



Government
of South Australia

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The Hon Ian Hunter MLC

Senator David Leyonhjelm
Chair
Select Committee on the Murray-Darling Basin Plan
Email: murraydarling.sen@aph.gov.au

Dear Senator

Thank you for your letter of 20 January 2016, seeking further input from South Australia to the inquiry of the Select Committee on the Murray-Darling Basin Plan.

I am pleased to provide responses to the questions raised by the Committee as attached.

Should the Committee have any queries regarding these responses, please contact Mr Tim Goodes, Group Executive Director, Strategy and Advice, Department of Environment, Water and Natural Resources, on telephone (08) 8463 6949 or by email at tim.goodes@sa.gov.au.

Yours sincerely

IAN HUNTER MLC

Minister for Water and the River Murray

17 / 2 / 2016

Encl: Responses to Questions

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Question 1

What management actions specific to the Lower Lakes and Murray Mouth have been undertaken by the government since the end of the Millennium drought.

In addition to routine river management and barrage operations undertaken in partnership with the Murray-Darling Basin Authority (MDBA), there are a range of management actions associated with programmes such as the Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project and The Living Murray Programme. These management actions include:

- long-term and annual planning for environmental watering and management of the delivery of environmental water;
- a Lake Albert Scoping Study, which investigated potential options for the long-term management of Lake Albert water quality and the Narrung Narrows;
- implementation of Lake level cycling to improve salinity in Lake Albert;
- construction of new fishways in the barrages to improve connectivity and support lifecycles and populations of fish within the CLLMM site;
- removal of the Goolwa Channel and Currency Creek Regulators and Narrung Bund;
- dredging of the Murray Mouth since January 2015;
- a vegetation programme to stabilise the region's ecology through planting to restore habitat, pest management, and protection of revegetated areas;
- various ecological and acid sulfate soil monitoring and research projects to support and assess management decisions for the site;
- development of a Drought Emergency Framework for Lakes Alexandrina and Albert;
- development of a monitoring and adaptive management framework for the CLLMM, including an update of the site's Ecological Character Description, and a site operations manual;
- translocation of threatened small-bodied freshwater fish populations into suitable CLLMM site release locations and *Ruppia tuberosa*, a keystone aquatic plant, to the Coorong South Lagoon;
- restoration of the Meningie foreshore through infrastructure installation, bank stabilisation and planting activities, in conjunction with the local community; and
- projects to build community capacity in the region including supporting Ngarrindjeri Partnerships, establishing a Community Advisory Panel, and supporting the Lakes Hubs at Milang and Meningie (the Lakes Hubs were established to assist with the dissemination of information and provide collaborative links between Government and local communities).

In addition to the above, the South East Flows Restoration Project has commenced which will contribute to reducing salinity levels in the Coorong South Lagoon.

Question 2

Restoring the environmental health of the Coorong, a Ramsar listed wetland, is one of the key drivers of water recovery under the Basin Plan. The committee has received submissions suggesting that thousands of gigalitres of fresh water are diverted annually away from the Coorong to the sea to drain farmland. The South East Drainage Restoration Project currently in progress is expected to return less than 50 gigalitres of fresh water to the Coorong annually.

The South East of South Australia has a complex network of drains and floodways constructed over the last 150 years, largely to reduce waterlogging and maintain the region's agricultural productivity. The total annual discharge to sea of all South East drains combined is approximately 250 gigalitres per year on average.

Historically, some but not all of the water would have flowed into the Coorong. Very little of the water from the lower regions of the South East is likely to have reached the Coorong.

It is not possible to direct all of the South East drainage water to the Coorong via engineering works. However, where feasible, the South Australian Government has undertaken works to increase flows to the Coorong South Lagoon. These flows complement but do not replace River Murray flows.

a. Does the government consider that the operation of the South East Drainage Scheme has an effect on the environmental health of the Coorong?

The South East Drainage Scheme provides a median volume of 29.7 gigalitres per year directly into the Coorong South Lagoon. The South East Flows Restoration Project proposes to upgrade elements of the existing South East Drainage Scheme to increase the median volume of water available for the Coorong by an extra 26.5 gigalitres per year.

