

# Boundary Creek, Big Swamp and Surrounding Environment – Remediation and Environmental Protection Plan

## QUARTERLY UPDATE

1 October to 31 December 2022

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# Introduction

In June 2017, Barwon Water acknowledged that the historic management of periodic groundwater pumping activities at the Barwon Downs borefield between 1982 and 2016 had resulted in water level decline and depressurisation of the Lower Tertiary Aquifer (LTA), which in turn was the primary cause of a reduction in groundwater contribution to the lower reaches of Boundary Creek (i.e. baseflow), that helped sustain streamflows during dry periods. When combined with other stressors, such as the modification of the creek, drought conditions and the ineffective regulation of passing flows at a private on-stream dam located on Boundary Creek, the overall reduction in streamflow led to a range of unintended consequences such as: the drying out of Big Swamp, the oxidation of naturally occurring acid sulfate soils and the subsequent decline in water quality within Big Swamp and the lower reaches of Boundary Creek.

In May 2018, Barwon Water established a community and stakeholder working group to participate in the design of a remediation plan for Boundary Creek and Big Swamp. As part of this process, Barwon Water invited the working group to nominate their own technical experts to help support them in their discussions to shape the remediation plan.

In September 2018 Barwon Water's commitment to undertake remedial works was legally strengthened through the issuing of a Ministerial Notice under section 78 of the Water Act, 1989. This notice mandated the development and implementation of the Boundary Creek, Big Swamp and surrounding environment – Remediation and Environmental Protection Plan (REPP) by 1 March 2020.

The section 78 notice defined remediation to be the controls and actions that could be practicably carried out to achieve improved environmental outcomes. In order to align this with an accepted scientific definition for remediation, the REPP further expanded the definition to be "the controls and actions that could be practicably carried out to improve the ecological condition and function of areas confirmed to have been impacted by historical management of groundwater pumping at Barwon Downs, noting that this is likely to be different to the original condition due to the extent of change since European settlement."

In February 2020, Southern Rural Water accepted Barwon Water's REPP, subject to inclusion of SRW feedback, with the REPP to be delivered under two parallel work packages:

- **The Boundary Creek and Big Swamp Remediation Plan** That outlines the controls and actions that could be practicably carried out to remediate the confirmed area of impact within the Boundary Creek catchment (i.e. where measurable and evidence based scientific methodologies conclude that the historical management of groundwater pumping activities at the Barwon Downs borefield resulted in environmentally significant adverse impacts); and

- **The Surrounding Environment Investigation** to investigate whether other areas within the regional groundwater system have been impacted by historical management of groundwater extraction.

A key requirement of the section 78 notice and the REPP is the provision of quarterly updates to Southern Rural Water to report on progress with implementation of the plan, as well as an Annual Report. The section 78 notice also stipulates that the Annual Report is required to be submitted to Southern Rural Water for review and comment before being made publicly available by 30 September each year.

This quarterly update is the eleventh since the REPP was implemented on 1 March 2020 and provides a high-level update on progress against the actions and timeframes outlined in the REPP between 1 October and 31 December 2022.

In addition to the information contained in the quarterly updates, the Annual Report, released on the 30th September each year, provides more detail on technical investigations, monitoring, data collected, and tracking against the success targets outlined in the Boundary Creek and Big Swamp Remediation Plan.

## Implementation of the REPP

In accordance with the REPP, Barwon Water have adopted an adaptive management approach, whereby the REPP can be adapted in response to the current 'state of knowledge'. This approach allows Barwon Water to evaluate how the confirmed areas of impact and the surrounding environment are responding to the adopted remedial actions and take further action, such as implementation of contingency measures, if and when required. This approach also ensures that the adopted remedial actions meet the vision, objectives and targets as informed by the community and stakeholder Remediation Reference Group (RRG) and their nominated experts.

To help address the requirements of the section 78 notice and ensure momentum was maintained, a number of key milestones and actions were established. However, as reported in the 1 July to 30 September 2022 Quarterly Update, this roadmap continues to be updated in accordance with the adaptive management approach to account for the current 'state of knowledge' and to capture any additional actions that were outlined in the 2021-2022 Annual Report (refer Figure 1).

