



River Lakes and Coorong Action Group Inc

SA

Winner 2009 Jill Hudson Environmental Award

Submission to SA Murray Darling Basin Royal Commission

River Lakes and Coorong Action Group Introduction and position statement

The River Lakes and Coorong Action Group welcomes the opportunity to make this submission to the South Australian Royal Commission.

The River Lakes and Coorong Action Group (RLCAG) is an independent community organisation with a track record of more than 12 years' advocacy for the health of the Murray Darling Basin system.

The River is the main stakeholder in our organisation. We are critically concerned with the health of the river system as a whole, with a fair allocation of water for all users as well as the environment.

We have engaged with Murray Darling Basin matters through submissions, symposia, meetings and campaigns since 2006 when the group formed to stop the building of a weir at Wellington. Members of the organisation, in particular founding member Henry Jones, were closely involved in the development of the Murray Darling Basin Plan.

Membership of RLCAG includes community members, farmers, fishers, scientists, environmentalists, tourism operators and other small business owners from around the region of Lake Alexandrina, Lake Albert, the Coorong and Murray Mouth. The group represents a great deal of local knowledge, both practical and scientific.

While RLCAG is a disparate group, members are united by their desire never again to see the effects of overallocation upstream impact on this region as it did during the drought of 2008. We fear the next drought, which may well be beginning, the inundation of sea water, the death of the Coorong and the extinction of species.

The River Lakes and Coorong Action Group welcomed the Water Act of 2007 and supports the Murray Darling Basin Plan. We believe that Basin state governments, the Australian Government and the Murray Darling Basin Authority are entrusted to implement the Plan as it stands, as a matter of urgency.

At the same time we note that the Basin Plan is already a compromise; 3200 GL of water returned to the environment is the bare minimum required to keep the Murray Mouth open and the Coorong alive and it leaves many wetlands and native species at risk.

The system remains at the tipping point of sustainability. There are signs that the river and wetlands of international importance are recovering slowly, but this will take years and there is no resilience in the system. The evidence is there in the slow recovery of species, the return of migratory birds in limited numbers, and biodiversity of the estuarine ecology. The Coorong, a Ramsar-listed wetland, remains in a critical state. A simple fact is that dredging the Mouth of the Murray has not stopped, despite the provision in the Murray Darling Basin Plan for dredging being necessary only one year in ten.

At present the state of the Darling River is of particular concern to this region. Flows from the Darling are critical for the health of the freshwater and estuarine systems including fish breeding events.

Terms of Reference

1. Whether the Water Resource Plans defined by the Act and Basin Plan (which are to include the long-term average sustainable diversion limits for each Basin water resource) will be delivered in full and in a form compliant and consistent with the Basin Plan by 30 June 2019.

It is outside the scope of this group's knowledge to comment fully on this TOR. The risk that State Water Resource Plans may not be fully developed by mid 2019 is of real concern and underlines the precarious interface between state and federal implementation of the Murray Darling Basin Plan.

We understand that the South Australian government is preparing Water Resource Plans in three areas in three stages, for the South Australian Murray region including the Coorong (by December 2017) Eastern Mount Lofty Ranges (by October 2018) and South Australian River Murray (by 30 June 2019).

We note that state Water Allocation Plans are already in existence for these NRM regions, and are prescribed for sustainable management under State legislation. However water take has not been actually prescribed in key areas including the Finniss River, South Australia's second largest river and a tributary of the Murray.

There is concern that the 22 Water Resource Plans being prepared by the NSW government will not be ready until 2019, allowing little time for review, so that there is a risk that the NSW WRP's may be rubber-stamped. Anecdotally we understand that the NSW WRP is 'watering down the recommendations of the Matthews Report'.

2. If any Water Resource Plans are unlikely to be delivered in full and in a form compliant and consistent with the Basin Plan, the reasons for this.
3. Whether the Basin Plan in its current form, its implementation, and any proposed amendments to the Plan, are likely to achieve the objects and purposes of the Act and Plan as variously outlined in ss.3, 20, 23 and 28 of the Act, and the 'enhanced environmental outcomes' and additional 450 GL provided for in s. 86AA(2) and (3) of the Act, respectively.

We are deeply concerned that five years after legislation the River system has not benefited as it should have from the Basin Plan as legislated, the system remains at the tipping point of sustainability, and there are many unknowns which obscure aspects of implementation of the Plan, and may further undermine it. These include:

- The outcomes of current investigations by the NSW Independent Commission against Corruption <https://www.theguardian.com/australia-news/2018/feb/08/nsw-minister-altered-barwon-darling-water-sharing-plan-to-favour-irrigators> and allegations of water theft
- Efficacy of some scientific work and hydrological modelling (concerns raised by CSIRO and Wentworth Group)
- Uncertainty around 36 of 37 projects proposed for SDL adjustment created by unclear business cases, inequivalent environmental outcomes and environmental risk, unclear or unacceptable governance arrangements (Wentworth Group of Concerned Scientists <http://wentworthgroup.org/wp-content/uploads/2017/11/SDL-adjustment-submission-Nov-2017-Full-submission.pdf>)
- Water Resource Plans in preparation by the States. The critical NSW Water Resource Plan is more than twelve months overdue.
- The impact of climate change on the implementation of the Basin Plan. While the MDBA has adopted an adaptive management approach <https://www.mdba.gov.au/news/mdb-fact-climate-change-basin-plan>, this approach is based on having accurate data, sound science and modelling, and states' cooperation through Water Resource Plans. None of these appear to be in place.

