

# **DROUGHT MANAGEMENT IN GOULBURN VALLEY WATER'S SOUTH WEST AREA**



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# DROUGHT MANAGEMENT IN THE SOUTH WEST AREA OF GOULBURN VALLEY WATERS

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## ABSTRACT

The Southwest region of Goulburn Valley Water, consisting of the towns of Broadford, Wallan, Kilmore and Wandong/Heathcote Junction, has been experiencing the worst drought on record. Between May 2002 and the current time, the usually reliable water catchment of Sunday Creek reservoir has received the lowest rainfall on record. This has resulted in the most severe water restrictions in the regions history.

The Southwest region is one of the fastest growing areas of Victoria outside of Metropolitan Melbourne. This paper discusses the impact of the water restrictions on a rapidly growing area and the operational management of limited water resources, the challenges of delivering quality product, policing severe restrictions and the actual implementation of our Drought Management Plan.

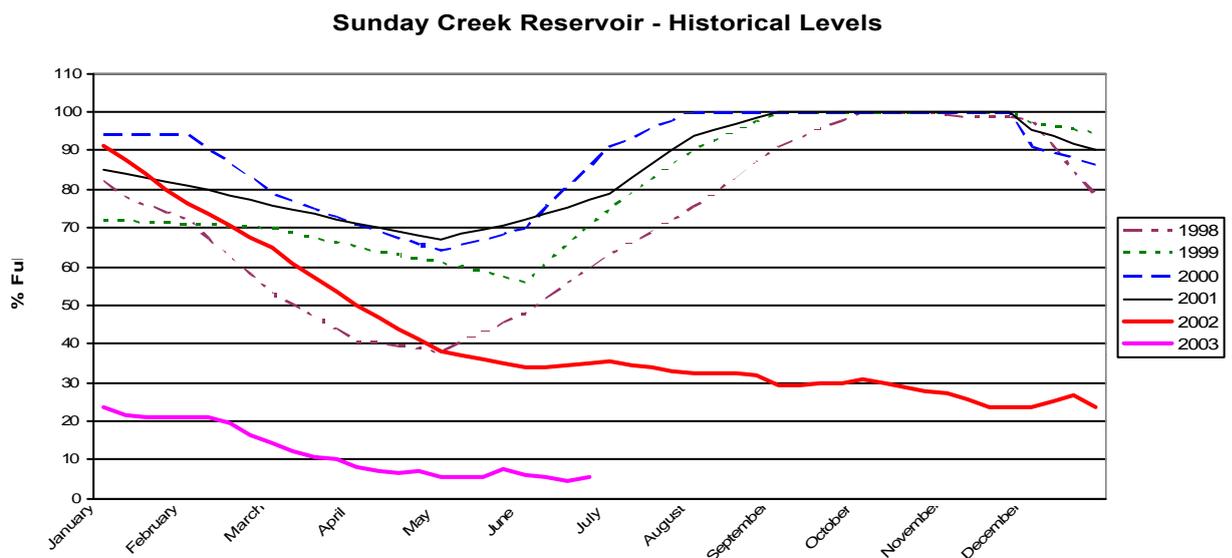
## KEY WORDS

Sunday Creek, Water Restrictions By-Law, Water Patrol, Water Tankers, Reclaimed Water, Drought Management Plan and Goulburn Valley Water

## 1.0 INTRODUCTION

The townships of Broadford, Wallan, Kilmore and Wandong /Heathcote Junction usually enjoy a reliable water supply from the Sunday Creek Reservoir. The reservoir would usually hold 1,700 Megalitres of water supply when full. The storage would normally overflow for four months of the year from the end of winter to the beginning of summer. This can then deplete to less than 55% of capacity from the end of summer to the middle of winter. Under normal conditions the rainfall is so reliable that it would refill each year. The only other occasion the storage fell below the 55% figure was in 1998 and depicted in Figure 1.

