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1 Executive Summary

The Riverine Recovery Project (RRP) is a $98 million State Priority Project that seeks to recover up to 15 GL of environmental water to River Murray environmental assets between Wellington and the South Australia/Victoria border. RRP will have significant positive impacts on the environment and the communities who call the Riverland and Murraylands regions home.

RRP wetlands projects have been delivered in two phases. RRP Phase 1 Wetlands included immediate works at six smaller ‘shovel ready’ sites (1A) and design, survey, community engagement and construction at five larger sites (1B) receiving Cabinet approval in 2011, works at these wetlands were completed in 2015. RRP Phase 1 Wetlands also progressed additional complementary wetlands for tendering and construction under RRP Phase 2 Wetlands.

RRP Phase 2 Wetlands will tender and construct the designs progressed in RRP Phase 1 Wetlands to enable managed wetting and drying of up to 11 additional wetlands, creating water savings (relative to their unmanaged state). This Regional Impact Assessment Statement (RIAS) describes the impacts to the regions for the $34 million RRP Phase 2 Wetlands project within RRP.

With the removal of some existing infrastructure and construction of new infrastructure to reinstate wetting and drying regimes, RRP Phase 2 Wetlands enables managed flow regimes and floodplain processes to help restore wetland health, support plants and animals dependent on wetlands and floodplains.

RRP is funded by the Australian Government and South Australian Government, and managed by the Department of Environment, Water and Natural Resources (DEWNR). The construction of infrastructure for RRP Phase 2 Wetlands is being delivered by DEWNR in partnership with SA Water.

RRP Phase 2 Wetlands is the most recent in a suite of complementary River Murray programs funded by the Australian and South Australian governments since 2003. Their cumulative effect is more than $400 million of funding delivered, and over a decade of continual construction works between 2011 and 2020 in the SA River Murray to achieve environmental outcomes.

The potential 11 RRP Phase 2 Wetlands sites are part of 7,362 ha of floodplain spanning 440 km of the River Murray. RRP Phase 2 Wetlands will improve flow and fish passage through 50 km of anabranches and creeks. The 11 sites total 435 ha that will be ready for water management, including more than 50 km of wetland fringe where the condition will be directly improved by reinstating variations in water levels. RRP Phase 2 Wetlands will also allow pumping at up to 23 ha of wetlands.

RRP Phase 2 Wetlands will improve the condition of the River Murray upstream of Wellington and result in very significant improvements for bird watching and fishing, including:
- Permanent ‘flowing’ creek habitat for native fish below Lock 4, linking the river with permanent deep water and intermittent wetland habitat. It also doubles the number of SA River Murray wetlands where native fish will dominate over alien species.
- Triple the number of sites along the SA River Murray primarily managed to provide food and habitat for migratory waders and Environment Protection and Biodiversity Conservation (EPBC) Act 1999 listed resident bird species such as the regent parrot *Polytelis anthopeplus*.

RRP Phase 2 Wetlands is expected to generate more than 40 full time jobs for two years from 2016/17 to 2018/19. Approximately half of these will be construction roles based in the region, with many of the remaining roles in a variety of program areas also being based locally. Most of the sites are near Renmark, Blanchetown, Swan Reach and Mannum, and there will be significant flow-on effects for the providers of goods and services in these towns. Providers of accommodation, food and hospitality, retail items and recreational activities will all experience the benefits.

The outcomes of RRP Phase 2 Wetlands will also encourage visitors to stay longer in the Riverland and Murraylands, as well as improve recreation for residents including walking, cycling, boating, fishing, yabbying and controlled duck shooting. Riverland and Murraylands tourism\(^1\) currently generates a combined $250 million in annual expenditure. This includes 568,000 overnight visitors and 1.9 million visitor nights. The anticipated boost to tourism and recreation through RRP Phase 2 Wetlands will result in flow-on economic effects for the regions.

DEWR has signed letters of in-principle support with landowners for the RRP Phase 2 Wetlands works and has developed wetland management plans for RRP Phase 2 Wetlands sites. During RRP Phase 2 Wetlands DEWR will finalise up to 17 management agreements with landholders for future wetland operations. RRP Wetlands Phase 1 delivered five wetland management agreements in perpetuity.

DEWR is working with a number of other partners to successfully deliver RRP Phase 2 Wetlands including the Australian Government (Department of Agriculture and Water Resources), SA Water, and in the regions, Landholders, River Murray and Mallee Aboriginal Corporation (RMMAC), Mannum Aboriginal Community Association Incorporated (MACAI), Ngarrindjeri Regional Authority (NRA), and Natural Resources South Australian Murray-Darling Basin (NR SA MDB).

DEWR is also working closely with regional stakeholders including Local Government (Renmark-Paringa Council, District Council of Loxton Waikerie, Mid Murray Council), Renmark to the Border Local Action Planning Group (LAP), Mid Murray LAP, Loxton to Bookpurnong LAP, Riverland West Landcare, Australian Landscape Trust and Banrock Station.

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\(^1\) 3 year annual average to June 2015
For the Traditional Owners, RRP Phase 2 Wetlands presents a unique opportunity for indigenous engagement in the implementation and ongoing management of River Murray wetlands. For the Ngarrindjeri / Ngaunguraku, this includes Indigenous-led management of the Sugar Shack Wetland Complex to return these permanent and intermittent wetlands and creeks to the way the ancestors of today’s Traditional Owner’s saw it. It also presents Aboriginal employment, capacity building and future tourism opportunities that can have a positive impact and legacy.

RRP Phase 2 Wetlands will also work with regional stakeholders to investigate and assess the feasibility of complementary wetland activities that seek to support local wetland restoration activities and build community capacity for regional management of wetlands into the future.

In summary, the expected financial, social and community, equity and environmental impacts to the Riverland and Murraylands regions from RRP Phase 2 Wetlands have been assessed to be overwhelmingly positive and very significant.
2 Agency

The Department of Environment, Water and Natural Resources (DEWNR).

3 Title

Riverine Recovery Project Phase 2 Wetlands (RRP Phase 2 Wetlands).

4 Issue

Regulation of the River Murray, including controlling flows using dams, levees, locks and weirs, has occurred since the 1920s. Regulation has reduced the natural variation in river water levels, reducing the frequency of large overland flows, but also reducing periods of lower river levels. This has, in turn, interrupted the natural regeneration cycle of the River Murray's animal and plant life. The impacts of river regulation on native species were amplified by the Millennium Drought between 1997 and 2009. Since the drought, returning flows have led to some improvement in the River Murray and its floodplains and wetlands. However, this has also highlighted that, due to long-term stress, many areas are still far from their pre-drought condition and that their ecological decline continues.

RRP Wetlands recognises the environmental issue created by stable water levels caused by river regulation. In wetlands with stable water levels, habitats available to fish, frogs and waterbirds are limited by the water regime and the distinct and often narrow bands of vegetation that water level stability creates. Opportunities for native fauna and flora to colonise new habitats are limited. Competition in wetlands with stable water levels may be high, productivity low and food chains well-defined and stable. Water level stability typically favours common and pest species, rather than desirable native flora and fauna that are adapted to environmental processes driven by water level variability.

4.1 Current and previous River Murray programs

The Riverine Recovery Project, a South Australian state priority project under the Murray Futures programme, aims to improve the river's health and the resilience of its wetlands, floodplains and backwaters. The project works, delivered between the South Australian/Victorian border and Wellington, include measures to improve the connectivity and movement of native fish, allow water level variation, improve ecological health and build partnerships with the local community including Traditional Owners.

RRP wetlands have been delivered in two phases. Phase 1 included immediate works at six smaller 'shovel ready' sites (1A) and design, survey, community engagement and construction at five larger sites (1B) completed in 2015. Phase 1 also progressed additional complementary
wetlands for construction in Phase 2. RRP Phase 2 Wetlands will construct these existing designs to enable managed wetting and inundation of 11 additional wetlands using less water.