RLCAG notes that the implementation of the Basin Plan is subject to an unwelcome level of politicisation. In a political situation outcomes may derive more from a few stakeholders' ability to influence processes than adherence to legislation, let alone taking account of the views and wishes of a majority who seek a fair allocation of water for all users including the environment.

Further legislation must also give certainty for the return of 450GL of water for the environment as specified in the original Basin Plan agreement to ensure the total amount of 3200 GL before approval of any SDL projects.

With regard to setting the SDL's in the Northern Basin we understand that the Australian Government and the MDBA have the power to renegotiate the 'toolkit' measures proposed in the Northern Basin Review, as these were outside the legislation. These measures were to subject to separate intergovernmental agreement independent of the Basin Plan amendment and can proceed without any legislative change.

With regard to constraints management, we believe that concerns about negative impacts and the extent of potential flooding are often overstated for political reasons.

The slow process has delayed progress on delivering the 450 GL, which is urgently needed to meet Basin Plan targets.

It has exposed the CEWH to accusations that he has more water than he can deliver so should sell back to irrigators.

We suggest that the MDBA should provide information to explain the benefits of constraint removal, including the benefits of preventing blackwater events and the benefits of floodplain inundation for regeneration, biodiversity, cropping, grazing and recreational use.

Environmental water flows should be prioritised under the Basin Plan and monitored closely so that they are not subject to water theft.

As we stated in the introduction, the 3200GL of water already represented a compromise. River water was already over-allocated at the time of the Water Act. The development of the Plan was therefore a difficult exercise in clawing water back for the system.

The 1500 GL cap on water buybacks voted in the Senate in October 2015 was not timely or cost effective. The cap forces over reliance on infrastructure projects which are not ready to be implemented, have not been embraced by eastern States, and will take years to construct.

The proposal to reduce SDL's in the "southern basin" in May 2018 by 605GL is of concern for reasons stated above and should not go ahead without substantial re-negotiation with the proponents by the MDBA.

The history of water recovery under the Plan has been beset by examples of politicisation, partisan influence and lack of accountability.

The purchase of Tandou Station's water rights by the federal Department of Agriculture and Water Resources, for \$78m, almost twice the price recommended by the Australian Bureau of Agricultural and Resource Economics and Sciences (Abares), when the property near Broken Hill had been unable to grow irrigated crops because of a lack of water for some years, is a case in point.

Some policies do not survive more than one political term. The RLCAG is also concerned that the outcome of water for the environment prescribed in the 2002 Living Murray initiative to return 500 GL of water to the environment by 2009. We understand that this amount of water was still to be returned and was to remain separate from the Plan.

Members remain deeply concerned about the management of the Menindee Lakes and the state of the lower Darling River, critical to the health of the system and to achieving the outcomes of the Plan.

It is an uncertain landscape, the RLCAG position is that this is not the time for new projects like the hastily tendered Broken Hill pipeline and we understand numbers of new irrigation projects that are springing up along the Murray.

4. Whether the underlying assumptions in the original modelling used to develop the objects and purposes of the Act and the Basin Plan have been sufficiently adjusted for the impact of improved technologies.

There is a clear disparity between the objective of dredging the Mouth of the Murray one year in ten and the fact that dredging has not ceased at the Mouth except for maintenance of the dredges. We do not believe that this target should be abandoned, however. It is early days and because of upstream theft of water it is not possible to evaluate original modelling at this point.

We note the position of the NSW Environmental Defender's office, that:

The Australian Government has an obligation to recover the volume of water mandated under the Basin Plan by mid-2019 – which currently stands at 2,750GL.

It also has the legal powers – should it choose to exercise them – to recover the balance of this volume if a Basin State decides to 'walk away' from the Plan.

However, the current, 1500GL limit on 'buybacks' added in 2015 to the Water Act 2007 could serve to frustrate this outcome if it is not physically possible to recover the remaining volume via on-farm water saving projects. Without delving into the legal and practical complexities of this issue, we note that Parliament could in any case choose to lift the 1,500GL limit in order to guarantee delivery of the 2,750GL by the statutory deadline. (EDO NSW 16 feb 2018)

The Commonwealth can make a regulation overriding any declaration by a State that some or all of the Water Act and/or Basin Plan do not apply;

The Ministerial Council currently comprises a Minister from each Basin State and the Australian Government. However, there does not appear to be any legal impediment to it functioning in the absence of an appointed Minister from one or more State;

Withdrawing from the agreement could result in the Commonwealth terminating funding for State water projects;

While States are responsible for preparing water resource plans, the Water Act 2007 allows the Minister to 'step-in' and order the MDBA to make one or more of these plans if any State refuses to do so by the statutory deadline. (EDO NSW 16 feb 2018)