These flows from the South East entering the Coorong at Salt Creek can contribute to reducing salinity in the South Lagoon, having the greatest benefit when barrage outflows are low.

Flows from the South East can only provide relatively modest volumes to the South Lagoon and are very variable from year to year. As a result they have negligible effect on the North Lagoon and on water levels that support healthy ecosystems across the Coorong. The River Murray remains the primary source of fresh water to ensure the environmental health of the Coorong.

The River Murray flows that benefit the Coorong also support environmental outcomes along the length of the River Murray, help keep the Murray Mouth open, provide connectivity through the barrages critical for native fish passage and export salt and other pollutants from the entire Murray-Darling Basin.

b. Is the draining of farmland in the South East a higher environmental priority for the S.A. government than the environmental health of the Coorong?

The draining of farmland in the South East commenced long ago. The first drains in the lower South East were constructed in 1863. Major drains were

constructed between 1949 and 1972 (the Anderson Scheme), largely to reduce inundation and support the region's agricultural productivity.

More recently, the Upper South East Programme (1997–2010) constructed drains to address issues of dryland salinity and flood mitigation and to improve the environmental health of wetlands. For example, the Restoring Flows to Wetlands in the Upper South East (REFLOWS) Project was developed within the Upper South East Programme.

The South East Drainage System is currently operated for multiple economic and environmental outcomes to:

- prevent inundation of agricultural land;
- address dryland salinity; and
- provide environmental flows to South East wetlands and the Coorong South Lagoon.

c. Does the S.A. government have any specific interest or oversight in the management of the Coorong?

The South Australian Government is the site manager. It manages the Coorong, and Lakes Alexandrina and Albert Ramsar site, reviews its condition and reports on the status of the wetland, including reporting any changes in ecological character.

The Australian Government also has a specific interest in the management of the Coorong as it is signatory to a range of important international agreements that apply to the site, including bilateral migratory bird agreements with Japan (JAMBA), China (CAMBA) and the Republic of Korea (ROKAMBA), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), and the Ramsar Convention on Wetlands.

Due to the significance of River Murray flows to the site and its national and international importance, the South Australian Government, the Australian Government and the upstream states cooperate to manage and maintain the ecological character of the site. For example, the CLLMM is an icon site under The Living Murray programme, which is a joint government initiative funded by the New South Wales, Victorian, South Australian, Australian Capital Territory and Australian governments and coordinated by the Murray-Darling Basin Authority (MDBA).

The MDBA, acting on behalf of the Basin States, is responsible for delivering water to South Australia, and for operation of the barrages (in collaboration with South Australian Government agencies and the Commonwealth Environmental Water Holder).

d. If so, can the government advise what management plans are in place to improve the environmental health of the Coorong?

A range of Basin wide and State based management plans are in place to improve the environmental health of the Coorong. These include:

- the Basin Plan and the Basin Wide Environmental Watering Strategy;

- the Coorong, Lakes Alexandrina and Lake Albert Ramsar Management Plan (2000);
- the Living Murray Initiative's Lower Lakes, Coorong and Murray Mouth Environmental Management Plan;
- the South Australian Long-term Environmental Watering Plan;
- Securing the Future: A long-term plan for the Coorong, Lower Lakes and Murray Mouth;
- the Coorong National Park Plan;
- the State Natural Resources Management (NRM) Plan, South Australian Murray-Darling Basin NRM Plan and South East NRM Plan;
- the Lakes and Coorong Fishery Management Plan; and
- Alexandrina Council Environmental Action Plan 2014-2018.

e. have there been any discussions with the MDBA to return water from the SE Drainage Restoration Project to the Coorong? If so, what was the outcome? If no, why not?

The South East Drainage System and the South East Flows Restoration Project have been discussed with the MDBA. Flows from the South East Drainage System were included in the MDBA's modelling to assess the environmental water recovery required under the Basin Plan. The South East Flows Restoration Project has also been proposed as a potential sustainable diversion limit adjustment project.

The South Australian Government continues to keep the MDBA informed about progress and about the flows from these initiatives to enable the MDBA's River Murray modelling to be kept up to date.

