The Secretary
Senate Standing Committee on Environment, Communications and the Arts
PB BOX 6100,
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Canberra ACT 2600
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Email: eca.sen@aph.gov.au

Inquiry into the Water Amendment (Saving the Goulburn and Murray Rivers) Bill 2008

A submission by the anti-North South Pipeline Group, Plug the Pipe

Plug the Pipe Spokesman,
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Re: *Submission of Plug the Pipe to the Inquiry into the Water Amendment (Saving the Goulburn and Murray Rivers) Bill 2008*

Dear Sirs,

Plug the Pipe wishes to express its strong support for the Water Amendment (Saving the Goulburn and Murray Rivers) Bill 2008.

Andrew Leahy, Chairman Plug the Pipe

About this Submission

Plug the Pipe agrees with the sentiment and objectives of the amendment bill (see below). This Submission however will focus on the specific consequences of not enacting the bill in relation to the contentious North South Pipeline.

The Victorian Government has justified the removal of 75 GL of water from the Murray Darling Basin by claiming that it can save water that is currently 'wasted' or 'lost' from the system to provide a benefit to the Urban populations of Melbourne, irrigated agriculture and the environment. This in fact is an oxymoron in respect to the MDB environment as it is not possible to 'provide more water to the environment by extracting water from it'.

The consequences of not achieving all of the Victorian Governments water savings targets will see prior water savings projects (living Murray and Waters for Rivers) be raided or at risk in the name of critical human need once the urban pipeline infrastructure is built. This bill protects water from these prior projects and future projects designed to bring more water to Murray flows. This prospect makes a closer look at all Victorian water saving projects relevant to this submission.

The nature of Victorian Water savings will be treated in a coarse way i.e. the volumes of the saving targets will be compared to the actual losses from the irrigation districts. Finer approaches of fundamentally important questions such as 'how much water is lost to river systems by reducing irrigation spills and leakage?' will not be covered. The interaction between aquifer systems connecting irrigation areas and river systems is a part of unexplored science but thought to be significant as suggested by Professor Mike Young in his droplet #13 publication. See Appendix B.

Key Points from the Bill:-

- Water for Rivers must achieve significant improvements in environmental flows into the Snowy River and the Murray River.
- That until the States of New South Wales, Victoria and South Australia have each achieved the objectives of increasing the flow of water in the River Murray as required by the Living Murray Initiative and that their water savings are independently audited and the saved water immediately available and must not be used for any other purpose.
- That the Basin Plan is to prohibit taking water for additional uses outside the Basin (unless prior to 3 July 2008 when the CoAG agreement was signed by these states, and QLD and ACT).
- The Basin Plan must not permit construction or operation of water infrastructure or work to control river flow and this must not be done contrary to the previous two clauses.
- The exception is water for Water for Rivers (again prohibiting taking from the MDB to another basin) and Snowy River environmental flows.
- No water infrastructure and river flow control enabling to take water from Basin Water resources for use outside the Murray-Darling Basin (unless water would have been taken prior to 3 July 2008).

Summary

The Water Amendment (Saving the Goulburn and Murray Rivers) Bill 2008 in essence will protect 94.6 GL of environmental water (Living Murray Initiative and Water for Rivers Programs) from non-environmental use. Currently the Victorian Governments intends to use this water as 'start-up' water for the North South Pipeline.

The Bill also isolates and quantifies this federally funded environmental water from a number of volumetrically significant Victorian water savings programs with incredible targets totaling **519.6 GL**. This year under **300 GL** of water will be lost to evaporation, seepage and outfalls from the GMW foodbowl districts. It should be strongly noted that only a proportion of this 300 GL of lost water can be saved in anyone year.

The $3.1 billion Federal water buy back scheme, the best models for predicted climate change and the current Victorian exodus from irrigation agriculture will ensure the current Victorian water savings projects will never be achieved.

The Victorian Government is claiming they can save 519.6 GL water from the foodbowl districts when only ~300 GL of water is currently being lost. This claim is like the emperor's new clothes and is entirely fictional.

Plug the Pipe estimates that less than 150 GL of water savings are available in total in the GMW foodbowl areas. The question of water savings is therefore critical in determining the impacts to irrigators and the environment as the programs have oversold the available water by a factor of 300%. In addition to this the Victorian Government has been highly evasive in describing the bulk entitlement for Melbourne. The fundamental question here is 'who will receive the water generated from Victoria's dichotomy of little understood water savings projects?' The expansion of the Victorian Water Grid is also a major concern.

Victoria's Foodbowl – The Goulburn Murray Gravity Irrigation Districts

'New Water' is the term coined by the Premier of Victoria. The term was used to visualize a plan to invest $2.3 billion into the Goulburn Murray Water region that would produce more useable water. This water is to be shared equally between the irrigators, environment and people of Melbourne via the contentious North South Pipeline.

However, what is not commonly well understood is that there are a number of older water savings projects that have yet to be completed and will run concurrently with the widely publicized Foodbowl water savings projects stage I and II. All of these projects are based in the Goulburn Murray region (see below)

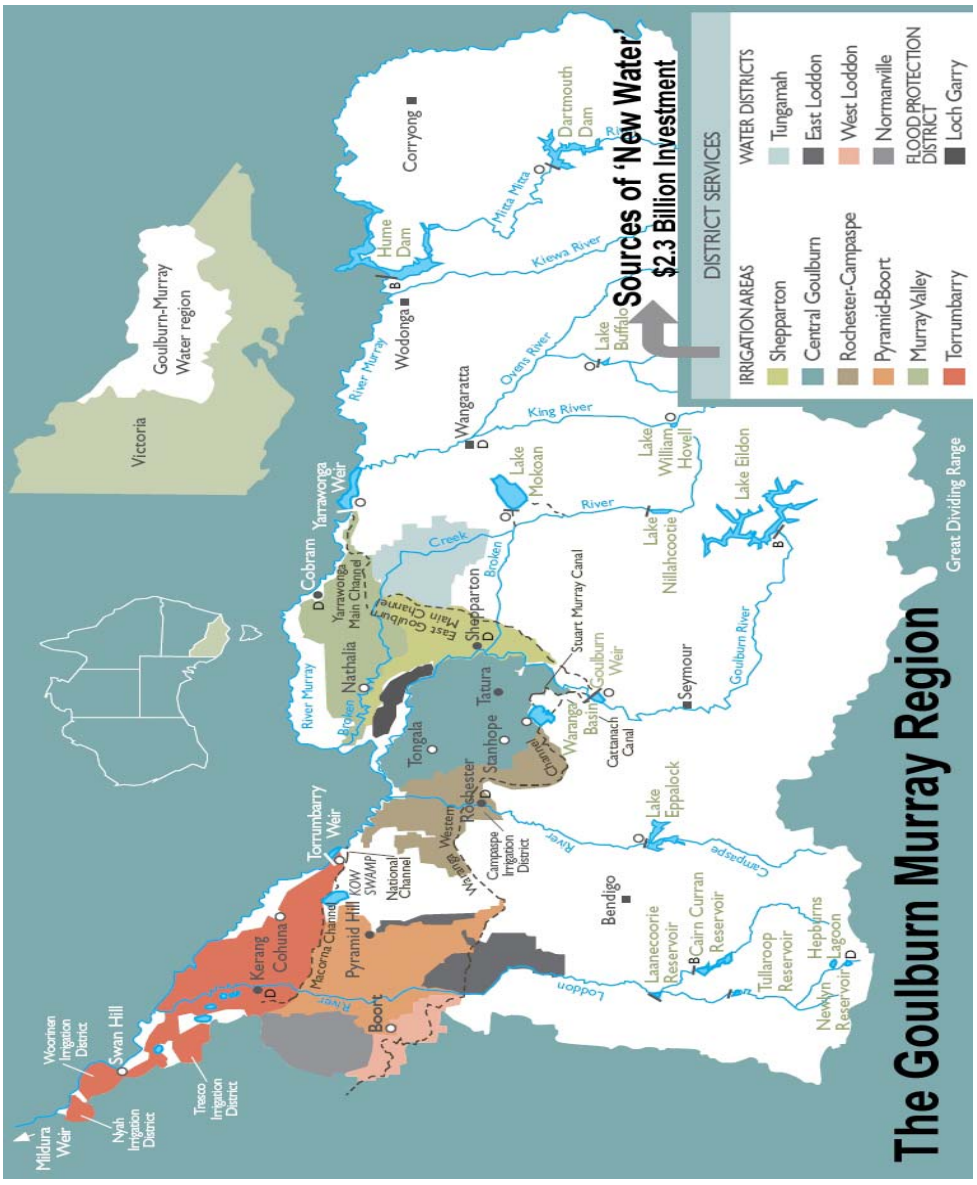


Diagram One : The Goulburn Murray Region

How much 'New Water' is Targeted From Losses?