**Figure 1:** *Historical Levels of Sunday Creek Storage*



In the autumn of 2002 the usual rainfall event didn't occur. By August 2002 the storage was below 30% capacity with no rainfall in sight. From there we began the introduction of Water Restrictions

## **2.0 DISCUSSION**

### **2.1 Water Restrictions**

Goulburn Valley Water has a 10 Stage Water Restriction By-Law, which is probably unusual compared to most other Victorian Water Authorities. Although we are not going to debate the unusual aspect of the by-law at this stage, a 10 stage by-law has some advantages in allowing for more gradual changes during an event but has some anomalies that are difficult to implement in 2003. The by-law will probably be changed some time in the future. We will refer to that as part of the outcomes of this event later in the paper.

Stage 5 water restrictions were introduced on the 14<sup>th</sup> of August 2002. This early stage of restriction prohibited the use of sprinklers and only allowed the use of a handheld hose to water trees and shrubs in residential and commercial gardens, along with washing cars by bucket. At this stage of restriction the greatest impact was the interpretation of the by-law. The phone calls were many and varied, particularly in view of the amount of building taking place in Wallan and Kilmore.

By the 25<sup>th</sup> of September 2002 the rain still had not fallen in any substantial quantity and another stage of restrictions was introduced. Stage 7 closely paralleled stage 5 except the times of day customers were allowed to use their hoses. They were restricted to the hours of 5:00 PM to 7:00 PM. The washing of driveways and paths with a hose was prohibited. At this level of restriction the need to police the restrictions was required. We employed some casual operators to patrol the restricted areas out of hours and at weekends. Once again the phone enquiries were many and varied.

A strategy planning meeting was held on Friday the 4<sup>th</sup> of October in Shepparton to implement the next stage of the Drought Management Plan. Stage 9 restrictions were to be introduced on the 1<sup>st</sup> of November. Flow from the Sunday Creek storage to Broadford Water Treatment Plant was to be reduced to a third of the normal inflow and the rest was to be supplemented by the introduction of trucked water supply from Seymour, some 20km away. This water was fully treated at the Seymour water treatment plant. A media release was delivered to the public on the 23<sup>rd</sup> of October stating the need for introduction of Stage 9 Water Restrictions and to inform our customers of the need to begin trucking the water in to Broadford and the approximate outlay of \$100,000 to \$150,000 per month to do so. Goulburn Valley Water also called for Expressions of Interest from contractors to cart the water from Seymour to Broadford. See Figure 2.

Stage 9 restrictions called for further bans on the use of hoses and only allowed for the use of water to be bucketed for trees and shrubs during the hours of 8:00 AM and 9: AM and in the evening during the hours of 7:00 PM and 8:00 PM. We were working closely with industry at this time on water conservation practices. Some surrounding rural areas were also suffering from the drought at this time. They would in normal circumstances be supplied with water from carriers via Goulburn Valley Water standpipes for stock and domestic purposes. These were also closed at this time. Water was carted to Broadford at a rate of 4 trucks carting an average of 27 kL per truck, 8 times per day. This equated to approximately 864 kL/day.