RRP Phase 2 Wetlands is the most recent in a suite of complementary River Murray Programs funded by the Australian and South Australian governments since 2003. These have been under a range of Australian Government programs aiming to address the declining health of the floodplains and River Murray environment, including:

- The Living Murray programme which delivers works and measures at six icon sites on the River Murray between Barmah-Millewa Forest and the Murray Mouth. This program allows the return of water to the environment to preserve habitat for plants and animals including iconic river red gums, birds, frogs, turtles and fish. It includes three icon sites in South Australia, the South Australian section of the River Murray Channel, Chowilla floodplain and the Lower Lakes (Lakes Alexandrina and Albert), Coorong and Murray Mouth.

- The Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project between Wellington and the Murray Mouth. This project, a South Australian state priority project under the Murray Futures programme, was created in response to the Millennium drought to contribute to managing the site for ecological health and contribute to the objectives of the Long-Term Plan for the region. The CLLMM Recovery Project includes targeted scientific research and measures to stabilise the ecological decline of the region and deliver a healthy and resilient wetland community, enhance migratory water bird habitat in the Lower Lakes and Coorong and encourage more frequent estuarine fish spawning and recruitment. Partnerships with the regional community including Ngarrindjeri Traditional Owners have been critical to its success so far.

- South Australian Riverland Floodplains Inundation Infrastructure Programme (SARFIIIP) is a package of environmental works and measures to allow periodic managed inundation of the Pike and Katarapko floodplains (the latter is also known as Katfish Reach), including management of salinity risks, and improvements in the operation of the South Australian River Murray between Lock 1 and Lock 6. The SARFIIIP works and measures will allow environmental water to be efficiently directed onto the floodplains in occasional large-scale floodplain inundation events at crucial stages in the breeding and growth cycles of species like Murray cod and the river red gum. The works will improve the health and resilience of these significant floodplain ecosystems and the species that live there, including the nationally significant regent parrot and the southern bell frog.

4.2 The RRP Solution

To address the impacts on native flora and fauna created by water level stability driven by river regulation, RRP will install infrastructure on wetlands to allow wetting and drying off-channel. This wetting and drying will mimic the variability which occurred prior to the construction of the weirs and barrages. Implementing variable wetland water regimes will establish more diverse
wetland habitats, helping to conserve the broadest spectrum of biodiversity. Water level variation will create areas that are inundated at varying frequencies and durations, and result in an improvement in native vegetation assemblages, which support a range of native fauna.

RRP will also improve hydraulic connectivity and fish passage for large-bodied native fish in the River Murray wetlands between Lock 6 and Mannum. Water savings generated by the implementation of a managed water level regime are a complementary outcome of the RRP. These water savings are able to be applied for environmental benefit elsewhere along the River Murray, strengthening South Australia’s ability to improve its environment. SARFIIP also occurs within this same area and focuses on floodplain inundation for ecological and environmental water quality benefit.

The involvement of the regional river communities including First Peoples of the River Murray and Mallee (Traditional Owners and native title holders), has been crucial in the development and selection of solutions for The Living Murray programme, Murray Futures programme and SARFIIP.

The regional community is central to the successful delivery of RRP and future river operations. The solutions proposed in RRP have been developed and will be implemented in partnership with local communities. This will help ensure long-term and sustained outcomes for the regional community including positive economic, community and social impacts and cultural heritage protection and environmental improvement for the River Murray between the South Australia/Victoria border and Wellington.

5 Region

The Riverland and Murraylands regions include areas along the River Murray from the New South Wales/Victoria border downstream to Coorong, Lower Lakes and Murray Mouth. The major towns for RRP are Renmark, Berri, Loxton, Waikerie, Barmera, Monash, Blanchetown Swan Reach, Mannum, and Murray Bridge. There are numerous other smaller townships and the total population of the Riverland and Murraylands is approximately 70,000 people. RRP Phase 2 Wetlands includes wetland sites across three councils, Renmark-Paringa, Loxton-Waikerie and Mid Murray.

The ancestors of the First Peoples of the River Murray and Mallee Region have lived in the Riverland and Murraylands and a broader region for thousands of years and are the Traditional Owners and recognised native title holders. The Riverland was also Australia’s first irrigation district, with many of the towns established for the re-settlement of soldiers after their return from World War I or World War II. Most towns were established historically as separate irrigation districts.

The six key industries in the Riverland and Murraylands include:
• Agricultural products (including irrigation)
• Manufacturing including value-added primary products
• Retail
• Transport and logistics
• Tourism
• Health and community services.

The region is a part of the larger SA Murray-Darling Basin Natural Resource Management region which forms the south-western portion of the Murray-Darling catchment into which the River Murray flows. The River Murray is South Australia’s most substantial and important surface water resource. The sites for RRP are shown on Figure 1.
Figure 1 Riverine Recovery Project (including wetland sites)
6 Stakeholders Affected

Throughout Phase 1, RRP staff have worked closely with Traditional Owners and other key stakeholders, and at each of the 11 proposed sites there is a high degree of support for the planned works and their future operation. Release of Phase 2 funds will ensure that the South Australian Murray-Darling Basin community’s vision for a healthy River Murray which delivers social, economic and environmental outcomes, is realised.

Stakeholders directly affected by RRP Phase 2 Wetlands works and measures include:

- Those affected at a site level such as:
  - Private landholders of RRP Phase 2 Wetlands sites
  - Traditional Owners, Native Title holders, Native Title claimants and their representative organisations (First Peoples, Nganguraku and Ngarrindjeri)
  - Sugar Shack Aboriginal Corporation (landholders at Sugar Shack Wetland Complex)
  - Mannum Aboriginal Community Association
  - Downstream irrigators.

- Those affected at a site, project and program level including:
  - Tourism bodies such as Destination Riverland
  - River Murray tourism operators and visitors
  - Regional community partners including the First Peoples working group
  - Mannum Aboriginal Community Association
  - Ngarrindjeri Regional Authority
  - Regional Local Government including Renmark-Paringa Council, District Council of Loxton-Waikerie and Mid Murray Council.

- Our State Government partner SA Water
- Natural Resources SA Murray Darling Basin, its Board, Wetlands and Community Engagement teams, SA MDB NRM groups
- Our Australian Government partner the Department of Agriculture and Water Resources.

More detail on these stakeholders and partners is provided in the following sub-sections.

6.1 Site Level Stakeholders

Site level stakeholders for RRP Phase 2 Wetlands include:
• Private landholders: 12 landholders will be affected by RRP Phase 2 Wetlands works on land they currently hold. It will be essential to achieve a satisfactory outcome for each landholder impacted by construction works and gain agreement from landholders where future access is required to operate and maintain RRP Wetlands Phase 2 infrastructure. In-principle agreement has already been secured with these 12 landholders.

• First Peoples who have been key partners for The Living Murray, RRP Phase 1 Wetlands and SARFIIIP will be directly affected by RRP Phase 2 Wetlands. The First Peoples are the Traditional Owners and registered native title holders from the South Australian/Victorian border down to Murbko South Wetland and are represented by the River Murray & Mallee Aboriginal Corporation (RMMAC).

• Ngunguraku are key partners in RRP Phase 1 Wetlands and will be directly affected by RRP Phase 2 Wetlands as Traditional Owners as well as owners of the Sugar Shack Wetland Complex. Sugar Shack Aboriginal Corporation (SSAC) has been integral to the development of the Sugar Shack Wetland Management Plan and the Detailed Design at the site. The Sugar Shack Wetland Complex is an integral site that will require the largest construction budget and provide the greatest water savings of the Phase 2 Wetlands. Ngungurku will be represented by MACAI. MACAI is a founding member of the NRA, and the NRA provided support to MACAI under RRP Phase 1 Wetlands. This is likely to continue under Phase 2.

• Ngarrindjeri were engaged in RRP Phase 1 Wetlands, partners in the CLLMM Icon Site and CLLMM Recovery Project and are the recognised Traditional Owners of the Lower Murray and CLLMM region. NRA represents the interests of Ngarrindjeri Native Title claimants and have a Kungun Ngarrindjeri Yunnan Agreement (KNYA) with the South Australian Government, with commitments to consult and negotiate on matters relevant to the Agreement.