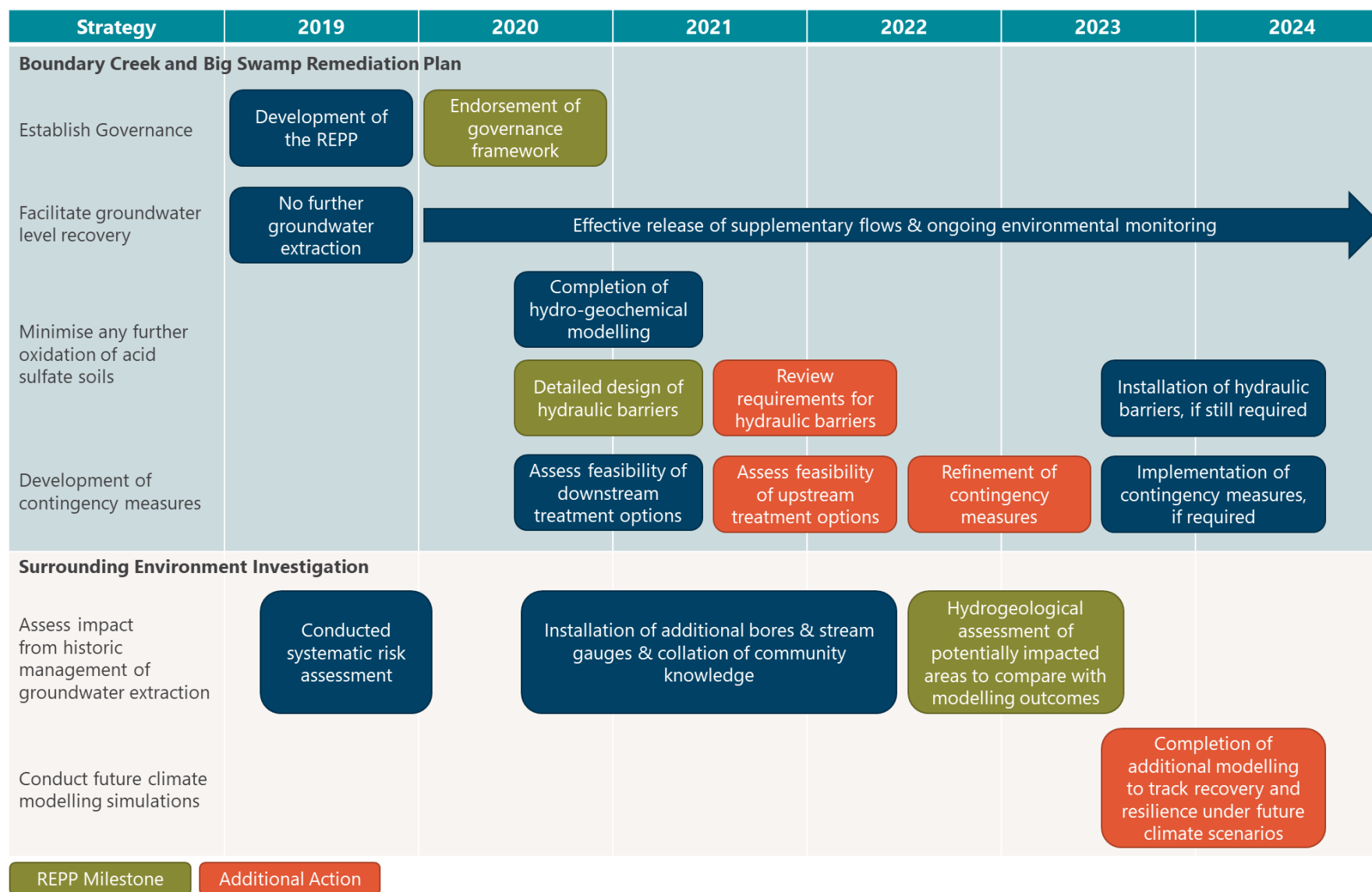


Figure 1: Timeframes for implementation of the REPP

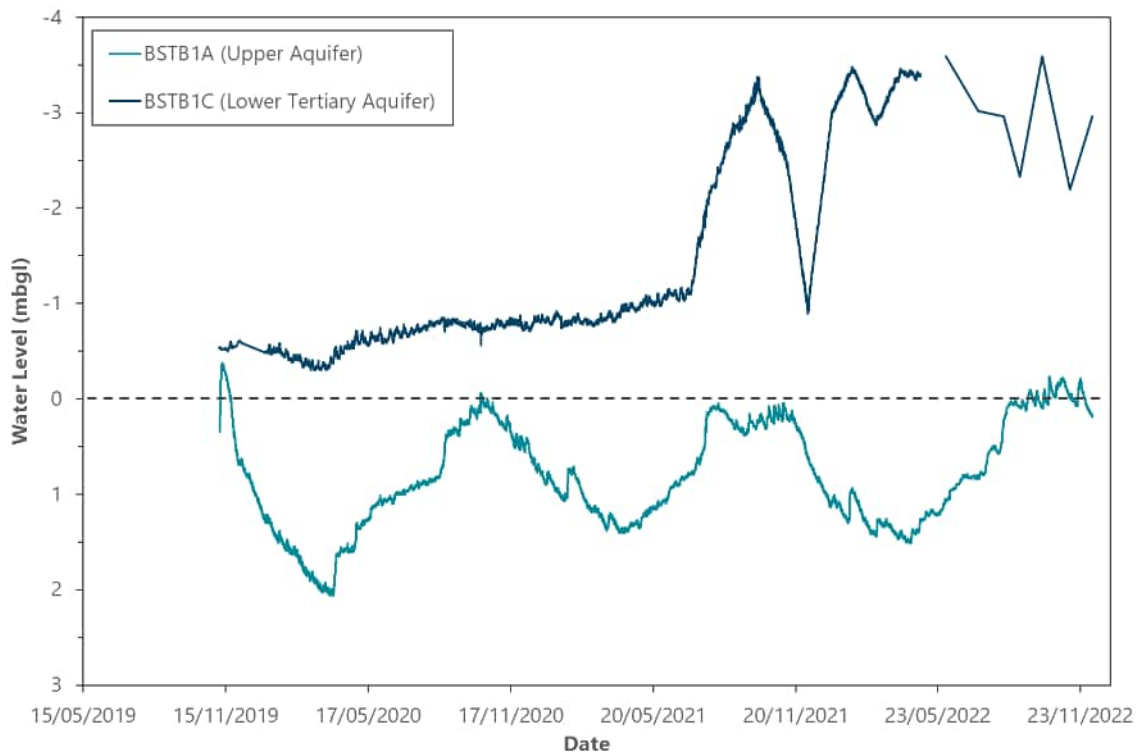
# Boundary Creek and Big Swamp Remediation Plan

## Boundary Creek & Big