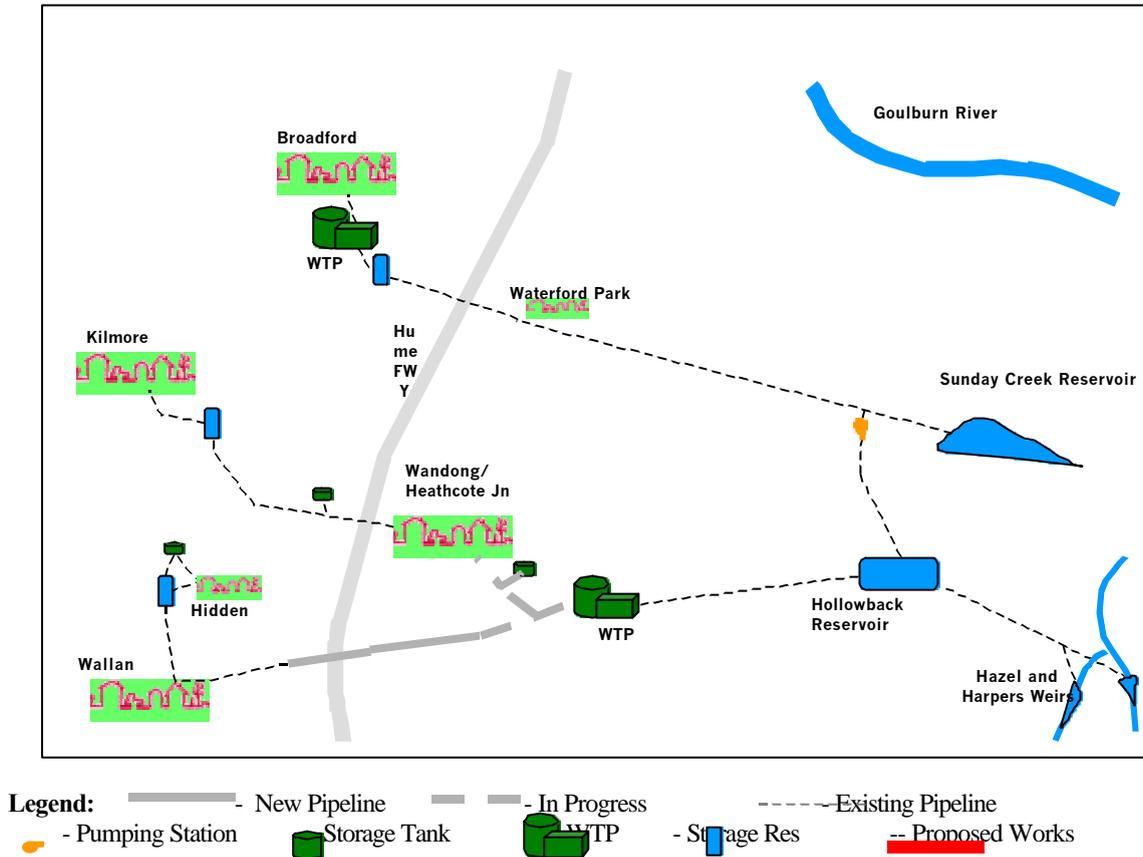
Stage 9 continued through until the 27<sup>th</sup> March 2003. By that time the level in storage at Sunday Creek Reservoir had decreased to less than 10% capacity, there was no inflow to the storage at all. Now experiencing the worst drought in living memory, stage 10 water restrictions were invoked.

Stage 10 restrictions limited water use to inside the house only. No water was to be used outside

of the home. Broadford Township was now totally reliant on water tankers; we installed a further tank at Broadford to accept increased tanker loads. Flow from Sunday Creek to the Broadford ceased and the water treatment plant was turned off.

The tankers now began to cart 1.1 ML to Broadford, which required 40 tanker loads per day. This equated to 5 trucks carrying 27kL on average, 8 times per day for 14 hours per day.

**Figure 2:** Schematic of Area affected by Stage 9 Restrictions



## 2.2 Water Cartage

After the water cartage was tendered, McColl's Transport, Tongala were the successful contractor. This was a reflection of the drought as the tankers would usually be engaged in milk transport from farms in the Tongala area. The milk production was down due to the small allocation of water for irrigation in that area.

The first duty for the operational staff was to erect a fill point at the Seymour end, which would deliver enough water to allow for a quick turnaround of the tankers. This was connected to a 300 diameter water main.

The standpipe was constructed from 150mm diameter steel pipe with a 150mm sluice valve, operated with a large wheel. A 150mm electronic flowmeter was also installed. From that configuration the tankers were filled in approximately 7 minutes.

At the Broadford end we first had to install 2 x 18,000 litre tanks. They were lowered into one large excavation and interconnected. A stainless steel filling manifold allowed the trucks to

discharge quickly into the tanks. A Flygt 3127 submersible lifted the water in to the normal high lift pump well at the end of the existing water treatment plant. The water was lifted to the clear water storage and chlorinated as usual. (in this case re-chlorinated). By the middle of March when stage 10 was introduced, another 26,000 litre tank was also installed.