In 2007 the Victorian Government announced the Foodbowl Modernisation Plan to save 225 GL (or 225 billion litres) through an investment in the Goulburn Murray Gravity Irrigation Districts. These districts include Murray Valley, Rochester, Torrumburry and Pyramid-Boort. The current Victorian water savings programs are listed in the table below.

Environmental water savings projects (blue)

Current Goulburn Murray Irrigation Districts water savings projects.

Water Savings Program	Target (GL)	Cost ($ M)	Comments
Central Goulburn 1234	17.6	50	Melbourne to use in full until 2011, Environment
Shepparton Modernisation	52	200	Melbourne to use in part until 2011, Environment
G-MW Reconfiguration	25	50	Melbourne to use in part until 2011,Environment
Foodbowl Stage One	225	1,000	2011 Melbourne, Environment, Irrigators
Foodbowl Stage Two	200	1,000	Environment, Irrigators
Total	**519.6**	**2,300**	

Source : G-MW

Shepparton and most of Central Goulburn were excluded from this investment as they had received funding from the **Living Murray** and **Water for Rivers** programs in previous years. The water savings from these areas are designed for the Murray and Snowy Rivers, although the Victorian Government will use this water for the North South Pipeline while the Foodbowl investments are starting up. A total of 95 GL of savings water and existing environmental water will be accumulated until 2010 for the North South Pipeline.

Environmental water savings projects to be used by the NS Pipeline (blue)

The North South Pipeline will accumulate environmental water until it starts pumping in 2010.

Water Savings Program	2008/9 (GL)	2009/10 (GL)	2010/11 (GL)
Short Term / Temporary allocation to Melbourne			
Central Goulburn 1234	17	17	17
Shepparton Modernisation		12	12
Part of Lake Eildon Water Quality Reserve		10	10
FBMP Stage 1a. Automation of regulators on trunks & carriers		10	20
Total Savings	**17**	**49**	**59**
Cumulative water savings	**17**	**66**	**125**
Projected Melbourne water use			**75**

Source: Melbourne Water.

In 2008 the National Plan For Water Security was approved by the Victorian Government, Victoria securing a further $1 billion to save a further 200 GL of water bringing the planned total savings from the gravity irrigation district to 519.6 GL. Currently the only savings plan to be close to completion is Central Goulburn 1234.

Works Priority and Sharing of Victorian Water Savings Projects

The Bill seeks to protect this water from non-environmental use.

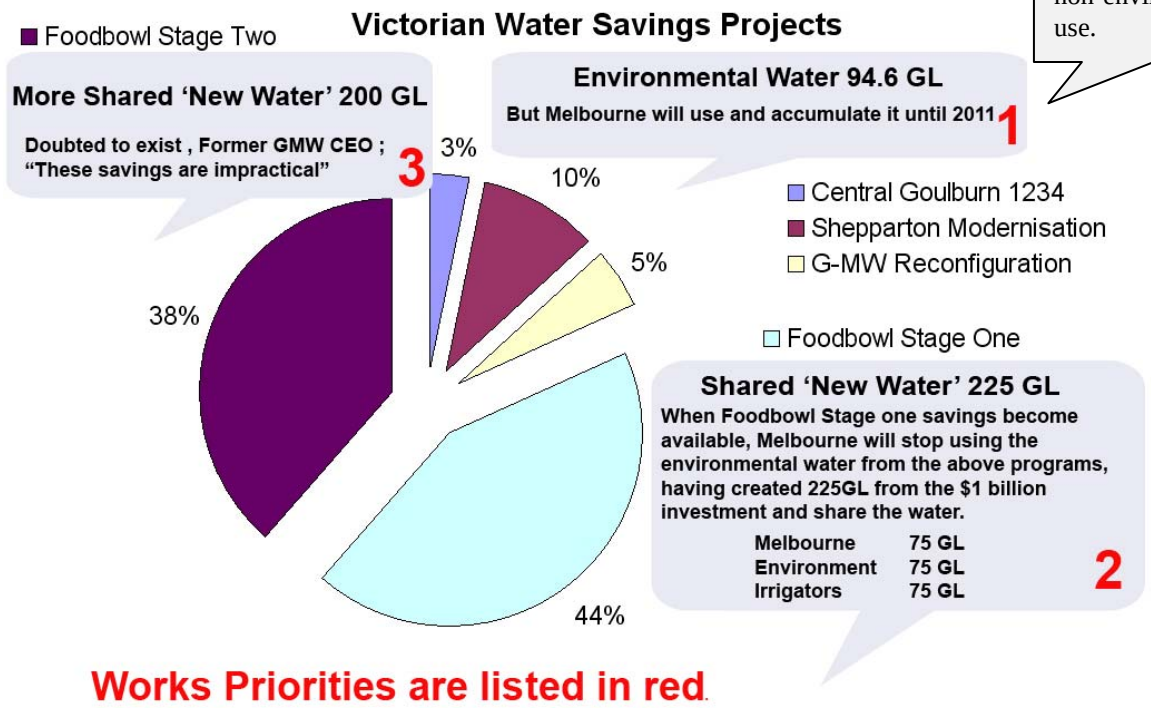
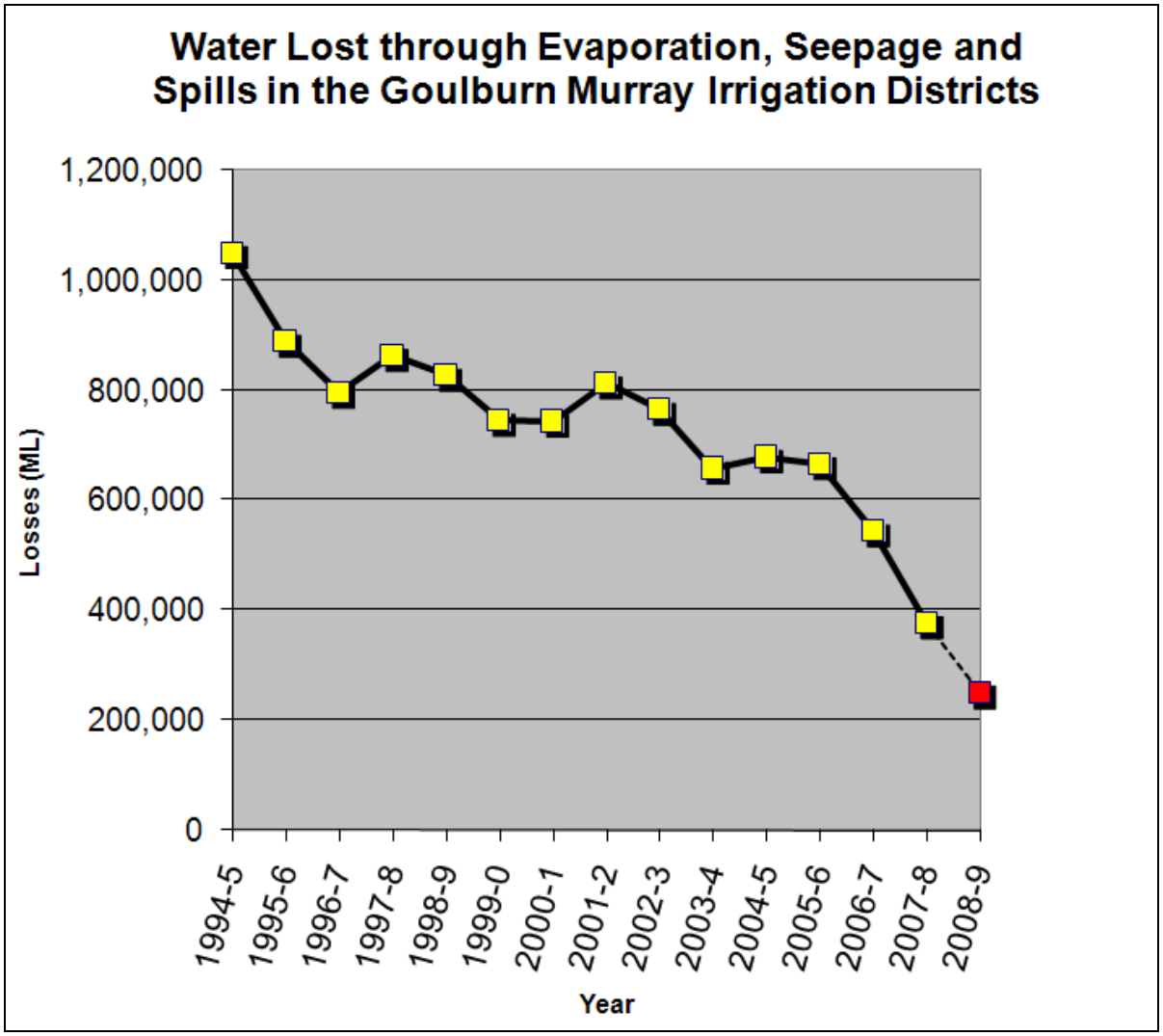