Swamp Status Update

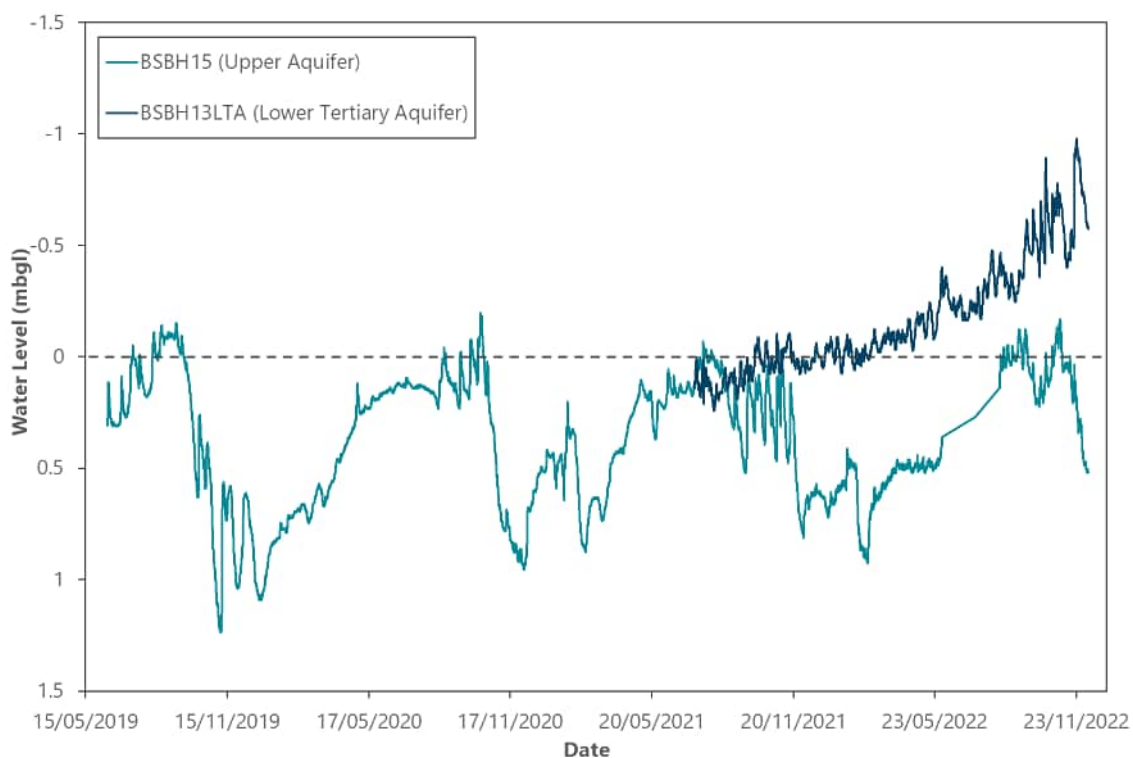
Based on the most recent data collected as part of Barwon Water's routine environmental monitoring program, the following observations can be made:

