

# LESSONS FROM THE 'BLACK SATURDAY' FIRES



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## ABSTRACT

The Victorian 'Black Saturday' fires in 2009 caused serious damage to water and wastewater assets operated by Goulburn Valley Water. This paper outlines the emergency response actions that took place to restore services to customers. It also details lessons that were learnt which can be used to minimise future fire damage and improve the response during any future fire emergency.

## KEY WORDS

Black Saturday fires, emergency response, fire protection

## 1.0 INTRODUCTION

The Black Saturday fires on 7<sup>th</sup> February 2009 resulted in the deaths of 173 people as well as untold environmental and property damage. Goulburn Valley Water services many towns in the fire affected areas. It lost key assets used to provide water and wastewater services. While service interruptions were minimised due to an effective emergency response, changes to design standards can minimise the damage caused by wild fires in the future.

## 1.1 Background

Warnings on the predicted extreme fire conditions for Saturday 7<sup>th</sup> February 2009 were distributed widely on the preceding Wednesday, Thursday and Friday. Goulburn Valley Water (GVW) ensured that its systems were 'fire ready' by ensuring that water storages were full and alerting staff to the potential dangers.

At about midday on the Saturday the first reports of a fire at Kilmore East were received. Soon after an operator working at the Kilmore water treatment plant, which is near Wandong, reported a large smoke plume to the north. He was instructed to evacuate the site. Power supplies to the plant, which is within the Mount Disappointment State Forest, were lost just before 2 pm.

Later, at about 5.15 pm, power supplies to the Marysville area were lost as another separate fire affected that area. Our duty operator was unable to reach Marysville due to police roadblocks.

Information on the progress and damage caused by the fires was limited. Some information was relayed from the State Emergency Control Centre; some from local contacts and the ABC radio coverage provided other news. The news was all bad, with the underlying message being that the fires could not be controlled.

A request to the State Emergency Control Centre for assistance to protect the Kilmore Water Treatment Plant - designated as critical infrastructure - was answered with the response that the CFA was only able to look after the safety of their crews at that time.

A visit to CFA control centres at Seymour and Kilmore confirmed that access to the fire affected areas was not possible, but provided contacts with police that would later be valuable.

The situation late on Saturday was that we knew that fires had burnt through areas containing important assets. SCADA and power supplies were down, and we were unable to determine the extent of damage, if any, to our assets. As a precaution, arrangements were made to transport mobile generators from Shepparton and Cobram to Seymour early on Sunday.

Later that night, power supplies to the Broadford water treatment plant and Clonbinane areas were also affected as a wind change drove the fire towards the north.

After another visit to the Kilmore CFA at about 6 am on Sunday the CFA incident controller gave approval to visit Wandong and the Kilmore water treatment plant area. After passing through three police road blocks it was possible to determine that the wastewater system at Wandong was largely undamaged as was the 3 ML Wandong tank. The control building at the Kilmore water treatment plant, containing chemical dosing equipment and all electrical switch boards and control equipment was, however, totally destroyed. The associated plant room and DAFF cells were undamaged.

The Corporation's emergency response plan was immediately initiated and a meeting organised for 9 am at our Seymour depot. In the meantime staff and generators were sent to Wandong to pump out the wastewater system.

The initial meeting of the emergency response group involved senior managers and key staff expected to be involved in the restoration of the Kilmore water treatment plant. Tasks were allocated and a framework for action developed. Key outcomes were:

- the immediate introduction of Stage 4 restrictions;
- a decision to seek restoration of a 1 ML/day supplementary water supply from Yarra Valley's Wallan system;
- a five day repair target for the Kilmore water treatment plant as this would avoid tankering; and
- a consistent media message.

Decisions were also made on the provision of temporary power supplies to the Broadford water treatment plant and for Waterford Park.

At this time no real information was available on damage at Buxton and Marysville. Access to these towns was not permitted so, other than the imposition of a 'boil water' notice and Stage 4 restrictions, no other action was possible.

