Water Action Coalition

Submission to Parliamentary Select Committee of South Australia

Roxby Downs (Indenture Ratification)(Amendment of Indenture) Amendment Bill 2011

Point Lowly Desalination Plant?

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Select Committee - Roxby Downs (Indenture Ratification) (Amendment of Indenture) Amendment Bill 2011

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TABLE OF CONTENTS

Section **Page**

1 EXECUTIVE SUMMARY

1.1 Introduction

This submission seeks to appeal to the common sense of both the South Australian Government (state), BHP Billiton Olympic Dam Corporation Pty Ltd (company) and the opposition to amend the Roxby Downs (Indenture Ratification) (Amendment of Indenture) Amendment Bill 2011 (indenture) to provide the flexibility to inquire into future water supply options and their security particularly given the stated aspiration of the company and the state in the Recitals (X) of the indenture:

Recitals (X)

"Health, Safety, Environment and Community (**"HSEC"**) issues are of high importance to the Company. The Company's aspiration is that its operations under this Indenture will cause zero harm to members of the public, its workforce and the communities in which it operates, and that any environmental impact of those operations is minimised. The Company, in conjunction with the State, intends to continue to take adequate measures to safeguard the public, the workforce and the environment in relation to operations under this Indenture."

The Water Action Coalition (WAC) concurs with the spirit of these recitals. However WAC believes the indenture does not reflect that aspiration in practice as it does not ensure the building of the desalination plant to the scale envisaged is a solution of last resort.

The indenture needs to make provision for not only the company but the state to inquire into the provision of alternative water supply options to either minimise the required scale of the desalination plant or do away with the need for it completely.

The state's inquiry should not be just limited to South Australia but include all other adjacent states given that all governments of Australia will benefit from the economic scale of this project.

It is acknowledged that the Assessment Report of the Environmental Impact Statement Olympic Dam Expansion (September 2011) discounted alternative water supply options, such as sourcing water from the River Murray and/or sourcing recycled water from Adelaide. However it needs to be remembered that these decisions took place at a time of political crisis during the Millennium Drought. This drought is now over.

The marine environment of Upper Spencer Gulf (USG) is rather special as the following selected quotes from section 5.1.2.2 Marine environment illustrate:

"The USG is an embayment (broad bay) that becomes more narrow and shallow as it extends north towards Port Augusta. Its mean depth of 13m drops to 7m north of Point Lowly. The region is dominated by large areas of tidal flats, deep water channels and seagrass habitats and, where conditions allow, rocky macroalgal reef or sponge communities dominate. The warm to hot climate, low rainfall, minimal terrestrial run-off and high evaporation result in the gulf being progressively more saline, approaching 48 g/L towards Port Augusta in autumn."

"Seawater circulation and exchange in the gulf is relatively limited, particularly north of Point Lowly, though there is significant exchange with the Southern Ocean in winter. The principal mechanisms for water exchange are a combination of tidal, wind driven and density driven currents. USG is the only location in southern Australia where shape and depth profiles result in significantly greater than expected tides, with ranges of more than 4m occurring at Port Augusta and 3m at Point Lowly, compared with less than 2m at the mouth of the gulf at Port Lincoln."

"Spencer Gulf has a very high proportion of marine species endemic to the region and the relatively warm water, high salinity and sheltered conditions has resulted in the unusual presence of some communities with tropical and subtropical affinities. State and nationally listed species occur or potentially occur in USG, including whale species, the Australian Sea Lion, Great White shark, dolphin species seahorses and pipefish."

WAC's Executive Summary contained within Submission 596 to the Parliamentary Inquiry into the Impact of the Murray-Darling Basin (MDB) Plan in Regional Australia has been reproduced as Appendix B to provide context and the committee with insight into WAC's comprehensive argument that the South Australian crisis of water supply from the River Murray was entirely preventable and should never have happened.

Although the Millennium Drought was real, WAC asserts that the problems experienced with the supply of South Australia's Minimum Entitlement of 1850 GL was a case of gross mismanagement of the MDB water resources, a situation that warrants an Interstate Royal Commission. The presentation given to the Select Committee Inquiry into the Lonsdale –Based Adelaide Desalination Plant on 30th June 2011, provided as Appendix A, is just as applicable to the decision to build the Point Lowly desalination plant.

The situation has changed dramatically in the space of a few short months and is illustrated by the record levels of water in MDBA public storages. According to the MDBA, total water in storage – whole of Basin stands at 19,641 GL (26/10/11). This is enough water to supply the required 200 ML per day (73 GL per year) required by the Olympic Dam Expansion (ODE) project from the proposed Point Lowly desalination plant for 269 years. Clearly both the company and state need to rethink earlier decisions given the recognised risk to the marine environment and the considerable economic costs and risks associated with building large-scaled desalination plant for the company and the state.

The Age reported 26/10/11 "Limits on water drawn from ground to increase":

"The independent Murray-Darling Basin Authority, which is drawing up draft plans to reform use of the river's water, is now considering increasing limits on water extracted from aquifers by an extra 2,400 billion liters a year basin wide. Current limits mean only 1,786 billion liters of water a year can be taken from underground systems."

The former MDBC considered "Groundwater a Resource for the Future" in 2004.

From a financial point of view, it is clear the ODE Project will have significant economic benefits not only for the state but for the nation as pointed out by Matthew Stevens of The Australian on 11th October 2011 "State and nation will make billions from massive mine." Quoting from the article:

"Olympic Dam's unofficial historian, David Upton, reckons OD will be the world's biggest mine, and yesterday the author of The Olympic Dam Story estimated the mine's targeted output of copper, uranium oxide, gold and silver would generate annual revenues of $US9.4bn ($9.48bn) at current resources prices."

In terms of the ODE water supply planned to be provided by the desalination plant of 73 GL/year, the gross annual earnings per kilolitre of water equals $129.86 per kilolitre based on David Upton's projected annual revenues. Both appendices highlight the fact that there is not one irrigation industry that gets close to the economic efficiency of the ODE project.

In terms of the total overall long-term average diversion from the MDB system of 15,400 GL per year (MDBA Guide to the proposed Basin Plan - Overview), the total planned capacity of the desalination plant of 102.2 GL represents just 0.66% of the current long-term average consumption from the basin.

Greg Kelton of the Advertiser on 14th October 2011 "Olympic Dam project to inject $8.6bn into South Australia" reported:

"Mr Foley said while $350 million a year in royalties would eventually be paid into the state Treasury, when working out GST payments to the states, the Commonwealth averaged state revenue over three years, which ensured any amount SA earned above its population share was shared with the other states. This puts SA in the same situation as resource-rich states WA and Queensland where high royalty payments result in reductions in their GST share. Under the horizontal fiscal equalisation formula, SA will keep about 7 per cent of royalties - around $24.5 million."

The above reports underscores that all states and the nation will benefit from SA's royalties and the project. If they are to benefit, they must be prepared to help out with providing one of the key resources that is in short-supply in South Australia – water. South Australia has paid a heavy price for voluntarily capping its diversion from the River Murray in the late 60's. South Australia's share of the consumptive use of the basin currently stands at 805 GL or 5.23%. It is time for the overall sustainable resource to be shared more equally and fairly to meet new demand within South Australia.

It is also clear from the indenture that this project is long-term, which in reality provides not only the state but all Australian Governments the opportunity and financial incentive to collaborate and work together to determine how the water supply needs of the expanding mining industry in South Australia can be best supplied without resorting to expensive and environmentally damaging desalination plants in either Gulf St Vincent or Spencers Gulf. There is the potential for substantial costs to be avoided or minimised.

1.2 Recommendations

It is noted that the indenture places the onus on the company to search for water:

13. THE COMPANY'S WATER REQUIREMENTS

(7) "*Underground Water Search*—The Company may, in accordance with any relevant Act and following consultation with the State, search for underground water within and outside the Olympic Dam Area. Where appropriate, in the opinion of the Company, it shall engage experienced groundwater consultants. The Company shall furnish to the Minister details of the results of any investigations and copies of any reports of such consultants as they become available."

Figure 5.7 "Predicted timing of the construction for major project components" is detailed in the ODE Draft EIS 2009 section 5. "Description of the proposed expansion" were based on government and BHP Billiton Board approval in 2010. A summary of that timing with respect to the desalination plant is contained with the following table:

Desalination plant construction	Purpose	Capability (GL/year)	As % Long-Term Av Current Consumptive Use (15,400 GL/year)	Desalination plant construction timing from commencement of removal of overburden		
				Commencement Date (years)	Completion Date (years)	Construction Period (years)
Stage 1	In-time for processing first ore	29	0.198%	2.5	5.25	2.75
	Government	24	0.156%			
Stage 2	In-time for processing 40 Mtpa	49	0.318%	11.5	13	1.5
Stage 3	In-time for processing 60 Mtpa	73	0.474%	12.75	14.25	1.5

In summary the ODE project requires just 29 GL/y within 5 years following the commencement of the removal of the overburden. A further 20 GL is required within 11 years to allow the processing of 40 Mtpa of ore and by the time the ODE is ready to process 60 Mtpa, 12.5 years down the track, a further 24 GL will be required.

The indenture needs to be amended to provide for the decision to build the desalination plant to be delayed as long as possible, and allow water to be supplied from the MDB during the initial construction stages of the project if necessary. This will allow time for an inquiry into other water resources, both potable, brackish and saline, to be considered for use by not only the Olympic Dam project but future South Australian mining projects from within the state and adjacent states.

This is clearly not a company matter but an urgent priority for the state and all Australian governments to re-allocate water to mining instead of to other less efficient industries.

Potential sources of water for consideration are as follows:

- Adelaide stormwater (50 to 160 GL/y seasonal) and wastewater (70 GL/y)
- South-East drainage scheme
- MDB groundwater and surface water
- MDB salt interception schemes
- Groundwater extracted as part of the process of coal seam gas extraction

Proposed Questions of the Indenture of the company and the state:

a. What are the expected capital and annual operating costs of the following items of infrastructure:

   i. Each stage of the desalination plant?

   ii. Pipeline and associated infrastructure to pump water from the desalination plant to Olympic Dam?

   iii. The required electricity supply infrastructure to generate and supply the power required by the desalination plant and to pump the water to Roxby Downs?

   iv. What is the expected cost to recover capital and operating costs to supply desalinated water to Roxby Downs or to third parties?

b. What is the contingency plan should the desalination plant not meet environmental requirements or suffer operational problems due to unforseen events that affect ODE production?

There is no doubt in the mind of WAC that both the company and the state would benefit significantly from a public relations point of view if the building of a desalination plant could be avoided in Spencers Gulf and at the same time, the pressure on the Great Artesian Basin could be relieved to sustainable levels.

It is clear from the ODE timeline and the history of delays to achieving approval by the company board (Presentation to the Australian Institute of Management "Olympic Dam Expansion Project" (AIPM) 8th September 2006) that there is time to solve South Australia's water supply problems without resorting to desalination.

c. In September 2006, the ODE was estimated to require 48 GL/y. Given the ODE project now requires 73 GL/y, can the company explain why the water requirements were increased by 52%?

d. Has the company or the state considered using Independent Verification and Validation for strategic environmental and technical risks that are key to the success of the project during the design, development and construction phase of the project?

WAC would welcome the opportunity to discuss these matters with the members of the select committee if required.

A PRESENTATION – SELECT COMMITTEE 30/6/2011

Londsdale-Based Adelaide Desalination Plant - Select Committee

Millennium Drought & SA River Murray Crisis

The Consequences for South Australia – Avoidable

Londsdale-Based Adelaide Desalination Plant - Preventable

John Caldecott
Convenor

Water Action Coalition

http://civictrust.net.au/page19.htm

1

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

Twenty-years of water reform, led by Canberra, failed South Australia when it counted the most, during the Millennium Drought. What happened was un-Australian. It was driven by market greed once water was finally converted into a commercial commodity. To avoid public scrutiny, it was given away for free to irrigators by state water allocation plans to allow their trade to the highest bidder.

WAC further asserts the crisis in South Australia's section of the River Murray was avoidable by better demand management by governments. The problems began in the late 80s and continued to compound as water reform or better called water privatisation progressed.