Diagram Two : Victoria Water Savings Projects based in the GM Region

Why the Water Savings Claims by the Victorian Government are so incredible?

Put simply, if the 7000km of open earth channels were to be replaced by a full piped system operating at an efficiency of 85% then the last time the Governments target savings would have been achieved is four years ago. Only 5% of the channel systems will be lined as a part of the modernisation process. The original calculations for the foodbowl savings plans were based on a 115 year average loss of water of 900 GL per year. The last time the system lost that much water was in the early 1990's.



Graph One - By reducing deliveries losses and potential water savings. Ie Water Saving Programs

The irrigation losses for this year will be around 300 GL or slightly more than half of the water required to achieve the Victorian Governments loss targets. **It is most important to understand that only a fraction of the water lost this year through evaporation, seepage and spillage can be saved.**

Basic Math

Total water Lost through evaporation, seepage and spillage	300GL
Less 100 GL lost in the Ramsar Listed Kerang Lakes(non recoverable loss)	100 GL
	200 GL
Less 60 GL lost through evaporation in open channels	60 GL
	140 GL
Less X GL seepage losses not recovered from open channels	X GL
Equals Potential Maximum Savings through Modernisation	**<140 GL**

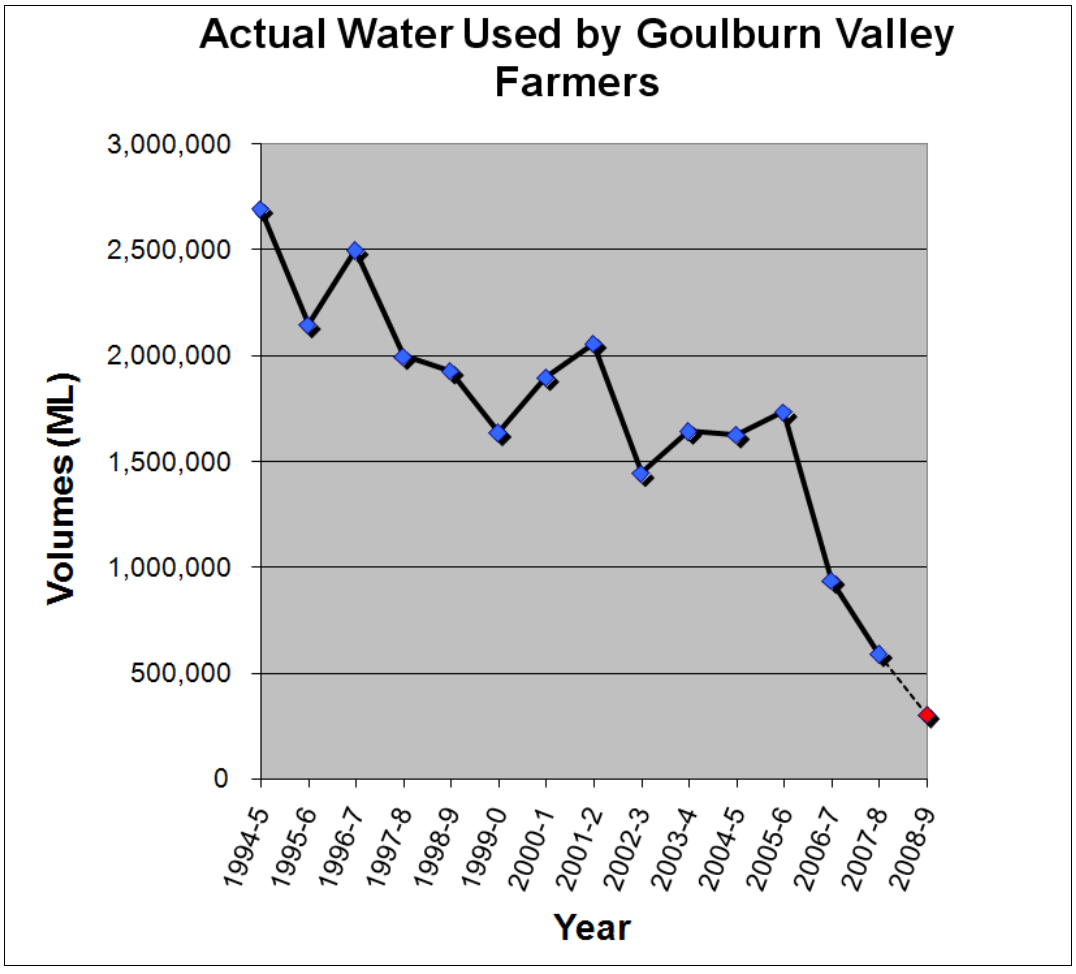
There we have it; the Victorian Government is claiming 519.6 GL of water savings when less than 140 GL of savings are available. Incredible!

7,000 km of open earth channels exist in the GMW Irrigation Districts. Just 5% will be plastic Lined.

Why are the losses from the irrigation areas declining and why is this trend likely to continue?