Question 3

Has any S.A. government agency, undertaken an economic analysis of the cost of forgone agricultural production from the total volume of water used to maintain the freshwater level in the Lower Lakes at 0.75m AHD?

The South Australian government is not aware of any such analysis.

Water levels in the Lower Lakes are not held constant but are varied through River and barrage operations that take account of seasonal inflows and evaporation variability, as well as the impacts of low flows during droughts. Water levels are generally higher in winter and spring and diminish from summer through to autumn when operations aim to prevent water levels falling below 0.4 metres AHD (the point at which adverse environmental consequences begin to occur).

In reality very little of the water that maintains the Lower Lakes could be practically diverted for other uses. Much of the flow to the Lakes would occur regardless either through regulated flow provided down the River Murray system for multiple users and to maintain water quality or through higher flows that cannot be regulated (i.e. captured in storages).

Any economic analysis of alternative management options and uses of Lower Lake water would need to consider the effects on the State's economy and communities including effects on recreational and commercial fisheries, water quality, local agriculture, tourism, local towns and the environment.

Question 4

During the last drought, the State Government investigated installing a weir at Wellington.

- a. Was a cost-benefit analysis conducted? If so, the Committee requests copies of the outcomes of those investigations.*
- b. The committee requests copies of any salinity modelling conducted thereto. In the government's view, what impact would such a weir have had on salinity above and below the weir?*
- c. What were the specific reasons that the Government elected not to proceed with the weir?*

The South Australian Government's position has always been that it did not want to construct a temporary weir at Pomanda Island (10 kilometres downstream of Wellington) unless it was absolutely necessary to protect the State's potable water supply i.e. it was a measure of last resort.

The temporary weir was considered to establish a stable water level so South Australia's major water supply pumping stations located below Lock 1 could access water and to address extreme water quality issues.

Preliminary investigations and works were undertaken to assess feasibility and environmental impacts allowing a decision to be deferred as long as possible. As the triggers for commencing construction were not reached the cost benefit analysis as required by all South Australian major public works was not pursued.

Salinity modelling was undertaken to support the preparation of an Environmental Impact Statement (EIS). The modelling projected salinities in the River Murray and in Lake Alexandrina during ongoing drought for the weir and no weir scenarios. The scenarios did not include temporary seawater ingress.

The results showed that projected salinities in Lake Alexandrina were higher in the first year following construction of a weir compared to no weir (largely due to the refill volume required behind the weir). For the river between Lock 1 and Wellington salinity levels remained within the same range for both scenarios indicating that the weir was expected to have negligible effects on salinity between Lock 1 and Wellington. The draft EIS is available at website:
<http://www.environment.sa.gov.au/files/sharedassets/public/cllmm/eis-draft-report.pdf>.

Following an improvement in flows to South Australia in 2010 and the corresponding reduction in risk to drinking water supplies, the emergency measure of constructing a temporary weir was not required.

Question 5

Salinity levels are of concern to many people and a key driver in reducing water extractions to increase river flows. Salinity levels in Lake Albert and the Coorong are used by people to argue for more action on the Basin Plan. Assuming Lake Albert and the Coorong are not under the direct control of the MDBA, who is responsible for taking action to reduce salinity levels in Lake Albert and the Coorong?

Lake Albert and the Coorong salinity levels depend on River Murray flows and water quality and local weather conditions.

The Basin States and the Australian Government are collectively responsible for actions that reduce salinity in the River Murray system, and ultimately Lake Albert and the Coorong, through their river flow and salinity management obligations under the Murray-Darling Basin Agreement, the Basin Plan and any other relevant management plans.

All Basin states contribute to salinity in the River Murray system with the aggregate impact of higher salinities in the mid and lower reaches and the Lower Lakes. As a result, it has long been identified as an issue that requires joint management.

Joint Basin Salinity Management Programmes have been undertaken since 1988, under the Murray-Darling Basin Agreement, and have been effective in managing salinity with a focus on reducing the levels of salt entering the River. The Basin Plan also sets out complementary salinity and water quality management obligations for all Basin states and the Australian Government including the Commonwealth Environmental Water Holder. In addition, environmental water recovery and delivery under the Basin Plan will assist to manage salinity through restoration of dilution flows.