- Groundwater levels within Big Swamp's upper aquifer system have started to decline due to the recent weather conditions, consistent with the historic trends (refer Figure 2 and Figure 3)
- Groundwater levels from bores installed in the Lower Tertiary Aquifer system within Big Swamp continue to indicate the long-term recovery and repressurisation of the Lower Tertiary Aquifer system, with the western end of the swamp consistently reporting artesian conditions since March 2022
- The surface water quality downstream of Big Swamp has remained relatively consistent since 30 September 2022, with pH levels at stream gauges 233276 and 233228 ranging between 5.7 and 7.1, and 5.8 and 6.5 pH units respectively (refer Figure 4 and Figure 5). However, this is expected to decrease again over the drier and warmer summer period, consistent with the historic trends

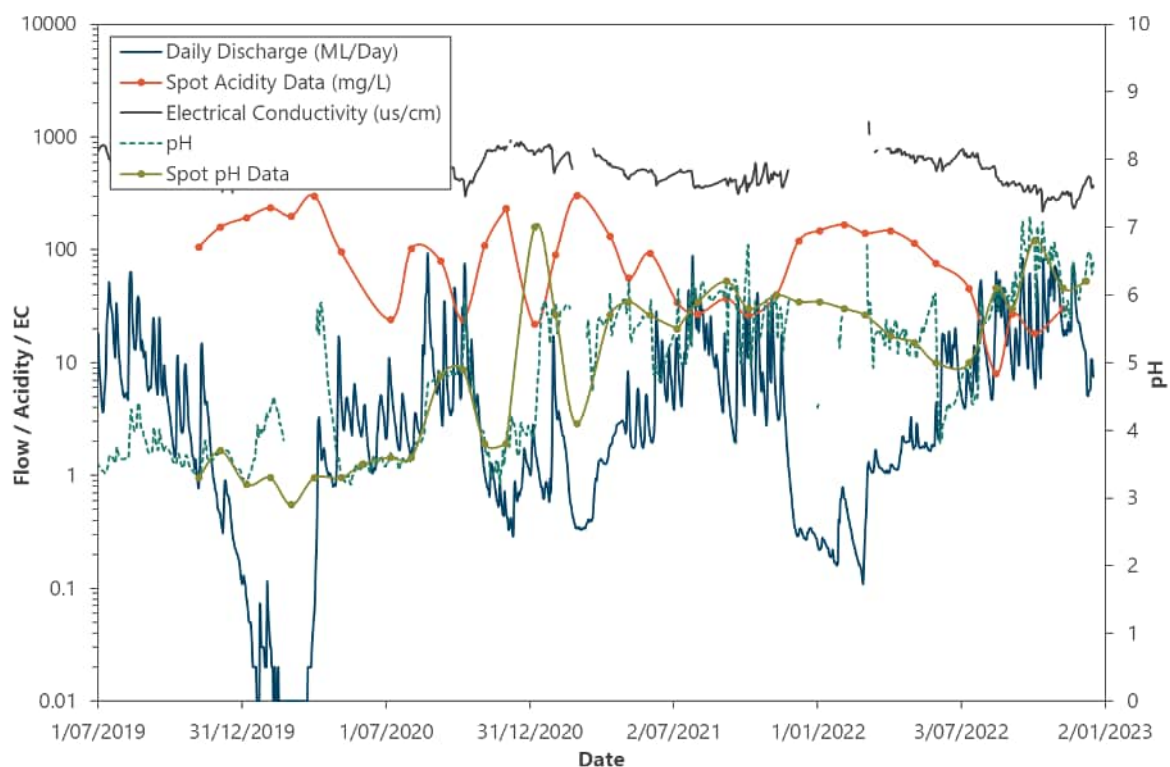
In addition to this, significant work has been undertaken since 30 September 2022 to develop a draft revised REPP that will be finalised based on the outcomes of the Ecological Risk Assessment and Paleoecology Study which are due to be completed by 30 June 2023. Further information regarding the REPP amendments are provided further on in this document.