The contract to build the Adelaide Desalination Plant was framed in a "climate of crisis" created by the Rann Government as it went along with the flow and the National Water Initiative. This in turn was reflected in the Adelaide Aqua contract and the need to build the plant as quickly as possible. The debt created as a consequence has been used to justify further privatisations and austerity measures to cut wages and conditions of the public service. A significant opportunity to save Adelaide Coastal Waters has been lost and will be made worse by the toxic pollution from the desalination plant.

Topics

- Some History
- What Happened During Millennium Drought
- Conclusions
- Recommendations

(Capacity of Adelaide Desalination Plant is 100 GigaLitres or 100,000 Megalitres)

2

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

During the drought both the Howard and Rudd Governments failed to prevent the disaster. Beginning with the Bannon government, successive South Australian governments went along with the flow of water reform and the COAG reform club.

In 2007 flows to South Australia fell significantly below our Minimum Entitlement of 1850 GL. Calls for a "State of Emergency" by the "The Advertiser" in July 2008 went unheeded. An Interstate State of Emergency in the basin should have been called when a dredge was required to keep the Murray Mouth open.

Note that since the floods, flows over the border into South Australia have ranged up to approximately 90,000 megalitres or 90 gigalitres per day! Flows are currently around 20,000 megalitres per day. The Adelaide Desalination Plant is only capable of producing 270 megalitres per day when fully operational.

River Murray Crisis – Been Before
Cartoon "The Critic" 11 October 1902

Image courtesy of the State Library of South Australia
The Critic (newspaper) 11 October 1902, p.16.

ACCC Water Monitoring Report 2009-10

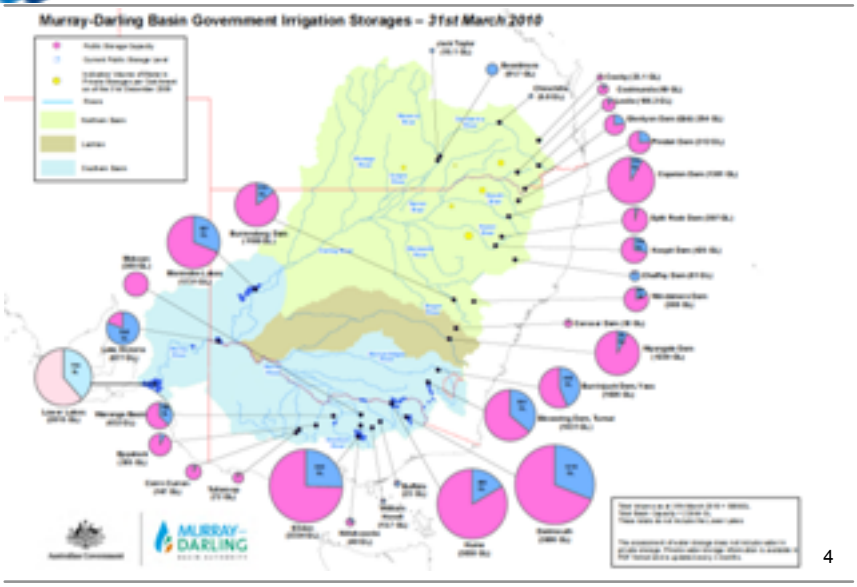
***Select Committee Hearing* : Adelaide Desalination Plant** *30th June 2011*

Of course we have been here before, the problems of early irrigation were investigated by the 1902 Interstate Royal Commission which led to the system of regulation in the River Murray. This process has not yet been repeated as private economic interests are being put before the common good. As a consequence, the government has lost its mojo.

Fragile environments continue to be put at risk; by desalination plants, stormwater, waste water, marinas and deep water ports in South Australia. I would not be at all surprised if the damage to the marine environment from these sources far exceed that of recreational anglers.

According to Peter Ralph of UTS "Seagrass meadows, mangroves and salt marshes have recently been identified as some of the densest carbon sinks by area. They store five to ten times the carbon held in tropical forests and they hang on to this carbon for very long periods of time. "It is estimated that seagrasses cover 5,000 km^2 of the sheltered waters of Gulf St Vincent." They are one of this state's treasures that should be preserved at all costs.

MDB Government Irrigation Storages



4

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

There are 65 major storages and 600,000 private dams in the basin.

They are capable of diverting one and half times the average flow of every river.

In addition there are 25,560 km of irrigation supply and drainage channels.

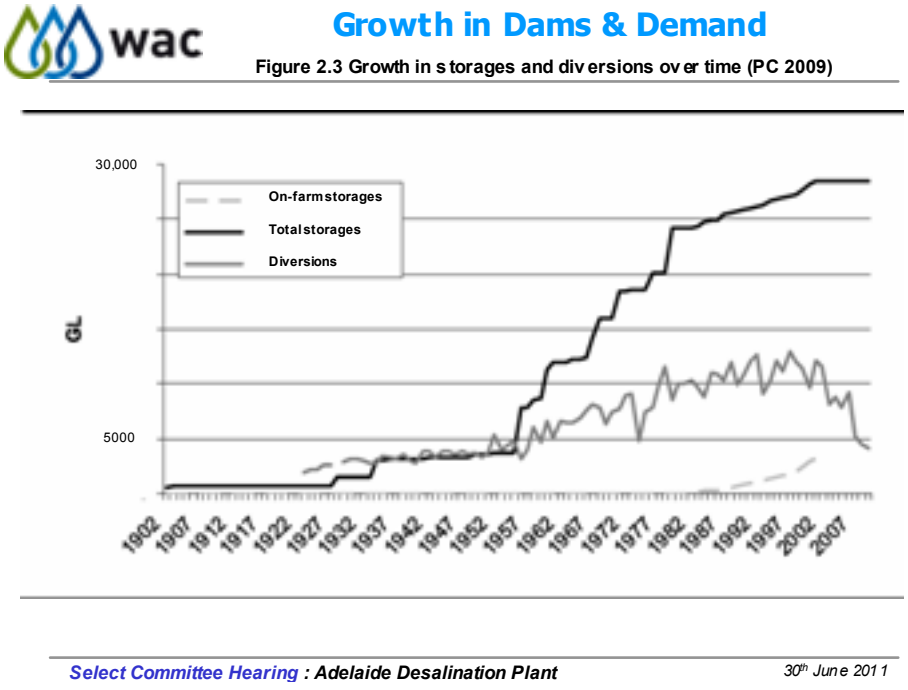
Total public storage capacity is 22,664 GL.

If an Olympic size swimming pool was this volume, the Adelaide Desalination Plant would be a very expensive 11,000 litre rainwater tank!

Dams were established to drought-proof or rain-proof the basin.

These storages currently hold 83% or 18,361 GL.

It would take the Adelaide Desalination Plant 184 years to produce this volume of water.

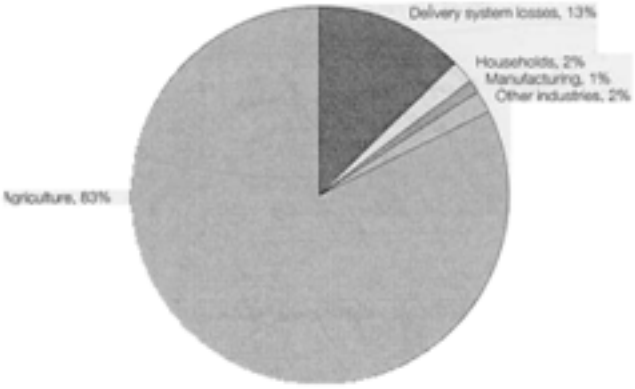


Diversions from the Basin increased 331% from the 1950s to 2000.

It is also clear the Interstate Royal Commission of 1902 served South Australia well for most of the last century until economic rationalism arrived.

Water Consumption in MDB -2004-05

Figure 3.2: Water consumption in the MDB in 2004–05



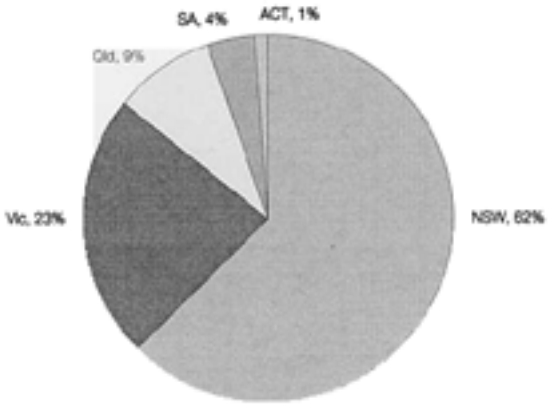
Source: ABS, ABS4610.0.55.007, *Water and the Murray-Darling Basin: A statistical profile, 2000–01 to 2005–06*, August 2008, p. 53.

ACCC Water Monitoring Report 2009-10

In 2004-05 households consumption from the basin was 2%, or 189 GL of the basin consumptive water resources, industry 1% and agriculture 96% including losses.

Manufacturing & Mining 2005-06 (< 1%)

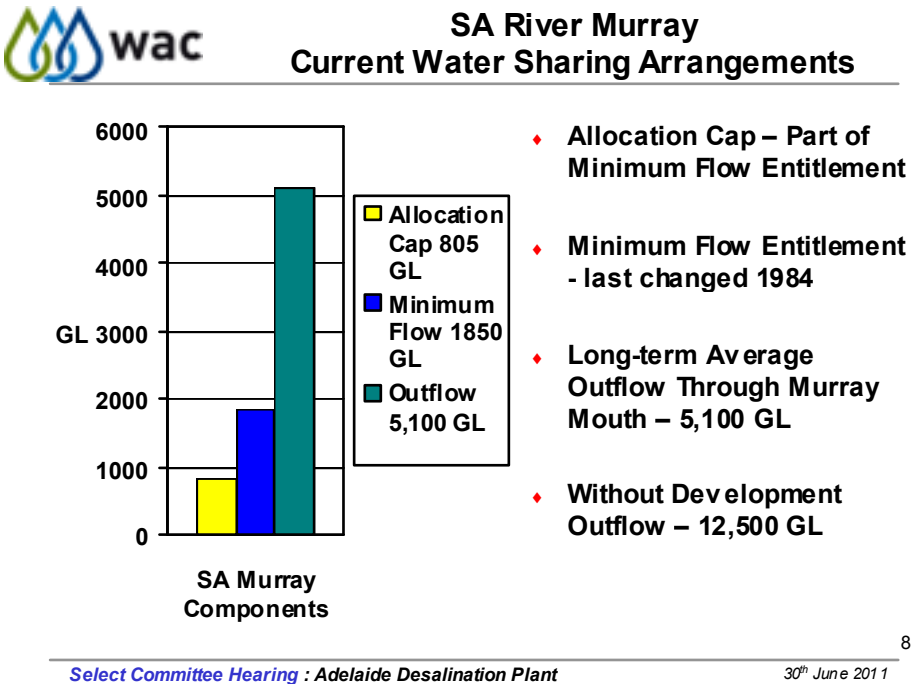
Figure 3.6: Manufacturing and mining water use in the MDB, 2005–06



Source: ABS, ABS4610.0.55.007, *Water and the Murray-Darling Basin: A statistical profile, 2000–01 to 2005–06*, August 2008, pp. 59–60

ACCC Water Monitoring Report 2009-10

In 2005-06 manufacturing & mining used less than 1% of water of the basin consumptive water resources. Of this amount NSW used the largest proportion.



The Minimum Entitlement of 1850 GL maintains water level from the border to the barrages. Included is a diversion cap of 805 GL. The cap was a result of the 1967/68 drought and in modern terminology, South Australia already has a Sustainable Diversion Limit designed around drought conditions.

Former Minister Maywald increased the cap for irrigation by 76 GL in 2008 the same year the 50 GL Adelaide Desalination Plant was announced.

The average outflow of 5,100 GL is what should be happening under current water sharing plans. **This needs to become a regulated outflow**.