By Sunday night a suitable generator had been sourced and following approval from Yarra Valley Water, a pump and electrical switchboard installed to recommission the supplementary supply from Wallan. The Broadford water treatment plant was again operating using another diesel generator, and the Wandong wastewater system was being managed to prevent any overflows. The team delegated the task of restoring the Kilmore WTP had finalised their strategy and commenced sourcing materials.

On Monday, after an initial short meeting of the emergency response coordinating team at Shepparton, the focus shifted to Marysville when access to the town was granted to GVW staff. Initial reports were of catastrophic damage to the town with significant leakage, mainly from damaged property service pipes (including fire services) and an overflow from the main wastewater pumping station. Buxton, which is supplied from Marysville, was without water. Only one water main failure was detected where a PVC main with little cover failed when a vehicle burnt above it.

Turning off or sealing service pipes was the first priority at Marysville, with this work continuing for several days. By Monday night all remaining residences in Marysville had water; supply was restored to Buxton on Tuesday. The 'Boil Water' notice remained in place for 3 weeks until a reliable mains power was restored to disinfection plants.

A more detailed inspection at Marysville subsequently found that the initial 2 km of the supply main feeding the 100 ML Aub Cuzens Reservoir was severely damaged. The wastewater irrigation systems also suffered significant damage.

Another paper by Greg Comer details the rebuilding of the electrical and dosing systems at the Kilmore WTP. This was done within the 5 day target and was a great effort by everyone involved.

## **1.2 Observations about the Emergency Response Effort**

Goulburn Valley Water and its staff are very proud of their efforts in maintaining water and wastewater services with only minimal disruption to customers. A debrief after the incident identified some areas where improvements could occur, but these were relatively minor.

Observations about the response were:

### ***a. Storage Capacity***

Goulburn Valley Water has relatively large storages at Kilmore (16 ML), Wandong (3 ML) and Marysville (100 ML). These storages were near full capacity immediately prior to the fires and were able to maintain an uninterrupted supply of water to residents. In the case of Kilmore the capacity exceeded the expected five day restricted demand and therefore avoided the immediate need to tanker water.

Goulburn Valley Water has had significant experience in tankering water, and while it is possible to maintain supplies to a town of about 6,000 people by this means, it would be a difficult 24 hour operation and time consuming for operational staff.

In an emergency such as that experienced on Black Saturday the extra storage capacity was invaluable.

### ***b. Emergency Generators***

The availability of diesel generators was critical for the restoration of water and wastewater services. GVW had a small number of large portable generators that were supplemented with hired units. We were fortunate that we sourced our hired units quickly as they became increasingly difficult to obtain after Sunday.

The benefits of having ready access to diesel generators and planned connection arrangements were an important tool in maintaining supplies.

***c. Water Consumption Levels***

Four weeks before the Black Saturday fires, restrictions at Kilmore and Wandong had been reduced from Stage 4 to Stage 2. In reintroducing Stage 4 restrictions and appealing for residents to restrict water use to essential in-house use it was assumed that consumption levels would be below the previous Stage 4 demand levels. This was incorrect, with daily consumption over the period 10<sup>th</sup> to 17<sup>th</sup> February being some 42% above the average daily figure recorded in the previous December.

An explanation may be that residents were still very conscious of the fire hazard, and that this took precedence over water conservation.

Because of the unexpected high water consumption and concerns about the declining level in the treated water storage, three tankers were engaged to deliver water from Seymour to Kilmore and Wandong for two days. In other towns tankering has been a very visible sign of water supply shortages and has resulted in a drop in demand. This did not occur at Kilmore.

***d. Critical Infrastructure Status***

Major water supply infrastructure such as the Kilmore WTP are designated as ‘Critical Infrastructure’ and supposed to have priority in respect to fire protection. In the extreme conditions that existed on Black Saturday, fire fighting in forested areas was not possible. CFA units were, quite understandably, concerned only with their own safety.

Water Corporations, and others, need to have their own fire protection systems and not rely on external agencies for help.