Question 6

Does the government consider that the Basin Salinity Management Programme is achieving its objectives?

The Basin Salinity Management Programme continues to successfully manage the salinity threat across the Murray-Darling Basin to protect the environment, irrigated agriculture, industry and critical human water supplies from adverse effects of high salinities.

The General Review of Salinity Management in the Murray-Darling Basin undertaken in 2014 showed that salinity remains an ongoing risk requiring a continued joint government management response.

Question 7

During the last drought when acid sulphate soils were being exposed by the Lower Lakes' level falling below the ocean, there were calls for the ocean water being let in to prevent the exposure of those soils.

- a. *Was a cost-benefit analysis conducted? If so, the Committee requests copies of the outcomes of those investigations*

During the Millennium drought, consideration was given by the Basin states and the Australian Government to the introduction of seawater as an emergency response to manage the broad-scale acidification of Lakes Alexandrina and Albert.

An economic analysis was commissioned but not completed. The analysis was intended to analyse the costs and benefits of alternative management options including inundation with seawater to inform an EIS. The analysis did not reach a point of providing any conclusive results. It was not completed due to the improvement in conditions no longer requiring the introduction of seawater to avert acidification.

- b. What, specifically, were the reasons why the State Government declined to allow temporary sea-water ingress into the Lake system to prevent acid sulphate soil exposure?*

Whilst considered as a last resort option to manage acidification, the introduction of seawater would have had significant, negative consequences including degradation of the existing ecosystems, changing the ecological character of the Lakes. Adverse effects on water quality at major urban, irrigation and stock and domestic water supply off-takes below Lock 1 would have also needed to be addressed.

As trigger levels for Lake-wide acidification were not reached, seawater was not required to avert acidification of Lakes Alexandrina and Albert.

- c. To what extent were State and Local Government revenues from land valuations diminished in River Murray communities, quantified by local government area, including Hindmarsh Island, from the drought and low river for instance affecting the recreational boating amenity of those Lower Lakes properties.*

No analysis of government revenues and land valuations has been undertaken.

Question 8

Given the widely held view that there is not enough storage in the Basin to guarantee the Lower Lakes would not dry in the next drought, what action has the government taken since the end of the Millennium drought to secure water supplies for Lower Lakes communities?

During the Millennium Drought, pipelines were constructed around the Lower Lakes to provide secure and fit for purpose water supplies.

A new potable pipeline was constructed in 2009 along the Narrung and Poltalloch Peninsulas that delivers water to the Raukkan Aboriginal and Narrung communities. In 2010, extensions to SA Water's existing potable pipeline network were made to supply stock and domestic water to the communities on the Sturt Peninsula and Hindmarsh Island.

A pipeline to deliver irrigation quality water to the Langhorne Creek and Currency Creek regions was constructed and commenced delivering water in 2009. The pipeline is operated by the Creeks Pipeline Company Ltd and provides irrigators an alternate water delivery option for their River Murray Water entitlements.

Question 9

During the last drought, a levee bank was installed at the entrance to Lake Albert.

- a. What were the State, Federal and local government costs of doing so?*
- b. For what duration was water pumped over the levee banks? What was the electricity cost of doing so? What were the State, Federal and local government contributions to the costs of doing so?*

Construction of the Narrung Bund (a temporary structure) was implemented as an emergency measure in the Lower Lakes region in response to falling water levels and the exposure of very large areas of acid sulfate soils.

When saturated, acid sulfate soils are benign and pose no threat. When exposed to oxygen and then re-wet, these soils cause acidification of the water body making it hazardous to human health, ecosystems, livestock and other animals.

The Narrung Bund provided a platform to enable water to be pumped from Lake Alexandrina into Lake Albert to prevent exposure of acid sulfate soils and to hold the pumped water in Lake Albert. It successfully averted large-scale acidification of Lake Albert and localised areas of the Narrung Narrows.

The joint Basin governments through the then Murray-Darling Basin Commission provided more than \$14 million for the construction of the Narrung Bund in 2008 and to cover subsequent pumping of water from Lake Alexandrina to Lake Albert and associated dredging works. All pumping was undertaken using diesel pumps.