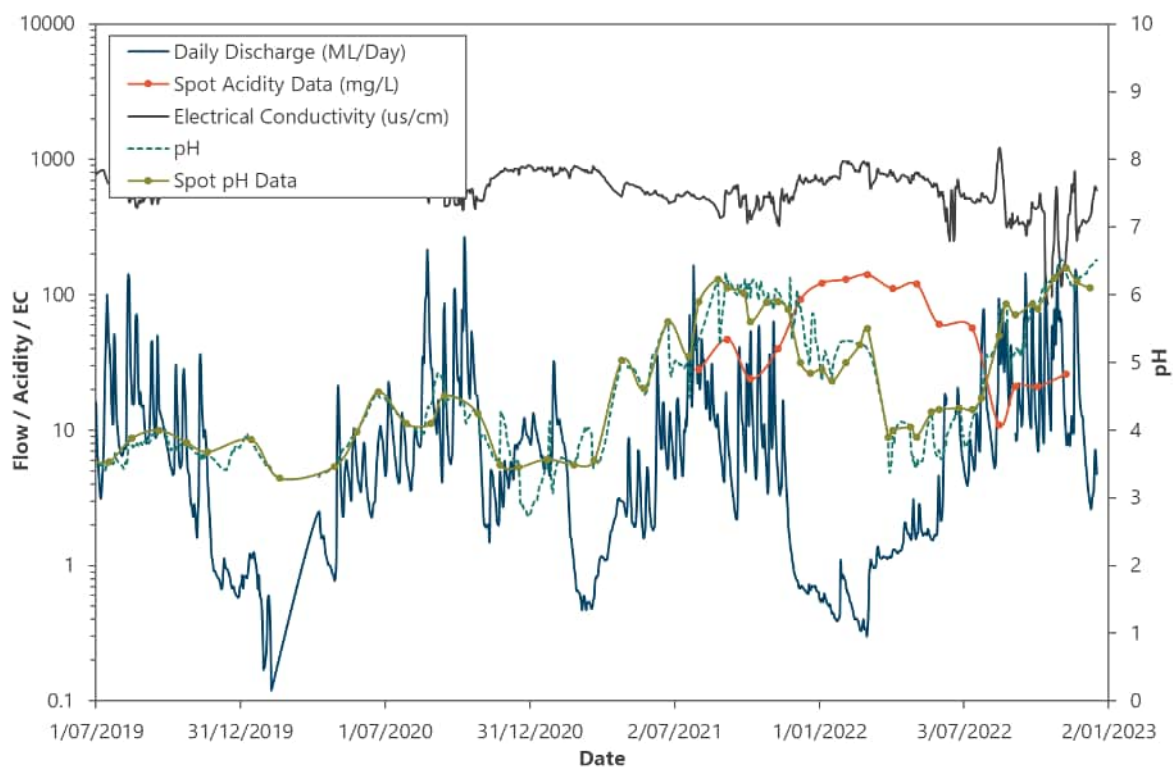
**Figure 2** Groundwater levels in the eastern portion of the swamp. Note that since the logger was removed from BSTB1C in April 2022 due to leakage associated with repressurisation of the LTA, the data presented after this time relates to spot sampling data



**Figure 3** Groundwater levels in the western portion of the swamp. Note that the logger from BSBH15 was found to be missing on 14 July 2022 and was replaced on 15 August 2022, data between these times relates to spot sampling data



**Figure 4 Streamflow, pH, EC and acidity readings in Boundary Creek – downstream of Big Swamp as recorded at stream gauge 233276 and during routine spot sampling**



**Figure 5 Streamflow, pH and acidity readings in Boundary Creek at Yeodene as recorded at stream gauge 233228 and during routine spot sampling**



## Actions Completed on the Boundary Creek & Big Swamp Remediation Plan

Table 1 outlines the actions completed for the Boundary Creek and Big Swamp Remediation Plan between 1 October and 31 December 2022.

**Table 1 Boundary Creek and Big Swamp - Actions completed in Q2 2022/23 (1 October – 31 December 2022)**

Action Items	Comment / Link
Completion of the Q2 2022/2023 Remediation Reference Group meeting	Completed on 16 November 2022
Submit quarterly update to Southern Rural Water for the period 1 October to 31 December 2022 and publish to the Your Say web page	Complete – this report Refer to the Your Say website located here: <a href="https://www.yoursay.barwonwater.vic.gov.au/boundary-creek">https://www.yoursay.barwonwater.vic.gov.au/boundary-creek</a>
Continue to collect data from new and existing monitoring assets	Complete and ongoing
Continue to release supplementary flows, where required, to try to maintain a flow of at least 0.5 ML/day at the Yeodene stream gauge #233228	Complete and ongoing
Undertake spring macro-invertebrate and water quality sampling in the Barwon River and Boundary Creek	Completed in November 2022 – report pending. The findings from this work will be published on the Your Say website located here: <a href="https://www.yoursay.barwonwater.vic.gov.au/boundary-creek">https://www.yoursay.barwonwater.vic.gov.au/boundary-creek</a>
Undertake the next round of the Big Swamp vegetation monitoring works	Completed in November 2022 – report pending. The findings from this work will be published on the Your Say website located here: <a href="https://www.yoursay.barwonwater.vic.gov.au/boundary-creek">https://www.yoursay.barwonwater.vic.gov.au/boundary-creek</a>
Progress amendment of the REPP based on the current 'state of knowledge' and the adaptive management approach.  This will include a review of the adopted remedial actions and the development of a risk-based remedial strategy that accounts for recent community and stakeholder feedback to help facilitate natural recovery processes.	On track for an interim draft to be submitted to Southern Rural Water by 31 December 2022  Noting that the remediation success targets and triggers for the implementation of contingency measures will be finalized following the completion of the Ecological Risk Assessment (ERA) and Paleoecology Study that are due to be completed by 30 June 2023
Development of contingency measures	As part of the REPP amendments Barwon Water have since developed a draft risk-based contingency approach that will be finalised following the completion of the Ecological Risk Assessment (ERA) and Paleoecology Study that are due to be completed by 30 June 2023  The use of Permeable Reactive Barriers (PRBs) are not currently considered to be a feasible