However there are:

- significant concerns regarding the scientific work and hydrological modelling undertaken by the MDBA as part of the NBR;
- ongoing concerns about alleged water theft, especially in the Northern Basin;
- ongoing concerns about legal pumping of environmental water purchased with taxpayers' money, particularly in the Northern Basin; and,
- the fact that the NSW Independent Commission against Corruption is currently undertaking an investigation, including into the making in 2012 of one of the most important State laws governing water sharing arrangements in the Northern Basin (namely the Barwon-Darling Water Sharing Plan or BD WSP). (EDO NSW 16 feb 2016)

In performing their duties and exercising their powers under the Basin Plan, the Minister and the MDBA are legally required to act on the basis of best-available scientific knowledge. It is therefore important to elaborate on the science and modelling underpinning the proposed 70GL reduction.

While the NBR did allow the MDBA to increase its knowledge base in certain areas (which was an excellent outcome), the actual recommendation to remove 70GL from the pool of environmental water was not based on sound evidence.

In particular, it was claimed that the 70GL reduction would have minimal impacts on the environment and downstream users. However, the hydrological modelling underpinning this claim was based on a number of flawed assumptions. For example, it assumed that:

- users are complying with water laws in the Northern Basin (which has been thrown into doubt by official investigations and reports by Mr Ken Matthews and the MDBA itself);
- the Commonwealth's environmental water could be simultaneously released from storage dams on the tributaries that flow into the Barwon-Darling River to produce one, large flow through the Darling (which is unprecedented);
- most of the Commonwealth's environmental water would actually make it through the Barwon-Darling River (despite the fact that environmental water paid for by taxpayers can be legally extracted by a few large-scale irrigators on that river system);
- the old rules that applied before the BD WSP was passed were a good enough representation of the regulatory regime governing water extractions. However, the rule changes that occurred under the BD WSP were significant, allowing (amongst other things) greater volumes of water to be pumped more quickly - and without the previous, daily limits on extractions;
- analysis of big flows on the Barwon-Darling would give an accurate representation of the impact of a 70GL reduction. However, failing to analyse lower flows was a serious omission, particularly given significant increases in access to these lower flows under the BD WSP; and that
- the 70GL reduction would have relatively minimal downstream impacts due to the MDBA's proposed, targeted water recovery program. However, the instrument that was eventually tabled in Parliament included amendments allowing States to vary the location from which water is recovered for the environment, completely undermining the purported benefits of the MDBA's targeted scheme. Further, these amendments were not in the version placed on public exhibition.

It is important to note that the MDBA used models provided to them by the States. (END EDO)

Socio-economic

We question whether socio-economic change in the Basin is critically tied to the effect of the Basin Plan. As one person has put it, a town in the Mallee with no river frontage is experiencing very similar socio-economic impacts because of changes in farming technology. There is a current example of the Cook farming family at Minlaton whose permanent workforce has dropped from 6 to one person in the last 50 years https://www.banksa.com.au/content/dam/bsa/downloads/about_us/BankSA_BusinessFocus_April_18.pdf

Changing technology and farming practices are the biggest risks to farm growth and employment opportunities in agricultural regions.

Tourism returns \$7 bn to the Basin economy, equivalent to irrigation.

5. If the Basin Plan is unlikely to achieve any of the objects and purposes of the Act and Basin Plan and/or the 'enhanced environmental outcomes' and the additional 450 GL referred to above, what amendments should be made to the Basin Plan or Act to achieve those objects and purposes, the 'enhanced environmental outcomes' and the additional 450 GL?

While we support the Basin Plan as legislated, the River Lakes and Coorong Action Group believes that there should be no further reduction in the amount of water returned to the system until a proper baseline of accountability is established.

In a year of extremely low water flows, the environment must be one of the first to get its allocation. There is a significant risk that the use of average flows in the plan screen us from seeing how the plan will work in a one in 25 or one in 50 year low flow event. Members of the River Lakes and Coorong Action Group would like to be reassured that with the current plan and any subsequent amendment that the environment was not adversely or significantly affected. An adverse outcome would probably mean a loss of a species. Hardship in an economic sense may not equate to the loss of a species. This is a risk we cannot afford.

The 1500 GL cap on buybacks should be lifted in order to achieve the objectives of the Plan.

The efficiency projects currently accepted by the MDBA to achieve 605 GL of environmental water in the southern basin must be renegotiated by Minister Littleproud and the MDBA to meet the twelve criteria developed by the Wentworth Group of Scientists. If this is not the case, the legislation should be disallowed.

6. Any legislative or other impediments to achieving any of the objects and purposes of the Act and Basin Plan and/or the 'enhanced environmental outcomes' and additional 450 GL referred to above, and any recommendations for legislative or other change if needed.

Members of the River Lakes and Coorong Action Group do not believe that current institutional and governance arrangements provide for sufficient oversight of the plan and support engagement with the community.

