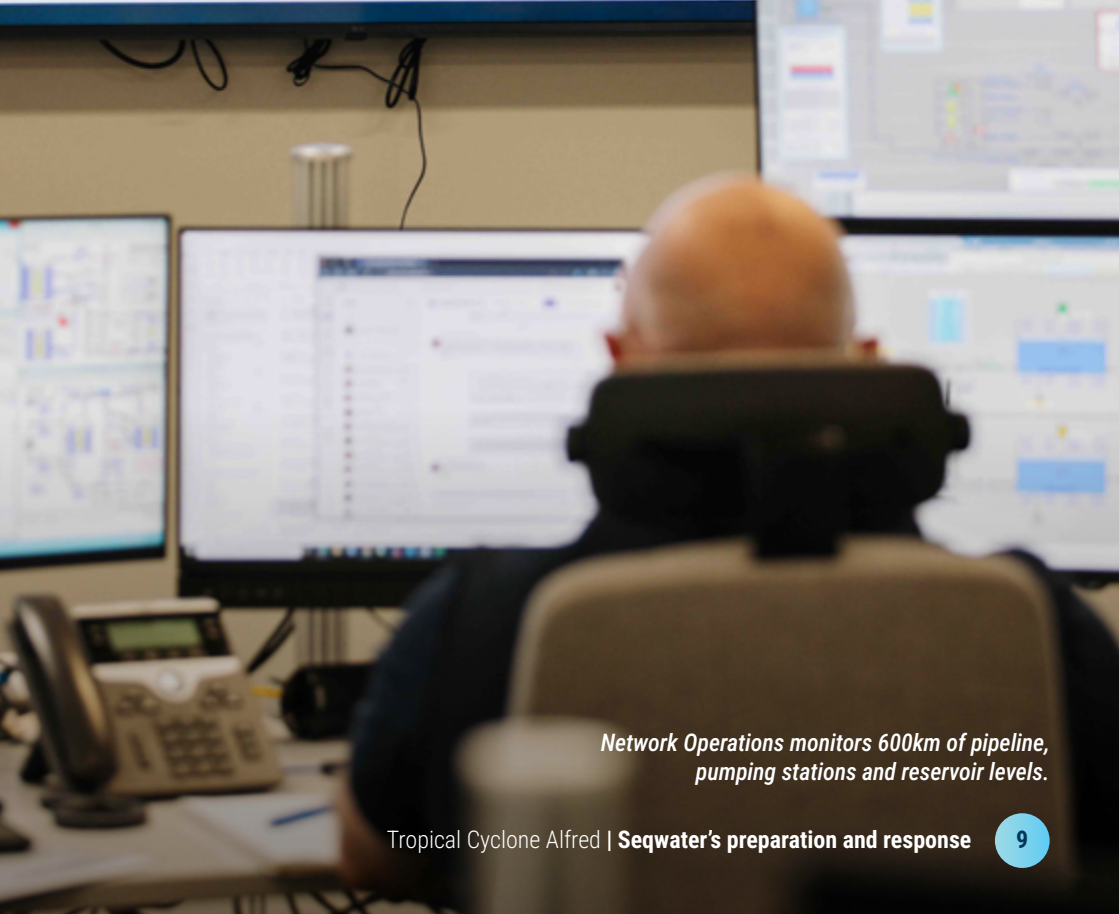
Rising to the challenge

The days before TC Alfred's arrival were a test of preparation, discipline, and collaboration - and they laid the groundwork for the response that followed. Seqwater anticipated the challenges that TC Alfred could bring:

- Widespread rainfall across the catchment resulting in flooding and significant inflows into dams, which were already close to capacity due to the wet summer.
- Significant inflows into waterways causing riverbank erosion, resulting in water quality issues for Seqwater's 32 water treatment plants.
- High winds causing power outages across the region and impacting the operation of Seqwater infrastructure.
- Challenging conditions such as heavy rainfall, flooding, high winds, falling debris and dangerous road conditions for our people working and travelling between sites.



Adding to the challenge, TC Alfred's path was unpredictable. Forecasters tracked the system's erratic movements, uncertain where TC Alfred would eventually cross. In the end, the heaviest rainfall hit the Gold Coast and Redlands regions.



Network Operations monitors 600km of pipeline, pumping stations and reservoir levels.

Dam safety

Seqwater's Flood Operations Centre was activated days before TC Alfred's landfall, serving as the central hub for data that guided critical decision-making and coordinated efforts to ensure dam safety and manage flood operations.

Guided by the Approved Flood Manuals, a team of 40 rotated on 12-hour shifts monitoring rainfall and running 599 models to ensure our dams could operate safely through a variety of rainfall scenarios.

TC Alfred brought widespread rainfall across South East Queensland with 600mm being recorded in the Gold Coast hinterland. Fortunately, the catchments for Wivenhoe and Somerset dams only received around 180mm and North Pine Dam received 400mm.