Permission was gained from the local council to follow a set route through Seymour to the Hume Freeway and Broadford. The allowable times of day were between 7:00 AM and 9:00 PM in residential areas. The trucks were to operate this way 7 days a week. The entrance to the Broadford water treatment plant was via a gravel roadway, approximately 1 kilometre long. This road had to be extensively reconstructed to take the weight of the tankers and dust suppressant applied.

### 2.3 Customer Queries

As the various stages of restrictions were implemented the Authority notified customers through as many outlets as possible. Mail, Television, Radio, Internet etc. The difficulty in the Southwest with our ten stage restriction and its interpretation was the fact that the region backs on to Melbourne. Melbourne had introduced level 1 of a 4 stage restriction at the same time.

Customer issues were many and varied, beginning with the different interpretations of the various stages of the water restriction by-laws. As each stage was implemented the incoming phone calls became more difficult to answer. If you think you have a sound understanding of your by-laws, think again. There will always be someone who will have a different slant on things. Some of the more unique questions are as follows:

- Under stage 7 restrictions the by-law states that permission will be given to wash a vehicle that is necessary for public health, such as a food carrying vehicle. One customer decided he qualifies under that by-law because he carted pumpkins to market on a flat bed truck.
- Having various levels across the Authority as a whole a caller rang and asked “What are the restrictions now?” Reply: “Where are you calling from?” Answer: “My lounge room”.
- Another called to inform us of an anomaly in the notification between a one page mail out and the notice printed in the local newspaper. At stage 9, one stated “Garden beds trees and shrubs in a private garden can only be watered using a watering can or bucket filled directly from a tap. Yet in the other notice it says we can only use a watering can filled directly from a tap. The caller insisted that people would be confused by the discrepancy.
- In the notices and the by-law you try to cover everything, yet you still get a question like, “What is the difference between a sprinkler, a sprinkler system and an automatic watering system?”
- When stage 9 restrictions were first introduced a caller rang and asked, “Will stage 10 restrictions be introduced after the state election” My reply, “hopefully we never have to reach stage 10 and if we manage the water resources we have, along with some rain, stage 10 wont be necessary.” (Wishful thinking) But he insisted that it was all political and we would introduce stage 10 after the election, we were only staying with stage 9 to allow the public to view the Government in a better light.

Another issue to consider when we reached stage 9 were the elderly and infirmed. The difficulty of trying to carry buckets to water trees and shrubs proved to be inhibitive. The Authority introduced another program whereby customers could apply in writing, to use a hand held hose. As long as they could prove they had extenuating circumstances, with a doctor’s certificate etc, they were given special permission and registered to use the hose for three days per week. This in effect allowed them some leniency, but in fact allowed them less water than other users.

## 2.4 Operational Issues

Trying to maintain a water supply system to the high standard of quality demanded by regulation and customer expectation, when we have very little raw product is extremely difficult. We have observed that it is more difficult to operate and maintain a system at a minimum rate of supply than when the system is at full capacity. The customer demands on quality don't change; your own operational standards and requirements don't change. Yet if you limit the quantity of supply to your customers and their lawns and plants are dying, you have to make sure that you respond to every reported leak or malfunction in the system immediately.

All reported leaks received immediate attention. Any water main breaks were given the highest of priority. Reported breaches of restrictions were acted on as soon as possible, although this wasn't always easy. Most breaches were reported by the general public and were called in under the name of anonymous. Mister or Ms Anonymous will call to do someone in for breaching the restrictions; they will often give some vague description of the offender and the address. When our patrol person cannot find the offender, they can't readily ring up Anonymous, because they haven't left a name or phone number. What happens next? Anonymous calls again and accuses us of not dealing with the complaint.

Preventative responses to conserve water and prevent leaks have involved the monitoring of flows and visual checks. Any leaks were easily detectable in the rural areas, the terrain being so dry, any minor leak stood out like an oasis. Other programs we implemented to find potential water loss included the monitoring of stormwater drains and pits in the heavily affected towns. We discovered a few leaks that were entering the stormwater system that were not showing on the surface. We monitored all creeks and water courses for the same purpose and even the sewers. A night time monitoring program was also instigated and some water losses were discovered and rectified.