We believe that current institutional and governance arrangements are the single biggest risk to the achievement of the objectives of the Plan, and this is a matter of great concern in this community. We understood that the legislation of the Murray Darling Basin Plan contained sufficient powers for the Australian Government to ensure States' cooperation with the Plan as agreed, but we have been informed on more than one occasion by our elected representatives at state and federal level, that this is not the case, that NSW will 'walk away' from the Plan, and that the Plan 'will fall over'. Clearly, to achieve a healthy working river system with a fair allocation for all water users including the environment, there needs to be cooperation and compliance among all states in the current unwieldy governance structure. In our view, the Murray Darling Basin Authority needs reform, the legislation needs strengthening to ensure cooperation of the States, and the Authority needs sufficient funding to implement an enforceable system of compliance.

At this point we would like to submit questions and comments compiled by a RLCAG member, printed below in full. These questions and comments outline some of the key concerns of this group.

Questions and Comments

1. Will the Commission identify the key institutional failings that have resulted in the present compromise of the Basin Plan?
 - a. Will recommendations be made that address institutional failings?
 - b. Will recommendations be made in relation to these issues?

2. Will the Commission identify breaches of the MDB agreement at a political level?
3. Will the Commission address matters such as political resistance and the influence of special interest groups?
 - a. Will the Commission address the obvious failure of the Commonwealth Water Minister to support the implementation?
 - b. Will it also note the influence of lobbyists and the deliberate distortion of scientific facts in relation to the Coorong and Lower Lakes Ramsar Wetlands?
4. Will the Commission identify the reasons for the failure to implement basic infrastructure changes that would improve irrigation water delivery systems such as replacing open channels with piped systems
5. Economic benefits flow from improved environmental conditions. Are these to be taken into account and how?
6. Will the Commission be identifying the potential and actual negative economic impact on industry groups and communities resulting from the failure to meet MDB Plan targets?
 - a. Will the Commission be recommending compensation to industry groups and communities impacted by the implementation failures?
7. Will the Commission be noting the cost to Australia's reputation that arise from its failure to meet international agreements such as the: Ramsar Wetlands Convention, CAMBA and JAMBA.
 - a. Will the Commission's findings in relation to environmental impacts on the various MDB Ramsar Wetlands including the Coorong and Lower Lakes Ramsar Wetland be forwarded to the Ramsar Secretariat?

Paul Davis

17 April 2018

7. The likely impact of alleged illegal take or other forms of non-compliance on achieving any of the objects and purposes of the Act and Basin Plan, and the 'enhanced environmental outcomes' and the additional 450 GL, referred to above.

There is clear evidence that illegal take and non-compliance have undermined the objects and purposes of the Basin Plan, and the 'enhanced environmental outcomes' and the additional 450 GL.

Part 2 of The Basin Plan specifies the overall environmental objectives of the Basin Plan, at 8.04

- (a) to protect and restore water-dependent ecosystems of the Murray-Darling Basin; and
- (b) to protect and restore the ecosystem functions of water-dependent ecosystems; and
- (c) to ensure that water-dependent ecosystems are resilient to climate change and other risks and threats.

Part 2 includes specific markers of improvement in relation to Lakes Alexandrina and Albert, the Murray Mouth and the Coorong, a wetland of international importance.

This region is a complex marine, estuarine and freshwater system. The health of Lakes Alexandrina and Albert, the Murray Mouth and the Coorong is a clear indicator of the health of the

system as a whole, acting as ‘the canary in the mine’. Generally, rivers die from the mouth up. In the case of the Murray Darling the impact of overallocation and over extraction obscures this. Evaluation in this region is further limited by the lack of scientific data available.

There is anecdotal evidence of the value of environmental flows, including significant increases in numbers of black bream. Local fishers state however that environmental flows have been delivered on the back of significant natural flows, and point out that median level flows are critical for maintaining ecological health.

It is apparent that while there have been improvements registered since 2006 - 2012, nowhere is there evidence of full recovery and certainly not to the point of resilience. In 2009 Lake Alexandrina was running at -1 m AHD to -0.3m AHD, and water levels had receded dramatically with the shrinking of the volume of Lake Alexandrina from 1100 GI to 660 GL, almost half. Today the managed level of the Lake is running at .05 AHD.

The Ramsar wetlands of the Coorong, Lakes Albert and Alexandrina remain in a fragile state, at the tipping point of sustainability.

Dr Faith Coleman (Ecoprotem) points out that “when managing a wetland, the common approach is to leave it alone for it to heal itself” but that water flow in the Coorong, Lakes Albert and Alexandrina Ramsar wetland has been constantly modified. "This modification has either been within the wetland itself, in the form of flow- restricting roads, banks, barrages and drains, or up-catchment, in the form of dams and irrigation activities.” Consequently it has become increasingly difficult to ‘freshen’ the 70 km long Northern Lagoon. As a result there has been a build up of organic carbon and sulphur into the water body, in various oxidization states. The combination of these leads to significant benthic invertebrate kills, most recently during January – March 2018.

At Pelican Point in the Northern Coorong, a traditional pelican breeding ground recognised in Ngarrindjeri lore, pelican breeding has never recovered. The local Aboriginal eco-tourism business has closed down.