SA River Murray Water Allocations

July 2008

Water Use Purpose	Allocations of Water (GL)
Irrigation	554.0 (68.9%)
Industrial	4.2 (0.52%)
Stock and Domestic	6.8 (0.84%)
Recreational & Environmental	22.9 (2.8%)
Metropolitan Water Supplies	650 (over a rolling five year period) i.e. 130 GL five year average (16%)
CountryTown Water Supplies	50.0 (6.2%)
Wetlands	15.8 (2%)
Environmental Land Management	21.3 (2.7%)
TOTAL	805

9

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

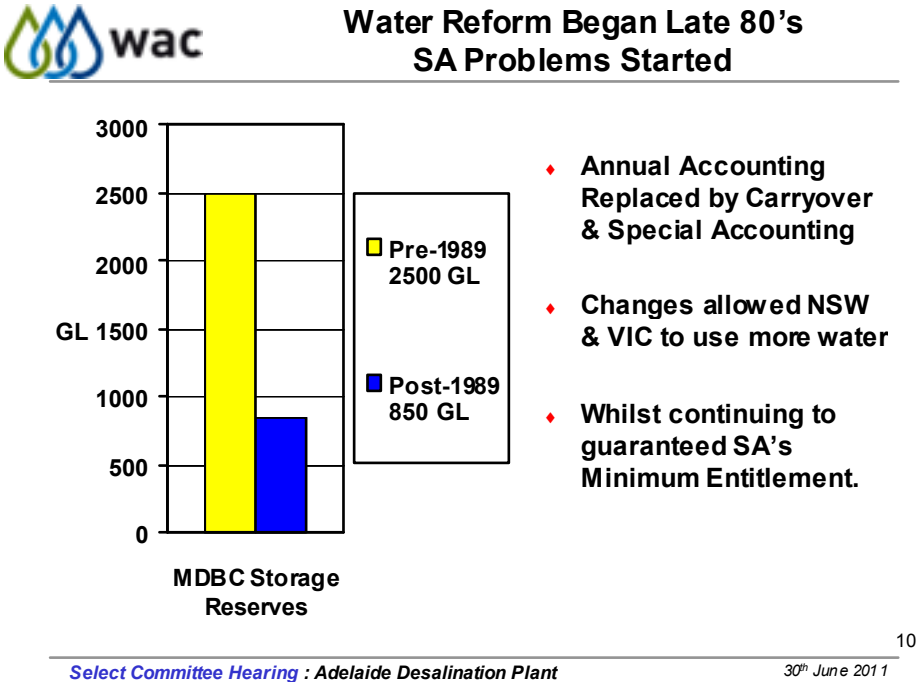
The cap in South Australia for urban water is 180 GL and 554 GL for irrigation.

The majority of water is piped. The scale of the efficiency of water use is unmatched by the eastern states.

The cap is also a barrier to water trade.

The Basin Guide makes no commitment to its continuance.

South Australia's long-standing conservative approach to water management is at significant risk from water reform.

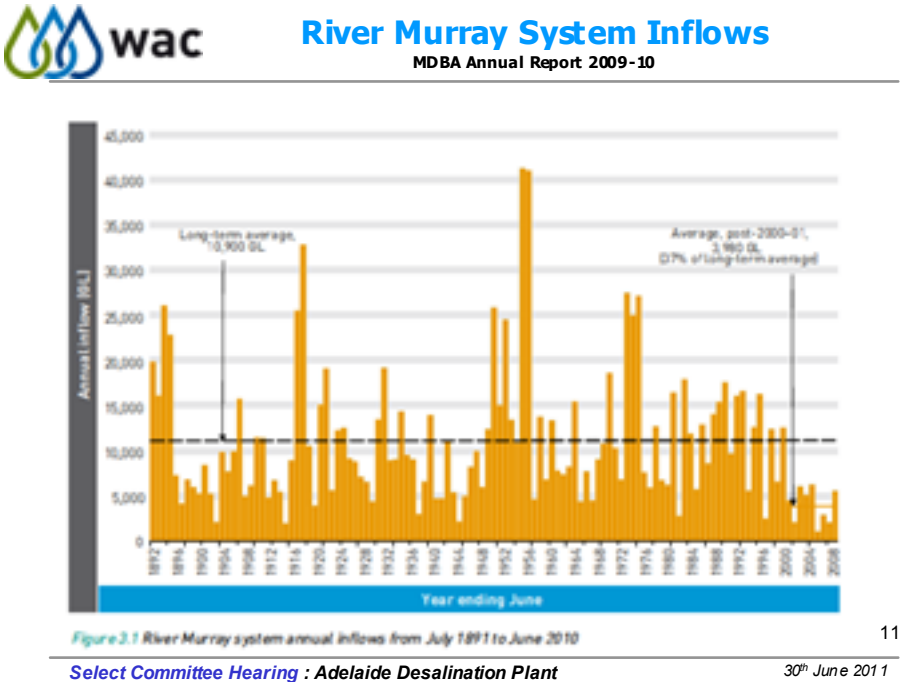


In 1989 the Bannon Labor Government agreed to reduce the storage reserve designed to safe-guard South Australia's Minimum Entitlement. This reserve was reduced from 2,500 GL to just 850 GL to allow upstream states to use more water, and they did.

Carryover allows upstream irrigators to keep unused water allocations, particularly for those growing annual crops vs permanent plantings.

This turned public water storages into private water banks.

Privatisation of water is taking place by unbundling water licenses from land to allow their trade by state Water Allocation Plans. These plans are subject to the approval of the Minister for Water and become statutory documents once approved.



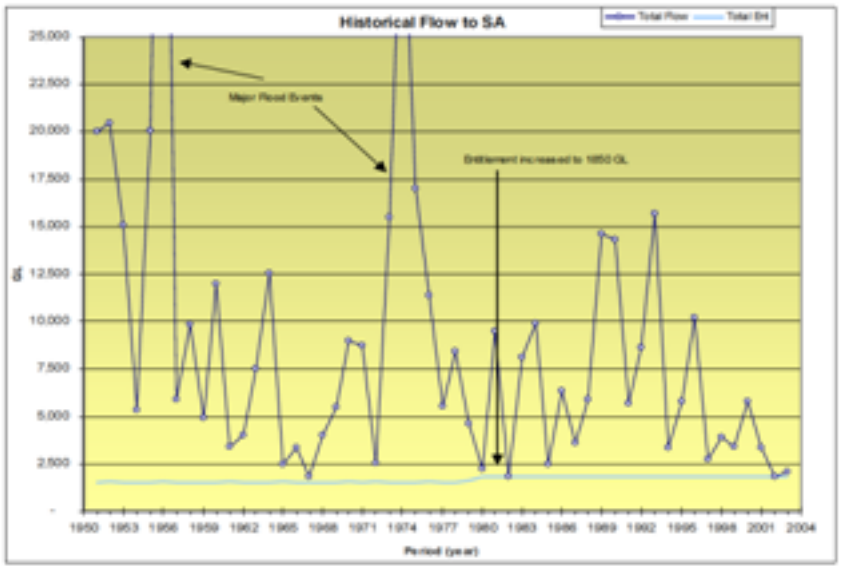
Severe droughts and major floods are routine in the Basin, it is not climate change but climate variability.

Inflows can range from a few thousand to 40,000 GL.

They began to trend down in 1996. Post 2000 the average inflow was 3,900 GL.

Designing consumption around long-term averages misrepresents the true picture. Above average flows occur only 34% of the time because major flood events creates significant bias in the statistic. Such statistics should not be used. The use of long-term averages are mandated in the Commonwealth's Water Act of 2007.

Historical Flow to SA (DWLBC 2010)



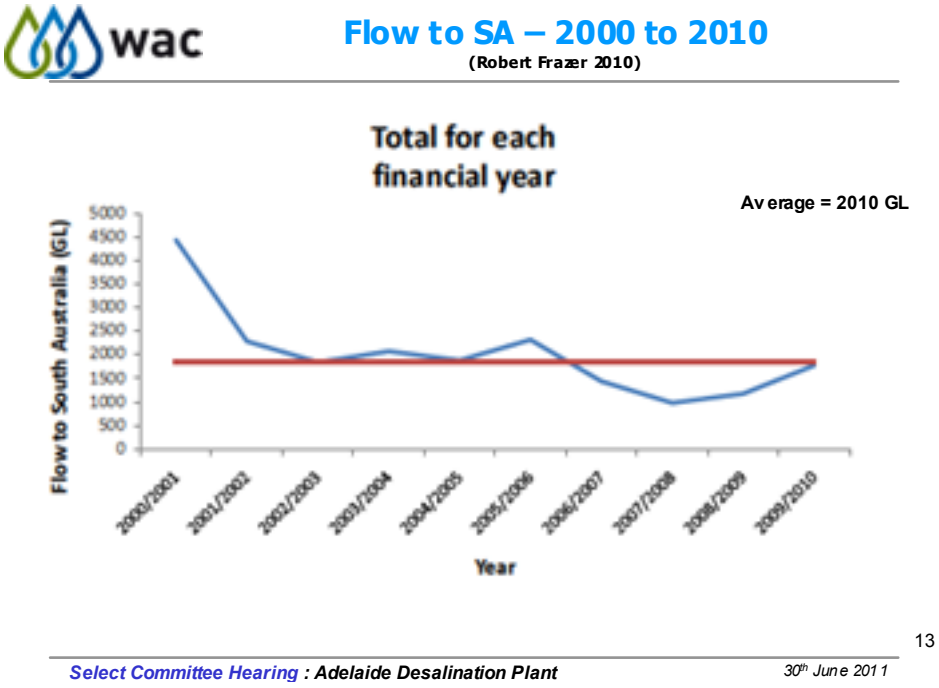
12

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

Since the 1990s the trend of in-flows to South Australia began to trend dramatically down.

First to go was the unregulated flows through the Mouth.

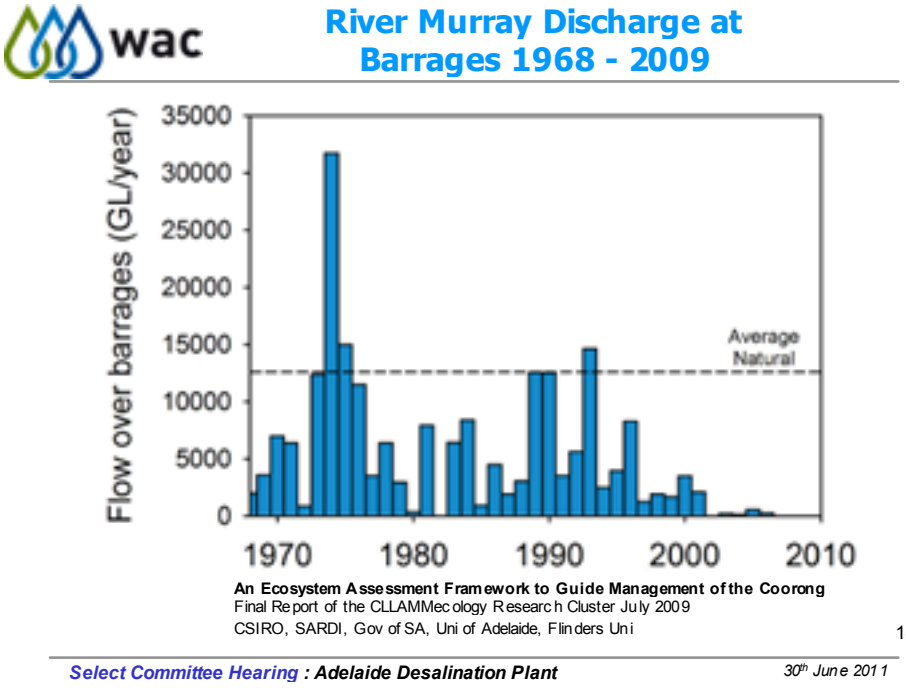
By 2003 all that left was South Australia's Minimum Entitlement, the blue line at the bottom of the graph.



The flows below 1850 GL caused South Australia's crisis.

They were used to justify the interventions in the River Murray, the 100 GL Adelaide Desalination Plant and the Langhorne Creek Pipeline. This pipeline, which as tradition dictates was mostly paid for by public money of upwards of $100 million, was then given away to the Creeks Pipeline Company Ltd for them to operate and benefit from. This was done to establish a further component of the new private water industry being planned by the Rann Government without the approval of the South Australian people.

The average flow during this decade of 2010 GL shows we could have survived by careful flow management.



The bar graph of discharges through the Barrages illustrates the impact of bias in water sharing plans vs. the environment. This bias has been in place since 1895.

The river's share of water can fall to 20% during severe droughts and rise to 80% during major floods.