Action Items	Comment / Link
	<p>remediation option based on the outcomes of the PRB Assessment completed in September 2022</p> <p>The findings from this work will be published on the Your Say website located here:  <a href="https://www.yoursay.barwonwater.vic.gov.au/boundary-creek">https://www.yoursay.barwonwater.vic.gov.au/boundary-creek</a></p> <p>Barwon Water are also currently working on revising the design of the downstream treatment option. The revised design will be submitted to Southern Rural Water by 30 June 2023</p>
Completion of a Level 3 Ecological Risk Assessment to quantify the risks of the existing metal and acidity loads on Boundary Creek, Big Swamp and the Barwon River and to help inform the development of suitable triggers for the implementation of relevant contingency measures, if required	In progress. Estimated completion 30 June 2023
Completion of a paleoecology study of Big Swamp	In progress. Estimated completion 30 June 2023

## Upcoming Actions associated with the Boundary Creek & Big Swamp Remediation Plan

Table 2 outlines the upcoming actions associated with the Boundary Creek and Big Swamp Remediation Plan between 1 January and 31 March 2023.

**Table 2 Boundary Creek and Big Swamp - Upcoming actions / milestones for the Q3 2022/2023 (1 January – 31 March 2023)**

Action Items	Due
Submit quarterly update to Southern Rural Water for the period 1 January to 31 March 2023 and publish to the Your Say web page	31 March 2023 – noting that the draft revised REPP proposes that the due date for quarterly reports be delayed by 14 days to capture as much data as possible from the reporting period. This is due to the delays in receiving the laboratory results and verified groundwater logger data following completion of the monitoring events.
Completion of the Q3 2022/2023 Remediation Reference Group meeting	March 2023
Continue to collect data from new and existing monitoring assets	Ongoing

Action Items	Due
Continue to release supplementary flows, where required, to try to maintain a flow of at least 0.5 ML/day at the Yeodene stream gauge #233228	Ongoing
Continue Level 3 Ecological Risk Assessment to quantify the risks of the existing metal and acidity loads on Boundary Creek, Big Swamp and the Barwon River and to help inform the development of suitable triggers for the implementation of relevant contingency measures, if required	Estimated completion 30 June 2023
Continue paleoecology study of Big Swamp	Estimated completion 30 June 2023

## Surrounding Environment Investigation

### Surrounding Environment Investigation Update

As reported in the Annual Report, Barwon Water continues to progress the surrounding environment investigation in line with the process outlined in Figure 1 and Figure 6. The outcomes of this work are due to be submitted to Southern Rural Water by 31 July 2023.

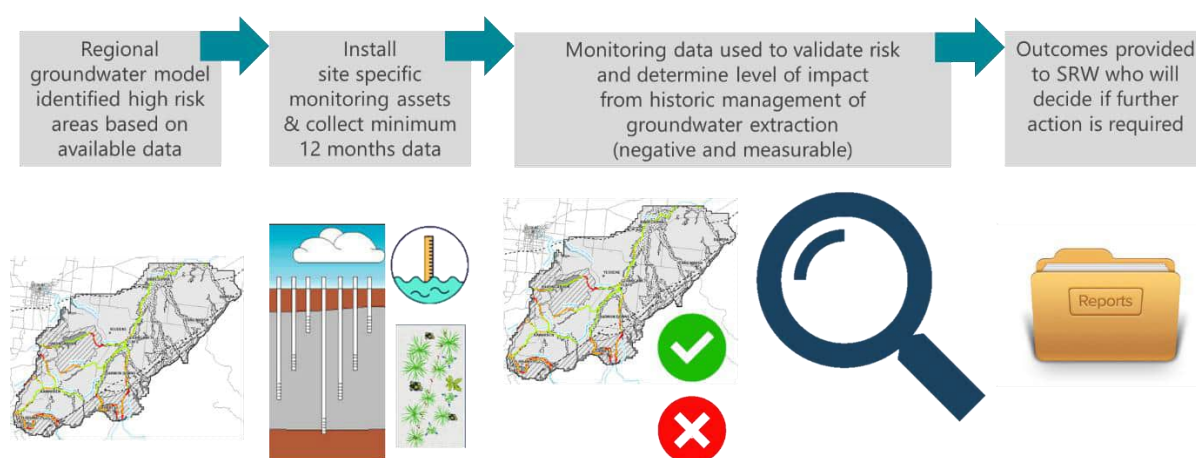


Figure 6 Process overview for the surrounding environment investigation

## Actions Completed – Surrounding Environment Investigation

Table 3 outlines the actions completed for the Surrounding Environment Investigation between 1 October and 31 December 2022.