6.2 Recreation and Tourism Stakeholders

Tourism stakeholders for RRP Phase 2 Wetlands include:

• Tourism operators on the River Murray in SA, including houseboats and canoe tours.
• Recreational groups such as field and game enthusiasts and fishers.
• Visitors using the River Murray or any anabanches.

6.3 Regional Community Partners

As discussed above, Aboriginal representative organisations such as RMMAC, MACAI and NRA will be key partners in the delivery of RRP Phase 2.

Other key regional community partners include:
• Wetland Groups

• Local Action Planning Groups (LAPs) have been established in the SA Murray-Darling Basin to enable communities, industry and government to work together to address the big issues of environmental degradation. There are 11 LAPs in the SA MDB region.

• Natural Resources Groups.

• The First Peoples NRM Working Group consisting of the directors of RMMCAC, DEWNR coordinates the First People’s Working Group and the partnership is guided by an Indigenous Land Use Agreement. Key goals for this group for RRP include:
  
  o Identifying Aboriginal employment opportunities in the construction at RRP Phase 2 Wetlands and broader NRM employment opportunities into the future.
  
  o Identifying wetland sites of significance to First Peoples where small investments could provide cultural outcomes for community as well as environmental outcomes for the State.
  
  o Supporting ongoing partnerships in wetland management with Natural Resources SA MDB and regional environmental organisations and taking advantage of synergies with Murray-Darling Basin Plan water resource planning processes.

• SSAC and MACAI are engaged through a funding and services agreement with the NRA. Under RRP Phase 1 DEWNR and NRA established a monthly working group to support Ngarrindjeri and Ngunguraku engagement, and this is likely to be reinstated for RRP Phase 2 Wetlands. The KNYA Taskforce meetings may also be utilised as a way of elevating issues that are not able to be resolved through the working group. Key goals for this group for RRP include.
  
  o Indigenous-led management of Sugar Shack Wetland Complex
  
  o Identifying Aboriginal employment opportunities in the construction at RRP Phase 2 wetlands and broader NRM employment opportunities into the future.
  
  o Supporting ongoing partnerships in wetland management with Natural Resources SAMDB and regional environmental organisations.
  
  o Taking advantage of synergies with the new NRA and Commonwealth Environmental Water Holder (CEWH) Water Delivery Agreement and Murray-Darling Basin Plan water resource planning processes.

• The Pike Community Reference Committee and Katfish Reach Steering Group have also been partners and drivers in SARFIIP, with some interest in the development and implementation of RRP. These groups include representatives from a range of landholders and organisations in the region. They are all committed to remaining involved and continuing to drive environmental benefits through RRP.
6.4 Regional Local Government stakeholders

Regional Local Government stakeholders include:

- Renmark Paringa Council
- DC Loxton Waikerie
- Mid Murray Council

6.5 Other Regional Stakeholders

Other RRP Phase 2 Wetlands stakeholders that are not represented through our partners include:

- Landholders adjacent to the RRP Phase 2 Wetlands sites.

6.6 South Australian Government partners

The key South Australian Government RRP Phase 2 Wetlands partner is SA Water. SA Water is the designated constructing authority responsible for the construction of specific RRP Phase 2 Wetlands infrastructure.

Overall program delivery will be undertaken by DEWNR and a negotiated construction management model is being formalised between SA Water and DEWNR through a Memorandum of Administrative Arrangement.

The SAMDB NRM Board and its delivery arm Natural Resources SA MDB, oversees the natural resource management for the region.

6.7 Australian Government Partners

The project’s Australian Government partners are:

- The Department of Agriculture and Water Resources (DAWR) acting on behalf of the Australian Government to administer RRP Phase 2 Wetlands funding.
- The Commonwealth Environmental Water Holder (CEWH) and Commonwealth Environmental Water Office (CEWO).
7 Consultation

Prior to RRP (pre 2011), Traditional Owners advocated for improved environmental and cultural heritage outcomes associated with the River Murray for decades, including through the lodgement of their Native Title claims over much of the region in the 1990s. For the Traditional Owners, the health of the River is critical to the health and wellbeing of their Nations.

Altering River Murray operations in South Australia to achieve environmental outcomes was first considered by the State and Australian Governments in the 1980s.

Around the same time, there were increasing regional community concerns about addressing environmental degradation, dryland salinity and a desire from the regional community for River Murray and floodplain restoration.

Specific SA River Murray wetlands planning and investigation into restoration works and measures began in the early 1990s. The regional community has led efforts to address concerns about both the degradation of the ecological health of the floodplains, wetlands and the deterioration in irrigation water supply quality (surface water) and groundwater quality.

Some smaller scale restoration projects were conducted in the 2000s on the floodplains as the result of partnerships between landholders and the South Australian Government.

7.1 During RRP Phase 1 2011-15

The 11 RRP Phase 2 Wetlands sites were progressed to detailed design as part of the Riverine Recovery Project Phase 1 between 2011 and 2015 in consultation with landholders, regional partners and stakeholders.

Upon resolution of the First Peoples Native Title claim in 2012, the RMMAC has advocated for greater recognition of First Peoples’ interests in regards to the River Murray. This has included the development of a First Peoples Strategic Plan that articulates a greater role for First Peoples in management, implementation and the pursuit of socio-economic benefits associated with the sustainable management of water resources.

Further down the Murray RRP Phase 1 Wetlands also supported the NRA and MACAI to develop the Yannarumi Assessment process. This risk assessment process enables Ngarrindjeri and Nganguraku to assess the lawfulness and life giving benefits of programs, processes, as well as the cultural health of Country, including individual wetlands. This novel process is being utilised by the NRA in a range of engagements, and will likely be part of their engagement with RRP Phase 2 Wetlands.

Weir pool manipulation trials for environmental purposes were undertaken by DEWNR in 2014. These included raising events at Locks 1, 2 and 6 and raising events at Locks 2, 5 and 6 in 2015 in consultation with regional local government partners and SA Water.
DEWNR has regionally-based staff responsible for engagement with regional partners and stakeholders for RRP. Consultation has included a broad range of activities such as:

- Communicating regularly with the Landholders of RRP Phase 1B priority wetlands, culminating in five agreed wetland management plans and five land management agreements that enable future operation of the wetlands.
- Communicating regularly with the landholders of RRP Phase 2 Wetlands sites, to conduct investigations and designs and culminating letters of intent to support construction works and future operation of these wetlands.
- Convening one-on-one and group discussions and presentations with stakeholders and members of the regional community.
- Providing presentations on RRP and SARFIIP to regional partners and a broad range of other stakeholders and interested regional community members such as:
  - Gerard Aboriginal community
  - Local Action Planning (LAP) groups and conservation groups
  - Tourism operators and recreational users
  - Local and State government.
- Informing the regional community about RRP through:
  - Website content including images and video
  - Radio interviews in the region that discuss RRP as well as SARFIIP works and measures.

The topic of RRP engagement with stakeholders and the region has been the delivery of RRP Wetlands Phase 1 projects including construction that took place up to 2015.

7.2 Planned during 2016/17-2018/19

Maintaining strong existing partnerships is crucial for RRP’s success. DEWNR will continue to partner with:

- MACAI (through NRA) to ensure Aboriginal heritage sites are protected during works and that cultural objectives and outcomes are incorporated into the management at the wetland sites including a continued role in Wetland Management planning and activities.
- NRA and MACAI: Protecting cultural heritage during RRP Phase 2 Wetland investigations and planning for construction and operation, driving Wetland Management actions at Sugar Shack Wetland Complex.
- SSAC: Developing Sugar Shack Wetland Management Plan with Aboriginal Cultural values setting the objectives and targets of management.
• First Peoples to ensure Aboriginal heritage sites are protected during works and that the project improves the cultural landscapes of the wetlands for First Peoples. This partnership is critical to maximising the employment and training opportunities during construction and future co-management and cultural tourism opportunities.

• Government partners including the DAWR, SA Water. These partnerships are critical to the effective and efficient delivery of construction and the future operation and maintenance of RRP Phase 2 Wetlands assets.