Significant problems are created when there are persistent years of low flows as occurred during the Millennium Drought.

This is not the fault of irrigators but the fault of Governments who failed to adequately manage the appropriation of water.

Government Costly Expenditures

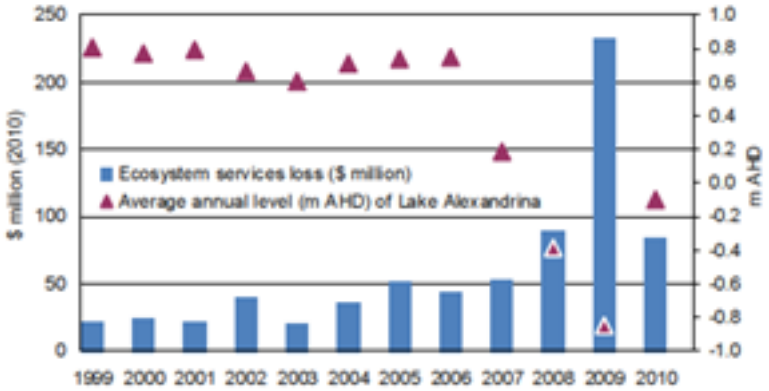


Figure 4.5 Magnitude of ecosystem services loss (in $ million) and levels (m AHD) of Lake Alexandrina

Goyder Institute 2011 – Science Review Basin Plan
Page 42 "The cumulative value of this loss was estimated at over $790 million."

15

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

This is a graph from the recently released Goyder Institute report which reviewed the Basin Guide for implications on South Australia. The total amount of these costs, which are detailed in Table 4.2 of the report amount to $791 million and do not include costs associated with building the Adelaide Desalination Plant. Quoting from the report "These ecosystem service losses may have been significantly reduced had the system been provided with base and environmental flow requirements."

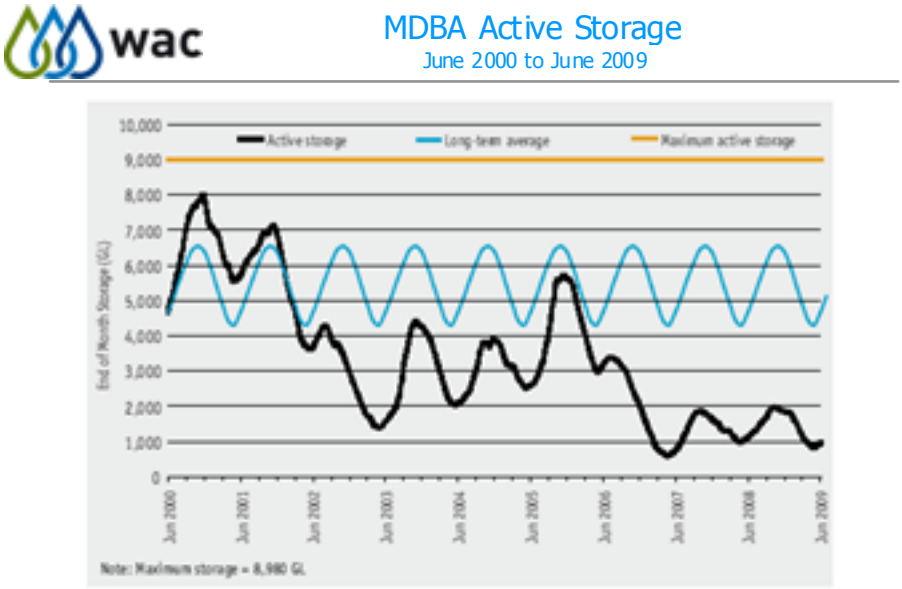


Figure 3.3 MDBA active storage, June 2000 to June 2009

16

MDBA Annual Report 2008-09 & **ABARE-BRS** Australian climate and agricultural monthly update – October 2010

Between 2000 and 2007, significant draining of basin storages took place.

Public storages went from a record high of 13,900 GL in 2000 to a record low of 500 GL by 2007.

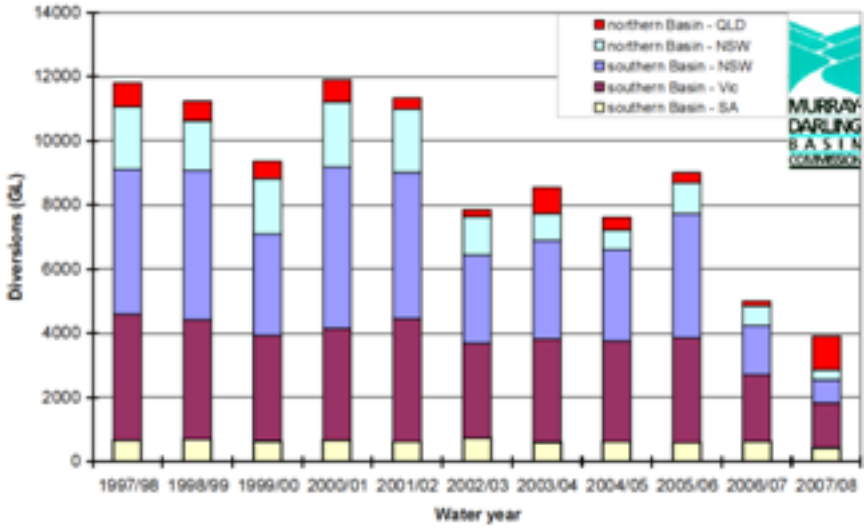
Quoting from a May 2006 New South Wales government document:

"Typically, NSW makes as much water available to licensed water users in any year as is available to the State, within the limits of the Murray-Darling Basin cap. This maximises water use in any one year but means that NSW maintains minimum water reserves for the next year. This is a deliberate policy of NSW that ensures that it is the decision of the individual user whether to use water or not to use the water they are entitled to, trade the water or save some to carry-over into the following season."

This was clearly not designed for a sustained drought or to meet its obligations to ensure sufficient flows to South Australia.

Basin Wide Diversions

Figure 5. Basin-wide diversions for the years 1997-98 to 2007-08. (MDBC 2008)



17

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

Given the scale of basin wide diversions, it is clear the reduction of inflows which began in 1997 were ignored.

South Australia's share of diversions is the yellow bar at the bottom of the graph.

River Murray Water Sharing

Statistic	2005/06	2006/07	2007/08	2008/09
Flow to SA (GL)	2311	1433	973	1170
Difference vs. 1850 (GL)	461	-417	-877	-680
Basin Wide Diversions (GL)	9,228	5,260	4,514	4,119
Irrigation Allocations SA (%)	70 - 100	80 - 60	4 - 32	2 - 18
Total Temporary Water Trades (GL)			1,231	1,883
Snowy Borrows (GL) (Total 2002/06 = 795 GL)	273			
Water Diverted for Cotton, Rice, Cereals, Pasture (GL)	6,179			

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011* 18

Total surface water diversions between 1997 and 2009 totalled 104,680 GL. **Our share was 6%. Just 1.7% of this water would have prevented South Australia's disaster.** Urban users were put on water restrictions. Irrigators allocations were cut but there was no restrictions on what their water could be used for. Most is used for export. The failure and consequences for South Australia were spectacular and exceed the State Bank Disaster in terms of the total economic, environmental damage and social costs. Murrumbidgee irrigators were allowed to borrow 795 GL from the Snowy. Diversions for cotton, rice, cereals and pasture amounted to 11,766 GL in 2004 to 2006 alone. Just how much irrigation water was used to support the live cattle, sheep and cow trade for example while South Australians were made to suffer? During the depth of the drought the highest average price for temporary water in 2008-09 was 37 cents per kilolitre. 100 GL of temporary water would have cost South Australia $37 million. It is now worth 2 cents per kilolitre i.e. $2 million for 100 GL. 100 GL of permanent high reliability water would have cost $310 million. What Government in their right mind would build a 100 GL Desalination plant at a cost of $1.8 billion with operating costs of $200 million per year when water was availability from the basin?

MDBA Irrigated Farms Performance 2005 – 06

MDBA Basin Plan: BP02 Sept 2009

GVIAP

Gross Value of Irrigated Agriculture Production

Industry	No Businesses	Water Applied GL	GVIAP $m	GVIAP$/kilolitre
Cereals	1,714	624	180	0.29
Hay	4,159	649	161	0.25
Cotton	638	1,574	798	0.51
Rice	1,055	1,251	274	0.22
Other broadacre crops	490	118	np	np
Fruit & Nuts	3,116	413	1,011	2.46
Grapes	4,845	515	721	1.40
Vegetables	1,062	152	555	3.65
Nurseries, cut flowers & turf	426	12	150	12.31
Diary	3,170	1,028	901	0.88
Meat cattle	6,181	554	593	1.07
Sheep & other livestock	3,422	439	143	0.83
Totals	18,634	7,370	5,522	0.75

19

Select Committee Hearing : ***Adelaide Desalination Plant*** *30th June 2011*

In 2005-06, 18,634 irrigation businesses used 7,369 GL of basin water.

The gross value of their production averaged 75 cents per kilolitre of water used.

Those who used the most water earnt the least.

Almost the entire Australian cotton crop is exported as virtual water, with little local value adding.

Industry Water Consumption

Figures Sourced MCA Submission to NWC

IGVA

Industry Gross Value Added

Industry	IGVA ($m)	Water Consumption (GL)	IGVA / Vol ($ / kilolitre)
Forestry and Fishing	$2,347	51	$46.02
Mining	$64,223	413	$155.50
Manufacturing	$99,688	589	$169.25
Water Supply	$7,407	2,083	$3.56
Electricity and Gas	$14,444	271	$53.30
Other Industries	$577,333	1,059	$545.17

20

Select Committee Hearing : Adelaide Desalination Plant *30th June 2011*

Irrigation is a poor cousin when compared to the economic efficiencies of other industries and Australian households.

In 2005/06, the Australian median household earnings per kilolitre of water used was $221 per kilolitre.

The consequences of not using water from the Basin makes neither economic or environmental sense when the alternatives are desalination plants.

The water for BHP Billington's Roxby Downs project should come from the basin or by piping recycled waste and stormwater from Adelaide, perhaps a new role for the Adelaide Desalination Plant?

MDB Water Entitlements Market

Table 3.2 Tradeable water entitlements on issue, 2007-08 (PC 2009)

	Regulated systems		*Unregulated systems*		*Groundwater*	
	Number	Nominal volume (GL)	Number	Nominal volume (GL)	Number	Nominal volume (GL)
NSW	10 401	8 464	1 345	110	2 867	1 004
Victoria	37 260	3 550	7 704	162	6 236	490
Queensland	10 893	3 142	1 018	349	369	76
SA	3 703	980	223	1	5 719	215
ACT	27	64	0	0	114	1

Source: NWC (2008).

Total Regulated 16,200 GL; Total Unregulated 622 GL; Total Groundwater 1,786 GL

SA Share Regulated 6% Unregulated 0.2% Groundwater 12%

21

Select Committee Hearing : Adelaide Desalination Plant *30th June 2011*

Tradable water entitlements on issue of 16,200 GL were originally granted for free by State Governments as they were a license to use water. They are now being given away for free again to create the new water market which allows anybody to purchase our water.

South Australia holds just 6% becaused it capped diversions in 1967/68. In the scheme of things, South Australia deserves more water for consumptive use and more reliable environmental flows.

During the drought, diversions ranged from 12,123 GL in 2000-01 to a record low of 4,119 GL in 2008-09.

Clearly, significant quantities of these entitlements are worthless and need to be cancelled by the States. A significant amount of the water being purchased by the Commonwealth is common water vapour (air space).

Gomersal Road Tanunda SA 4th November 2008

22

Select Committee Hearing : ***Adelaide Desalination Plant*** © John Caldecott *30th June 2011*

This is a picture of a broadacre farm being converted to grapevines on the Gomersal Road Tanunda in 2008.

What Government in their right mind would allow the conversion of a viable dry broadacre farm into irrigated vineyards during one of the most protracted droughts in history?