**Table 3 Surrounding Environment Investigation - Actions completed in Q2 2022/23 (1 October – 31 December 2022)**

Action Items	Comment / Link
Completion of the Q2 2022/23 Remediation Reference Group meeting	Completed on 16 November 2022
Submit quarterly update for the period 1 October to 31 December 2022 to Southern Rural Water and publish to the Your Say web page	Complete – this report Refer to the Your Say website located here: <a href="https://www.yoursay.barwonwater.vic.gov.au/boundary-creek">https://www.yoursay.barwonwater.vic.gov.au/boundary-creek</a>
Continue collection of data from new monitoring assets for the surrounding environment investigation	Ongoing
Continue collation of community information regarding sites/issues of concern to inform the surrounding environment investigation	Ongoing
Subject to streamflows and site conditions, complete the remaining stream gauge installations	Barwon Water continues to explore options for access to enable installation of the Barongarook stream gauge  The East Barwon stream gauge reinstatement remains outstanding as we continue to negotiate relevant approvals and access
Commence the assessment phase of the surrounding environment investigation	A suitably qualified consultant was appointed to conduct the Loves Creek Hydrogeological Assessment in September 2022. This work is forecast to be completed by the end of June 2023  Works to investigate the remaining areas will commence in Q3/Q4 2022/2023  The outcomes of these works will be used to inform the overarching surrounding environment investigation that needs to be submitted to Southern Rural Water by 31 July 2023
Progress amendment of the REPP based on the high level approach to the Surrounding Environment Investigation that was submitted to Southern Rural Water on 30 June 2022	On track for an interim draft to be submitted to Southern Rural Water by 31 December 2022

## Upcoming Actions – Surrounding Environment Investigation

Table 4 outlines the upcoming actions associated with the Surrounding Environment Investigation between 1 January and 31 March 2023.

**Table 4 Surrounding Environment Investigation - Upcoming actions / milestones for the Q3 2022/2023 (1 January – 31 March 2023)**

Action Items	Due
Submit quarterly update to Southern Rural Water for the period 1 January to 31 March 2023 and publish to the Your Say web page	31 March 2023 – noting that the draft revised REPP proposes that the due date for quarterly reports be delayed by 14 days to capture as much data as possible from the reporting period. This is due to the delays in receiving the laboratory results and verified groundwater logger data following completion of the monitoring events
Completion of the Q3 2022/2023 Remediation Reference Group meeting	March 2023
Continue collection of data from new monitoring assets for the surrounding environment investigation	Ongoing
Continue collation of community information regarding sites/issues of concern to inform the surrounding environment investigation	Ongoing
Continue the assessment phase of the surrounding environment investigation	The outcomes of these works will be used to inform the overarching surrounding environment investigation that needs to be submitted to Southern Rural Water by 31 July 2023

## Issues Register

Table 5 below outlines any issues that have been identified during implementation of the REPP that may impact future implementation activities.

**Table 5 Issues register**

Issue	Likelihood	Consequence	Comments
Coronavirus (COVID-19) pandemic limits/delays engagement with stakeholders and the community	Medium	Low	Remediation Reference Group meetings continue to be held online in lieu of face-to-face meetings, with e-mail updates and notes also provided  In general, these meetings have been well attended with most members being able to attend online.

Issue	Likelihood	Consequence	Comments
			Wherever health advice permits, we will attempt to engage in a face to face setting also.
Coronavirus (COVID-19) pandemic impacts availability of appropriate consultants or contractors to undertake required work for implementation of the REPP	Medium	Low	Barwon Water have experienced delays regarding the availability of consultants, contractors and materials to complete work for this project during the coronavirus (COVID-19) pandemic.  With consultants continuing to be close to capacity this remains an ongoing risk and may lead to unexpected delays.
Community concerns regarding the potential impacts of stream gauge infrastructure on the Platypi	Low	Medium	The re-instatement of the East Barwon stream gauge remains on hold as we continue to negotiate relevant approvals and access due to concerns regarding potential impacts on the Platypi.  Review of these concerns by Platypi experts suggest the likelihood of this occurring is extremely low. However, Barwon Water are looking to investigate this further.
Extended remediation timeframes	Medium	Low	While water level and quality improvements are evident, the hydro-geochemical modelling report indicated that even with active intervention, the timeframe for the removal of existing acidity loads could still be in the order of 35 years.  Further work is currently being undertaken to determine the risks based on the current conditions. This will inform the revised remedial strategy for inclusion in the revised REPP.

