Special Edition - May 2021

Coorong Infrastructure Investigations Update

Welcome to a special update on the *Healthy Coorong, Healthy Basin* (HCHB) Coorong Infrastructure Investigations Project (CIIP). In this edition we will give an update on the feasibility investigations that are underway and take a look at future opportunities for the community to have their say.

If you would like more information on the HCHB Program or have questions on anything contained in this update please contact the program team at projectcoorong@sa.gov.au.

The Coorong, connected waters and surrounding lands have sustained many unique First Nations cultures and economies since time immemorial. The Healthy Coorong, Healthy Basin program acknowledges the range of First Nations rights, interests and obligations for the Coorong and connected waterways and the cultural connections that exist between Ngarrindjeri and First Nations of the South East peoples across the region and seeks to support their equitable engagement.

Aboriginal and Torres Strait Islander readers are advised that the following document may contain images and names of people who have died.

Australian Government
SOUTH AUSTRALIA
Government of South Australia
Department for Environment and Water

Shortlisted Infrastructure Options

Throughout 2020, we consulted the community on which long-term management options for the Coorong should be subject to further investigation. The process included opportunities for the community to shape assessment criteria, the release of a number of guiding documents, a series of online information webinars, a YourSAy survey and a community consensus workshop.

The community consultation determined that the most important, essential outcome for the project is finding "*the option/s that best contribute to improving the ecology of the South Lagoon as determined by scientific evidence, given water availability and constraints*."

In December 2020, following analysis of all the feedback gathered, the following five infrastructure options were shortlisted and are undergoing detailed feasibility assessment:

- A connection between the Coorong South Lagoon and Southern Ocean
- Targeted dredging of Coorong flow constrictions to improve connectivity
- Lake Albert to Coorong Connector
- Further augmentation of South East Flows to the Coorong
- Additional automated barrage gates.

A high-level summary of these options was included in a 2020 technical review of previously identified and investigated infrastructure options on the Coorong Infrastructure Investigations Project website.

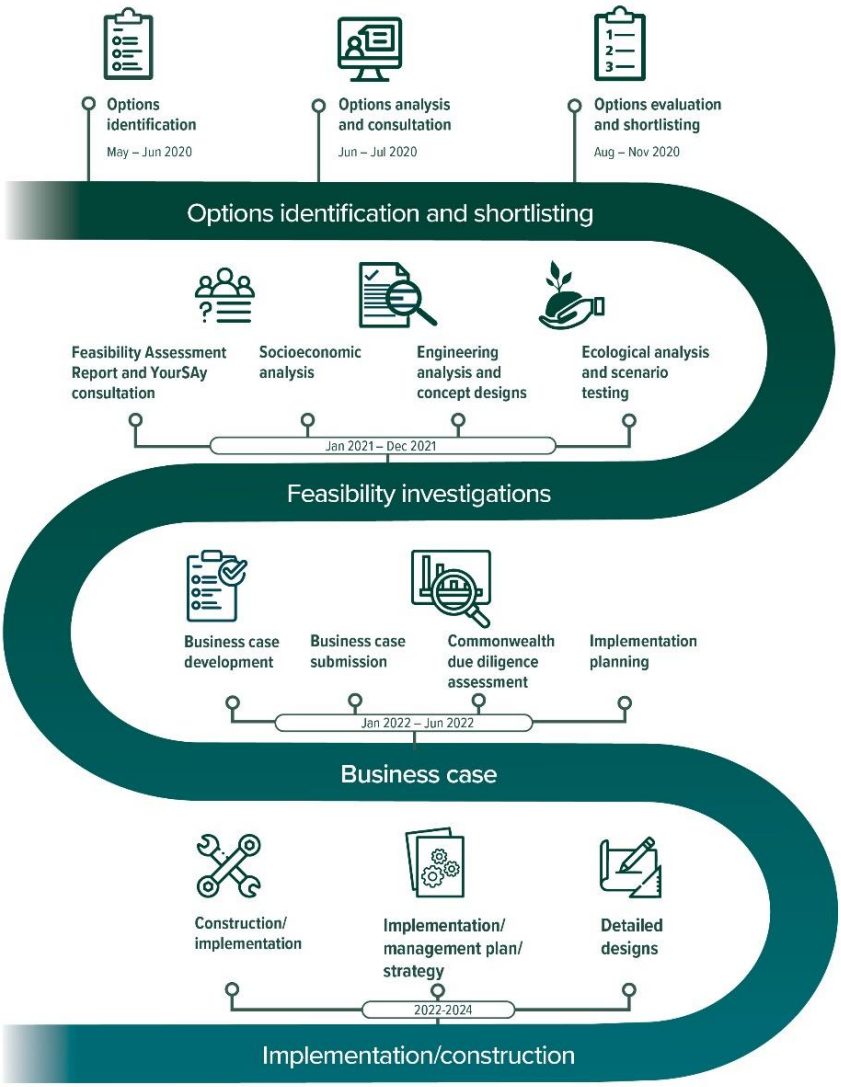
Please note that this is only an investigation into feasibility at this stage, not a decision to proceed with any of these concepts. Further community consultation will be undertaken on any options deemed to be feasible before a decision is made regarding the progression to implementation.