Conclusions

- **The River Crisis in South Australia was avoidable**
- **No Need to Build Adelaide Desalination Plant or BHP Billington Desalination Plant in Upper Spencer Gulf**
- **Systemic failure in governance to conserve and place restrictions on what could be grown**
- **The Commonwealth water buyback of 900 GL failed South Australia. They did not call a "State of Emergency"**
- **South Australia's model of Minimum Entitlement and Cap should be copied not destroyed.**
- **Basin Plan Sustainable Diversion Limits need to be set for the full range of water availability scenarios and not just long-term averages.**

23

Select Committee Hearing : Adelaide Desalination Plant *30th June 2011*

In 2007-08 the National Water Commission released its first national water market report, 1,231 GL of temporary water was traded in that year. In 2008-09 this grew to 1,883 GL.

Despite the severe drought water was available in the basin.

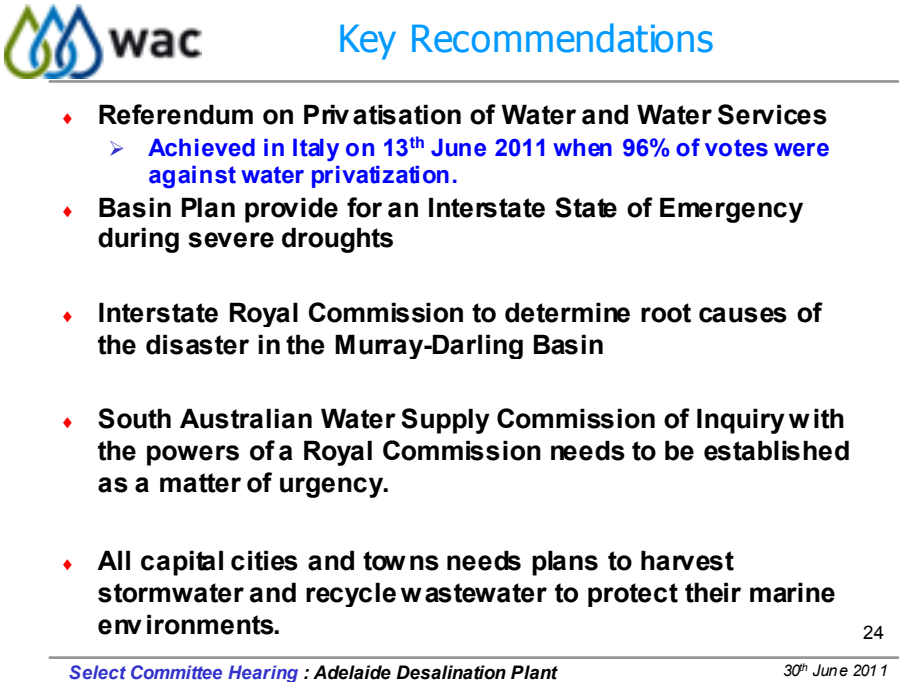
The Commonwealth failed to call a State of Emergency to prevent South Australia's disaster.

Instead they left us to the mercy of the new national water market.

Their water reforms can not be trusted by South Australians or by its agencies such as the MDBA, set up to implement its economic reform agenda.

South Australia's decades of water conservation should be copied and not destroyed. We deserve more water not less.

The Basin Plan needs to be designed around droughts and not only floods.



South Australians need to know where our politicians stand on upholding the public's trust that water remains their common property. A referendum must be held to debate and approve the privatisation of water and water services.

The draft Water Industry Act is more Commonwealth economic reform to privatise the common property of South Australians. Its objective is to further breakup water supply and services to create a private water industry.

While "SA Water" remains a corporation it will be privatised. Water reform's market principles are being applied to all prescribed water regions of the state through Water Allocation Plans. South Australia will loose control of its water.

Only a South Australian Water Supply Commission of Inquiry will be able to unravel the decades of bad policy and gross mismanagement of water and its consequences without political and market interference.

Both Sir Thomas Playford and Don Dunstan would have acted by now. Lastly it is time to focus on saving our Gulfs from stormwater, wastewater, desalination brine and unsuitable development, our seagrass beds are hidden carbon treasures.

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B WAC PARLIAMENTARY SUBMISSION WAC-D-005 - EXTRACT

This extract is from the Executive Summary of WAC's submission to the Parliamentary Inquiry; "Inquiry into the Impact of the MDB Plan in Regional Australia" Submission 596 issued on 8th February 2011.

A.1 Context

Australia is still reeling from the devastation of the Queensland and New South Wales floods, which have been described as our nation's greatest natural disaster: a million square kilometres of land inundated thousands of homes damaged or destroyed and twenty-eight lives lost.

Within days the Queensland Government announced a Royal Commission and committed sufficient funds to rebuild entire communities. The cost of reconstruction is estimated to exceed $20 billion.

In 2009, twenty-six communities in Victoria were ravaged by fire with thousands of homes destroyed. Reconstruction is underway and the recommendation of a Royal Commission adopted.

Australia responds well to natural disasters and yet the most urgent economic, ecological and human threat of our time is not being addressed with the same urgency and resolve.

Decades of mismanagement of the River Murray and Murray-Darling Basin continue to threaten the viability of towns throughout the Basin. Regional economies are collapsing. The social consequences have included bankruptcy, family break-up and suicide.

Poor policies have resulted in inappropriate initiatives. South Australians are now paying for massive investment in an unnecessary desalination plant that will add to the degradation of Gulf St Vincent and increase the price of urban water supplies tenfold within a decade.

The true extent of the crisis is well documented, but the real cost will not become apparent for many years. Much-needed flows resulting from the recent upstream floods will provide the River Murray, Lower Lakes and Coorong with only a temporary reprieve.

A.2 Introduction

The Water Action Coalition (WAC) is a broadly based movement of community groups and environmental organisations formed in response to growing public concern about the degradation of the River Murray and related water issues in South Australia.

WAC comprises twenty-five representative community organisations from across South Australia and takes its knowledge from an authoritative reference group of eminent scientists, environmentalist and water specialists. Its patron is Maude Barlow who served as Senior Advisor on Water to the 63rd President of the United Nations General Assembly during 2008/2009.

The mission of WAC is to ensure a sustainable water future for South Australia. A future that ensures an equitable use of all water resources for future generations in a manner that does not compromise interdependent ecosystems, both freshwater and marine.

What follows is a précis of evidence contained within WAC's submission to the MDBA, which debunks the myth that the crisis in water supply, which affected the city of Adelaide and other urban centres in South Australia, was primarily a consequence of drought. It was in fact a man-made problem, which also impacted on the rural sector, especially South Australian communities reliant upon the River Murray.

WAC's submission to the Authority asserts that the crisis in South Australia was entirely due to bad policy, over allocation upstream of the South Australian border and failure to conserve as the drought became more protracted. The following analysis of events questions the actions taken by both federal and state governments and provides evidence that the same governments are guilty of a substantial conflict of interest, in being required to act for the public common good whilst simultaneously assisting private interests to establish a water market.

A.3 Basin Management – A Historical Perspective

For thousands of years, the Aboriginal nations of the Murray-Darling Basin learnt to live with and adapt to climate change and natural climate variability, ranging from extreme drought to major flood. Prior to development, the natural average flow through the Murray Mouth averaged 12,500 GLs per year and the Murray Mouth never closed.

The situation changed in the late 1800s with the first diversions of the waters of the Murray-Darling river system. Since then there has been a state-based tug-of-war over the use of those waters to sustain economic development as opposed to the environmental health of the Basin.

The Commonwealth of Australia was founded 1901; its Constitution endorsed by Australians via referendum. Of profound significance to the governance of the waters of the rivers of Australia, Section 100 of the Australian Constitution states:

"The Commonwealth shall not, by any law or regulation of trade or commerce, abridge the right of a State or of the residents therein to the reasonable use of the waters of rivers for conservation or irrigation."

Sir Isaac Isaacs, the Victorian delegate to the Constitutional Convention, made clear the context in which the water of Australian rivers was regarded by delegates when section 100 was being debated:

"*Isaacs stressed the need for a decision to be made on its merits from a national perspective, given that rivers "by their very existence and course, are the common property of Australia*" (Water Politics in the Murray Darling Basin 2007)

Sir Isaac Isaacs rose to the position of Chief Justice of the High Court and was subsequently appointed Governor General of Australia.

Royal Commissions are the highest form of public inquiry into matters of substantial public importance. In 1902, an Interstate Royal Commission was established by the State Governments of New South Wales, Victoria and South Australia, to inquire into mismanagement of the Basin, which was having major impacts in South Australia (A Fresh History of the Lakes: Wellington to the Murray Mouth, 1800s to 1935).

The trigger for the Royal Commission was a conference held in Corowa in 1902, organised by a groups of agriculturalists known as the River Murray Main Canal League, who sought an assured water supply. The Premiers of New South Wales and Victoria, the Attorney-General of South Australia and the new Prime Minister, Edmund Barton, also attended this conference, to discuss regulation of the river.

Who 'owns' the Murray? Corowa Water Conference and Interstate Royal Commission 1902

"*A prolonged drought from 1895 to 1902 drew attention to the fact that cooperation between the River Murray states and the Commonwealth government was needed to draw up regulations for Murray water use, particularly necessary in times of drought. The outcome of the community driven meeting at Corowa was the establishment of a Royal Commission to report on 'the conservation and distribution of the waters of the Murray and its tributaries for the purpose of irrigation, navigation and water supply*".

"*The Royal Commission found that the navigability of the lower Murray would eventually be secured by the use of locks and weirs but until then South Australia must be ensured a certain volume of water and New South Wales and Victoria were restricted to taking a specific amount.*" (State Library – Government of South Australia).

Low Flows Sustainable Diversion Limit

This "certain volume of water", now known as the minimum entitlement, was last adjusted in 1984 and currently stands at 1850 GL; comprising a dilution flow of 696 GL and diversion entitlement of 1154 GL. South Australia has imposed a cap on its diversion entitlement since the late 60's. This cap currently stands at 805 GL, 5.2% of the current average total consumptive use throughout the Basin (15,400 GL) recently estimated by the Authority.

The cap was last increased, by 81 GL in 2008, by then Minister Maywald, to allow for water trade for irrigation. In that same year the Rann Government announced that a 50 GL per year desalination plant would be constructed at Port Stanvac in outer Adelaide. This was later doubled in 2009 to 100 GL. The following quote from Securing the Future: Long-Term Plan for the Coorong, Lower Lakes and Murray is insightful:

"*Recent water allocation history in South Australia – In recognition of the stressed condition of the River Murray, South Australia ceased issuing any additional irrigation entitlements after the 1967-68 drought. However, other states did not follow the lead set by South Australia and continued to increase irrigation entitlements for over 30 years*"

The placing of a cap on irrigation entitlements precluded the issuing of further water entitlement licences. South Australia now holds just 6% of total regulated water entitlements of 16,200 GL, 0.2% of unregulated water entitlements and 12% of groundwater entitlements in the Basin (PC 2009).

South Australia chose reliability of water supply during low flows and a guaranteed monthly flow that varied with the season. This decision was made to sustain irrigation, water supply to the cities and towns of South Australia, water levels and freshwater ecosystems to the barrages and the structural integrity of over 100 kilometres of public and private levee banks established below Lock 1. In today's language this should be recognised as a "Low Flows Sustainable Diversion Limit".

The reliability of water supply to South Australia was underpinned by the requirement for New South Wales and Victoria to hold a reserve of 2,500 GL in Murray-Darling Basin Commission (MDBC) reservoirs. However, in 1989, South Australia agreed to a reduction of the reserve to 835 GL and a series of other changes:

"*Up until 1989 it was also required that a reserve of 2,500GL is available in the MDBC reservoirs at the end of each water year.*"

"*Under the Murray-Darling Basin Agreement, that reserve has been reduced to a minimum reserve of 835GL. This is held equally by New South Wales and Victoria, effectively 417GL each.*"

Reference: Background to water management: in the NSW Murray and Lower Murray-Darling River Systems May 2006.

These new agreements disadvantaged South Australia from the moment that they were signed. When combined with the Council of Australian Governments (COAG) Water Reform Agenda of 1994 and the National Water Initiative of 2004, a social, economic and environmental disaster was precipitated in South Australia. These initiatives are clearly inconsistent with Section 100 of the Australian Constitution, which stipulates that a state is allowed only "*reasonable use of the waters of rivers*" and that all residents of a state have equal rights to that use. This latter aspect was ignored by the NWI as the following quote from clause 27 of the agreement demonstrates:

"Recognising that States and Territories retain the vested rights to the use, flow and control of water, they agree to modify their existing legislation and administrative regimes where necessary to ensure that their water access entitlement and planning frameworks incorporate the features identified in paragraphs 28-57 below."