Almost 240 gigalitres of water was pumped from Lake Alexandrina to Lake Albert between April 2008 and June 2010. A total of 150 gigalitres was pumped immediately following the construction of the Narrung Bund in April 2008, and a further 89.9 GL was pumped between January and June 2010 to ensure that water levels did not fall below minus 1.0 metres AHD, thereby maintaining the inundation of acid sulfate soils.

- c. Why hasn't the levee bank been fully removed after the drought? Which level/s of government have contributed to the partial removal, and what has been proposed or sought by any level of government regarding funding the removal of the rest?*

The Narrung Bund was fully removed by October 2012. The site has been returned to as close as practicable to its pre-construction state, removing potential navigation hazards and meeting all preconstruction commitments and undertakings.

Removal of the Narrung Bund cost around \$1.9 million, funded by the Australian, South Australian and the joint Basin governments through the MDBA.

Removal commenced in September 2010 and was separated into two phases:

- Phase 1 – removal of the Narrung Bund- including the removal of as much imported sand material as possible and all steel and concrete materials; and
- Phase 2 – dredging to restore the channel profile.

The site was allowed to settle for 15 months between Phases One and Two.

- d. *What, specifically, are the State Government's reasons for not supporting the construction of a 'Coorong Connector' enabling through-flows from Lake Alexandrina to the lower Coorong?*

The Lake Albert Scoping Study Options Paper indicated that raising and lowering lake levels to maximise salt export (Lake cycling) was the best management approach with potential to achieve historical salinity levels before it was possible to build and operate a Coorong Connector. The Options Paper can be located at: http://www.naturalresources.sa.gov.au/files/sharedassets/sa_murray-darling_basin/water/lake-albert-scoping-study-options-paper-rep.pdf

The Coorong Connector was considered technically feasible but was also costly (approximately \$19-\$25 million) with only a marginal benefit cost ratio.

The study also identified that implementation of the Basin Plan should mitigate extreme salinity levels in future. However, if extreme conditions were experienced following a drought then 'temporary reset pumping' could be implemented. This option involves speeding up the recovery of Lake Albert by installing temporary pipes and pumps to transfer Lake Albert water into the Coorong.

- e. *To clarify points raised in evidence, how does the South Australian Government or other levels of government (as a percentage of natural environmental lake level moderations) create 'lake cycling' and what in numerical terms do the Government believe to be the benefits of lake-cycling?*

Lake cycling can be undertaken when large volumes of water are available, such as an unregulated flow event or delivery of large volumes of environmental water. It involves:

- o surcharging the water level in the Lower Lakes;
- o maintaining the high water level for a short period to enable mixing of the fresh water with the higher salinity water;
- o releasing the higher salinity water from the Lakes via the barrages (to export salt to the sea); and
- o then delivering additional water to refill the Lakes.

In July 2011, the salinity level in Lake Albert was around 6,000 EC. In 2011-12, Lake cycling was introduced to assist in exporting salt from Lake Albert. The water level in these cycles ranged between 0.5 metres AHD and 0.89 metres AHD. In July 2012, the salinity level had decreased to around 3,700 EC. The decrease in salinity is mainly attributed to Lake cycling and the larger volumes of water received from an unregulated flow event and environmental water delivery.

Between July 2012 and July 2015 water availability conditions meant that it was only possible to undertake a partial Lake cycling event in early 2014-15. However the combination of Entitlement flow, unregulated flow events and environmental flows have helped to continue to reduce salinity levels. In January 2016 the average salinity was around 2100 EC.

Question 10

What other management options for the Lower Lakes barrages have been considered by the government (including options that were rejected and, if so, the reasons for rejection)?

The Long-term Plan for the Coorong, Lower Lakes and Murray Mouth highlighted the opportunity to develop a lake level policy and barrage operating strategy to guide the management of water levels in the Lower Lakes and operation of the barrages and improve ecological outcomes. The strategy is now under development by the South Australian Government with assistance from the MDBA and Australian Government.

