



# CASE STUDY

## Redcliffe Water Mains Burst

### Overview

Unitywater was established in 2010, through the amalgamation of water operations of three Queensland councils: Moreton Bay Regional Council, Sunshine Coast Regional Council and Noosa Shire Council.

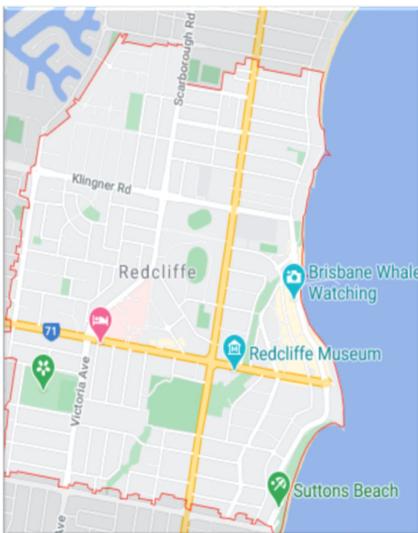
Since inception, Unitywater has successfully integrated and managed councils' water networks and systems through various initiatives. One of these initiatives was to reduce the non-revenue water (NRW) loss through preventing of water thefts and water leakage.

In 2011 Unitywater implemented the **Smart Water Network Program** across its water network. As part of the program, Unitywater created 200 defined zones, also known as district metered area (DMA), by connecting a series of flowmeters and pressure sensors across the network.

Establishing DMAs on a water network is a proven methodology to prevent water loss. The data from the sensors on the DMA is processed through a central event management (CEM) system which allows 24/7 surveillance of the network from Unitywater's Control Room. This monitoring allows measurement of flow and pressure data within the DMA zone, which helps timely identification of slow, trending leaks and helps prevent larger, disruptive main breaks from occurring.

### Challenge

On 23 November 2018 Unitywater's Control Room received flow alerts from a DMA at Woody Point, Redcliffe. The alerts were reporting excessive and increasing flows into the zone, which was uncharacteristic for the time of day based on the predicted flow data generated by Unitywater's CEM system via Takadu.



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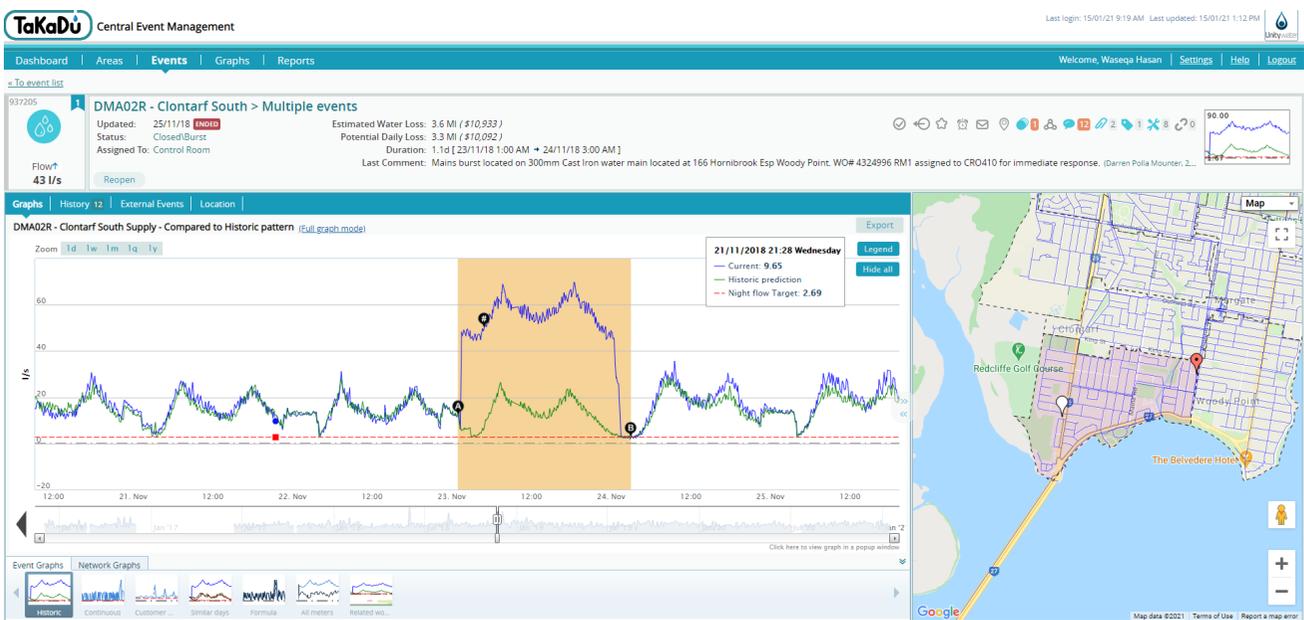