CSIRO The Murray-Darling Basin Sustainable Yields Project

This project concluded in 2008. One of the most insightful graphs published by CSIRO was a time series at Wentworth (integrating the MDB) of total effective surface water use (including down-stream use), total without-development flow and relative level of surface water use under the historical climate. Some of the key observations are as follows:

- From 1895 to late 2005 the relative level of water use from the Basin has varied from less than 20% during big floods to 80% during severe droughts.
- The relative level of water use is largely independent of the growth in the capacity of major storages that began to dramatically increase from the mid-fifties to just under 35,000 GL by the late 80's.
- Annual inflows range from a few thousand GL during a severe drought to in excess of 40,000 GL during a big flood.
- Some parts of the southern parts of the MDB experienced a 1 in 300 year drought during the Millennium Drought.

Reference: Water Availability in the Murray-Darling Basin – CSIRO October 2008

Given South Australia's low flows Sustainable Diversion Limit, it is easy to understand the following statements made in the CSIRO's presentation on the Murray Region under current water sharing arrangements:

- "*Adelaide and SA rural town water supply would be unaffected under this or any 2030 climate (change model) scenario*"
- "*The modelling indicates that levels in the Lower Lakes would not fall below mean sea level under any 2030 climate (change model) scenario, although minimal lake areas would be lower than under the historical climate in very dry years" (assuming full implementation of SA allocation practices)*

Reference: Presentation for the Murray Region – CSIRO July 2008

Although intimately involved, both the South Australian Government and the Commonwealth chose to ignore the CSIRO findings and their environmental commitments to restoring flows under the water reform process.

Millennium Drought

From 1998 to 2008, Murray-Darling Basin annual inflows averaged 5,700 GL: a 49% reduction compared to the 1892 to 1997 average of 11,600 GL. Inflows began to trend down from the late 90's, but this was seemingly ignored. The prevailing mantra, in the face of declining inflows and storage volumes, was to maximise production rather than apply sound conservation measures.

"Typically, NSW makes as much water available to licensed water users in any year as is available to the State, within the limits of the Murray-Darling Basin cap. This maximises water use in any one year but means that NSW maintains minimum water reserves for the next year. This is a deliberate policy of NSW that ensures that it is the decision of the individual user whether to use water or not to use the water they are entitled to, trade the water or save some to carry-over into the following season."

Reference: Background to water management: in the NSW Murray and Lower Murray-Darling River Systems May 2006

From 1997/98 to 2008/09, watercourse diversions ranged from 12,124 (2000-01) to 4,119 (2008-09) GL and totalled 104,660 GL. The average was 8,722 GL. South Australia's share of these diversions was approximately 6%.

"*Example of the drought in the MDB: Water extractions fell 70% but the Net Value of Irrigated Agricultural Production fell 1% (2000/01 to 2007/08)*"

Reference: Water Rights & Water Trading: Lessons from the Australian water market World Bank, 31st January 2011

During 2002-05 the New South Wales Government allowed 795 GL to be borrowed from Snowy Hydro by NSW irrigators, to be repaid from future allocations.

As at 18th January 2011 the total volume held in public storages is 18,052 GL, 81% of total capacity - a record amount, which would require 180 Adelaide desalination plants operating at full capacity for an entire year to produce; a volume which could provide South Australia's annual urban water supply cap (180 GL) for the next 100 years.

According to WaterFind (2011), the previous record for total storage volumes in MDB public storages was 13,900 GL in 2000, when 62.6% of total capacity of 22,216 GL was achieved.

Flows to South Australia began a steep path of decline from 1990 and by 2001-02 had fallen to South Australia's minimum entitlement of 1850 GL. Under current water sharing arrangements, environmental flows are supposed to average 5,100 GL per year through the Murray Mouth. These flows help to ensure that the Coorong receives the freshwater outflows vital to the sustainability of its unique ecology. River Murray discharge at the barrages averaged 6,023 GL from 1975 to 1997. Between 1997 and 2009, the average was 890 GL.

At the End of the River – The Coorong and Lower Lakes 2010 puts it all in context:

"*Taking extractions into account, the estimated quantities of water reaching the Mouth during the 1980s were around 4,385 GL per annum, 5,496 GL per annum during the 1990s. For the nine years from 2000-2008, the average annual volume was just 1006 GL.*"

"However for most of the last nine years, there has been very little water released over the Barrages, and none since 2006. Consequently, instead of relatively fresh water being drawn into the Coorong to offset evaporative losses, marine water has been drawn in. This marine water carries 35g of salt per litre or 35,000 tonnes/GL."

South Australia's predicament compounded when the arrangements, sanctioned by the MDB Ministerial Council in 1989, were applied from 2005-06. New South Wales and Victoria did not deliver South Australia's minimum entitlement of 1850 GL. From 2006-10, the deficit totalled 2,054 GL. The MDB Ministerial Council failed to act to prevent the 1989 special accounting provisions from being required:

"*Public risk management – the MDB water sharing arrangements must share water in both wet and dry conditions. Currently Murray River water sharing arrangements are based on a formula which allocates minimum monthly flows to South Australia, with the balance shared between New South Wales and Victoria. These arrangements are a function of the South Australian objective to maintain river levels for navigation. Strict adherence to this water sharing protocol would have allocated the vast majority of 2006/08 inflows to South Australia. The MDB Ministerial Council has agreed to a special water sharing regime, based on the Agreement, during this period, to share available water equitably.*"

Reference: Modern Agriculture Under Stress - Lessons from MDB MDBC 2008

The Murray-Darling Ministerial Council was well aware of the environmental implications of South Australia not receiving its minimum entitlement of 1850 GL:

"*South Australia has a current minimum inflow in 2008-09 of 900 GL. Modelling predicts that, under this scenario, the pH of Lake Alexandrina could drop to 7. At pH 7 freshwater ecosystems will continue to function. But if the current downward trend in water level continues, the acidity of the lake could fall below pH 6.5 in the summer of 2009-2010. If flows into SA increase to 1,850 GL/yr then the pH of Lake Alexandrina will remain steady at 9.*"

"Lake Alexandrina and Albert Ecological Condition Progress Report" April 2008

These arrangements had devastating effects on South Australian irrigators, used to receiving 100% of their entitlement but not a drop more. During the drought, their entitlements ranged from 100% (2000-03) to just 2-18% (2008-09). Their counterparts in the Murray System in Victoria received between 200% (2000-02) and 35% (2008-09).

As a result of the significant reduction of inflows, MDB public storage volumes suffered significant declines from 2000 to 2003 and again from 2005 to 2007, when total active storage declined to a record low of 500 GL.

In the period 2003-08, the City of Adelaide and the towns of South Australia consumed an average of 128.3 GL per year. While restrictions were place on urban users of MDB water, no such restrictions were placed on the irrigation sector, which uses 95% of all diversions. While no state government should have to purchase what it owns and controls, if a further 50 GL of temporary water was required for urban use it would have cost $18.5 million in 2008-09 when average allocation prices peaked.

The Economics of Murray-Darling Water Use

In 2005-06, 18,634 businesses were involved in irrigation, using 7,369 GL of MDB water and responsible for a gross average value of irrigation agricultural production of 75 cents per kilolitre of water used. The gross value of irrigated agricultural production was $5,522 million, 36.8% of the gross value of agriculture production ($14,991 million). The gross productivity of irrigated water consumption ranged from 22 cents per kilolitre for rice production, which used 1,252 GL of water, to $12.31 per kilolitre consumed by nurseries and in the production of cut flowers and turf.

The 2001 cotton crop was a record of 3.52 million bales. In 2005-06, 93% of the national cotton crop was produced in the Basin. Cultivation of this crop consumed 1,574 GL of water and earned gross income of 51 cents per kilolitre of water used. Almost the entire Australian cotton crop is exported, with little local value adding. In terms of virtual water, if the volume of Murray-Darling water consumed by the cotton industry in the production of this crop was exported, it would require a fleet of 3,148 supertankers to do so; an amount equivalent to almost twice South Australia's current total diversion cap of 805 GL.

Using the Gross Median Household Income from 2005-06, the Gross Household Income per household water consumption for 2005-06 ranged from $189 per kilolitre for Queensland to $298 per kilolitre in the Australian Capital Territory.

Using figures derived from a Minerals Council of Australia submission to the NWC 2011 Biennial Assessment. Industry Gross Value Added (IGVA) have been normalised to $ per kilolitre are summarised in the following table:

Industry	IGVA ($m)	Water Consumption (GL)	IGVA %	Water Use %	IGVA/Vol ($/kilolitre)
Agriculture	$24,344	12,191	3	73	$2.00
Forestry and Fishing	$2,347	51	0	0	$46.02
Mining	$64,223	413	8	2	$155.50
Manufacturing	$99,688	589	13	4	$169.25
Water Supply	$7,407	2,083	1	13	$3.56
Electricity and Gas	$14,444	271	2	2	$53.30
Other Industries	$577,333	1,059	73	6	$545.17

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MCA response to National Water Initiative 2011 Biennial Assessment of Progress – Minerals Council of Australia December 2010

The Weekend Australian Inquirer Special "The Drought Breaks", 13-14th November 2010

"The Drought Years" uses ABS statistics to show the drought vs. non-drought years (56 years or 36% of the time) for the period 1864 to 2010. Droughts are categorised into 3 categories; Devastating Drought (37 years or 25% of the time), Major Drought (28 years or 19% of the time) and Less Severe Drought (26 years or 18% of the time)

Water Reform and the Millennium Drought

The Intergovernmental Agreement on a National Water Initiative was signed on 25th June 2004 by the then Prime Minister, Premiers of New South Wales, Victoria, Queensland and South Australia, and the Chief Ministers of the Australian Capital Territory and the Northern Territory. It is subject to Biennial Assessments by the National Water Commission, established to oversee its implementation, detailed in schedules that are part of the main document. Never placed before Parliament, this document is being treated as if it was an Act of Parliament.

The Australian Government Department for Water, Environment, Heritage and the Arts neatly summarises the true intent of the NWI where it publishes the "National Water Initiative Water Trading Study Final Report" June 2006:

"*The National Water Initiative (NWI) is Australia's blueprint for national water reform. Central to the initiative are water markets and trading. Trading is the main means through which available water resources are to be (re)allocated amongst users, representing a fundamental shift away from the historic administered allocation arrangements. Trading may involve a reallocation of water within a sector, between sectors, or between communities.*"

Implementation of the NWI was not reviewed or modified as the Millennium Drought worsened. Calls for a State of Emergency by South Australians were ignored. The patently false philosophy that water markets and trading would resolve the problem was never reviewed; nor was such an approach questioned during the Global Financial Crisis.

State governments used water sharing plans to allow the unbundling of water entitlement licences from land and their trade on the newly created water market. NWI documentation does not use the word "privatisation". State governments neither informed their electorates that they were privatising their natural water resources nor sought their permission to do so via referendum.

Water sharing plans are simply authorised by the responsible Minister for Water free from parliamentary and public scrutiny. Water licences can be mortgaged or sold to anybody in the world irrespective of the purpose.

The NWC published its first market report in December 2008. Allocated (temporary) water traded in the Basin from 2007-2010 totalled 5,421 GL.