The construction of fishways through The Living Murray Programme and subsequently the CLLMM Recovery Project will result in the provision of fish passage at each barrage by the end of 2016, and a greater ability to provide environmental flows through the fishways to support productivity in the Coorong.

The introduction of seawater by opening the barrages was considered only as an emergency measure to manage acidification of the Lower Lakes at the height of the Millennium drought. Because trigger levels for Lake-wide acidification were not reached, this action was not required. The introduction of seawater would have had significant adverse ecological and water quality impacts.

Question 11

The conditions of the funding agreement to provide for the doubled capacity and funding for the desalination plant at Port Stanvac were that Adelaide reduce its reliance on the River Murray.

As Adelaide's only climate-independent source of water, the desalination plant provides the necessary water security to underpin the State's economic and population growth to 2050 and beyond. It also provides an insurance policy against future droughts.

Desalination reduces Adelaide's reliance on the River Murray by providing an alternative source which can be balanced with SA Water's use of the River Murray water and the State's reservoirs.

In addition, under the *National Partnership Agreement on Water for the Future and Implementation Plan for Augmentation of the Adelaide Desalination Plant*, the South Australian Government was obliged to secure 6 gigalitres of high reliability water entitlement from SA Water, which is now held and managed exclusively for environmental purposes in the River Murray.

In addition to the 6 gigalitres, in eligible years (i.e. after 1,600 gigalitres are made available for South Australia) the next 12 gigalitres are to be made available to meet the River Murray's environmental watering needs. Once the 12 gigalitres have been provided, 5 per cent of all subsequent inflows up to 1,850 gigalitres are to be allocated to the environment (with a maximum of 120 gigalitres to be provided to the environment over any ten year rolling period of eligible years).

- a. *What have been the River Murray usage figures since the desalination plant became operational?*

Responses to Questions

River Murray usage figures for Metropolitan Adelaide and associated country areas since the desalination plant become operational are provided below.

Year	Volume Extracted (gigalitres)
2011/12	59.0
2012/13	81.7
2013/14	42.1
2014/15	73.2

- b. *What has been the water output of the desalination plant since it became operational?*

Water production to date (to end of December 2015) is approximately 131 billion litres.

The output of the Adelaide Desalination Plant is regularly updated at:
<https://www.sawater.com.au/community-and-environment/our-water-and-sewerage-systems/water-sources/desalination/adelaide-desalination-plant-adp>

- c. *How much water has the Government through SA Water or otherwise drawn from the Murray Darling Basin, and what has been the:*
- Range of prices per kilolitre;*
 - Median and Average price per kilolitre; and*
 - Total cost per financial year of such water purchases?*

When water is purchased, it is purchased at market value and from willing sellers. Information regarding how much has been purchased and where from is commercial in confidence.

- d. *Is the government aware of how the operational cost per kilolitre of the desalination plant compares with desalination plants elsewhere in the world? If South Australia's is not the most cost competitive, in the Government's view what are the factors contributing to the less-competitive international comparison?*

SA Water's operating expenditure including costs associated with the Adelaide Desalination Plant form part of their regulatory Business Proposal which is subject to review by the State economic regulator (Essential Services Commission of South Australia). An independent review of the Adelaide Desalination Plant operating costs concluded that they reflect a prudent and efficient approach to the management and operation of the ADP.

- e. *In conclusion, to what extent in numerical terms has the desalination plant decreased Adelaide's reliance on water supply from the Murray River?*

The desalination plant has reduced reliance on River Murray water supply by providing an alternative water source of up to 100 gigalitres per year to support growth and to manage future droughts.

Question 12

The South Australian government extended the Murray River pipeline system to Ceduna instead of installing a desalination plant on the State's west coast.

- a. *What cost-benefit analysis was conducted into the alternatives? The committee requests copies of the investigations that were conducted.*
- b. *What were the comparative costs of building the pipeline to Ceduna and costs of pumping water there, as opposed to establishing a desalination plant?*

The Iron Knob to Kimba pipeline completed in 2007 provides limited transfer capacity of River Murray water to customers between Kimba and Lock.

Additional water supply options including a regional seawater desalination plant and optimising the use of existing water resources are being considered.