Graph one shows a long term trend of declining water lost from the irrigation areas. A reduction in water lost from the irrigation areas represents a direct reduction in potential water savings. These irrigation losses or water savings are set to decline even further because:-

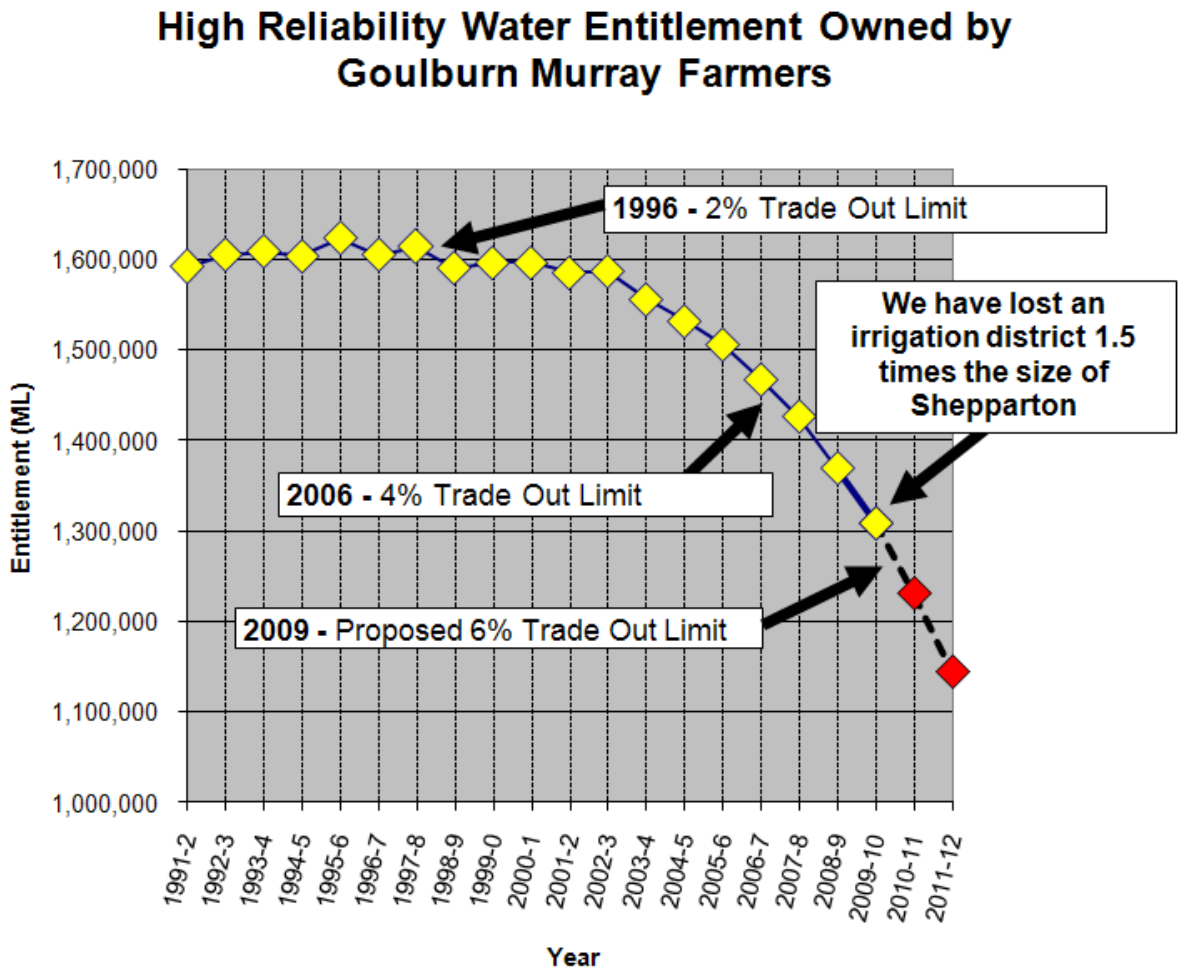
1. Lower availability of water through climate change. A recent study by the Victorian Government (Northern Water Sustainability Study) predicts that under the effects of a medium climate change scenario that the inflows of water to the Goulburn System will be 1000 GL less. The availability of water in the Goulburn Murray system has been in rapid decline for the past 20 years.



Graph Two - By reducing availability of water or the effects of climate change

2. The exodus of agriculture by irrigators. The Foodbowl districts have also lost around 300 GL (or 18%) out of an original 1600 GL of high security water entitlement since the introduction of water trade in 1991. Most of this water has been taken up by horticultural planting in the lower Murray. Plug the Pipe questions the sensibility of moving so much water from medium security agriculture (grazing and dairying) to high security agriculture (viticulture and almonds). In a similar sense taking 75 GL of water from the MDB to urban populations with the need for ultra high security also makes little sense.

   The VFF estimates that between 300 and 600 GL of water entitlement will be lost through permanent trade by the time the $3.1 billion buy back scheme is implemented. This situation is set to be further aggravated by the economic effects of a severe commodity down turn and the continuance of the drought. All of the Goulburn Murray Irrigation districts reached their 4% trading cap within months of the new season opening this season. This rationalization of the irrigation districts will continue.



Graph Three – The contraction of the irrigation districts. Farmers leaving irrigated agriculture

3. In the past years Goulburn Murray Water has spent $20-40 million p.a. on infrastructure renewal. Significant gains in efficiencies have been made over the previous 15 year dry period.

4. Lower availability of water through indirect climate change effects. I.e the Victoria Alpine Mega Fires (>1,000,00 hectares) will significantly affect catchment yield for decades.

Comment: If the downsizing of the irrigation districts continues any previous sold water savings will become like an unjust tax on the irrigation districts i.e. Water that leaves the district through either permanent trade of water or the sale of water savings removes the opportunity to save water because of its lower availability. This is because water savings are sold as discrete entities, those qualities must be honored forever into the future even if the no longer exist.

Victoria's Water Grid : A Paradigm Shift for the Murray River

The Victorian Government knows full well the acute shortage of water in the Murray-Darling Basin but is still proceeding with the construction of the north-south pipeline. This project has deservedly been widely condemned by grass root populations, scientists, think tanks and the leaders of every non-labor political party.

The Victorian Government maintains the north-south pipeline is a vital component of Victoria's emerging water grid. The use of the term "water grid" to describe the pipeline is a misnomer. The pipeline is a one way street. Water can flow in only one direction - from the Murray Darling Basin to Melbourne. However, the term water grid is valid in the sense that the pipeline allows for the development of privatized water markets in the non-agricultural sector.

The pipeline allows investors to purchase water in the Eildon Dam and sell it to Melbourne via the north-south pipeline, to Geelong via the Geelong interconnector and to Bendigo and Ballarat via the Goldfields Superpipe. The grid is continuing to expand (see Appendix C) and will have increasingly deleterious impacts on the MDB River systems should the predicted climate change scenarios play out. This network of pipelines gives over 4 million people access to water from Eildon. Victoria's population is expected to double over the next forty years and will ever increasing pressure on the dam's supplies.

The north-south pipeline is strategically important to the Victorian Government's plans to allow urban populations to source their own water, in turn divesting them of a core governmental responsibility. Investment has been poor in water infrastructure for a very long time and the spider's web of pipelines currently networking across the state represents a cheap, quick, dirty and flawed solution to the low availability of water. For example Coliban Water is an urban water authority supplying Bendigo and major towns in

central Victoria, its water efficiency is below 50% - that means for every litre supplied to customers over a litre is lost in its delivery. The investment required to bring its infrastructure up to world class is a little over $12,000 per ML. Obviously Coliban is governed by the ease of market economics solutions, purchasing rural water at $2,500 per ML from the water market is a far cheaper solution than fixing up its own infrastructure. Coliban has been aided by a government philosophy that has been focused on a quick fix solution as a matter of political expediency with unmeasured consequences. The Victorian Auditor General made critism of the haste and lack of due diligences in the Foodbowl Project and North South Pipeline planning, the Victorian Government responded by justifying its short cuts in the name of urgency.

What effect will the expansion of the Victorian Water Grid have on the Murray River? It will represent a paradigm shift for its working flows and will be dramatically expressed in time of severe drought. The water taken for the grid will be transformational in nature, that is its security will move from irrigation security to ultra high urban security. This may occur in the form of qualification of rights issued by the water minister of the day in a time of drought, aggressive entry into existing water markets and or the hoarding of large quantities of carry over water.