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## Solution

After receiving the alerts, Unitywater’s 24/7 Control Room operators checked the sensor patterns and analysed data from the Takadu CEM. By analysing the data, Unitywater’s System Loss engineers concluded this significant event was a water mains break. The team located the leak down to a specific DMA area within Unitywater’s Smart Water Network by analysing signals from sensors and meters at the critical pressure points. An immediate request was made to Detection Services to survey the identified DMA.



**Figure 1: Takadu data shows an abnormally high flow (blue) instead of predicted flow (green) indicating a leak or burst in the network**



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Initially the break was thought to have occurred in a stormwater culvert, which would be difficult to locate in the DMA. However, after thorough investigation of the DMA, a large mains burst was located under the footpath which was discharging directly into a stormwater drain and running directly into the bay. This type of burst would have been easily missed without the Smart Water Network and CEM system.

### Results

At its peak, the flow rate of the leak was 42 L/s (litres per second). This incident resulted in approximately 3.6 ML of lost potable water. If the leak had gone undetected by the CEM, it would have cost Unitywater \$4.1M over the course of a year, based on Seqwater bulk-water charge to Unitywater of \$3,122 per ML in F19-20.

Due to the timely detection from the Takadu CEM and efficient response protocols, Unitywater was able to significantly reduce:

1. Run time of this leak
2. Loss of clean treated drinking water
3. Loss of revenue
4. Risk of potential claims from public property damage

### Conclusion

Water leak could occur under a creek or elsewhere underground, and never surface. This study is a perfect example of a break that would have gone unnoticed behind an empty building without Unitywater's Smart Water Network Program. The financial implications and the environmental impact of similar incidents that go unattended can be significant.



# CASE STUDY

## Unauthorised Use in Sports Field

**In 2011, Unitywater implemented the Smart Water Network Program across its water network.**

This program included creating 200 defined zones, also known as district metered area (DMA), by connecting a series of flowmeters and pressure sensors across the network. Establishing DMA on a water network is a proven methodology to prevent water loss.

The data from the sensors on the DMA is processed through a central event management (CEM) system which allows 24/7 surveillance of the network from Unitywater's Control Room. This monitoring allows measurement of flow and pressure data within the DMA zone, which helps timely identification of slow, trending leaks and helps prevent larger, disruptive main breaks from occurring.

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Unitywater was established in 2010, through the amalgamation of water operations of three Queensland councils: Moreton Bay Regional Council, Sunshine Coast Regional Council and Noosa Shire Council.

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### Unmetered usage during night hours

Over a three-day period, system loss engineers observed frequent and consistent increases in water use of approximately 20 L/s (litres per seconds) for 15 minutes every hour, from midnight to 3am.

This flow was identified through one of Unitywater's flowmeters and was flagged as unexpected usage by the Takadu CEM system.





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## Unauthorised Use in Sports Field



Figure 1: Smart Water Network Trends from Takadu CEM indicating abnormal use during night-hours



Figure 1: Area of unauthorised water use found via CEM data

## Findings

Unitywater's 24/7 Control Room operators had identified usage spikes in flow as tanks (circled below in red) at the sports field started filling-up. A test was undertaken onsite to check the flows at the nearest Pressure Reduction Valve (PRV). This test concluded when the tanks started filling and stopping at the same time as the flows at the PRV. All onsite inspections indicated that the two storage tanks were filling up with drinkable water through the 100mm unmetered fire service.



Unitywater

Serving you today, investing in tomorrow.

Smart Water  
Network Program  
Unauthorised Use



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Unauthorised Use in Sports Field

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## Results

Unitywater lost 2,700 litres of water through this unauthorised usage. This would have resulted in approximately \$1.0M in annual non-revenue water loss in the absence of any preventive action. Unauthorised use is often difficult to track. Smart water network system provides a proactive approach in preventing, monitoring and recovering non-revenue water loss.