• Development of wetland management partnerships between Natural Resources SAMDB, regional environmental organisations and Aboriginal representative organisations.

RRP Phase 2 Wetlands seeks to build similar relationships with broader community stakeholders interested in wetland management and environmental water planning. Consultation during RRP Phase 2 Wetlands will include:

• Reaching agreement regarding access, construction and operation with Landholders so that new RRP assets can be constructed operated and maintained.

• Consulting with Local Government including Renmark Paringa Council, DC Loxton Waikerie and Mid Murray Council regarding RRP Phase 2 Wetlands works and future operations.

• For publicly accesible sites, wider regional benefits including opportunities to improve recreation and tourism activities in the region such as:
  o walking, hiking or bush walking
  o bike riding
  o BBQ and family picnic areas
  o nature camping
  o educational and interpretive information
  o cultural tours
  o bird watching
  o photography
  o canoeing/kayaking and boating
  o bank or boat yabbying or fishing
  o duck hunting (limited season in restricted areas only).

• Consulting with partners and key stakeholders such as Destination Riverland and sharing information with the community about existing uses in the main river channel between Wellington and the Border including:
  o swimming
  o house-boating
canoeing/kayaking, and boating
- yabbing and bank or boat fishing.
- water skiing/jet skiing
- wake boarding

- Facilitating partnerships with LAP groups and Natural Resources SAMDB to build community capacity for future wetland management.
- Facilitating the development of tools that Landholders can use to track their wetland’s health and weir pool level impacts on their wetland.
- Organising and facilitating events to bring together the community where appropriate, such as the opening of sites and the celebration of successes when operations occur.
- Promotion of RRP Phase 2 Wetlands achievements in stakeholder and media communications including newsletters, radio and television, providing website content about RRP Phase 2 Wetlands and participation at regional community days and events at River Murray sites.
- Developing multimedia products to promote how the management of the River Murray is contributing to desired environmental and river outcomes.

DEWNR will look to find sites where small investments can be made that will lead to Cultural and NRM outcomes for Aboriginal and broader community groups at sites that are of importance to them.

8 Summary of Impacts and Analysis

The expected regional impacts of RRP have been assessed to be overwhelmingly positive and in some cases very significant based on DEWNR’s current program and project plans and the department’s existing knowledge and experience including the very positive regional impacts of RRP Phase 1 at a number of sites between 2012 and 2015.

A summary of the economic, social and community, equity and environmental factors is presented at the end of this section in Table 1.

Figure 2, also at the end of this section provides a short-, medium- and long-term summary of the range of financial and employment impacts

8.1 Economic Factors

Capital Investment, Existing Businesses and Regional Employment

RRP Phase 2 Wetlands is expected to have a very positive economic impact on regional businesses and employment as it will deliver an estimated $30 million of new capital expenditure to the region between 2016/17 and 2018/19. This will provide very significant
opportunities for local businesses to win contracts. It will also provide opportunities for successful contractors to employ regional people and purchase local materials and services.

RRP Phase 2 Wetlands construction contracts must comply with *State Procurement Board Policies and Guidelines* which include the *SA Industry Participation Policy*. This Policy requires tenderers to prepare an *Industry Participation Plan* (IPP). The IPP considers South Australian labour hours, regional capital investment and local small to medium enterprise involvement and has a minimum 15% tender weighting. The IPP becomes part of Contract conditions and data will be collected by the Contractors and provided to the South Australian Government to verify their compliance.

It is expected the total value of RRP construction contracts will be approximately two thirds of capital expenditure. Construction works are planned at up to 11 sites, with construction activities expected to occur over two years, although this could be impacted by adverse weather conditions.

The RRP Phase 2 Wetlands construction phase will create an estimated 20–25 FTE (full time equivalent) jobs in the region for 2 years from 2016/17 to 2018/19. Additional employment is also expected both within and outside the region to deliver other parts of the program. This includes roles for program governance and administration, program and project management, contract management, environmental science and community and Aboriginal communications and engagement and construction supervision and engineering support.

Prior to RRP Phase 2 Wetlands, construction at the Chowilla icon site (The Living Murray program) occurred between 2010 and 2014. The approved works for the RRP Phase 1 were constructed between 2011 and 2015. Construction for the CLLMM Recovery Project commenced in 2015 and are planned to continue until at least 2017. Construction for SARFIIP is planned to commence in 2016 and continue until 2020.

These programs and projects have all delivered direct construction jobs to the region and additional jobs both within and outside the region in other project areas. These programs and projects also required goods and services from the region, creating positive flow-on effects for the regional economy.

The cumulative effect of these programs, including RRP Phase 2 Wetlands, on the region will be the injection of more than $400 million of Australian and State Government funding. This will generate more than a decade of continual construction works on the SA River Murray to achieve environmental outcomes that also have very significant positive financial impacts to the region.

*Attracting business and capital to the region*

**Tourism**

It is expected that the implementation of RRP Phase 2 Wetlands will support tourism businesses and will have a positive impacts on the region.
Regional tourism was significantly impacted by the Millennium drought (Destination Riverland 2012) with revenue falling faster in the Riverland than other South Australian regions (2.2% per annum compared to 1.3% per annum) to a drought low of $110 million in 2009/10. Results from a 2008 survey reported that the drought had impacted on travel behaviour. Economic modelling estimated that the cost of the Millennium drought to the tourism of river regions between Albury and the Lower Lakes was $69.9 million.

After the drought ended, tourism revenue in the region then fell further to $100 million in 2010/11, the worst summer period in a decade when negative media attention, in response to high flows in the Murray River being referred to as “floods” at the same time as floods were occurring in Brisbane. For the region, this caused a significant number of cancellations and lost income (Destination Riverland 2012).

Key messaging, including more careful and positive messaging about safe slow flows in the River Murray and advertising new tourism investment, including almost 100 new beds at 4 star standard or better, has been crucial to support the turnaround of tourism in the Riverland. The Riverland has seen three consecutive years of increasing tourism since 2011/12 from $123 million to $142 million in 2013/14 (Destination Riverland 2015).

The construction of RRP Phase 2 Wetlands infrastructure will improve tourism opportunities on some of the wetlands sites, particularly those that are public sites, and floodplains adjacent to the wetlands sites. This aligns with the Riverland Tourism Plan 2020 which aim is to provide destinations that will be attractive to tourists, even in droughts.

As the condition of the wetland vegetation and ecosystem visibly improves and native fish passage allows return of native species to the wetlands, these areas are expected to become increasingly attractive for recreation and tourism. The ability to improve tourism destinations is expected to result in continued investment in regional recreation and tourism.

**Indigenous Employment**

DEWR will support the RRP Phase 2 Wetlands Constructing Authority SA Water and successful construction Contractors to comply with the *Workforce participation in Government construction procurement Policy* (Government of South Australia 2010) by connecting them with local employment agencies and Aboriginal owned subcontractors. The Policy requires construction Contractors to provide 15% of labour hours for apprentices, trainees, Aboriginal people and local people with barriers to employment including two percent specifically for Aboriginal people. This is achieved by specific clauses in the construction contract terms and conditions as well as implementing a *Workforce Participation and Skills Development Plan*.

For other contracts, DEWR will comply with the *Aboriginal Business Procurement Policy* (Department of State Development 2015) which supports the government procuring goods and services. This procurement can be direct from Aboriginal owned business enterprises for values up to $22,000 (inc. GST) and use a simplified procurement process for Aboriginal businesses that
meet the requirements of the South Australian Business Register or national certification for values up to $220,000 (inc. GST).

CLLMM South East Flows Restoration Project is seeking to encourage tendering companies to understand DEWNR's commitment to reconciliation and Aboriginal employment and provide them with contact details for Aboriginal representative organisations so that they can undertake direct negotiation regarding employment opportunities. SA Water has standard tender clauses it has utilised in the Lower Lakes and southern Fleurieu region to this affect that has resulted in beneficial Aboriginal employment and future partnerships between Aboriginal organisations and contractors beyond the initial project.

**Financial Flow on effects**

It is expected that the $34 million RRP Phase 2 Wetlands investment will deliver a series of positive financial flow-on effects to the region, some examples are described below.