Reference: Australian Water Market Report 2009-10: NWC December 2010

An indication of how the Victorian state government reacted to managing the drought is illustrated in the following PowerPoint presentation slide - *"water trading reducing impacts of the drought"*

"*2007/08 - 1 in 100 yr dry event, after 10 years of drought*

- *storages emptied quickly*
- *lowest allocations on record - starting allocations at 0%*
- *<40% allocations in December*
- *100's of towns under water restrictions*
- *some would have run out*

Solution

Declare water shortages

Qualify rights to water and transferred ownership

- *reduce environmental flows*
- *provide for critical human needs (urban and rural)*
- *provide market starter*
  - *enable trade to occur earlier in season to inform decisions*
  - *risk not enough being in storage system to run the system for full season*
  - *shortened season (end in March instead of May)*"

Reference: Water Trading in Victoria – History, Policy and Future World Bank Forum, 31st January 2011

Economic Consequences of Mismanagement during the Millennium Drought

A team from the University of NSW attempted to quantify the costs in a paper entitled "Engineering a Crisis in a Ramsar Wetland: the Coorong, Lower Lakes and Murray Mouth Australia" November 2009:

"*Projected and real costs of dealing with the crisis in the Coorong, Lower Lakes and Murray Mouth and other rivers in the Murray-Darling Basin as a result of overextraction and regulation of rivers. See Fig. 1 for locations of some of the current or proposed structures.*"

"*There are considerable costs in treating the symptoms of the current crisis, possibly up to $2.2 billion (Table 2). The value of water for the CLLMM needs to be informed by the considerable externalities currently realised as real engineering costs and costs to community (Table 2). Governments will embark on a long-term Basin Plan (Table 2) but this is unlikely to deal with the underlying cause of the crisis.*"

A.4 MDBA Operations And The Guide To The Proposed Basin Plan

The claimed range of increased long-term average outflows through the Murray Mouth of 1960 GL, as a result of the proposed 3,000 GL per year reduction to current diversion limits, is contingent upon continuing to receive the long term average outflow under current arrangements (5,100 GL). However, the average outflow between 1997 and 2009 was 890 GL. WAC does not have confidence that the Basin Plan will achieve its outflow target, given the history of declines in both environmental and entitlement flows to South Australia since 1989.

There is a significant lack of information about key Basin parameters such as inflows, storages, losses, diversions (legal and illegal), outflows and the characteristics of their variability. Critically, the Authority is silent about the operation of the River Murray and the changes made since 1989 that have significantly disadvantaged South Australia. This lack of information does not allow confidence that the long-term statistics used by the Authority will create a more viable River Murray.

The averages used by the Authority are significantly greater than those determined by the CSIRO Sustainable Yields Project "Water Availability in the Murray-Darling Basin", the largest research project ever undertaken by the CSIRO. The Authority has stated that the long-term average surface water inflow from 1895 to 2009 was 32,800 GL vs. 11,600 GL stated in the Authority's Annual Report of 2007-08. Inflows in excess of 30,000 GL occur infrequently, the 1956 floods being an example.

The Guide fails to demonstrate how the Millennium Drought could have been managed differently to prevent the social, environmental and economic disasters which occurred in South Australia.

The Authority has neither defined the range of operating scenarios of unsustainable water availability, nor addressed the over-allocation of water licences in the Basin. The Productivity Commission has stated that the total number of tradeable water licences on issues in 2007-08 is as follows:

- Total regulated 16,200 GL
- Total unregulated 622 GL
- Total Groundwater 1,786 GL

The Guide gives no information about water licences, their history or licence holders.

A.5 The Plight Of South Australia

The Authority has failed to take account of the long-term sustainable arrangements that South Australia made as a result of the 1967/68 drought. A cap on diversions has been in place for decades, creating what is a Low Flows Sustainable Diversion Limit within South Australia's minimum entitlement of 1850 GL.

In signing the 2005 NWI agreement, South Australian Premier Rann not only approved the privatisation of water and water services, but also exposed to market forces the most meagre water supply of any state in the Basin.

The combination of the cap and the minimum entitlement of 1850 GL represents a significant barrier to water reform and the creation of a water market.

South Australia may be the driest state, but its water policy guaranteed the reliability of water supply and the sustainability of the Murray system to the barrages. It also enables the river to discharge any excess flows from regional or interstate flood events into the Coorong and the Murray Mouth. All flows above the minimum entitlement of 1850 GL are unregulated and used as environmental water.

These arrangements are at significant risk from water reform and the Basin Plan, which does not guarantee South Australia's minimum entitlement and allows water licences to be traded to the highest bidder. South Australia's River Murray system is highly regulated. Allowing water to be traded out or purchased by the Commonwealth will significantly compromise the viability of the whole system for all stakeholders, particularly during times of low flow.

Agreements made in 1989 and specifically the reduction of reserves that were required to be held equally by New South Wales and Victoria from 2,500 GL to 835 GL has had disastrous effects. These arrangements and subsequent changes failed to guarantee the supply of South Australia's minimum entitlement of 1850 GL when it was critically required: during the depth of the Millennium Drought. There are insufficient incentives in place to encourage the upstream states to ensure that sufficient reserves are held to guarantee South Australia's minimum entitlement.

As previously stated, the Authority has failed to operate the Basin to ensure the Murray Mouth receives the long-term average outflow of 5,100 GL. Between 1996 and 2009, the average was just 890 GL, with many years of no flow through the Murray Mouth. Combined with the reduced flows through Lock 1, this has had devastating consequences for Lake Bonney, the Lower Lakes, Coorong and Murray Mouth and communities that depend on them.

Perhaps the most significant contributor to South Australia's problems has been the Authority's mismanagement of Basin storages, in failing to react to significant declines of inflows from the late 1990s until the floods of 2010. Public storages in the Basin were at a record peak of 13,900 GL in 2000 and were run down to minimal levels by June 2003 and again in 2007.

While water restrictions were placed on urban water consumers, no such restrictions were placed on the irrigation industry. The unbundling of water licences also led to the purchase of water licences to build golf courses and marinas. Effectively, there were no restrictions on water use; the only prerequisite being the ability to pay the market price.

The reduction of River Murray flows into South Australia that began in 1990 has had catastrophic effects, particularly between 2006/07 and 2009/10 when South Australia's minimum entitlement of 1850 GL was not delivered. The economies of many regional and country towns dependent upon the River Murray were at the point of collapse and many Basin communities suffered severe social stress.

A flow of 2,054 GL or 494 GL per year would have prevented the disaster. This volume of water was readily available: 5,421GL of allocated water was traded between 2007 and 2010.

The declaration of a National State of Emergency in the Basin in 2006/07, requiring all water sharing regions to help address South Australia's crisis, would have averted the South Australian disaster. From 2004/05 to 2005/06, a total of 11,766 GL was diverted to grow cereals, cotton, rice and pasture.

In 2005/06 the gross value of irrigation industries growing cereals, cotton, rice and hay was $1,413 million, consuming 4,099 GL and earning an average of 34.5 cents per kilolitre of water used. Paying compensation for the use of this water would have cost significantly less than both the water market alternative and the Commonwealth Government's buy-back.

Inflows began to trend down in the late 90's. Instead of conserving and restricting what could be grown, MDB storages were depleted. Over 100,000 GL was diverted between 1997 and 2009, South Australia's use of this water was just 6%; the crisis could have been prevented by holding reserves of 2,500 GL, as was the policy until 1989, when the reserve was decreased to just 835 GL.

As previously indicated, a "production at all costs" mentality seems to prevail in the Basin; with each state maximising water diversions to this end.

The Lower Lakes and the fragile environment of the Coorong continue to be endangered, as are Adelaide's coastal waters. The addition of over 100 GL of toxic hypersaline deoxygenated water from the Adelaide desalination plant could have significant consequences for Gulf St Vincent. Both South Australian Gulfs are inverse estuaries sheltered from the open ocean with a unique marine environment.

Adelaide is being increasingly compromised as a viable city, given the condition of its creeks, rivers and adjacent coastal waters. Efforts to address these problems have been severely compromised because of the billions of dollars of debt incurred from building and operating Adelaide's 100 GL desalination plant.

Like most Australian cities, there are no comprehensive plans in place for Adelaide to recycle stormwater and wastewater and protect impacted marine ecology. Such plans necessitate the quarantining of land suitable for stormwater management and harvesting from unsuitable development. Significant opportunities such as Cheltenham Park in Adelaide are being lost to housing development.

Public policy making is a debacle in South Australia. If BHP Billiton's proposed Olympic Dam Mine Expansion is approved, requiring additional water supply, there are far more sensible alternatives than to build a large-scale desalination plant in Upper Spencer Gulf. Such a development would present a major threat to the unique marine ecology of the Gulf.

A.6 Conclusions

The River Murray is an integral part of South Australia's environment, society and economy. The failure to supply South Australia's minimum entitlement of 1850 GL from 2006 to 2009 has had significant environmental, social and economic impacts that will persist for decades. The decision to build and operate a 100 GL desalination plant in Adelaide will result in costs to the taxpayer in excess of $4 billion at current prices.

Reference: Will desal be worth its salt? 22 January 2011

The current cap for South Australian towns and the city of Adelaide is a meagre 180 GL, just 1.2% of the average total current consumptive use from the basin (15,400 GL) quoted by the Murray-Darling Basin Authority and a paltry 3.5% of the current average of flow out of the Murray Mouth (5,100 GL). South Australia's consumptive share of surface water diversions, totalling 104,660 GL between 1997 and 2009, was approximately 6%. A mere 2,000 GL would have prevented South Australia's environmental, social and economic crisis.

South Australia effectively established a Low Flow Sustainable Diversion Limit in 1967/68. Since 1989 the behaviour of upstream governments has been un-Australian; successive South Australian governments have been asleep at the wheel.

State and federal governments are fixated on the establishment of a water market; an agenda at odds with the intent of Section 100 of the Constitution and which directly threatens public rights and the environmental health of the Basin.

These concerns are supported by the December 2009 decision of the High Court. In finding against ICM Agriculture, which had claimed compensation for significant reductions to groundwater entitlements made by the NSW Government, the High Court identified the problem as privatisation. Clause 55 of the its judgment states; "The second point of interest is that the language of the 1896 Act and the 1912 Act does not disturb the common law notion that water, like light and air, is common property not especially amenable to private ownership and best vested in a sovereign state[55]."

Those driving the process of water reform maintain that they seek a better deal for the environment and for irrigators: these are empty promises. Their true agenda is the privatisation of water for the benefit of financial markets; undertaken in a manner that brings into question the integrity and accountability of successive state and federal governments.

Privatisation will also further complicate Basin management, drive up costs and reduce the competitiveness of the economy, with serious consequences for households and industries alike.

Australian water is increasingly owned by foreign interests and, if this process continues unchecked, we risk losing control of our water resources.

Any prospect of co-operation between States and their communities remains at risk from a one-size-fits-all water reform agenda, ill-conceived litigation to further develop water markets and a belief that we can trade our way out of the problems of over-allocation by treating water as a commodity.

The actions of governments during the Millennium Drought were unacceptable. Further engineering intervention by building more dams and weirs will only reduce the amount of water available for the environment. Only careful balancing of demand vs. water availability for the common good can achieve good environmental outcomes.

The Millennium Drought exposed water reform for what it is: a fraud. If there was genuine concern for the long-term future of the communities, economy and environment of the Basin, a National State of Emergency in the Basin would have been established to ensure the state of South Australia received its minimum entitlement of 1850 GL and the NWI agenda to establish a national water market put on hold. The failure to act cost South Australia billions of dollars.

The draining of the Basin storages during prolonged and ongoing drought was mismanagement on a scale which requires investigation by a fully empowered Royal Commission. Such an inquiry must also determine whether the Basin governments have acted in the public interest in promoting the reform agenda of water privatisation and the national water market.

The costs to South Australians, as a result of the operation of this new market, are considerable. Its minimum entitlement of 1850 GL was sacrificed to support the introduction of the national water market in 2007, with no consideration of compensation.

Upstream states have seemingly forgotten that South Australia capped its diversions in the late 60s, while they increased their diversions by over 300% in the same period. These states owe a considerable part of their prosperity to the sustainable approach to water management adopted by previous South Australian governments.

There are grave concerns that, under the new arrangements, Basin states will focus on maximising diversions to maximise economic returns and blame the Commonwealth for lack of environmental flows.

South Australia's reasonable entitlement, as implied in Section 100 of the Constitution, is no longer guaranteed and there is clearly no commitment by the up-stream states to meet that requirement during periods of low flow. This state of affairs is unreasonable and therefore unconstitutional.

Section 100 of the Australian Constitution also enshrines the fundamental principle that water should not be traded as a privately owned commodity; and yet this is precisely what has been happening in recent decades - in a clandestine manner. The waters of the Murray-Darling system have become a valuable commodity, to be traded on global financial markets. Water trading is portrayed as the means to achieve fairer redistribution of entitlements and allocations. In fact, water trading is water privatisation in action.