***e. Good Information and Contacts are Critical***

Goulburn Valley Water was able to respond quickly at Kilmore because it was able to access the fire affected area to gauge the extent of the damage very early on Sunday morning. Planning for repair work could then progress with certainty.

Access to the area was managed initially by the CFA Incident Controller, and later by the police. Good links with these groups are essential to obtain important information quickly during an emergency when everyone is under great pressure. These links don’t happen on the day of the emergency – they need to be established beforehand.

It is also important to realise that the statement that you are an essential service may not gain access to an area. This was illustrated at Wandong where a power company repair truck was held up for over three hours at a police road block.

***f. Educate Fire Authorities on Water Sources***

One important lesson was that fire brigades in our area did not know where they could best access water from GVW systems for fire fighting. This was illustrated at Waterford Park and Marysville where water was taken from inappropriate locations. At Waterford Park water was taken from the reticulation system. This quickly emptied the elevated

tank which was not able to be refilled because of the power failure.

Approximately 50 metres away was a hydrant on a large gravity fed supply main that had higher pressure and virtually unlimited water. At Marysville, CFA tankers were trying to fill from small mains in the highest area of the town. This area ran out of water.

Water Corporations have a responsibility to better educate local fire brigades about where tankers should fill during major fires. This knowledge helps the Water Corporation, the fire fighters and the community.

#### ***g. Our Most Important Resource***

In any emergency water corporations rely on their staff. Our staff performed magnificently and met every challenge. We had volunteers from other work teams wanting to be involved, while staff working on the 'hard' jobs wanted to complete the work and not be relieved even though remaining fires in the area were still threatening their homes.

Working at Marysville was a traumatic experience and we involved trained counsellors in a debrief at the end of the emergency response phase. The session was not compulsory, but all but one person attended and the feedback was very positive. Counselling was also offered to staff working in other areas.

#### ***h. Offers of Assistance***

After the Black Saturday fires GVW received immediate offers of support from other Water Corporations, consultants and suppliers. It was very clear that people wanted to help, and their offers were extremely generous. While in most cases we did not need to call upon this assistance, it needs to be recognised that in a genuine emergency there is an enormous amount of practical assistance available and this should be built into emergency response plans.

### **1.3 Looking to the Future**

Goulburn Valley Water has learnt some important lessons from the Black Saturday fires which it will incorporate into its design standards and emergency response plans. It will also seek to better inform our customers about the limitations of reticulated water supply systems during extreme fire events.

A high priority will be to change our design standards to better protect key assets from fire damage.

Fire protection systems can take many forms. At the Kilmore water treatment plant there was a relatively large cleared area around most of the plant and this protected some components. However, the control building had box gutters and it is suspected that leaves collected in the gutters and were ignited by wind-blown embers. This in turn caused the building to catch fire.

In this case the simple solution would be to avoid any build up of inflammable material in the building gutters, or to avoid gutters completely.

Building materials are also important. Buildings at both Marysville and at Sunday Creek

Reservoir survived largely undamaged within forested areas because of their construction from fire resistant materials.

Sprinkler systems can also be a useful means of fire protection. While traditional sprinkler systems are designed for interior protection, exterior sprinklers would be an ideal fire suppressant in rural and forested areas.

Goulburn Valley Water will also aim to better educate the public about what may happen to their reticulated water supply during a major fire. Reticulated supply systems have limited supply capacity, and are often dependent on a mains power supply. During a major fire event, when everyone is seeking to use water, water may not be available. This is important information for people to use in developing their own fire protection plan.

## **2.0 CONCLUSION**

The Black Saturday fires provided Goulburn Valley Water with many challenges. These were met at the time and our customers experienced only minor interruptions to water and waste water services.

The experience of Goulburn Valley Water in its emergency response phase has also created knowledge which can assist other Water Corporations to refine their emergency plans.

Importantly, we need to recognise and provide greater fire protection for vulnerable assets to avoid major damage.