**Construction impacts**

During the construction phase, the RRP Phase 2 Wetlands construction workforce is expected be based in the region and will require goods and services such as accommodation, hospitality including restaurants, cafés and bakeries, retail items including groceries, clothing and fuel and other services such as recreational activities. Experience with previous programs such as RRP Phase 1 has shown that some non-local members of the workforce remain in the region over construction breaks and enjoy recreational opportunities, contributing further to the regional economy.

**Tourism and Recreation opportunities**

RRP Phase 2 Wetlands is expected to improve the condition of the River Murray and upto 11 SA River Murray wetlands. This will provide scope for improved tourism and recreational experiences, particularly bird watching, fishing, yabbing and duck hunting (where approved and when in season). These improved experiences will encourage tourists in the region and increase the length of their stay. This will have a positive flow-on effect for regional businesses who will provide goods and services to these visitors, particularly in the larger towns along this section of the River Murray that are near where the wetland sites are located (Renmark, Loxton, Blanchetown, Swan Reach and Mannum).

These opportunities will be shared by local residents who enjoy existing trails for walking, cycling and water activities in the region as well as bird watching, bank or boat fishing, yabbing and photography and limited seasonal duck hunting in approved locations.
Tourism is a very significant regional industry and employer. Riverland and Murraylands tourism currently generates a combined $250 million in annual expenditure. This includes 568,000 overnight visitors and 1.9 million visitor nights. The regional tourism industry includes approximately 630 businesses and employs 1,400 people. Some of the identified priority actions to grow regional tourism demand align completely with RRP Phase 2 Wetlands including developing new opportunities for eco-tourism and nature-based experiences (Destination Riverland, 2015).

Medium to long term opportunities

A key concern for regional tourism (Destination Riverland 2015) is to provide visitors with reassurance that there is water in the river, that the river is safe, and there are wonderful experiences to be shared during low flow and high flow periods. The combination of managed inundation of SA River Murray wetlands and the Chowilla, Pike and Katarapko floodplains through operation of SARFIIP and RRP infrastructure will provide destinations that offer this flexibility. This will help to protect the regional tourism industry.

If no action is taken (status quo)

If the RRP Phase 2 Wetlands works are not undertaken there would be very significant negative financial impacts on the region, including the loss of:

- Construction employment
- Both direct RRP Phase 2 Wetlands opportunities and flow-on effects for local businesses
- Current RRP Phase 2 Wetlands capital investment and opportunities to support tourism in the region
- Regional tourism revenue during future droughts.

8.2 Social Factors

Social Groups

RRP Phase 2 Wetlands will provide significant positive impacts to social and community groups in the region.

First Peoples, Ngarrindjeri and Ngunguraku seek greater involvement and recognition in natural resources management and water management. RRP Phase 2 Wetlands builds on other opportunities, including TLM, SARFIIP and RRP Phase 1 opportunities, for Traditional Owners to meaningfully engage in the planning and implementation of environmental works programs on the river that is the life-blood of their community. Traditional Owners are realising this through

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2 3 year annual average to June 2015
3 Direct employment and Tourism businesses June 2014
the Aboriginal heritage surveys and monitoring which ensures that heritage sites are protected during works and future indigenous led management of Sugar Shack and future opportunities for cultural tourism and wetland management program delivery.

The delivery of RRP Phase 2 Wetlands works also provides Aboriginal employment opportunities that will continue throughout the life of the project. The resultant restored landscape will then allow First Peoples provide long-term employment opportunities as well as provide co-management opportunities to ensure that the cultural values remain a focus for the management of the Sugar Shack wetland sites.

*Lifestyle impacts*

In the medium term as the condition of the wetlands and fish passage in the wetlands improve, improved recreational activities will result such as bank or boat fishing, yabbying, bird watching and photography and limited seasonal duck hunting in approved locations. This will have positive lifestyle impacts for the people of the region.

*Recreation*

Existing tourism destinations in the region that are expected to be supported by RRP Phase 2 Wetlands works include:

- Existing private River Murray accommodation and operators
- Renmark, Paringa, Loxton, Swan Reach and Mannum townships.

Recreational activities that are expected to improve as the condition of the wetlands and native fish passage improves include:

- Walking, hiking or bush walking
- Bike riding
- BBQ and family picnic areas
- Nature camping
- Educational and interpretive information
- Aboriginal-led tours
- Bird watching
- Photography
- Canoeing/kayaking and boating
- Yabbying
- Bank or boat fishing
- Duck hunting (limited season in restricted areas only).
8.3 Flow on effects

RRP Phase 2 Wetlands will provide significant positive flow on effects to social groups in the region. The increased activity in the region over the next two years will require a continued time commitment from members of our partnerships.

The health of the River Murray, its wetlands and floodplains is considered intrinsic to the health of the Aboriginal Communities in the Riverland as individuals and as a community. Therefore the objectives of RRP to restore the wetland health in partnership with Traditional Owners is expected to have positive flow-on effects to the Indigenous health and wellbeing. The employment and training opportunities throughout the delivery of works and beyond through co-management and environmental water management will ensure capacity gained during RRP and SARFIIP is not lost. There is also an opportunity to capitalise on existing knowledge for cultural tourism at Sugar Shack. This assists the often marginalised community’s capacity to survive in a competitive regional economy. The ability to broker co-management opportunities at the sites to bring cultural values to the fore will help MACAI, NRA and Traditional Owners to realise their cultural prerogative to Care for Country.

It will provide support for the NRA and member organisation MACAI progress its new water delivery agreement with the CEWH.

RRP Phase 2 Wetlands will deliver overwhelmingly positive social and community impacts, some of which have been sought for over a decade by DEWNR’s partners and the regional community. Realising the regional benefits will require a time commitment from partners and stakeholders to engage with DEWNR and have input into the project.

8.4 Status quo

Maintaining the status quo for the region has a number of negative impacts including:

- Loss of the regional empowerment that RRP Phase 2 Wetlands provides to manage the regional water resources.
- Loss of the regional community cohesion benefits that RRP Phase 2 Wetlands provides including:
  - Traditional Owners may not realise their long held desires for protecting wetland cultural sites, improving the wetland cultural landscape and lose employment and training opportunities that may influence future co-management, environmental water planning and cultural tourism opportunities.
  - The regional community may not achieve long held desires for long term and sustained river health improvement and ecological restoration outcomes.
  - The regional community would not achieve the desired environmental water efficiency improvement for 11 RRP Phase 2 Wetlands.
• The regional tourism industry will lose the ecological benefits that support future new tourism destinations which can all remain attractive to visitors in low-flows
• The regional tourism industry will remain susceptible to loss of revenue during low-flows and high water (floods).

8.5 Environmental Factors

RRP is an initiative which will improve the management of wetlands along the River Murray between Wellington and the border of South Australia and Victoria. It is a once in a lifetime opportunity for infrastructure improvements to wetlands that will enable environmental water to be delivered for the next 100+ years. RRP Phase 2 Wetlands completes the work of RRP and enables the full intended benefits to be realised.

The positive environmental impacts that will be delivered by RRP Phase 2 Wetlands include:

Environmental Water

A very significant benefit to South Australia from the Basin Plan is providing increased water for environmental flows in the South Australian River Murray, and the efficient and effective use of South Australia’s environmental water during future planned inundation events. RRP Phase 2 Wetlands also provides a benefit to South Australia by constructing works and taking measures that allow coordinated, effective and efficient management of the South Australian River Murray infrastructure.

Vegetation

RRP Phase 2 Wetlands will establish new communities and enhance existing vegetation biodiversity and regeneration at a wetland site and at an ecosystem scale. This includes the rejuvenation of existing native vegetation such as river red gum, black box and lignum the establishment of new wetland plant communities including submerged aquatic plants, and amphibious plants and land plants and control of pest species such as willow.

RRP Phase 2 Wetlands will also create new communities of vegetation that will provide habitat for fauna as well as increase the food supply for birds such as the regent parrot, black swan and migratory waders and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) listed resident species.