The creation of the new water market, by unbundling water licences from land and allowing them to be traded, has serious implications. Irrigators now look at their water entitlements with two sets of eyes. One set looks at the potential of earning income from traditional irrigation to grow crops for income whilst the other sees the value the water is worth on the open water market. This is a significant impediment to the determination of reasonable SDLs under the Basin Plan.

Water reform is a radical economic venture without precedent in Australia. A natural resource is being privatised by governments which have neither sought nor been given an electoral mandate to do so. No other democracy has embarked on such reform without the approval of the electorate.

A.7 Key Recommendations

A.7.1 Authority / Basin Plan

a. The Authority must develop a range of flow-specific SDL's for the Basin as a whole, similar to the low flow SDL successfully operated by South Australia for many decades.

   i. Integral to the low flow SDL is a cap that prioritises domestic needs over export use and provides for population growth.

   ii. As the cycle moves into drought, water must be prioritised and restrictions placed on water trading and what crops can be grown with the available water, to ensure that the needs of Australia are placed ahead of the use of water by export focussed enterprises.

b. The Authority must demonstrate how the management of Basin water over the last two decades would have been different, particularly for South Australia, if an accredited State Water Sharing Plan had been in existence.

   i. Modelling of the impact of the new arrangements should be undertaken, to ascertain how the past two decades could have been managed differently to prevent the crisis that occurred in South Australia during the Millennium Drought.

c. All statistical parameters that fully describe the distribution, including the mode, median and standard deviation, must be published.

   i. The Authority must make available the database used to determine its long-term averages for independent analysis and comparison with the recent history of the past two decades. The Authority must explain the reason for the differences between its long-term inflows and the statistics that represent consumption.

   ii. Statisticians with an understanding of quality control and quality assurance must be engaged to review documentation used by the Authority to compile the Basin Plain.

d. The Authority must clarify what flows are required through the Lower Lakes, Barrages and the Murray Mouth to sustain the Coorong and Lake Albert for the full range of water availability. All water sharing regions in the Basin must fairly contribute to meet these downstream needs.

e. The Authority must define sustainability for the full range of inflows and diversions that are an integral part of the historical record and the water required for conservation.

   i. The Authority must determine SDLs for each category of climate variability experienced in the basin; Floods, Normal, Low Flows, Droughts and Emergencies.

   ii. Emergencies must necessitate suspension of water allocation plans and allocation of all resources of the Basin to address the crisis, prioritising Australian needs first.

   iii. The Basin Plan must be focused on managing droughts rather than floods.

f. The Authority must detail consumptive water use during the Millennium Drought by category of use.

g. South Australia's share of MDB water should be increased, given the long-term conservative water management of South Australian governments.

h. The Authority must apply the policies it proposed for the Environmental Watering Plan to the management of the natural resource as a whole.

i. The Authority must consider alternative approaches such as:

   i. Determination of irrigation areas that should be downsized or decommissioned because of water inefficiencies or environmental degradation related to irrigation activity, especially salinity and pollution.

   ii. Provision of compensation for compulsory acquisition of water allocations during emergencies.

   iii. Requiring states to use their powers to downsize irrigation entitlements and set lower allocations.

j. All water diverted from the original natural conditions must be counted towards SDLs and include groundwater extraction, flood plain harvesting, water used to fill the 23,000 km of irrigation channels and farm dams.

k. During droughts and emergencies, the total share that can be used for consumptive use by irrigation must be capped to ensure the survivability of Australia's unique ecological assets and not allowed to rise to the extent it did during the recent drought, when around 75% of river flows was used for consumption.

l. The Basin Plan and the Murray-Darling Basin Agreement must protect South Australia's minimum entitlement by requiring any shortfalls to be made up in subsequent years by NSW, Victoria and Queensland. South Australia's minimum entitlement of 1850 GL must not be compromised by water trading out of South Australia or by the Basin Plan.

m. Water should only be traded within irrigation districts on a collaborative basis and any change to an irrigation region's entitlement should only be made with the agreement of the MDBA and state governments affected by such amendment.

n. Consideration of all potential regional savings of water, not in the context of increasing an SDL, but in terms of being able to improve the environmental watering of the system as a whole or increasing the SDL of a downstream region with greater productivity.

o. Inclusion of surface water interceptions in the proposed reduction of diversions.

p. Conveyance losses must be defined in proportion to share of consumptive use and distinction made between losses related to channel as opposed to pipeline supply.

A.7.2 National Public Inquiry

a. A National Public Inquiry with the powers of a Royal Commission is required to determine whether Australian governments have prioritised the creation of water markets over the common good. Fair Water Use (Australia) has developed draft terms of references for consideration by the Commonwealth for such a National Public Inquiry

   i. The purpose of this Inquiry is to determine the systemic causes of the environmental, social and economic damage and problems created by the current plans and system of management of the Murray-Darling Basin.

   ii. The Inquiry should define the changes that need to be made by all levels of government, including by their departments and corporations, to safeguard the public's interest in water as the common property of all Australians and the utility and amenity of the Murray-Darling's water courses to the sea under the "public trust doctrine".

   iii. The Inquiry should determine what changes should be made by the Commonwealth, the States of Queensland, New South Wales, Victoria and South Australia and The Australian Capital Territory with respect to governance and management of the Murray-Darling Basin.

b. Water reform has compounded the mismanagement of the Basin and there is a need to fully understand the considerable complexities involved, as water is a natural resource and interdependent not only in terms of ecology but with society and the economy.

c. There is ample time for such an Inquiry to be held, as the Basin Plan is not due to come into full effect until 2020. Australians deserve and need to know the truth.

d. Additional matters to be considered:

   i. The implications of Free Trade Agreements signed by Australia with respect to the Australian water resources, especially those of the Basin.

   ii. The total cost of the investment to create and maintain water markets and how these costs are going to be recovered from water users.

   iii. The Global Financial Crisis should have necessitated review of the considerable economic reform component of water reform – as this review was not undertaken, it should form part of the brief of the Commission.

   iv. Full disclosure of allocation history during the Millennium Drought and investigation as to why there was systemic failure to conserve water as inflows reduced; an action which would have prevented the economic, social and environmental disaster that took place in South Australia.

   v. The social and economic costs of water reform.

   vi. Gross economic returns per kilolitre for various water uses, not only irrigation but also industrial and household activity, and the total amount of water used in each category.

A.7.3 Commonwealth / State Governments

a. The Commonwealth must consider a water tax that will discourage inappropriate use and recover all costs associated with the public's considerable investment in the MDB.

b. Proposed amendments to the Water Act 2007:

   i. Empower the Authority to address the full variability of the Basin and not just a one-size-fits-all solution that requires the Basin Plan to be designed around long-term averages, ignoring South Australia's Low Flows Sustainable Diversion Limit.

   ii. Ensure the Basin is climate-proofed by optimising the use of Basin storage capacity, both public and private.

   iii. Ensure the Basin Plan is consistent with section 100 of the Australian Constitution and define water availability for all known scenarios of water availability.

      1. Require the Murray-Darling Basin Authority to compile and release the full set of statistical parameters such as location, dispersion and shape characteristics for inflows, public and private storages, consumptive use, and losses in storage and distribution systems, and flows through the Barrages and Murray Mouth.

   iv. Require the establishment of caps on water diversion for each category of flows between floods and drought, to ensure the sustainability of the MDB with emphasis on:

      1. Greater degree of conservation,

      2. Prioritising food production for Australians.

   v. Require the suspension of water trading during emergency periods, to ensure that water is allocated where the need is greatest, rather that to those who pay the highest price.

   vi. Demonstrate that the environmental water purchased by the Commonwealth's water buyback scheme has practical use during low flows and severe droughts and does not compromise South Australia's minimum entitlement.

   vii. Remove any impediments that prevent the Authority from managing the Basin in the public interest and for the common good.

   viii. Require the Authority to define SDLs for the range of water availability in steps of 500 GL. All SDLs must specify the amount of water that will flow through the Barrages in the Lower Lakes.

b. Australian governments must pass laws that recognise the Public Trust Doctrine and commit Australia to water conservation and water security for all Australians,

c. Australians must be given the opportunity to decide whether water is considered a common good, the common property of all Australians, or converted into a commodity to serve private interests and those who can pay the most.

i. Just as the Australian Constitution was approved by referendum, so must Australians have the opportunity to indicate whether they wish their water resources privatised or retained as the common property of Australia.

ii. All trade in water entitlements must be suspended until governments secure the approval of the Australian people to change the Australian Constitution to allow water privatisation.

d. It is essential that legislation and funding for comprehensive stormwater harvesting and wastewater recycling is put in place without further delay, to save impacted marine environments. Laws and regulations are required to ensure sustainable and non-wasteful use of water by businesses and irrigators.

e. Funding is required for education to encourage community actions towards rainwater collection, conservation and to gain a greater knowledge of their natural water resources.

f. MDBA forecasts of water entitlement must be made public at the same time as the information is released to state governments.

g. The MDBA independent review of Drought Water Accounts, announced in early January 2009 by the CEO of the MDBA, must also be made public as a matter of urgency.

h. Free trade in water entitlements should be terminated, specifically excluding foreign investors, to avoid compounding management complexities and to minimise the costs to the Australian public of managing the Basin and the natural water resources of Australia.

i. The Water Act and the Basin Plan should give greater consideration to the needs of all Australians ultimately dependent upon the Murray-Darling Basin for food, water and products and not just those who are regarded as being members of the Basin Community. Water is not for the exclusive use of the irrigation sector.

j. Establish National State of Emergency plans that may be implemented as required for whole or part of Basin. Fair Water Use (Australia) has developed draft terms of references for consideration by the Commonwealth for a National State of Emergency Commission. A State of Emergency would be proclaimed to enable appropriate actions to be taken to address the needs of a state or region in crisis from severe drought. Trigger points may be threats to consumptive use for Australian needs or irreversible threats to the environment.

k. The South Australian Government must seek amendment of the Murray-Darling Basin Agreement, re-establishing the 2,500 GL reserves, to guarantee South Australia's minimum entitlement of 1850 GL. Further, these arrangements should not be allowed to be compromised by the introduction of the Basin plan.

l. All water licences purchased by the Commonwealth should be extinguished and the states made responsible for the management of their reasonable share of water.

m. State governments should be responsible for all restructuring involving the permanent transfer, reduction or cancellation of water access entitlements.

n. Only water allocations granted for a given water year should be considered tradeable and only be within a water district or adjacent water district.

o. The waters of the Murray-Darling Basin should not be exposed to private ownership, especially by overseas companies. Water shares, the new term for water licences, should not be able to be owned and controlled by foreign interests.

p. As custodians, we have a lot to learn from Aboriginal culture that respects water and interdependent ecology as part of our place.

q. The fundamental human right to clean, affordable water as a common good must be codified by Parliament and by laws that do not automatically sanction weirs, pipelines, diversion and desalination as short-term solutions.

B DEFINITIONS AND ACRONYMS

B.1 Definitions

Term	Description
Authority	Murray-Darling Basin Authority and the Murray-Darling Basin Commission before that.
CLLMM	Coorong Lower Lakes Murray Mouth
Basin	Murray-Darling Basin
Gigalitre (GL)	One Gigalitre is 1,000 ML or 1 billion litres and represents a volume of water one square kilometre by one metre deep. Current supertankers are able to transport 500 million litres of crude oil or 0.5 GL. Sydney Harbour holds approximately 500 GL The Adelaide Desalination Plant has been designed to produce 100 GL of water per year. In 2004/05 South Australian households used an average of 253 kilolitres per household. Using ABS 2005/06 Median Household Income, the income per kilolitre was $196.
SDL	Sustainable Diversion Limit. Term used in the 2007 Water Act defined in terms of long-term averages.

B.2 Acronyms

Acronym	Description
ACWS	Adelaide Coastal Water Study
ADP	Adelaide Desalination Plant
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EIS	Environmental Impact Statement
ERDC	Environment, Resources, Development Committee Standing Committee South Australia Legislative Council
FGSV	Friends Gulf St Vincent
MDB	Murray-Darling Basin
MDBA	Murray-Darling Basin Authority
MDBC	Murray-Darling Basin Commission (Superseded by the MDBA in 2008).
MLC	Member Legislative Council (SA)
NWC	National Water Commission
NWI	Intergovernmental Agreement on a National Water Initiative
WAC	Water Action Coalition