





*30 days in the life of
MidCoast Water*
24 March to 24 April 2015




17th NSW Engineers & Operators
Regional Conference
Ballina 26 & 27 October 2015
Sharing Knowledge

MidCoast Water's area of operations



Gloucester Shire
Greater Taree City
Gloucester
Great Lakes
Tea Gardens



- Presentation overview

- ❖ Operational incidents
 - ❖ Gloucester water supply – over chlorination
 - ❖ Tea Gardens water supply – over fluoridation
- ❖ Natural disaster southern area



- The Gloucester water incident – Day 1 – Tues 24 March 2015

- ❖ 6am: Operator noticed an unusual smell at the WTP
- ❖ Morning – normal reticulation sampling taken at 7.30am, with chlorine levels 3.7 & 3.8 mg/L.
- ❖ Operator commenced treatment plant operation 9.30am with as yet unidentified contaminated water
- ❖ Operator reduced the chlorine dose at the WTP based on the samples taken at 7.30am
- ❖ 12.04pm – first call from a customer – *water tasted like sulphur and was bitter*
- ❖ A work order was raised, mains flushing commenced for this customer
- ❖ 2pm to 3pm – 2 more calls, one being from Gloucester Hospital
- ❖ Plan to further investigate the following day to prevent the use of on-call



• The incident – Day 2 – Wed 25 March

- ❖ 9am – first media enquiry – responded to by customer service.
- ❖ Customer calls increase rapidly (314, or more than three time average)
- ❖ Chlorine levels final tested after various delays between 10.30 and 10:50 and registered above field instrument range in reticulation >8.8 mg/L. Later peak recorded over 15 mg/L.
- ❖ 11.20am Incident notified to Executive – an incident management team put together.
- ❖ Telstra have planned shutdown of mobile service between approximately 11am and 3pm
- ❖ 12 noon NSW Health and NSW EPA notified
- ❖ Additional crews arrive at Gloucester from Taree to assist with flushing and testing
- ❖ Crates of bottled water purchased and conveyed to Gloucester for schools and hospital



The Roundabout Inn had a novel solution to Gloucester's water woes.



• Day 3 – Thurs 26 March

- ❖ Independent engineering investigator engaged by MidCoast Water to:
 - - identify the root cause of the incident
 - - comment on MidCoast Water's response to the incident, and
 - - recommend any improvements to the response
- ❖ Flushing and intensive chlorine monitoring continues
- ❖ Confirmed to Newcastle media that the incident had 'nothing to do with Coal Seam Gas'



- Day 4 – Fri 27 March

- ❖ \$50 rebate on water bill announced
- ❖ 9am MCW Councillors and Executive arrive in Gloucester to speak with community members
- ❖ 11am Independent investigator Hunter H2O arrives on site in Gloucester to commence site review.



- The technical cause

- ❖ Syphoning of hypochlorite solution into the treated water after plant shut down.
- ❖ The problem was intermittent and couldn't be replicated until the hypochlorite tank was refilled
- ❖ Hypochlorite dosing pumps and loading valves improperly designed and commissioned



• The root causes

- ❖ A shortfall in the right staff resources
- ❖ Inadequate training of current staff
- ❖ Lack of quality systems and internal controls
- ❖ No integrated business management system
- ❖ Lack of system knowledge management
- ❖ Facilities not up to current design standards and a lack of change management
- ❖ Incomplete implementation of the drinking water quality plan



• Areas for improvement

- ❖ Time taken to realise there was an issue
- ❖ Poor communication between staff taking customer inquiries and staff responsible for water quality
- ❖ Evidence of a problem on Tuesday afternoon
- ❖ No Incident Management Plan
- ❖ Shortage of staff resources
- ❖ The issues with the dosing system could have been picked up earlier with better escalation of issue
- ❖ A chlorine analyser at service reservoir had not been working for a number of years
- ❖ Previous reviews of the WTP had identified the need for online instruments but all work suspended pending decision to rebuild at new site or modernise current site



- What worked well

- ❖ Once the incident was declared everything worked as if there was a incident management plan in place
- ❖ *'Response by the Executive and Staff during the incident was exemplary'*
- ❖ Notification to regulators
- ❖ Updates to the public (Mainstream and Social Media)
- ❖ \$50 Rebate to customers
- ❖ Independent Review
- ❖ 'Meet the Public Day'
- ❖ Apology Letter to Public



- What it cost

- ❖ \$50 rebate to customers \$90,000
- ❖ Claims of damages \$9,500
- ❖ For the week of incident staff costs \$36,000