Fauna

At RRP Phase 2 Wetlands sites fauna benefits include:

• Increasing connectivity and improving fish passage between riverine and wetland habitats to allow movement of fauna particularly native large bodied fish such as silver perch, eel-tailed catfish and control pest species such as common carp
• Securing and improving habitats and food supply for critically endangered species in the wetlands, migratory waders and EPBC listed resident bird species such as the regent parrot and water birds such as the black swan, waterfowl and other bird species.
• Providing opportunities for more large bodied native fish to live and travel in the anabranches.
• Increasing numbers of zooplankton (small organisms that live and drift with the surface water) in the anabranches.
• Increasing populations of birds, reptiles, mammals and amphibians including southern bell frogs and yabbies in the wetlands.

8.6 Equity Factors

RRP Phase 2 Wetlands has a significant positive impact on the equity of Basin Plan funding received by South Australia compared to the funding received by Victoria and New South Wales.

The regional employment arising from RRP Phase 2 Wetlands construction and program delivery activity between 2016/17 and 2018/19 will have a substantial positive impact and provide equity of opportunity. There will be further regional tourism employment opportunities from healthier wetlands from 2018/19 onwards.

The construction of RRP Phase 2 Wetlands infrastructure will deliver opportunities for improved recreational activities for the Riverland and Murraylands regions. This will have a positive impact on the regional economy and the equity of tourism development in the region.

RRP Phase 2 Wetlands engagement with MACAI, NRA and RMMAC provides a unique opportunity for these Aboriginal communities to build their capacity to interact and engage with government and research agencies. Given the historical lack of engagement with these communities, this capacity building is key to moving toward equity in representing their Cultural values and uses in water planning. Similarly, the co-management opportunities in RRP Phase 2 Wetlands will help Traditional Owners move towards playing a major role in regional NRM on their traditional lands. In the immediate term, the employment opportunities in the program will help to address the community’s distinct economic disadvantage within the region and work towards ‘closing the gap’.

Future tourism opportunities can be pursued by SSAC for cultural tourism at the Sugar Shack wetland site. A recent example of a similar opportunity being realised is cultural tourism by MACAI at Ngaut Ngaut Conservation Park that offers cultural tourism at this site to tourists on the Murray Princess riverboat cruises (downstream of Lock 1).
<table>
<thead>
<tr>
<th>Category</th>
<th>Economic factors</th>
<th>Economic factors</th>
<th>Social and Community</th>
<th>Social and Community</th>
<th>Environmental Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
<td>RRP Wetlands Phase 2 Implemented</td>
<td>RRP Wetlands Phase 2 Not Implemented</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RRP Wetlands Phase 2</td>
<td>For existing regional businesses, on local employment</td>
<td>Effect on capital investment in the region</td>
<td>If no action is taken (Status Quo)</td>
<td>If no action is taken (Status Quo)</td>
<td>Environmental factors</td>
</tr>
<tr>
<td>Construction Works and Management measures (2017-2019)</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland Management / Water level manipulation (2019 onwards)</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Improved River Murray Wetland Management (after 10-20 years operating, 2030-2039)</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td></td>
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</tbody>
</table>

**Categories of Impact**

- ✓ Very significant positive impact to the region
- × Very significant negative impact to the region
- ✓ Significant positive impact to the region
- × Significant negative impact to the region
- ✓ Positive impact to the region
- × Negative impact to the region
- - No change to the region
<table>
<thead>
<tr>
<th>Economic Impact</th>
<th>Short Term 2017-2020</th>
<th>Medium Term 2021-2030</th>
<th>Long Term 2031-2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional capital investment</td>
<td>$90 million</td>
<td></td>
<td></td>
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<tr>
<td>Estimated Construction</td>
<td>2 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction: 15-20 FTE for 2 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other roles: 15-20 FTE for 2 years</td>
<td></td>
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<tr>
<td>New Employment</td>
<td></td>
<td></td>
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<tr>
<td>Purchase of Goods and Services</td>
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<tr>
<td>For contracts</td>
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<tr>
<td>By construction workforce</td>
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<tr>
<td>For recreation in the region</td>
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<tr>
<td>Economic multiplier effect</td>
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<tr>
<td>Contractor business</td>
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<tr>
<td>Construction workers</td>
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<td></td>
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<tr>
<td>Goods and Services suppliers</td>
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<td></td>
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<tr>
<td>Supplier workforce</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Opportunities from construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional Tourism Industry</td>
<td></td>
<td></td>
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<tr>
<td>$230 M for 12 regions 2012-2015</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverland &amp; Murraylands</td>
<td></td>
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<tr>
<td>$236 million 2019/20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creating Tourist Demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourism Driver</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Low-flow tourism</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

New River Murray recreation opportunities
Including nature based experiences

Improved Murray River experiences in Riverland and Murraylands

More wildlife for tours in low flow in Riverland and Murraylands
(migratory and wading birds, native fish)

More visitors staying for longer and purchasing goods and services

More visitors to River Murray in Riverland and Murraylands
9 Solutions

Through the Basin Plan there will be more water returned to the environment in South Australia. However, more water is just part of a solution. The ability to be able to effectively and efficiently manage the available water to achieve specific environmental outcomes is equally important.

RRP Phase 2 Wetlands contributes to the implementation of the Basin Plan by achieving efficient and effective environmental watering. This is achieved by constructing surface water infrastructure to protect and restore key environmental and cultural heritage wetland assets and also improving management of the SA River Murray. Engaging MACAI, NRA and First Peoples in the management planning for RRP Phase 2 Wetlands will also facility the State's Basin Plan requirement to give regard to Aboriginal Cultural values and uses.

RRP wetlands seek to address stable water levels created by river regulation. Infrastructure allows wetlands to dry to mimic the water level variability that occurred prior to river regulation, that variability being important to the native flora and fauna. The program objectives of RRP Phase 2 Wetlands are to:

- Restore hydrological and ecological functions at targeted wetlands and associated water courses (e.g. through re-introduced wetting and drying regimes).
- Integrate wetland restoration efforts to ensure a representative mosaic of wetland types at an appropriate landscape scale.
- Provide environmental water through the development and application of ecologically appropriate hydrological management regimes.
- Improve hydrological connectivity of targeted wetlands and water courses with the River Murray and surrounding habitats, especially where existing infrastructure does not meet current best practice.
- Engage community participation in wetland management.

RRP Phase 2 Wetlands infrastructure works and measures include the construction of environmental regulators and levees and access tracks and targeted dredging and vegetation clearance at the RRP Phase 2 Wetlands sites as well as the removal of redundant infrastructure.

Operation of these works and measures will simulate natural flooding regimes that will assist in returning key wetlands and the associated floodplain environments to a healthy state.