Why should it matter if water is used in an irrigation district or in a city? Consider the following example.

An irrigator in Mildura sells 100 ML of his water to Geelong. That water will now travel from the Eildon Dam to Melbourne and Geelong via the North South and Geelong Pipelines. Previously, its delivery involved travel from the Goulburn and Murray Rivers all the way across the state to Mildura. In this case there is a benefit to the rivers flows purely based on delivery destination. The extraction of water via urban pipelines provides little benefit to the transportation flows of our rivers.

In addition to this impact, water maybe lost to the river by reductions in the connecting farm-river aquifer system or spillage back into the river system. Most of Victoria's irrigations districts adjoin the Murray River (See Appendix B, Diagram One).

This example may seem trivial however the current drawings on the Goulburn River are already significant. The reduced inflows as a result of climate change along with the expected doubling of Victoria's population within 40 years make these accumulative effects highly significant.

Current Pipelines sourced by Goulburn (Eildon Dam) Water.

Pipeline	Extraction (GL)	Comments
North South and Geelong Pipelines	75	Maximum Capacity 150 GL pa
GoldFields Superpipe (Bendigo Ballarat)	38	
Broadford Pipeline	14	
Wimmera Mallee Pipeline	~4	Part only
Total	**131**	

Note : Each of these pipeline have higher maximum capacities than the current listed extraction rate.

Note : Plug the Pipe is **not** an anti pipeline group. Where real social benefits and water savings exist, Plug the Pipe is supportive. Ie Wimmera Mallee Pipeline. Plug the Pipe also strongly believes that sustainable options such as recycling and storm water harvesting should be given a higher priority in water supply infrastructure spending than they currently are now.

Appendix A - Plug the Pipe, Who are we?

Plug the Pipe is the largest and fastest growing agri-environmental group in Victoria. Our membership is significant and draws membership from one end of the state to the other. We are concerned about the long term effect that the proposed North South Pipeline will have on the well being of local communities, the natural environment and irrigated agriculture.

Plug the Pipe is grateful for the opportunity provided by the Senate Standing Committee on Environment, Communications and the Arts to make a submission to the Inquiry into the Water Amendment (Saving the Goulburn and Murray Rivers) Bill 2008. Further information on our groups activities can be viewed here:

http://www.plugthepipe.com

Appendix B – Droplet #13

Droplet No. 13 **28th September 2008**

Droplets explore ideas and propositions, which, if developed further, might improve water use. They develop ideas and search for the fundamental concepts and building blocks that one might consider if not constrained by prior decisions.

Grounding connectivity: Do rivers have aquifer rights?

"It is better to be approximately right rather than comprehensively wrong."

When groundwater aquifers are connected to a river, they need to be managed as a single integrated system. A connected river gains water when an aquifer is higher than the river and loses water when the aquifer is lower than the river. The rate of gain or loss is determined mainly by an aquifer's gradient towards a river and its capacity to transmit water. Significant time lags can be involved.

How should entitlements be defined and allocations made when ground and river water systems are connected? Should river entitlement holders or the river be given an entitlement to the other resource? Is trade between ground and surface water systems possible? How should any impact of climate change be managed?

Groundwater entitlement systems

As is done in NSW, the state of the art when establishing a groundwater entitlement system is to issue unit shares in the system. In systems where shares have been issued, allocations are made in proportion to the number of shares held. The system is simple and can cope with changes in supply.

A formal announcement process is necessary. Each year an assessment of the amount of recharge needs to be made and, once enough water has been put aside for base flow and mandatory inter-system transfers, the remaining recharge can be allocated to share holders. Shareholders should expect allocations to vary from year to year and, if it gets drier, to receive a smaller allocation. In the simplest of systems, allocation announcements are varied with changes in the depth to the water table.

To ensure efficient water use, it is necessary to allow entitlement holders to carry forward unused allocations with adjustment for losses and flows out of the system.

Where the aquifer is contiguous and porous, water tends to move quickly from one location to another. In such systems, groundwater trading is possible. As porosity declines and/or the aquifer becomes fragmented, trading rules become harder to set.

Types of aquifer

When discussing the effects of aquifers on river flow, Rick Evans has proposed that aquifers be zoned according to the time it takes for the act of extracting water from a bore to reduce river flow.

Aquifers right next to a river

Right next to a river, pumping reduces river flow almost immediately and entitlements are more accurately defined as part of the river system. In much of Australia, however, aquifers right next to a river are not considered to be part of the river system. This means that those able to pump right next to a river gain access to an entitlement that is more reliable than any river entitlement.

It is interesting to note that Queensland legislation is now written so that a river boundary can be defined to include all groundwater bores within a specified distance of a river. Reflecting on the merits of such an approach, Evans has suggested that most groundwater licences within 5 kms of the River Murray should be defined as part of this river's entitlement system and managed accordingly. In a drought, this would mean that allocations to groundwater and surface water resources would reduced at a similar rate.

Aquifers that can store river water

Further away from a river, there is often a transitional zone where the rate of contribution to or extraction from river flow depends upon river height. In these zones, allocation and pumping

rules need to be based on river height and on the time it takes for changes in the rate of extraction to affect river flow.

These are the aquifers that tempt groundwater hydrologists to suggest they could be managed like a dam. In highly regulated rivers, river height tends to be constant and, hence, opportunity to do this may seem limited. If river management rules were changed, however, so that river height could be managed strategically with a view to reducing drought risk. Run the river high and the adjoining aquifers could be gradually filled. Run the river low and the water stored in the aquifer could be gradually returned back to the river. We think this opportunity is worth evaluating. New accounting would be necessary.

Aquifers further out from the river

The time it takes for groundwater to flow from more distant zones to a river can take many years. Time lags of 20 to 50 years are not uncommon. As a result, entitlement trades which involve the movement of the point of extraction closer to the river need to be managed with great care. The solution is to set trading rules by sub-zone. Entitlement trading from these sub-zones to a river is possible with adjustment for the time lags involved and to ensure that the trade does not result in long-term or even permanent "borrowing" of water from other zones or from the river.

Dealing with adverse climate change

Having set the scene, we can now explore one of the key questions posed in this droplet. In a system where a river gains water from an aquifer and it gets drier,

a) should river or aquifer users be protected from the impact of this decline in water availability; or
b) should the impact be shared?

If the latter sharing approach is taken then one option is to issue a "gaining" river formal shares in the aquifer system and, conversely, a "gaining" aquifer formal shares in the river system.

Under such an arrangement, managers would be forced to manage connected systems as a single interacting system. When recharge increases, those with an interest in a gaining river would get more water and when recharge declines, they would get less water. The result is a regime that would establish a level playing field between ground and surface water users. We think the approach has merit.

Trading among connected river and groundwater systems

Pushing the envelope one step further, it is possible to imagine an entitlement regime where an irrigator or an environmental water manager could purchase a groundwater entitlement and, with appropriate adjustment, arranges either for

a) the entitlement to be converted into a river entitlement; or
b) the entitlement to be tagged so that any allocations made to it are transferred, with an appropriate volumetric adjustment and time delay, to a river account.

The main difference between these two options lies with the way allocation risk is distributed. When a groundwater entitlement is converted into a surface water entitlement and the exchange rate is wrong, the reliability of all other entitlements in the system changes. Under the second tagged approach, exchange rate errors can be corrected so that there is no long-term impact on the interests of others. Given the risks involved, in the case of groundwater to river water trading, a tagged approach is likely to result in more efficient decisions.

Where to from here?

Obviously, careful aquifer-specific analysis of the options presented in this Droplet needs to be undertaken. Significant investments in aquifer mapping, connectivity assessment and monitoring would be necessary.