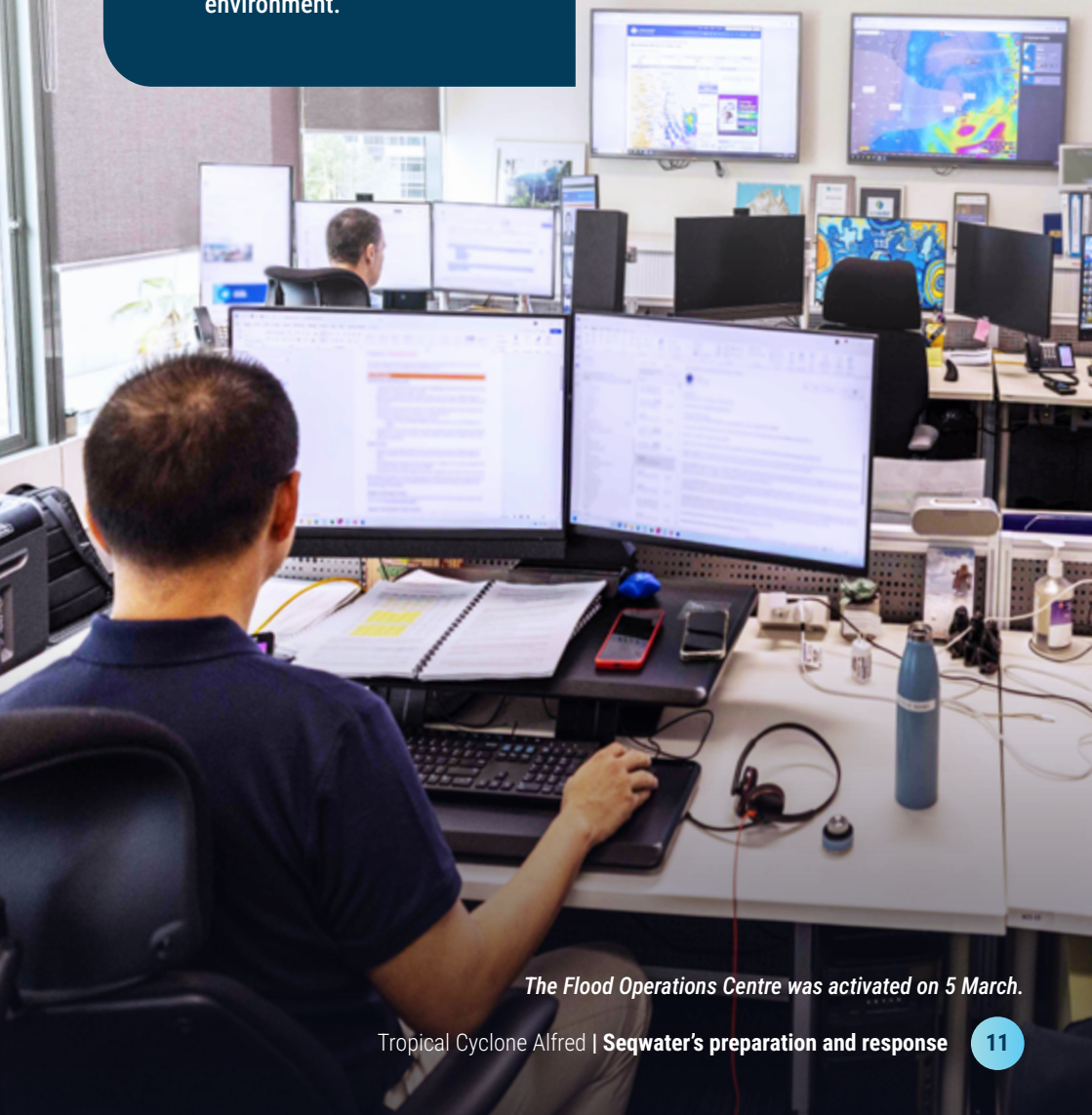
For our three gated dams, controlled releases started at North Pine on 9 March followed by Somerset on 10 March and Wivenhoe on 11 March. By 15 March, controlled releases from the three dams had stopped and the Flood Operations Centre was stood down.

Throughout this event, the Flood Operations Centre played a vital role in keeping the dams safe, protecting downstream communities and the region's water security.



At the centre of Seqwater's response was the Flood Operations Centre:

- guided by the Flood Manual
- continuous monitoring and decision-making
- focus on safety, supply and environment.



The Flood Operations Centre was activated on 5 March.

Water quality

On 11 March, the Brisbane River - the raw water source supplying the Mount Crosby Water Treatment Plant - measured turbidity more than 100 times the normal river rate. Following intense rainfall across South East Queensland, creeks and rivers were inundated with fast flowing water.