The Southern Coorong remains dry. Local fishers who have fished in this region for three and five generations report that there has been no commercial fishing in the southern Coorong for more than 20 years.

The Basin Plan S 8.06 provides specifically that the Murray Mouth remains open at frequencies, and for durations, sufficient to ensure that the tidal exchanges maintain the Coorong’s water quality (in particular salinity levels) within the tolerance of the Coorong ecosystem’s resilience.

Basin Plan modelling indicated that the recovery of 3200 GI for the environment would ensure that the Mouth stayed open nine years out of ten, without the need for dredging. In fact, dredging at the Mouth of the Murray has not stopped, except for maintenance of the dredges. Given other successful outcomes of the delivery of environmental water, and the importance of flushing salt through the Mouth, we believe that this target should not be abandoned but that there should be a reexamination of the modelling to establish how to achieve this target.

8. In relation to any found instances of illegal take or work, whether appropriate enforcement proceedings have been taken in respect of such matters and if not,

why.

9. Whether, in any event, the enforcement and compliance powers under the Act are adequate to prevent and address non-compliance with the Act and the Basin Plan, and any recommendations for legislative or other change if needed.

During the development of the Basin Plan in November 2011 the Wentworth Group of Scientists found that the best publicly available science presented in the 2010 Guide to the draft Plan said that 3,856 - 6,983 GL of water was needed to be recovered from consumptive use to achieve hydrologic and environmental goals. This was later revised to a minimum of 4,000 GL just to flush out the 2 million tonnes of salt accumulated in the system annually. The final iteration of the Plan compromised on 3200 GL. Currently 2106 GL has been restored and there is no confidence about the return of the water remaining.

The 5% contingency contained in the Plan was argued by the River Lakes and Cooroong Action Group at the time, in order for the MDBA to be in a position to increase environmental flows in the knowledge that the 3200GL was not likely to achieve the environmental objectives of the Plan.

10. Whether monitoring, metering and access to relevant information (such as usage data) is adequate to achieve the objects and purposes of the Act and Basin Plan and the 'enhanced environmental outcomes' and additional 450 GL referred to above.

This is an area where increased and more efficient data collection could utilise the skills of a number of independent and community groups.

Around the Lower Murray, Lakes Alexandrina and Albert, there are several community groups who carry out monitoring of the water levels and salinity levels. These include the Finniss Catchment Group. A number of fishers are working in the Lakes and Coorong on a regular, if not daily basis. There is considerable expertise and local scientific knowledge in these groups. This knowledge could be employed more effectively.

Dr Faith Coleman (Ecoprotem) points out the need for reliable data collection in evaluating the effectiveness and efficiency of the delivery of environmental water:

“ One of the greatest challenges when managing the Coorong, is the current lack of knowledge around the spatial impacts of water flow or level variation on salinity, sediment and nutrient distribution, over various temporal scales.

During the Millennium drought, significant funds were spent on a large range of baseline and short-term monitoring programs. Unfortunately, each of these designed for specific purposes, so either did not cover the basic attributes for estuarine characterisation, were not undertaken frequently enough, did not assess enough places for spatial comparison or were not undertaken long enough to answer the questions we currently have, in regard to the impact of normal flow regimes. Most of these assessment and monitoring programs (as summarized in the EPA's Coorong, Lakes and Murray Mouth Water Quality Monitoring Program 2009- 2016) are no longer undertaken.

The current department water quality monitoring of the Coorong is almost entirely the outputs of permanent automated monitoring stations, with the majority around the Murray Mouth. While historically these sites occasionally had manual water quality, they now all take Electrical Conductivity at a single unspecified depth and water level. Some also monitor temperature.”

There is little communication between community groups and established committees, unless particular relationships exist. This disjunct is of concern in the implementation of a Plan which is perceived as increasingly process-driven. Throughout the history of formalised water use there have been examples of government policy being opposed by community groups because of their local knowledge which contradicted the policy. The SA government’s Water for Good policy is one example.

Salinity

Clearly there is a need for increased flows to meet the water quality objectives of the Murray Darling Basin Plan as evidenced by the frequent recurrence of algal blooms along the river system.

To comment on the scale of the issue in this region, the following calculation by former member of this group may be of interest:

Given that there are about 500,000 minutes in a year, the amount of salt which needs to be flushed out of the Murray Mouth is about 4 tonnes every minute. If you can imagine a semitrailer carrying 20 tonnes, the system needs one of those every 5 minutes of every day to get rid of the Basin's salt load. It's one of the many ecosystem services that the Murray provides - one of Australia's biggest freight services.

The amount of salt and toxic nutrients flushed out each year would fill 2/3 of the Melbourne Cricket Ground.

Locally we believe there has been a reduction in the number of real-time recordings of salinity in the Lakes and Coorong but there are still a number of markers in place. Community members are engaged in a community monitoring program which could be further supported. In this area salinity can fluctuate because of wind and currents, for example from 200 EC to 2000+ EC observed recently.