The challenge now is to work out how to get the foundations for such aquifer-river sharing systems right, cut through the complexity and put systems in place that can be expected to improve with increased understanding and knowledge.

As a bare minimum, we recommend that system managers should start to define the size of each river's share of the water in each aquifer connected to it and vice versa. We also recommend that agencies trial the tagged trading of water entitlements among between connected river and groundwater systems.

The good news is that all this is not new. In places like the Arizona, California and Texas, existing regimes enable people to store water in aquifers. In these parts of the world, it is also possible to swap surface and groundwater allocations. In fact, it has even got to the stage that some American States are doing ground-surface water trades with one another.

Examples of the early development of such ideas can also be found in Australia. In South Australia's Angas Bremer system, for example, irrigators are given credit for 100% of any surface water they drop into an aquifer on the condition that this water is used within 5 years. Another example can be found in Queensland's Burdekin River Delta where up to 250 GL of water per year is pumped into a groundwater recharge system so that cane growers can access groundwater when they need it. Draft Australian guidelines for management of the health risks associated with aquifer recharge have been released.

Mike Young, The University of Adelaide, Email: Mike.Young@adelaide.edu.au
Jim McColl, CSIRO Land and Water, Email: Jim.McColl@csiro.au

Acknowledgements

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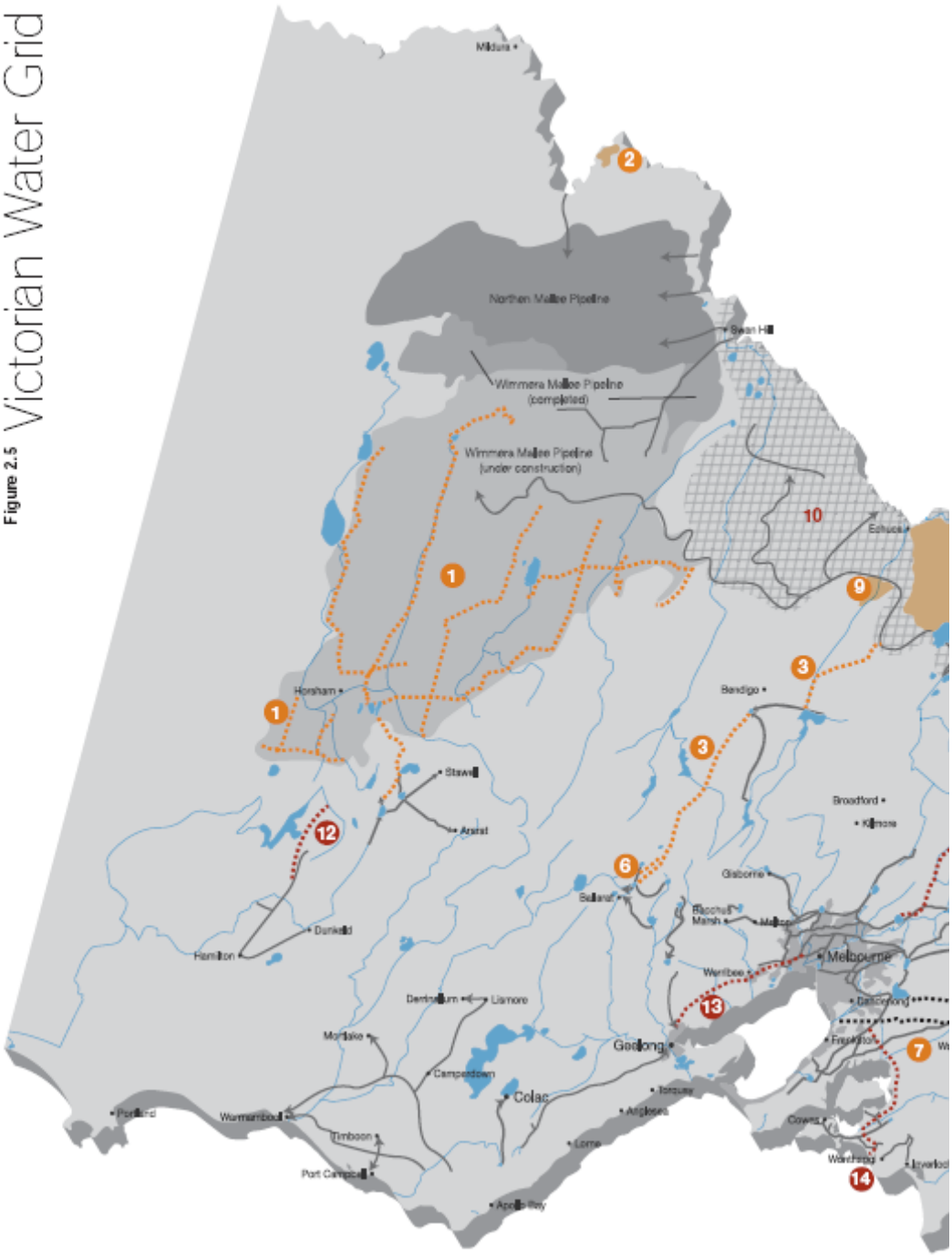
References (*Access them by clicking on the links embedded in this droplet.)*

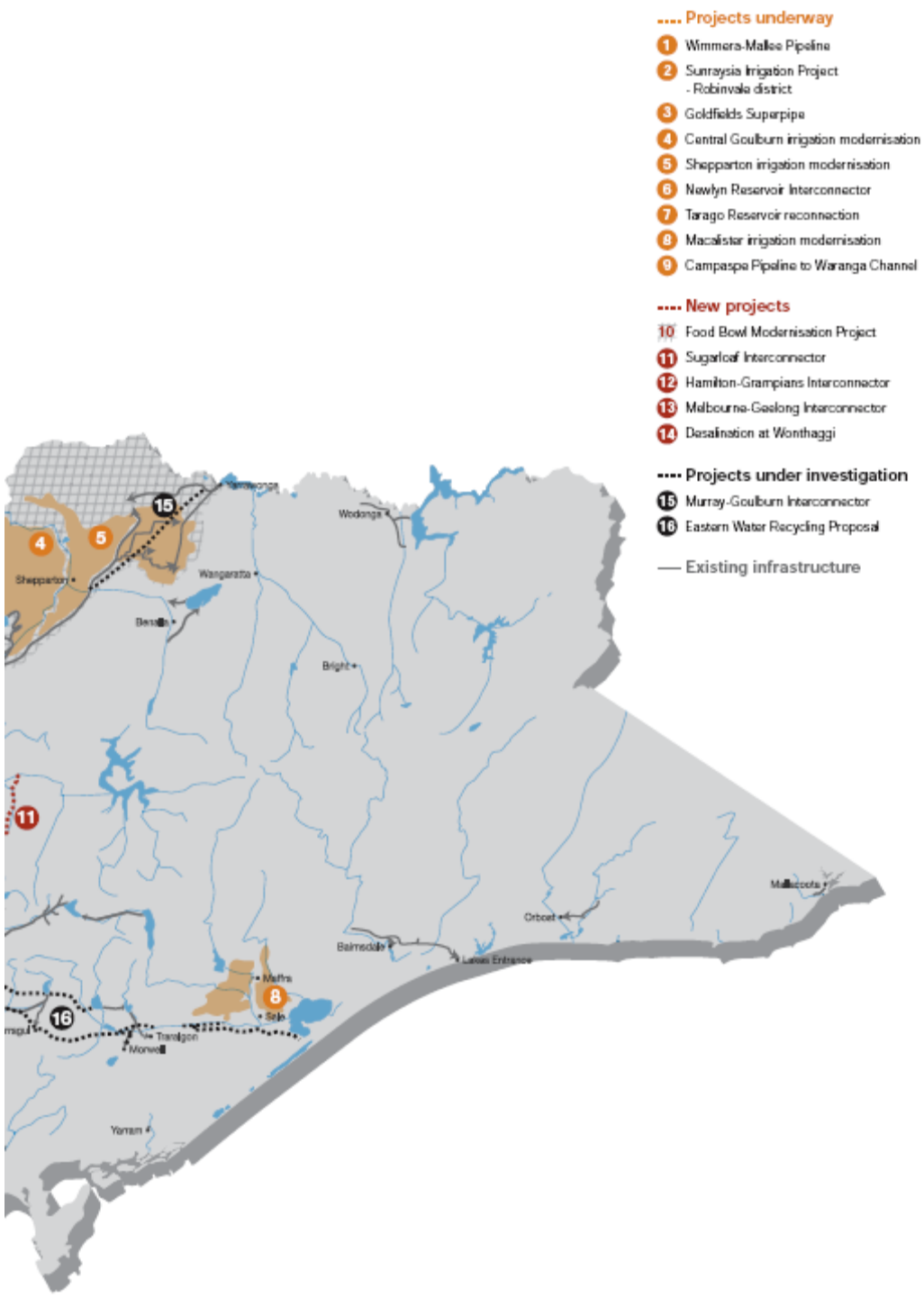
Evans, R. (2008) The impact of groundwater use on Australia's Rivers. Land and Water Australia.
Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2): Managed Aquifer Recharge