SA Water's Long-term Plan for Eyre Region sets out the current and future plans for water in the region.

Further information on the Long-term Plan and water resources in the Eyre Peninsula are available through the following websites:

- <http://www.sawater.com.au/community-and-environment/our-water-and-sewerage-systems/our-networks/regional-south-australia-water-supply/eyre-peninsula>
- <http://www.naturalresources.sa.gov.au/eyrepeninsula/land-and-water/managing-water-resources/water-security>

Question 13

What is the South Australian Government's policy position regarding the Snowy Hydro scheme, specifically the historical decision to permit reversion of flows previously entering the Murray Darling Basin from that scheme instead back down the Snowy River and out to the ocean?

The Snowy Hydro-electric scheme is an important hydro-electricity generation and storage and supply scheme. In recent years there has been considerable work undertaken to recover and release environmental flows from the scheme to the Snowy River and the River Murray.

The NSW, Victorian, and Commonwealth Governments have recovered water to allow up to an additional 70 gigalitres and 212 gigalitres to be released to the Murray and Snowy Rivers respectively for environmental purposes.

Question 14

The South Australian government historically contributed towards the cost of, firstly, lining irrigation channels in the South Australian Murray, and secondly, replacing those concrete-lined channels with pipelines. These developments resulted in substantial water savings from seepage and evaporation. Subsequent improvements on-farm in irrigation efficiency were, so far as the Committee is aware, driven by

private landholders until recent federal funding assistance. It may be that the South Australian taxpayer also contributed towards those water efficiencies. Considering the foregoing, what is the government's best estimate, in today's dollar terms, of the South Australian state taxpayer's contribution over time towards such historical water efficiencies? (that is, State Government expenditure, excluding Federal government investment)

Historical investment in infrastructure efficiencies by the South Australian Government, in collaboration with the Australian Government and irrigators occurred between 1970 and 2007.

Rehabilitation work was undertaken in the Riverland and Lower Murray to replace ageing, open channel and low pressure supply lines, remove leaking open channels, replace diversion mechanisms and channel fed flood irrigation and improve on-farm water management.

Given the significant time span over which the projects were undertaken and time that has passed since their completion, precise present-day expenditure cannot be provided. The estimated State Government funded contribution towards the rehabilitation schemes is between \$70 million and \$80 million.

Question 15

In the water market:

- a. Is the S.A. government competing with S.A. irrigators in the water market?*
- b. How much water have the SA Government or SA Water purchased on the temporary market in the last 10 financial years, at what cost per kilolitre, and in total for that financial year?*

When temporary water is purchased, it is purchased at market value and from willing sellers. Information regarding how much has been purchased and where from by SA Water is commercial in confidence.

- c. The Committee has heard a claim from a South Australian witness that South Australian water in upstream storages is treated unequally with interstate water, alleging SA carryover water 'spills first' from storages. The committee invites the South Australian Government to respond to that assertion, and to provide views generally on carryover rules and whether any reforms might be desirable.*

The changes to the Murray-Darling Basin Agreement made in 2008 grant South Australia the right to defer part of its water entitlement from one year to the next by utilising upstream storages in the River Murray System without impacting on the water availability for New South Wales or Victoria. The arrangements allow South Australia to better manage its water from year to year and manage risks to critical human water needs (CHWN) by carrying over CHWN reserves in upstream storages.

In order to not affect the water availability of New South Wales or Victoria, the effective outcome is that any deferred water stored would spill prior to any spills from water stored for New South Wales and Victoria.

- d. Does the government consider there should be any reform in the water market? If so, what reform should occur?*

The South Australian Government does not consider that water market reform is required. The water market in the Murray-Darling Basin is a mature and active trading market with several levels of regulation to support market efficiency and effectiveness. The Basin Plan includes trading rules that guide State water trading rules and complement rules governing inter-state trade under the Murray-Darling Basin Agreement. The rules aim to reduce inappropriate trade restrictions, improve transparency and access to information and to support an efficient and effective water market.

The South Australian Government continues to work with the MDBA and other Basin governments to implement the water trading rules and to improve the quality and transparency of information that is available to the market.