Throughout 2021, the department is objectively assessing the technical feasibility and the environmental, social and cultural benefits and impacts of long-term management solutions to improve flows to the Coorong.

These investigations are guided by the desired state of the Southern Coorong – discussion paper and emerging findings from the HCHB Scientific Trials and Investigations Project. The discussion paper provides an up-to-date, shared understanding of the current state of the Southern Coorong, explains what might happen if we 'do-nothing', presents an overview of the 'desired state', and provides guiding principles on how to achieve the desired state.

It is envisaged that phase two of *Healthy Coorong, Healthy Basin* will implement those long-term management options deemed feasible from 2022 – 2024.

Investigations Timeline



What Have We Found So Far

There is strong interest from the community in understanding the scope of each infrastructure option being considered. The current focus is on understanding the environmental benefits expected from each infrastructure option at a broad-level, which will then inform the development of concept designs later in 2021.

Over the past six months, we have completed preliminary hydrodynamic modelling and are now undertaking more detailed biogeochemical and habitat modelling to identify preferred infrastructure scenarios that provide the best ecological response for the Coorong South Lagoon. These modelling activities will be used to inform an ecological risk and benefit assessment, which will form part of an integrated and iterative investigation process, to develop infrastructure concept designs.

Early findings from the hydrodynamic modelling work undertaken to date, are summarised below to provide an initial indication of how the investigations are evolving.

A connection between the Coorong South Lagoon and Southern Ocean

The option of a connecting pipe or channel between the Coorong South Lagoon and the Southern Ocean has the benefit of being independent of water availability in the River Murray or south east drainage network.

Three broad options are currently being investigated:

- Pumping seawater into the South Lagoon to dilute salt and nutrients and export water out of the South Lagoon via the North Lagoon and Murray Mouth.
- Pumping water out of the South Lagoon to export salt and nutrients to the ocean, drawing lower salinity water in through North Lagoon and reducing water retention time in the system.
- A combination of pumping in and out of the Coorong South Lagoon.

Preliminary modelling results indicate that pumping both into and out of the South Lagoon reduces salinity in the South Lagoon. The impact of pumping 250 ML/d *out* of the South Lagoon is similar to pumping *in* 500 ML/d. Pumping out of the South Lagoon into the southern ocean is therefore more efficient than pumping into the lagoon to drive water out through the mouth. While pumping out of the South Lagoon can result in low water levels over late spring and summer, this impact can be mitigated by pumping out only when water levels are above a threshold, or the combination of pumping water in, as well as out, of the lagoon.

This modelling also indicates some challenges in managing undesirable impacts of pumping options. For example, pumping seawater into the South Lagoon pushes higher salinity water into the North Lagoon - at least in the short term until sufficient salt export has occurred.

Pumping at the southern end of the South Lagoon results in slightly greater salinity benefit, when compared to locating this infrastructure option at the northern end, however, the difference is minimal. Hence, other factors (e.g. site access, vegetation clearance, cultural sites) are likely to be larger drivers of pump location than salinity benefit to the Coorong.

Targeted dredging of Coorong flow constrictions to improve connectivity

Targeted dredging (between The Needles and Parnka Point, and at Pelican Point) increases water levels in the South Lagoon, and hence the available mudflat for shorebird foraging over late summer. This dredging, however, also reduces water levels in the South Lagoon faster in spring (of the first year), which may be detrimental to aquatic plants if they then become exposed and are unable to complete their lifecycle.