Last revised: 4 February 2009 URL for this page: http://www.myoung.net.au

Appendix C – The Victorian Water Grid

Figure 2.5 Victorian Water Grid




Projects underway
1 Wimmera-Mallee Pipeline
2 Sunraysia Irrigation Project - Robinvale district
3 Goldfields Superpipe
4 Central Goulburn irrigation modernisation
5 Shepparton irrigation modernisation
6 Newlyn Reservoir Interconnector
7 Tarago Reservoir reconnection
8 Macalister irrigation modernisation
9 Campaspe Pipeline to Waranga Channel
New projects
10 Food Bowl Modernisation Project
11 Sugarloaf Interconnector
12 Hamilton-Grampians Interconnector
13 Melbourne-Geelong Interconnector
14 Desalination at Wonthaggi
Projects under investigation
15 Murray-Goulburn Interconnector
16 Eastern Water Recycling Proposal
Existing infrastructure
Shepparton
Wangaratta
Bright
Wodonga
Orbost
Bairnsdale
Maffra
Sale
Traralgon
Morwell
Yarram

Timing right for water investment - Opinion - Editorial - General ...

2 Feb 2009 **...** REVELATIONS that Coliban *Water* has virtually abandoned any hope of finding a suitable potable groundwater supply in the Kyneton region **...**
*www.bendigoadvertiser.com.au/news/opinion/editorial/general/**timing-right-for-water**-*

Timing right for water investment

2/02/2009 10:03:00 AM
REVELATIONS that Coliban Water has virtually abandoned any hope of finding a suitable potable groundwater supply in the Kyneton region signals the beginning of a new search for answers.

The two obvious alternatives that spring to mind - pipelines either between Kyneton and Woodend or Castlemaine and the Goldfields Superpipe - would both come at enormous cost to customers, government and the community.

A pipeline between Kyneton and Woodend would connect Coliban's Kyneton customers into Melbourne's water supply.

Any proposed connection between Castlemaine and the Superpipe would involve the distribution of water sourced from the Goulburn system.

Coliban Water believes only one of these two options would be required, because taking one of these similar sized communities out of the existing arrangements would alleviate a lot of the pressure on local storages.

Today's news comes on the same day the Victorian Opposition raised its concerns about the level of debt regional water authorities are carrying.

Coliban Water and the State Government may have little choice but to sink further into debt in order to ensure the ongoing supply of water. A strategic investment by government into water infrastructure is always going to be about the future - jobs, quality of life, investment and even life itself. Given interest rates are at the extreme low point of the cycle, now is the time for that investment to be made.

What do you think?

Write a letter to the editor, or e-mail editor@bendigoadvertiser.com.au

Bendigo Weekly

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Superpipe on track

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Appendix D – Melbourne Bulk Entitlement

Food Bowl Modernisation Project

Steering Committee

"New Bulk Entitlements for Melbourne"

Technical Paper for Discussion

August 2007

The information contained in this technical paper has been compiled by the Department of Sustainability and Environment for the sole purpose of assisting the Governance Sub-committee in its task of providing advice to the Food Bowl Modernisation Project Steering Committee. The technical information provided is not intended to be representative of Government policy nor is it intended to reflect or endorse a particular course of action. Any reproduction of the material contained in this paper should be accompanied by a statement to that effect.

BACKGROUND

1. Stage 1 of the Food Bowl Modernisation Project (FBMP) will recover a total of 225 GL (Long Term Cap Equivalent (LTCE)) in water savings, with the first 75 GL of very high reliability savings for Melbourne. These savings will be recovered from a range of project works across the Goulburn-Murray Irrigation District (GMID) which is operated by Goulburn-Murray Water (G-MW). Construction of the Sugarloaf Interconnector by February 2010 will allow savings to be physically transferred from the Goulburn River near Yea to Sugarloaf Reservoir.

2. In order to put in place the legal framework to allow Melbourne to access these water savings, new bulk entitlements (BEs) will need to be created and several existing BEs will need to be amended. An overview of the existing entitlement framework is provided at Attachment A.

3. Water savings will be realised on both the Goulburn and Murray systems and new BEs for Melbourne must be established on both these systems. This paper describes the key elements which will specify the new entitlements for Melbourne. These key elements are:
   - the form and reliability of the new entitlements for Melbourne;
   - limits on Melbourne's use of the new entitlement;
   - the access period for Melbourne's entitlement; and
   - rules for accessing Murray system water savings from Lake Eildon.

4. These four elements are discussed below. Future papers will outline the principles for transferring water savings from Stage 1 of the FBMP to the environment and irrigators.

ISSUES

Form and reliability

5. The form and reliability of Melbourne's entitlement are the key specifications and are fundamentally linked. The proposal which the Victorian Farmers Federation (VFF) negotiated with the Victorian Government in early 2007 is for Melbourne to be given a very high-reliability BE and for Melbourne to be restricted from entering the water market to secure water. Such an entitlement would be similar to Goulburn Valley Water's (GVW's) and Coliban Water's (CW's) urban entitlements supplied from the Goulburn system, but with explicit clauses preventing temporary and permanent trade.

6. CW's and GVW's entitlements on the Goulburn system have a very high reliability of 99% and reliability is independent of both seasonal allocations and G-MW's system operations. Instead, reliability is linked to the 24 month inflow volume to Lake Eildon which is exceeded 99% of the time. If the actual inflow over the preceding 24 months is less than the trigger, CW's and GVW's entitlements are restricted proportionately. The inflow trigger is revised every five years to ensure 99% reliability is maintained.

7. The same method is proposed for specifying and maintaining the reliability of Melbourne's entitlement on the Goulburn system, and for specifying any restrictions. It is proposed that the reliability of Melbourne's entitlement on the Murray system be specified in an analogous way. This would require the development of inflow triggers to Lake Dartmouth, as the existing urban entitlements have the same reliability as high-reliability water shares and are therefore restricted based on seasonal allocations rather than an inflow trigger.

8. By creating very high reliability BEs for Melbourne on the Goulburn and Murray systems, the full 75 GL would be available almost every year. It is unlikely Melbourne will use the full 75 GL every year. However usage of this water is ultimately a commercial decision for Melbourne. Any unused water would remain in storage for and would be available for sharing amongst all users in subsequent years, for example by returning the water to the general pool for allocation in the following water year.

9. Under a changing climate, inflows to Lake Eildon and Dartmouth Reservoir are expected to reduce. A key benefit of linking the reliability of Melbourne's entitlement to inflow triggers which are revised regularly is that Melbourne's entitlement would suffer virtually no impact as a result of climate change.