There is a need for ongoing research and modelling of systems throughout the Basin, including to achieve a better understanding of the impact of coal seam gas fracking on groundwater systems and the Great Artesian Basin. The relationship of groundwater and the GAB to the Murray Darling system was not well understood at the time of development of the Plan. In this context, we understand that coal seam gas activities mobilise salt, which will impact on the Murray Darling Basin system. In this context we cite the Healthy Headwaters study of 2013, which is available at https://qldgov.softlinkhosting.com.au/liberty/opac/search.do?mode=ADVANCED&limit=All&action=search&queryTerm=Healthy+HeadWaters+Coal+Seam+Gas+Water+Feasibility+Study&includeNonPhysicalItems=true&resourceCollection=All&branch=All&operator=AND&_open=1

11. Whether water that is purchased by the Commonwealth for the purposes of achieving the objects and purposes of the Act and Basin Plan and/or the ‘enhanced environmental outcomes’ and the additional 450 GL referred to above will be adequately protected from take for irrigation under water resource plans, and any recommendations for legislative or other change if needed.

12. Whether the Basin Plan in its current form, its implementation, and any proposed amendments to the Plan, are adequate to achieve the objects and purposes of the Act and Basin Plan, the 'enhanced environmental outcomes' and the additional 450 GL referred to above, taking into account likely, future climate change.

Current monitoring, evaluation and reporting are undermined at federal and state levels. The MDBA Framework for Evaluating Progress suffers from a lack of availability of real baseline data and from state and federal governments' failure to adhere to the legislated implementation of the Basin Plan.

Communities in this region have confidence in the Basin Plan legislation but have real concerns about the management and implementation of the Plan under the existing structure of Australian and State governments.

The River Lakes and Coorong Action Group has long advocated changes to S100 of the Constitution so that the management of the Murray Darling Basin is governed by the Australian government (although the clear partisan politicising of the previous Water Minister and evidence of particular relationships between senior bureaucrats and vested interests gave no confidence in this regard) or an Authority properly funded and equipped with the powers to manage this extraordinary resource for the benefit of the whole system including Indigenous cultural purposes, irrigators, fishers, recreational users, and the environment.

Communities throughout the system see the River and its wetlands every day, take climatic conditions into account and are able to form opinions. Community landcare groups in this region regularly undertake monitoring of water levels and water quality including salinity. However, at present, using publicly available data, it is not possible for the community to assess the South Australian Government against their reporting requirements to the Commonwealth Environmental Water Holder.

13. Any other related matters.

It is not possible to assess adequately how effective and efficient the delivery of environmental water has been to this area without the delivery of the prescribed environmental flows and more detailed reliable data.

The delivery of environmental water to this region is compounded by problems of delivery upstream.

This is further underlined by politicisation and particular dealings to the point of corruption.

Politicised misinformation

There are three common themes to political lobbying against the return of environmental water to the lower Murray River, Lakes Alexandrina and Albert, and the Coorong. These are inaccurate and distressing for people who have spent years advocating for a fair share of water for all users.

These are:

- South Australia wastes water. This statement is often linked to statements like: Why send water downstream that will evaporate off Lake Alexandrina?
- Building of weirs/dams/bunds / blockages in the system to hold water back upstream

- The Lakes and Coorong were not a freshwater system and therefore we should flood the region with saltwater.

South Australia is the most efficient and compliant MDB state.

As the MDBA recognises, South Australia receives 7% of the water allocation for the Basin and 7% of the population in the Basin are in South Australia. Most of the water that flows into South Australia remains in the river for the benefit of the environment. River Murray water is also critical for the human needs of the 1.29m people of Adelaide and across the Eyre Peninsula.

SA was the first state to voluntarily put a cap on entitlements in 1969, and South Australian irrigators have a history of being among the most efficient and innovative across Australia. South Australian irrigators employ fully-piped pressurised irrigation systems and have led the way in adopting efficiencies like drip line irrigation as opposed to spray irrigation.

Currently, South Australian irrigators lead other states in terms of metering and compliance, and this has been the case for some time.

Lake Alexandrina's rate of evaporation is lower than the Hume and Chaffey Dams

Since 2006 the idea arises from time to time that water delivered to South Australia is wasted through evaporation from Lake Alexandrina. Lake Alexandrina has a surface area of 649 km² at an average depth of 3m going down to 6m, and stores 1,610 GJ of water. Because it is such large body of water located in a mild temperate climate the rate of evaporation is low - CSIRO modelling shows a rate of 1060 mm compared with the Hume Dam rate of 1075 mm, with actually 'reverse evaporation' in the months May to July. (McJannet D.L., Webster I.T., Stenson M.P., Sherman B.S. *Estimating open water evaporation for the Murray Darling Basin - A report to the Australian government from the CSIRO Murray-Darling Basin Sustainable Yields Project November 2008* pp 21-25) Estimates vary and rates of evaporation vary each year. While Lake Alexandrina is a large body of water and a larger surface area lake will lose more than a small one, the rates of evaporation at Renmark and Mildura are likely to be twice what they are in the region of the Lakes and Murray Mouth. Lake Alexandrina has a lower rate of evaporation than the Hume Dam, and its rate of evaporation is half that of Chaffey Dam.