- **The Tea Gardens WTP Fluoride incident 24 March to 5 April 2015**

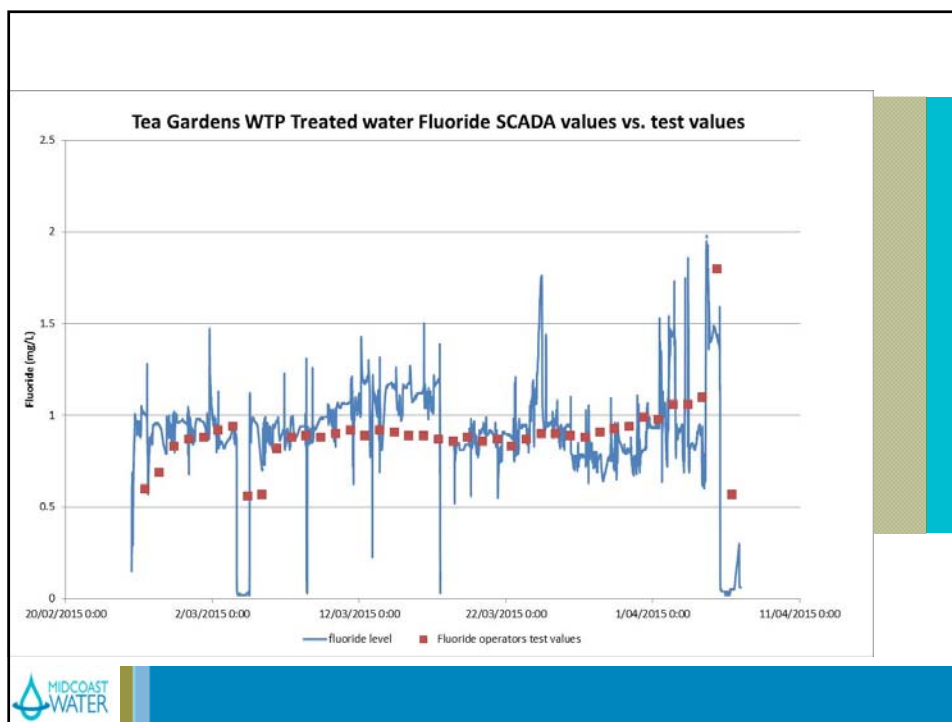
- ❖ At 2pm 5 May 2015 Operators recorded a high fluoride of 1.8mg/L and after weeks of issues turned off the fluoride system
- ❖ Sampling continued in the supply reservoir to monitor fluoride levels for the next week
- ❖ The fluoride hopper electronic scales were affected by temperature and not working correctly
- ❖ On examination of SCADA it was found that there was no easy accessed trend for the Operator of the fluoride analyser values, the powder auger run time and filling water on a graph
- ❖ This event was seen as a near miss
- ❖ Investigation into the cause commenced



- **Technical cause**

- ❖ Makeup water high and low flow cut out had been provided however the powder auger continued to complete its full run time into an incomplete makeup water volume
- ❖ This sequence repeated a number of times had increased fluoride in the makeup tank beyond the original design concentration in the solution tank
- ❖ SCADA had not been commissioned properly to test logical control, trend presentation of fluoride information in an easy form for operator overview
- ❖ The fluoride analyser was located 'in pipe' about 10 m downstream from the dosing point causing large variations in fluoride
- ❖ Fluoride alarm valves of 1.1 and 0.9 mg/L occurred daily creating alarm fatigue which was not corrected after it was apparent





• Improvements

- ❖ SCADA logic control for fluoride system reviewed, easy available trends presented for operator, fluoride analyser relocated further downstream, system and alarms tested and commissioning which was documented
- ❖ Root cause is similar to Gloucester incident including business systems, issue escalation, risks associated with design and implementation of equipment



- The Storm event 20 to 24 April 2015

- ❖ Rainfall exceeded 350mm
- ❖ Wind speed exceeded 110km/hr
- ❖ Storm was equivalent to category 2 cyclone
- ❖ Area effected was south of Forster to south of Sydney
- ❖ Phone system not available making communications difficult



- The Storm event 20 to 24 April 2015

- ❖ Severe coastal erosion at Hawks Nest threatening loss of water and sewerage assets
- ❖ Loss of power in the towns of Stroud and Bulahdelah for 24 hours, Tea Gardens and Hawks Nest out till 22 April
- ❖ Widespread flooding
- ❖ Sewerage system overflowing



- The Storm event 20 to 24 April 2015

- ❖ A MCW generator was used to power Hawks Nest STP, commercial units were fully committed to Newcastle area
- ❖ Tankers were used to moderate sewerage overflows along waterways, limited availability
- ❖ Staff were isolated and had to rest at MCW facilities as local commercially available accommodation was fully taken by emergency services



- Lessons learnt

- ❖ Slow to escalate
- ❖ Difficulty resting staff to manage fatigue
- ❖ Emergency generator/pumps proved useful but limited in numbers
- ❖ Staff brought in from other areas were not familiar with local systems
- ❖ No contingency planning
- ❖ Alternate communications system needed



- Summary for 30 days in the life of MCW

- ❖ Running 'lean and mean' can get you in trouble
- ❖ Blame the systems not the people
- ❖ Hard lessons create a burning platform for change – a much sharper focus business systems and risk management
- ❖ Transparency is critical for community and regulator confidence.
- ❖ Have a plan to ensure that it won't happen again. Share it widely.



Thank you