10. On the other hand, the reliability of irrigators' and the environment's entitlements from the FBMP would reduce under climate change as the 75 GL of long-term water savings for irrigators and the environment will comprise a greater portion of low-reliability water savings. Low-reliability entitlements would be more heavily impacted than high-reliability entitlements under climate change.

11. If these implications for reliability were unacceptable, other options which mitigate the risks to reliability could be developed. However, these options would need to include the ability for Melbourne to enter the water market, at least on a temporary basis, and/or have access to carry-over. This needs to be considered in the context of existing Government commitments.

12. For example, Melbourne could be issued high-reliability water shares which are subject to a seasonal allocation but are fully available in most years except during severe drought. This type of entitlement would be identical to that held by irrigators and the BEs held by urban water authorities on the Murray system. Whilst irrigators and the environment would not receive any more high- reliability entitlement, the potential impact from climate change would be less since Melbourne's entitlement would also bear some loss of reliability.

13. During times of low water availability, Melbourne would need to enter the water market to purchase additional water to enable diversion of 75 GL in any one year. Ongoing carryover for all water users may reduce the volume Melbourne would need to purchase, but is unlikely to eliminate this need to enter the water market.

14. Alternatively, Melbourne, irrigators and the environment could each receive a mix of the high- and low-reliability water savings. An equal sharing of the high- and low-reliability water savings between the three user groups would mean that the potential impacts of climate would be borne equally by Melbourne, irrigators and the environment.

15. Under such an arrangement, the availability of Melbourne's entitlement would vary between wetter and drier years, with less than 75 GL available in dry years. If coupled with the provision of ongoing carryover for all water users, Melbourne would be able to store unused entitlement in Lake Eildon for later use during dry years. However, Melbourne may still need to enter the water market to obtain additional water (up to its 75 GL/y maximum) if it were required.

16. It is impossible to predict the timing and severity of climate change, and its potential impacts on the reliability of entitlements resulting from water savings. Instead, the shares of water savings should be based on known historical data and the entitlements should be subject to the 15 year review process as specified in the Water Act 1989 (the Act).

17. The potential future impacts of climate variability and climate change on water entitlements in northern Victoria will be considered as part of the Northern Region Sustainable Water Strategy, which is currently being developed.

Limiting use

Annual cap

18. To meet the commitment that Melbourne is to be entitled to a maximum of 75 GL/y, the BE will specify an 'annual cap' of 75 GL. In other words, the BE will specify that a maximum of 75 GL can be extracted from the Goulburn River offtake in any one year. The BE will require that the diversion volume be metered and reported on annually.

19. The Act requires that BE holders comply with the specifications under that BE and non-compliance is an offence. The Act enables a range of enforcement mechanisms, for example the Minister may apply to a court for an injunction or require the BE holder to take any necessary actions to remedy the offence.

Limiting offtake rate and timing

20. The Sugarloaf Interconnector will be designed having regard to the need for operational flexibility and the timeframe over which it will be necessary to pump from the Goulburn River to Sugarloaf Reservoir. Definition of a maximum offtake rate will not be necessary as it will be limited by the 75 GL annual cap and the design capacity of the pipe and pump infrastructure.

21. The timing and rate of offtake from the Goulburn River must be consistent with the intent of the passing flow requirements under clause 11(a) and Schedule 6 of G-MW's Goulburn BE, which specify minimum flows downstream of Lake Eildon. The BE will require G-MW and Melbourne to agree, within a specified timeframe, to a set of operating rules which will ensure that water for Melbourne is ordered and released such that minimum flow requirements will be maintained. These operating rules will be submitted to the Minister for Water for approval.

Access period

22. Since the water savings for Melbourne will be sourced from the recovery of losses associated with the delivery of allocations against water shares, these savings will not be realised until a seasonal allocation is announced. Therefore, it is proposed that Melbourne's entitlement will not become available until a seasonal allocation is announced.

23. Limited resource availability due to drought or climate change may delay the announcement of a seasonal allocation, which would mean that Melbourne's entitlement would not be available on 1 July. However, the entitlement would be available as soon as a seasonal allocation is made.

Rules for accessing Murray system savings

24. Water savings for Melbourne which are realised on the Goulburn system will be held in Lake Eildon. Water savings recovered on the Murray system for Melbourne will need to be accounted for by 'back-trading' against the Goulburn Inter-valley Trade (IVT) Account, thereby effectively holding the Murray savings in Lake Eildon. Given that there is net trade from the Goulburn to the Murray system, there will be sufficient water in the Goulburn IVT Account to facilitate this 'back trade' in all years when the seasonal allocation on the Goulburn exceeds approximately 30% (based on the current level of entitlement that has been permanently traded from the Goulburn to the Murray system).

25. If the allocation on the Goulburn system is low enough, there may not be sufficient water in the Goulburn IVT Account to allow 'back-trade' of Melbourne's full Murray system entitlement. This constraint could be overcome with the construction of the Murray-Goulburn Interconnector.

Attachment A: Entitlements Framework Background

Existing Bulk Entitlements in the Goulburn-Murray Irrigation District

Goulburn-Murray Water (G-MW) holds BEs on the Goulburn and Murray systems, namely:

- *Bulk Entitlement (Eildon – Goulburn Weir) Conversion Order 1995*; and
- *Bulk Entitlement (River Murray – Goulburn-Murray Water) Conversion Order 2000.*

Under these BEs, G-MW is required to supply primary entitlement holders. On the Goulburn system, G-MW must supply water share holders, domestic and stock schemes, and regional towns. On the Murray system, G-MW must supply water share holders. Restriction rules apply when there is insufficient water to supply all primary entitlements.

Existing Entitlements to Losses in the Goulburn-Murray Irrigation District

A variety of losses are incurred when G-MW delivers water to primary entitlements. Under its Murray BE, G-MW has a specific allowance for distribution losses. However, under G-MW's Goulburn BE, distribution losses are not specifically identified. Instead, the BE states both G-MW's entitlement to take water from the Goulburn River and its obligation to supply a number of primary entitlements. The difference between these represents the losses in the system plus water stored in the system.

The losses which will be recovered under the FBMP will need to be transferred from G-MW's relevant BE to new BEs established for Melbourne. This process would be analogous to the established process for transferring loss savings from G-MW to the environment under the Living Murray and Snowy Initiatives.

Existing Urban Entitlements on the Goulburn System

CW and GVW hold BEs on the Goulburn system under which they supply regional towns. These entitlements have a very high reliability of 99% and reliability is independent of both seasonal allocations and G-MW's system operations. Instead, reliability is linked to the 24 month inflow volume to Lake Eildon which is exceeded 99% of the time. If the actual inflow over the preceding 24 months is less than the trigger, CW's and GVW's entitlements are restricted proportionately. The inflow trigger is revised every five years to ensure 99% reliability is maintained.

Existing Urban Entitlements on the Murray System

The urban water authorities on the Murray system hold BEs for the purposes of supplying regional towns from the River Murray. These BEs have the same reliability as high-reliability water shares held by irrigators and are therefore subject to seasonal allocations.

Existing Melbourne Bulk Entitlements

The three Melbourne retail authorities (Yarra Valley Water, City West Water and South East Water) hold BEs covering the Yarra, Thomson and Goulburn basins. There are nine BEs, one for each authority in each basin. The BEs in the Goulburn basin are for the Silver/Wallaby Creeks which divert water across the divide into Toorourong and Yan Yean Reservoirs.

These are source entitlements and each retail authority's BE is an unspecified share of the total inflow and storage capacity of the Melbourne supply system. The retail authorities are required to jointly manage their capacity shares as a pooled resource. The Bulk Entitlement Management Committee has been established to manage the BEs on behalf of the three retail authorities.