RRP Phase 2 Wetlands currently includes proposed works and measures at 11 sites, outlined in Table 2.
<table>
<thead>
<tr>
<th>Wetland</th>
<th>Location and Strategy</th>
<th>Ecological Objectives and Watering target</th>
<th>Description of Infrastructure Solutions (construction scope of works)</th>
<th>Description of Regional Community and Future Wetland Management Solutions</th>
</tr>
</thead>
</table>
| Murtho-Wiela | 7 km north-west (upstream) of Paringa. Eastern side (left bank) of the River Murray,  | **Objectives**  
- Improve flow through this anabranche  
- Remove barriers to large bodied native fish passage (including silver perch and eel tailed catfish)  
- Establish a community including un-common and threatened amphibious and submerged plants  
- Improve the viability of the native trees (including river red-gum) and plants (including lignum)  
- Improve the viability of frog communities (including southern bell frog)  
- Maintain diverse native fish and waterbird communities  
- Control willow and other pest plant species  | **Wetland Management Infrastructure**  
- Establish clay and rock borrow pits  
- Construct new and upgrade existing access tracks  
- Construct temporary coffer dams  
- Decommission two existing crossing structures  
- Construct one new flow improvement structures (fish-friendly)  
- Construct one new crossing  
- Decommission existing regulator structure  
- Construct new box culvert wetland regulator structure (fish-friendly, penstock gates)  
- Construct embankments  
- Channel improvement works (channel enlargement and tree removal)  | Wetland is managed by Murtho / Wiela Wetland Group (MWWG) with input from Renmark to Border Local Action Planning Association (RBLAP) and DEWRN (NR SAMDB).  
Traditional owners are represented by the River Murray and Mallee Aboriginal Corporation (RMMAC). |
|          | River kms 603-613  
5.5 km of flow improvements                                                                                      | **Watering target**  
Permanent connection of anabranche system; intermittent pumping into Wiela Sheding Basin. No future water level manipulation at this site. |                                                                                                                                 |                                                                                                                                 |
| Woolnook Bend | 11 km north (upstream) of Paringa. Eastern side (left bank) of River Murray.  | **Objectives**  
- Improve flow in Plummens/Squiggly Creek  
- Increasing passage between wetland, creek and river habitats  
- Restore habitat for large-bodied native fish  
- Decreasing sedimentation  
- Facilitating scour to restore deep hole habitat  | **Wetland Management Infrastructure**  
- Upgrade access tracks  
- Construct temporary coffer dams  
- Remove existing crossing structure (Jermacans Causeway) and abandon access track  
- Construct new ford crossing (Squiggly Creek)  
- Channel improvement works (possible dredging Plummens/Squiggly Creek)  | Wetland is managed by DEWRN (NR SAMDB) in consultation with Woolnook Wetland Association (WWA), the Riverland Field and Game Association (RFGA) and RBLAP, DEWRN Crown lands) and Landholder (Freehold).  
Traditional owners are represented by RMMAC.  
Site is currently used for canoeing and seasonally for duck hunting.  
Current irrigation water supply for landholder. |
|          | River kms 579-597  
Part of Riverland Ramsar site                                                                                     | **Watering target**  
Permanent flow through Plummens/Squiggly Creek. No future water level manipulation at this site.                        |                                                                                                                                 |                                                                                                                                 |
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Objectives</th>
<th>Wetland Management Infrastructure</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Goat Island and Paringa Paddock | Between Renmark and Paringa. Connected to the River Murray, just downstream of Lock 5. Western side (right bank) of the River Murray. 8.3 km of flow improvements. River km 560-566. Part of Riverland Biosphere. | - Improve the viability of the native trees (including river red-gum) and plants (including lignum).  
- Improve the viability of frog communities (including southern bell frog).  
- Improve channel and basin water quality (salinity).  
- Increase the frequency of floodplain inundation and flow through. | Establish clay and rock borrow pits  
Upgrade access tracks  
Construct temporary coffer dams  
Construct two earthen water retention banks  
Construct new regulatory structure (fish-friendly) and pipe regulator  
Construct new pipe regulator  
Channel improvement works (small scale dredging or embankments works)  
Vegetation removal and pipe culvert jetting/cleaning | NRSAMDB manage this site for ecological benefit with the support of Renmark Paringa Council, First Peoples of the River Murray and Mallee and the local community.  
Traditional owners are represented by RMMAC.  
The site is accessed by the public and includes bike and walking trails and is used by the public. These are maintained by Renmark-Paringa Council. |
| Pyp Horseshoe       | 10 km north-west of Loxton. Eastern side (left bank) and located within a large bend of the River Murray. 7.4 km of flow improvements / 44.9 ha of managed wetland. River km 466. | - Create permanent flow through wetland  
- Enable inundation of lagoons at high river levels  
- Remove barriers to large bodied native fish passage (including silver perch and eel-tailed catfish)  
- Maintain diverse fish communities and enable fish passage between wetland, creek and river  
- Control common carp to improve aquatic plant growth  
- Establish a community including uncommon and threatened amphibious and submerged plants  
- Improve the viability of the native trees (including river red-gum and black box) and plants (including lignum)  
- Improve the viability of frog communities (including southern bell frog).  
- Maintain diverse native fish and waterbird communities  
- Control willow and other pest plant species | Establish clay and rock borrow pits  
Upgrade access tracks  
Construct temporary coffer dams  
Remove existing regulators, crossing and flow obstruction  
Construct two new box culvert wetland regulator structures (fish friendly, penstock gates)  
Construct new regulator crossings  
Channel improvement works (dredging of main eastern creek connection and excavate silted north-western connection)  
Remove shallow levee on northern section of wetland  
New fencing and gates | Two supportive private landholders manage this site for ecological benefit and communicate with NR SAMDB on wetland management.  
Traditional owners are represented by RMMAC.  
Current land uses include cattle grazing, recreation and conservation. |
| Irwin Flat           | 13 km north (upstream) of Blanchetown. Eastern side (left bank) of the River Murray. 3.3 km of flow improvements / 7.4 ha of managed wetlands. River kms 290-294. | - Establish a community including uncommon and threatened amphibious and submerged plants  
- Improve the viability of native trees (including river red gum, lignum and river cooba)  
- Maintain threatened fish communities (including silver perch and eel-tailed catfish)  
- Control common carp to improve aquatic plant growth  
- Increase diversity of frogs and waterbirds | Establish clay and rock borrow pits  
Construct new and upgrade existing access tracks  
Construct temporary coffer dams  
Remove existing culvert at crossing  
Upgrade crossing across Caringa Creek (improve flow, fish-friendly)  
Construct new box culvert wetland regulator structure (fish friendly, penstock gate) for Irwin Flat Lagoon  
Channel improvement works, excavating the channel between Caringa Creek and Irwin Flat Lagoon | Landholders support managing this site for ecological benefit. The site currently has two stock and domestic water supplies from Caringa creek.  
Land access agreements required for construction and future operation.  
Traditional owners are represented by the Ngarrindjeri Regional Authority (NRA).  
The site is used for recreation by the community and is accessible by boat and car and is used for camping, water sports, fishing, canoeing, photography, bird watching. |
<table>
<thead>
<tr>
<th>Location</th>
<th>Objectives</th>
<th>Wetland Management Infrastructure</th>
<th>Land Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar Shack (upstream)</td>
<td>Establish a community of uncommon and threatened amphibious and submerged</td>
<td>Establish clay and rock borrow pits</td>
<td>Land is managed by Traditional Owners who are supportive of managing for ecological and cultural benefit with support from DEWNR.</td>
</tr>
<tr>
<td></td>
<td>plants</td>
<td>Upgrade access tracks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve the viability of native trees (including river red gum)</td>
<td>Construct temporary coffer dams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased abundance and breeding success of culturally significant fauna</td>
<td>Remove four existing culvert regulators and one pipe regulator</td>
<td>Site has high Ngarringideri cultural value and presents co-management opportunities for Sugar Shack Aboriginal Corporation including returning the site to how their ancestors saw it.</td>
</tr>
<tr>
<td></td>
<td>Increased abundance of frog communities</td>
<td>Construct four new box culvert wetland regulator structures (fish-friendly, stop logs) and one pipe regulator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased abundance of birds, large waders and shorebirds</td>
<td>Construct blocking bank with pipe culvert and one way valve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain diverse native fish communities and observe bony herring</td>
<td>Construct three ford crossing to assist natural flows</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control common carp to improve aquatic plant growth</td>
<td>Remove two existing crossings</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Construct two crossings with culverts and lockable gates</td>
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<tr>
<td></td>
<td></td>
<td>Improve the viability of native trees (including river red gum)</td>
<td></td>
</tr>
<tr>
<td>Watering target:</td>
<td>Wetlands 2, 5, 8 and 13: Five partial dries in five years</td>
<td>Pumping infrastructure to 2 temporary wetlands</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wetlands 3 and 6: Pump to fill temporary wetlands, three years in</td>
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<tr>
<td></td>
<td>five</td>
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<tr>
<td></td>
<td>Wetland 10:1 complete dry and two partial dries in five years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver Lea (Swan Reach</td>
<td>Establish a community of uncommon and threatened amphibious and submerged</td>
<td>Establish clay and rock borrow pits</td>
<td>One supportive private landholder manages this site for ecological benefit, particularly the bird community.</td>
</tr>
<tr>
<td>Ferry</td>
<td>plants</td>
<td>Upgrade access tracks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promote breeding by Black swan and other water birds</td>
<td>Construct new and upgrade access tracks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide habitat and food supply for waterbirds</td>
<td>Construct temporary coffer dams</td>
<td>Traditional owners are represented by the NRA.</td>
</tr>
<tr>
<td></td>
<td>Control common carp to improve aquatic plant growth</td>
<td>Remove existing pipes</td>
<td>Current land use is recreational.</td>
</tr>
<tr>
<td></td>
<td>Establish frog communities, (including the southern bell frog)</td>
<td>Construct two new box culvert wetland regulator structures (fish-friendly, penstock gates) through the embankments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain diverse native fish communities and increase passage between</td>
<td>Channel improvement works (removing logs and willows)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>wetland, creek and river habitats (adjacent to known Jack water fish habitats in river)</td>
<td></td>
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<td></td>
<td>Improve the viability of native trees (including river red gum)</td>
<td>Construct ford crossing in access track to assist natural flows</td>
<td></td>
</tr>
<tr>
<td>Watering target:</td>
<td>One complete dry and two partial dries to different depths each 5 years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big Bend</td>
<td>Control common carp to improve aquatic plant growth</td>
<td>Establish clay and rock borrow pits</td>
<td>One supportive private landholder manages this site particularly for carp control.</td>
</tr>
<tr>
<td></td>
<td>Establish a community of uncommon and threatened amphibious and submerged</td>
<td>Upgrade access tracks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plants</td>
<td>Construct new and upgrade access tracks</td>
<td>Traditional owners are represented by the MACAL.</td>
</tr>
<tr>
<td></td>
<td>Maintain diverse native fish communities</td>
<td>Construct temporary coffer dams</td>
<td>Current land is recreational and visual amenity as adjacent to the river.</td>
</tr>
<tr>
<td></td>
<td>Establish frog communities (including southern bell frog)</td>
<td>Remove existing structures and flow impediments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain a diverse bird community</td>
<td>Construct two new box culvert wetland regulator structures (fish-friendly) and embankments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test our understanding of drier water regimes, and the benefits and risks</td>
<td>Some vegetation clearance (one of the channels)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to native flora and fauna</td>
<td>Cutting improvement works</td>
<td></td>
</tr>
<tr>
<td>Watering target:</td>
<td>One complete dry and two partial dries to different depths each 5 years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Description</td>
<td>Objectives</td>
<td>Wetland Management Infrastructure</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| North Curnamong | 25 km north-east of Mannum (upstream) The western side (right bank) of the River Murray. 44.7 ha of managed wetlands River km 197 | Objectives  
- Create multiple and different habitats within the site  
- Protect and increase three threatened aquatic plant populations  
- Establish a community of uncommon and threatened amphibious and submerged plants  
- Establish frog communities (including southern bell frog)  
- Control Common carp to improve aquatic plant growth  | Wetland Management Infrastructure  
- Establish clay and rock borrow pits  
- Construct new and upgrade access tracks  
- Construct temporary coffer dams  
- Remove two existing structures  
- Construct one new box culvert wetland regulator structure (fish friendly, penstock gates) including embankment improvement  
- Construct new box culvert crossings  
- Channel improvement works (vegetation clearance in northern lagoon)  | Three supportive private landholders manage this site.  
Traditional owners are represented by the NRA.  
Current land use is recreation, amenity and occasional sheep grazing.  
Current stock and irrigation water supply for landholder. |
| Teal Flat      | Near Purnong (upstream). The northern side (right bank) of the River Murray. 74.2 ha of managed wetland River km 176 | Objectives  
- Protect endangered aquatic plant populations  
- Establish a community including uncommon and threatened amphibious and submerged plants  
- Maintain diverse native fish communities  
- Establish frog communities, including the southern bell frog  
- Maintain waterbird communities  | Wetland Management Infrastructure  
- Establish clay and rock borrow pits  
- Upgrade access tracks  
- Constructorary coffer dams  
- Replace two existing pipe culverts  
- Construct three new box culvert wetland regulator structures (fish friendly, penstock gates) through the existing embankments  
- Profile existing southern embankment, sheet pile and construct new pipe regulator structure  
- Channel improvement works (vegetation clearance in connection channels)  
- Construct new entrance with lockable gates.  
Water Supply Infrastructure  
- Construct new irrigation pump station on river including power supply works, control system and tank  
- Construct new irrigation pipeline from pump station through embankment and interfacing with existing irrigation network  
- Decommission and remove redundant infrastructure | Two supportive private landholders who manage holiday homes and a working farm adjacent to the site.  
Traditional owners are represented by the NRA.  
Current land use is recreation and amenity.  
Educational opportunity: Variable water regime benefits educational signage on public road. Targeting travellers and holiday home occupiers from the region and city. |
| **Teal Flat Hut** | **Objectives** | **Wetland Management Infrastructure** | **One supportive private landholders manage this site.**  
Traditional owners are represented by the NRA.  
Current land use is recreation and amenity. |
|-----------------|----------------|--------------------------------------|---------------------------------------------------------------|
| Near Pumong (downstream). The northern side (right bank) of the River Murray.  
20.2 ha of managed wetland  
River km 175 | • Establish a community including uncommon and threatened amphibious and submerged plants  
• Maintain diverse native fish communities  
• Improve conditions for water fowl, waders and shorebirds  
• Establish frog communities, including the southern bell frog  
• Control common carp to improve aquatic plant growth | • Establish clay and rock borrow pits  
• Upgrade access tracks  
• Construct temporary coffer dams  
• Construct one new box culvert wetland regulator structures (fish-friendly, penstock gates) and embankment  
• Channel improvement works (clearing vegetation and dredging)  
**Water Supply Infrastructure**  
• Construct new domestic water supply intake on River  
• Construct new water supply pipeline, tank and stock trough  
• Construct solar power supply and controls |
| **Watering target**  
One complete dry and two partial dries in five years |  |  |  |
10 Coordination