Dams add to the problem, not alleviate it

Proposals to dam the system are of great concern and are the reason that the River Lakes and Coorong Action group first formed, to combat the building of the proposed Pomanda Weir under the South Australian Governemnt's Water for Good policy.

A whole of system approach is underlined. The system should work so that there is sufficient water in the Murray to hold back the Darling, and sufficient Darling flows to push water out the Mouth.

We would like to debunk, once and for all, any concept of further weirs or dams in the area of Lock 1.

The Lakes and Coorong are a complex freshwater and estuarine environment

Anecdotally, some of the first pastoralists to settle in this area drove their cattle from Adelaide and settled at the first major expanse of fresh water they found - Lake Alexandrina. These families still water their cattle from the Lake today. Their station diaries show a history of freshwater extending back some 160 years.

That this is primarily a freshwater system has been shown in scientific studies. We attach here, in full, a paper contributed by River Lakes and Coorong action Group member Paul Davis.

AN ENVIRONMENTAL HISTORY OF THE LOWER LAKES AND THE COORONG

Jennie Fluin, Deborah Haynes and John Tibby. September 2009

<https://www.environment.sa.gov.au/files/5d2c3aee-1b6a-4f88-8a87-9ed700e0512e/cons-gen-environmentalhistorycooronglowerlakes.pdf>

Extracts from the above report

This report reviews the diatom-based evidence for the history of salinity and pH in Lake Alexandrina and The Coorong. Diatoms are a type of aquatic algae that have species compositions highly influenced by the salinity and pH of their host waters. In addition, because they build their cell wall from silica, diatoms preserve in sediment. Hence, by examining the species composition of diatoms in dated sediment cores, it is possible to obtain a record of pH and salinity change through time.

Our review has found for Lake Alexandrina:

- There is no evidence in the 7000 year record of substantial marine incursions into Lake Alexandrina.
- In addition, there is no evidence in the Lake Alexandrina record of any periods of significant acidification events. Indeed, our evidence suggests that pH at the sites examined has always remained well above seven.
- There were substantial alterations to the diatom community in Lake Alexandrina following European settlement and particularly after barrage installation.
- Our review of The Coorong has found that:
 - the pre – European diatom flora from The Coorong is dominated by diatoms associated with marine and estuarine environments
 - diatoms derived from the River Murray and Lake Alexandrina penetrated no further south than Noonameena in the North Coorong Lagoon
- These data suggest that the primary role of River Murray discharge was to:
 - keep the Murray Mouth open and allow sea water into The Coorong
 - generate estuarine conditions at the northern end of the North Lagoon during high flow periods
 - facilitate circulation and mixing in the North Lagoon such that salinities were maintained at or below those of seawater
- Fresh / brackish surface and groundwater flows from the South East region played a major role in controlling salinity levels in the South Lagoon
- The post – European diatom floras in The Coorong are substantially different to those of the pre – European and suggest a widespread increase in salinity. (p2)

To summarise, in terms of salinity, it would seem that there was a salinity continuum in Lake Alexandrina prior to barrage construction. At the river mouth, close to the location of the Goolwa Barrage, there is strong evidence of estuarine conditions. Moving up the Goolwa Channel, into the centre of the lake, salinity diminishes to mostly fresh conditions with the occasionally salinity peak due likely to prevailing wind conditions or extended period of low river flow. Towards the north – eastern section of the lake, there is essentially no evidence for salinity elevated above fresh to slightly brackish conditions. These patterns exist for all the documented record (i.e. 7000 years). (p11)