Operational staff have also been required to monitor water use and deal with the public in relation to enforcement of the restrictions. One of the programs involved some monthly meter reads. This uncovered that some customers were far exceeding the ideal of 4.2 kL per week. Investigations were needed and the water patrol crew visited the high users to assist with water conservation. Some excess usage discovered hidden leaks etc. which when discovered assisted both the Authority and the customer in water conservation.

Some others were deliberately breaching the restrictions and other methods of dealing with that were required. There have been all sorts of wonderful excuses for using water outside of the restrictions; the standard answer was to claim they weren't aware of the restrictions. Other instances were often nothing more than one neighbour feuding with another. In one case we received a letter from one address claiming the person next door was breaching the restrictions. Upon investigating the claim it was discovered that the person who wrote the letter was in fact the one breaching the restrictions.

Another instance was triggered by a failed marriage and when a complaint was received and attended to, it was discovered that it was just the ex husband setting up his wife. The response by some people who were caught red handed breaching restrictions was to write a letter to the CEO or the Board Chairman, accusing our staff of harassment.

Water quality issues were another difficult area to manage; there isn't enough water to flush mains in the normal way. If it is absolutely necessary to carry out main flushing, we hire a tanker and flush from a hydrant in to the tanker. The tanker load in most instances is returned to the water treatment plant and recycled.

As previously mentioned the Southwest area is experiencing a building boom. Current growth is 10% per annum and projections are that it will continue for some time. So another operational issue related to new customers and the installation of instant lawn on the new property. We had difficulty in explaining to new arrivals that they couldn't water their new turf. The usual argument was dollar related, having paid for the lawn as part of the package and now having to watch it die. We set about contacting all building companies and real estate agencies in the area and requesting that they didn't offer instant turf as part of the package. This proved to be successful, with some customers taking up the offer to pay now and receive the lawn when the drought ends.

Community infrastructure is also important to us. The Broadford Bowling Club invited us to a meeting to review the options of watering Bowling Greens. The cost to the community and the Bowling Club would have been severe to have let the bowling greens die. At the meeting the various options were discussed to continue watering the greens. Groundwater and other normal sources were inhibitive. This is where we explored the possibility of using reclaimed water. Our environmental group worked closely with the EPA and other interested groups and developed the Environmental Improvement Plan for reclaimed water, less than 1 ML. Once we worked through the requirement of the plan and put all of required controls in place, the bowling club survived on reclaimed wastewater. Once the first reclaimed water user was established, others began to follow suit, from earthmoving contractors to council road grading and even a commercial flower grower.

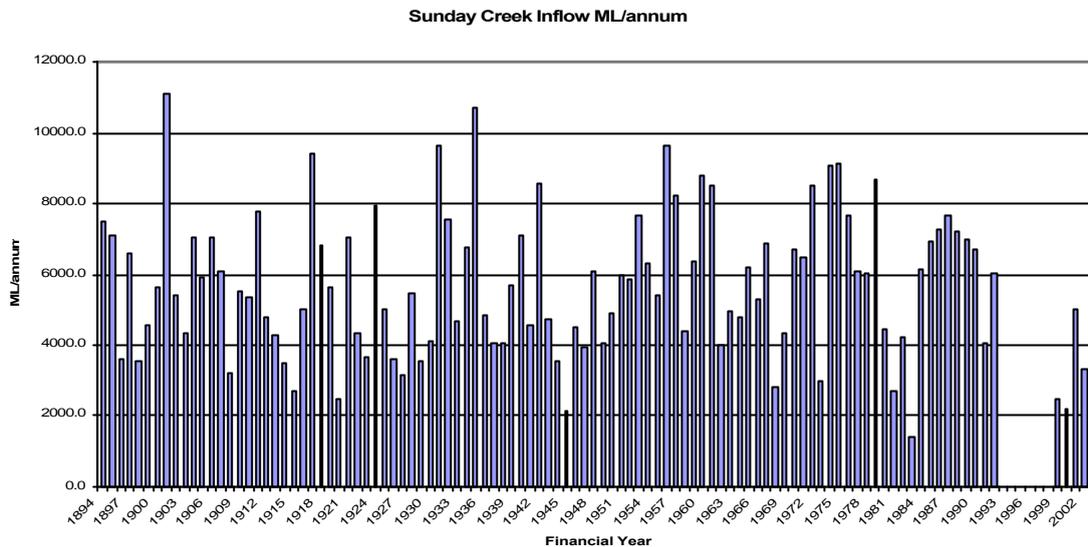
## **2.5 Present and Future Infrastructure**