RRP Phase 2 Wetlands is an Australian Government and South Australian Government funded project administered by the Department of Agriculture and Water Resources and delivered by DEWNR in partnership with SA Water for the South Australian Government.

SA Water is delivering specific parts of the project under a partnership arrangement with DEWNR. SA Water is the designated constructing authority responsible for the construction of specific RRP Phase 2 Wetlands infrastructure.

For RRP and CLLMM projects, the Living Murray programme and SARFIIP, DEWNR coordinates and accesses technical expertise from other parts of government. This includes Australian Government Agencies such as Bureau of Meteorology (BoM), CEWO, DAWR, Department of the Environment, and the Murray-Darling Basin Authority (MDBA). It also works with South Australian Government agencies including the Department of Planning, Transport and Infrastructure (DPTI), Primary Industries and Regions South Australia (PIRSA) and the South Australian Research and Development Institute (SARDI).

11 Local Government

During RRP Phase 2 Wetlands, DEWNR is consulting with Renmark Paringa Council, District Council of Loxton-Waikerie and Mid-Murray Council on proposed RRP works. Where it affects councils, DEWNR informs Renmark-Paringa, Berri-Barmera and Loxton-Waikerie, and Mid-Murray Councils regarding all weir pool manipulation events.

12 Preferred Option

The RRP Phase 2 Wetlands solutions proposed are described previously in Section 8.

The Riverland and Murraylands regional communities have partnered with government for over a decade to achieve floodplain, wetland and river restoration works on the SA River Murray and its anabranches. The consultation prior to RRP Phase 2 Wetlands has been crucial in identifying sites and possible solutions the community will support to achieve the desired environmental outcomes. Having a mature partnership with the community prior to RRP Phase 2 Wetlands has provided some clarity and direction for DEWNR when scoping the RRP Phase 2 Wetlands business case for the Australian Government.

13 Agency Contact

Department of Environment, Water and Natural Resources: www.environment.sa.gov.au or contact us via phone (08) 8204 9000, or mail GPO Box 1047, Adelaide SA 5001.
14 References

Department of State Development (2015) South Australian Industry Participation Policy

Department of State Development (2015) Aboriginal Business Procurement Policy