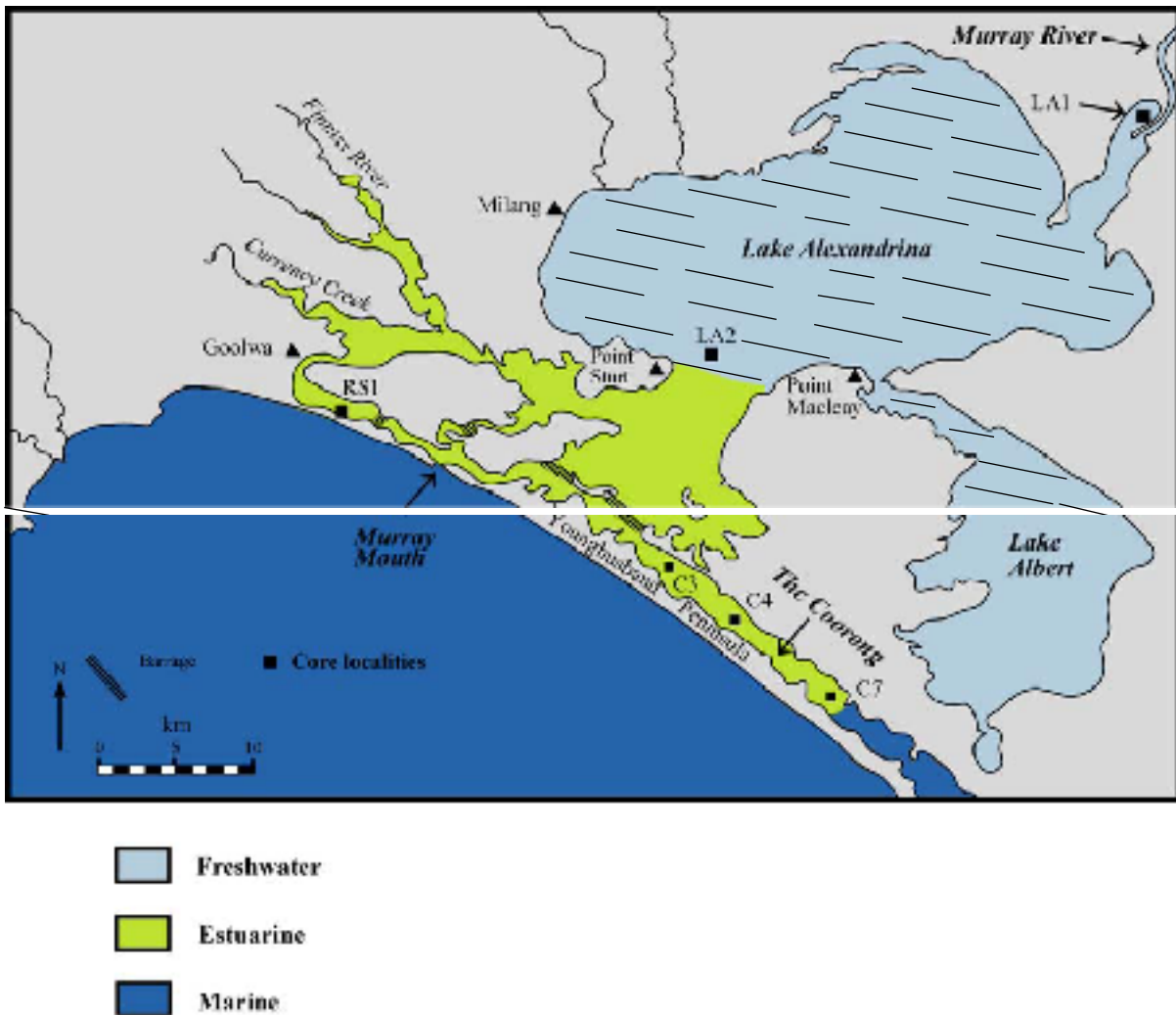


Figure 6: Summary diagram of information from Figures 2-5 showing the extent of the Murray River estuary before barrage construction as inferred from diatom-based evidence. (p16)

Our findings demonstrate that the current state of The Coorong and Lower Lakes is without precedent and that the ecosystems are very different to those which existed prior to European settlement of the region. (p22)

Many proposals in regard to the management of the CLLMM region draw upon inferences about their pre-impact condition. In particular, some calls to allow sea water into Lake Alexandrina have been justified by an assumption that sea water would have penetrated into the Basin in the past. **However, as is summarised in Figure 6, this is not the case and the majority of the Lake has been fresh for its entire history.** (Emphasis added) (p22)

Diatomic evidence accords with the hydrology as per the following:

Webster (2005) has documented the hydrodynamics of The Coorong and his conclusions are as follows:

The hydrodynamics of The Coorong, that is its currents, water levels and salinity regime, are driven by freshwater flows through the barrages and from the Upper Southeast drainage area, wind blowing over the water surface, evaporation and precipitation, and by sea level fluctuations propagating through the Mouth channel. Sea level fluctuations are due to the tides, the passage of

storms and weather systems, and to a seasonal cycle of water level variation in the Southern Ocean. Significant barrage flows serve three main functions from the hydrodynamic perspective. They ensure that the Mouth channel is scoured out for at least part of the year allowing sea level fluctuations to penetrate into The Coorong to cause currents and mixing which are essential for removing accumulated salt. Barrage flows introduce fresh water into The Coorong which is eventually drawn and mixed into the South Lagoon thereby lowering salinities. Thirdly, large barrage flows elevate the water level and ensure that mixing exchange through the narrow, shallow channel between the two lagoons is more effective (Webster, 2005). (p15)

The diatom data summarised herein are not inconsistent with such a model. (Emphasis added) (p15)

Other useful references:

Bourman, Bob. 2010. *Life of the Murray*
<https://quadrant.org.au/opinion/doomed-planet/2010/10/life-of-the-murray/>

Sim, T. and Muller, K. 2004. *A fresh history of the lakes: Wellington to the Murray Mouth, 1800s to 1935*. River Murray Catchment Management Board, Strathalbyn.
<http://www.gwlap.org.au/docs/A%20Fresh%20History%20of%20the%20Lakes%202004.pdf>

Webster, I.T., 2005. *An Overview of the Hydrodynamics of the Coorong and Murray Mouth*. Water for a Healthy Country National Research Flagship CSIRO Report Series.
<https://publications.csiro.au/rpr/download?pid=procite:6fbe4612-7d86-4215-8ea4-7d17d0842e47&dsid=DS1>

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