This surge led to significant riverbank erosion and elevated turbidity levels, commonly referred to as dirty source water, impacting the raw water supply to our 32 treatment plants. Thanks to proactive planning and foresight, Seqwater was well-prepared for the challenge, with operators stationed at critical sites and essential supplies stocked to ensure continued operations.

However, the greatest challenge was faced by our largest water treatment plant at Mount Crosby, which draws water from the Brisbane River and provides half of South East Queensland's drinking water. Heavy rainfall across the Lockyer Valley carried a huge amount of sediment

into the Lockyer Creek that fed into the Brisbane River just downstream from Wivenhoe Dam.

On a normal day, Mount Crosby treats water from the Brisbane River with a turbidity measurement of five Nephelometric Turbidity Units (NTU). When NTU exceeds 80, production is impacted as it takes longer to treat water. On the 11 March, the turbidity in the Brisbane River where the Mount Crosby WTP draws its water from, was more than 100 times the normal river rate at 600 NTU.



*Inset: Water samples from the Brisbane River.
Main image: Sediment basins at North Pine Water Treatment Plant.*

Water quality continued

Once again, the Seqwater team demonstrated its preparedness, with strong reservoir levels enabling the continued delivery of safe and secure water supplies to communities.

The decision was made to take Mount Crosby offline for four hours to allow the raw water quality to stabilise and to identify the best flocculation and coagulation process during unprecedented times.

This temporary outage allowed for the water treatment process to recommence, and production was gradually ramped up to maintain water supply. Almost all of the region continued receiving water to their taps during this time.

Water supply at the time was also supported through the broader South East Queensland Water Grid, with increased production of 100 megalitres a day from the Gold Coast Desalination Plant.

Seqwater maintained controlled operational releases from Wivenhoe Dam during this period to dilute the high turbidity levels coming from Lockyer Creek and improve overall quality in the Brisbane River.

It's a powerful reminder that moving and treating water is both a science and an art – one that takes deep expertise, precision and a great deal of patience.



Wivenhoe Dam controlled release

Water quality continued

Queensland is no stranger to cyclones. When they strike, as they often do in North Queensland, one of the first things to go is electricity.

In the days before TC Alfred, our teams prepared for the worst, securing and positioning extra mobile generators across the network to keep water flowing through 22 vital pump stations and monitoring points.

When the storm hit and power went down across the region, those preparations proved their worth – the generators roared to life, keeping our systems running and communities supplied when it mattered most.

However, the widespread power outages had a ripple effect – they disrupted telecommunications, cutting off the critical data Seqwater depends on to track pumping operations and storage levels across the network.

This created one of the most challenging moments of the event. Without our usual digital visibility, we couldn't see customer demand or how our reservoirs were responding in real time. But our teams were ready, with staff stationed at key sites, who, when safe to do so, stepped outside into tough conditions to visually check and confirm water levels at reservoirs.

Thanks to their preparation, courage and commitment – and foresight to have mobile generators in place – no reservoirs ran dry. Through teamwork and determination, Seqwater kept water flowing to 3.8 million people across the region.



On site generators refuelled by our diesel trailer

Safety first

Ensuring the safety of our people are at the heart of what we do. At Seqwater, nothing matters more than making sure every team goes home safely to their family and friends at the end of the day.

When TC Alfred hit, it tested that commitment like never before. The severe weather challenged how we responded – but every decision was guided by one principle: safety first.

Precautions were put in place early, particularly for those in regional sites. Travel was halted as the cyclone crossed the coast and once conditions eased, no one moved without a risk assessment in place.

Employees worked in pairs, stayed in constant communication with their teams and supported one another through every step.

With nearly 50 people positioned across regional and isolated sites, it's a remarkable achievement that there were no injuries through the event. It's a testament to our people – the care, discipline and unwavering commitment to keeping each other safe.

Safety first, always.



McGavin View recreational site

Key achievements



North Pine Dam controlled release

We learnt a lot and we're stronger and more prepared for the next event. Throughout the cyclone, Seqwater employees showed extraordinary commitment and resilience.

Many worked long hours on the front line, often far from their families, to protect our dams, our water network and our communities.

Their efforts ensured our dams continued to operate safely and South East Queensland's drinking water quality remained protected, even as rivers swelled and dams spilled. It was an incredible display of teamwork, professionalism, and heart in the face of nature's power.

- South East Queensland's drinking water and water quality was protected with limited impacts, thanks to the reliability of our bulk water supply system.
- Our 26 dams, 31 water treatment plants, the Gold Coast Desalination plant, 33 water reservoirs, and 22 pump stations were constantly monitored during the event.
- Sites remained resourced, staffed, and operational throughout the event.
- Timely, accurate information was provided internally to staff and externally to stakeholders, enabling a coordinated regional response.
- Above all, the safety of Seqwater employees and the community we serve was prioritised at every stage of preparation, response and recovery.





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Seqwater's preparation and response



#DCS1650 / DCS-330