Having mentioned the growth factor in the region, we are often accused of not managing our water resources very well and that it is the growth of the region and not the drought that is causing the problem. In 1999, Goulburn Valley Water engaged consultants Sinclair Knight Merz (SKM) to conduct a survey in to the present and future needs of the Southwest Region. From that we have the South Western Resource Study, completed in May 2000. The study deals with the present and future growth of the region and the demands of Sunday Creek Reservoir. The study reveals that the present growth would not have an impact on the regions water resources until 2007. The present drought has exacerbated the issue.

If the report recommended that we augment the supply in 2007, the present growth drought requires us to bring that forward to 2004. The state Government on retaining office in 2002 recommended the forming of the Water Task Force. The various options recommended in that report will be discussed in detail by the task force. It will be this group that will ultimately decide what form the augmentation of supply in the area will be. It could be that we construct a separate water supply from the Goulburn River to Broadford or that we could source supply from Yarra Valley Water to Wallan.

Sunday Creek Reservoir was originally designed to provide a total annual demand of 3070 ML. The 2001/2002 demand on the reservoir was 2030 ML. A normal year with average rainfall would provide 3000 ML. Figure 3 highlights the lack of inflow to Sunday Creek over the past year.

### **Figure 3:      *Sunday Creek inflow ML/annum***



## 2.6 Maintenance

Whilst preventative maintenance programs in the distribution were non-existent during this period, we did take advantage of the Sunday Creek storage being empty. The storage outlet tower has varying off take heights. The normal operation is to draw water off the top (being of the better quality) and as the water depletes the valves are opened accordingly. The storage being full for most of the time during a normal year, see figure 4, maintenance of the valves and stick screens would be very difficult.

**Figure 4:** *Sunday Creek Storage (full)*



Now that the storage is empty, see figure 5, we have taken advantage of that to perform some badly needed maintenance. This storage was filled in 1983, anecdotal evidence tells us that the job was barely completed in that year, which was after the 1982 drought, and when the drought broke in 1983 the storage filled very quickly. So the outlet structure has been under water since. This is the first opportunity we have had to perform this type of maintenance.

**Figure 5:** *Sunday Creek Storage (almost empty)*



### **3.0 CONCLUSION**

Conclusion, we wish there was one to this event as a whole. At the time of compiling this paper we have 109 ML in storage, with the lowest point being 77 ML on the 11<sup>th</sup> June 2003. However, the ultimate conclusion to managing an event like this is to ensure your Drought Management Plan can be effective. Any table top exercise will not accurately reflect the issues confronted during an actual event, but any pre planning will act in your own best interest. If a plan does not exist in the first place one would have little hope of dealing with issues such as this, effectively.

Any outcomes of managing an emergency, be they positive or negative, need to be recorded, analysed and used for future planning and response. Water conservation practices are to be encouraged from now and into the future. We cannot afford to let this event pass by without learning from it.

The 10 stage water restrictions by-law needs to be addressed and will be in the near future

We have managed this emergency to the best of our knowledge and ability at this time and if the drought persists through the coming spring and summer we have plans to cart water from Yarra Valley Water to our storage at Pretty Sally in Wallan.

### **4.0 ACKNOWLEDGEMENTS**

The Southwest operations staff, who have shown outstanding commitment to their roles within Goulburn Valley Water during this event and I thank them for that.

Mark McNeil and Steve D'Agata for their assistance with technical information and to all of the staff who have had to deal with the phone calls and the other people within Goulburn Valley Water who have shown an understanding of our operational difficulties at this time.