Question 16

The South Australian Murray has river shacks potentially subject to inundation under the Murray Darling Basin Plan. These are referenced in the Government's submission to the inquiry.

- a. *What is the latest estimate on the number of shacks potentially affected?*
- b. *What flood heights might be possible where these shacks are?*
- c. *In its budgeting, in dollar terms what provision is being made for Risk in relation to potential liability from policy making and resultant loss of life, capacity or property from such strategies and to what extent is it believed that other levels of government might be separately, jointly or severally liable thereto?*

Enhanced flows being considered under the Constraints Management Strategy are within the normal historical flow range and would not be greater than 80,000 megalitres per day at the border.

This is a high river flow with a minor flood risk only for shack areas downstream of Cadell. Based on initial modelling and consultation with landholders, the flows being considered are likely to only cause minor inconveniences, such as the movement of stock and temporary closure of minor roads or low-level bridges to around 23 shack areas.

Inundation maps for the River Murray at 60,000 megalitres per day and 90,000 megalitres per day flow rates are available at:

<https://www.waterconnect.sa.gov.au/Systems/RMIM/SitePages/Home.aspx>

Subject to Basin Ministers' decision in mid-2016 on the package of constraints measures to progress, the next steps will involve property-by-property assessments and discussions with landholders and businesses that may be affected about any risks and mitigation options. Mitigation works and measures would also benefit landholders during natural minor flood events.

The Australian Government has committed \$200 million to invest in works and measures to avoid or mitigate any risk to people or property in ways that are acceptable to landholders and communities. In addition, some constraints measures may be eligible for funding set aside for sustainable diversion limit adjustment supply measures.

If constraints cannot be removed or eased, environmental flows will continue to be delivered within the existing physical constraints and operational rules.

Question 17

Is the government satisfied with MDBA progress on addressing the Native Fish Strategy to date?

The Native Fish Strategy was endorsed by the Murray-Darling Basin Ministerial Council in 2003, with a long-term (50 year) goal of rehabilitating native fish communities in the Basin back to 60 per cent of their estimated pre-European settlement levels. The strategy provides direction for a wide range of government and community initiatives, and investment in areas such as water and natural resource management, biodiversity and threatened species conservation, recreational fisheries, biosecurity and pest species management and research.

The South Australian Government is confident that full implementation of the Basin Plan will assist in delivering the long-term goal of the strategy and is satisfied with progress to date.

Question 18

Does the Government support the release of the carp herpes virus into waterways, and what cost, scale and time-frame does the Government believe to have the best cost-benefit ratio?

The research indicates that the virus has good potential for helping to control carp. A full analysis of all risks and benefits would be required before any decision is made to release the virus into waterways to ensure there would be no unintended adverse consequences. For example, it will be very important to ensure there is no risk of infecting other fish and animal species. It will also be necessary to understand the effects on the aquatic food web of quickly removing large numbers of carp which provide an important food source for other species.

Question 19

Has the State Government assessed the state of SA River Murray levee banks and, if so, to what extent might higher flows in the Murray in future require that weakened integrity of those levee banks might need improvement? Has such a requirements been costed and, if so, what is that cost and to what extent is the State Government seeking contribution from other levels of government towards those costs?

The South Australian Government has assessed the levee embankments between Mannum and Wellington, including those owned by private individuals or irrigation trusts.

The majority of levees were constructed to deal with natural flood flows significantly in excess of the flows able to be delivered under the Basin Plan should constraints be relaxed. Some privately owned levees may require improvement.

Question 20

Has the State Government investigated the potential removal of silt, sand and snags in the SA River Murray to improve River Murray flows with the added benefit of improved navigation, river safety and recreational amenity?

Silt, sand and snags are not a significant issue in South Australia. From time to time, for example after high flow events, the removal of sediment and debris is undertaken to support effective operation of the locks and weirs.

Unless there is a specific risk the removal of snags is not undertaken. Snags provide habitat for a wide range of plants and animals and widespread removal results in declining fish abundance and distribution. Widespread removal of snags from channels also results in increased erosion and bedload transport, resulting in increased siltation.