Dredging at Pelican Point alone, or at the mouth alone, had very little impact on the Coorong water levels or salinities in the model.

Dredging in combination with pumping water out of the South Lagoon had a greater impact on reducing South Lagoon salinity, particularly over autumn, when compared to pumping or dredging alone.

Lake Albert to Coorong Connector

The benefits of the Lake Albert Connector are limited to times when there is sufficient flow in the river, and would not be effective under conditions experienced during the Millennium Drought. However, when sufficient flows are available to operate this option, modelling indicates that a Lake Albert Connector can reduce salinities in the South Lagoon under 'best case' conditions. More realistic operational scenarios achieved roughly only half this benefit.

Further augmentation of South East Flows to the Coorong

Early indications highlight that this option delivers only a modest increase in freshwater flows directly to the South Lagoon. As an immediate priority for this option, we are revising previous yield modelling through a more contemporary interpretation of likely climate change to 2050, including different combinations of assumptions from Drain L, West Avenue Watercourse, Blackford Drain and/or Tilley Swamp. This will provide a revised

indication of whether South East Flows Augmentation is viable from a "yield to the Coorong" and expected ecological benefit perspective.

Additional automated barrage gates

Preliminary modelling indicates that a doubling of automated barrage gates, even under a range of 'best case' operational scenarios, would not sufficiently reduce salinities in the South Lagoon compared to other options. Positive benefits from further barrage automation would only be experienced at a very local level in the North Lagoon.

The Coorong Partnership community advisory group considered this preliminary modelling at its meeting at Raukkan on 6 May 2021. The Partnership noted that community consultation determined that the most important essential outcome is finding the option/s that best contribute to improving the ecology of the South Lagoon as determined by scientific evidence, given water availability and constraints. On this basis, the Partnership advised that it supported the recommendation from the department that additional automated barrages should be discounted from further consideration under this specific investigation.

Next Steps

By end June 2021, we anticipate that preliminary hydrodynamic modelling, biogeochemical modelling, ecological interpretation and an ecological benefit/risk assessment will be available to prioritise the shortlisted infrastructure options, and further inform a decision on what variations of specific shortlisted options will proceed to concept design.

We have engaged Kellogg, Brown and Root (KBR) to provide engineering services and develop a range of concept designs by spring 2021. These concept designs will outline the major design elements of each prioritised option, and allow us to establish a cost estimate for each option. More detailed design documentation would be undertaken as part of any subsequent 'design and construction' implementation process.

Later this year, our focus will also shift to socio-economic analysis of the prioritised options, ahead of comprehensive community consultation to inform the feasibility evaluation of infrastructure options.

In early 2022, business case/s for implementation will be developed for preferred options once all information has been considered. Subject to Commonwealth funding, it is envisaged that phase two of *Healthy Coorong, Healthy Basin* will implement a long-term management option deemed feasible from 2022 – 2024.

Engagement Opportunities

As the investigations progress this year we will:

Inform you throughout the process – through our quarterly HCHB updates and communications after significant milestones.

Involve the Coorong Partnership, First Nations, and targeted stakeholders where appropriate, ahead of any major review / decision point that significantly changes an option, or any review of whether to continue with an option.

Consult the community on the final feasibility evaluation/assessment of infrastructure options – through community workshops, meetings and the YourSAy online consultation hub.

Be flexible in our approach - willing to change the approach to suit evolving needs of the project and community.

With the investigation results now starting to come in, we anticipate an engagement schedule for the remainder of the year to include:

- **July 2021** – A series of community engagement opportunities to communicate preliminary findings and outline what variations of specific shortlisted options will proceed into the concept design phase.
- **September 2021** – Sharing information on the draft concept designs.
- **November/December 2021** – A series of community engagement activities including workshops/meetings and a YourSAy online consultation on the final feasibility evaluation/assessment of infrastructure options.

In addition, we are always happy to provide updates or presentations to interested community and stakeholder groups outside of these processes.

If you have any questions on this update, or would like to request a presentation on the project to your stakeholder group, or anything else related to Project Coorong, please contact the project team at projectcoorong@sa.gov.au.

The South Australian Government's Healthy Coorong, Healthy Basin Program is jointly funded by the Australian and South Australian governments.