## Community Engagement

The ninth Remediation Reference Group (RRG) meeting was held via Zoom on 16 November 2022. This meeting was attended by Barwon Water, members of the community and stakeholder Remediation Working Group and Southern Rural Water.

Topics discussed included:

- A brief discussion regarding the following items that were raised during the previous RRG meeting

- Costs incurred to date with regard to the development and implementation of the REPP
- Future community information sessions
- Status of RRG nominated experts
- An overview of the journey and evolution of the REPP and the Boundary Creek and Big Swamp Remediation Plan
- A summary of the actions completed since the last meeting which was held on 21 September 2022
- Snapshot of the current conditions at Big Swamp
- Completion of a workshop regarding the proposed revisions to the REPP, including:
  - Why the REPP is being updated
  - The proposed changes to the REPP's underpinning principles
  - The proposed changes to the Boundary Creek and Big Swamp Remediation Plan and the success targets
  - An overview of the process and next steps to enable the adoption of the revised REPP
- An overview of the progress and adopted approach to the surrounding environment investigation
- An overview of future climate resilience monitoring work

During this meeting an open forum was also held for group members to raise any topics that were not discussed above and for members to ask any questions that they may have. A high level summary of the feedback received during this meeting is outlined in the table below.

**Table 6 Community feedback**

Community Feedback Received	Response
In addition to the external costs incurred with regard to the development and implementation of the REPP, the RRG suggested that sharing an estimate of the internal costs would also help demonstrate how seriously Barwon Water is investing in these works	Barwon Water are currently reviewing the internal costs and will provide an update to the RRG during our next RRG meeting.
The RRG members sought clarification regarding the budget for the Barwon Downs decommissioning works and expressed concerns regarding the timing of the proposed decommissioning works	<p>The budget outlined in the 2023-2028 Price Submission includes:</p> <ul style="list-style-type: none"> <li>● The preparation of a decommissioning plan outlining the decommissioning details for each bore based on the requirements outlined by the National Uniform Drillers Licensing Committee to support Barwon Water's application for a licence to decommission the Barwon Downs extraction bores</li> <li>● Submission of an application for a licence to decommission a bore(s) to Southern Rural Water,</li> </ul>

Community Feedback Received	Response
	<p>which is required prior to the commencement of any decommissioning works for a groundwater bore</p> <ul style="list-style-type: none"> <li>Decommissioning of the Barwon Downs extraction bores by a suitably qualified driller in line with the decommissioning requirements outlined by the National Uniform Drillers Licensing Committee. The cost estimate included in the 2023-2028 Price Submission includes the time and materials for a suitably qualified driller to fill and permanently seal each of the Barwon Downs extraction bores.</li> </ul> <p>Although the 2023 Price Submission and relevant decommissioning funding will be confirmed in the coming months by the Essential Services Commission, and take effect from July 1, 2023, Barwon Water will commence the preparation of a decommissioning plan in early 2023, by engaging a suitably qualified consultant to prepare the decommissioning plan. This will outline the specific methodology and backfill/perforation/sealing requirements for each bore.</p> <p>Allowing time for the decommissioning plan to be developed, applying for and receiving a decommissioning licence from Southern Rural Water, and procurement of a specialist driller, it is likely that the earliest on-ground decommissioning works will begin is 2024/25. This is earlier than the date identified in the 2023 Price Submission (i.e. 2026/2027 as outlined in Section 6.3 of the 2023 Price Submission) however, Barwon Water will aim for this earlier delivery date. It should be noted Barwon Water has a significant \$549M capital works program scheduled for the pricing submission and prioritising works is important to manage risk and resources.</p>
<p>An RRG member asked for clarification about what the supplementary flows were and how they were different to passing flows</p>	<p>The supplementary flows, which are released via pipeline into the upper reaches of Boundary Creek (i.e. above the private on-stream dam) are designed to help sustain streamflow's during dry periods to help keep the swamp wet – i.e. when there is insufficient rainfall to sustain streamflows.</p> <p>The passing flow requirements relate to the private on-stream dam, which is required to pass all flows coming into the dam at certain times of the year (i.e. between 1 November and 30 June). Noting that during the passing flow condition period, this includes the passing of Barwon Water's supplementary flows.</p>
<p>RRG members enquired about the automation of the flow release valve on</p>	<p>Barwon Water continue to pursue automation of the flow valve on the private on-stream dam. However, further</p>



Community Feedback Received	Response
the private on-stream dam that has been discussed during previous RRG meetings	<p>discussion is still required between the landholder, Southern Rural Water and Barwon Water to clarify the valve's operating conditions given the dam is beyond Barwon Water's control and Southern Rural Water are the regulators of the dam.</p> <p>Barwon Water are currently upgrading the telemetry at the stream gauges located upstream and downstream of the dam so these can talk to each other and be used to adjust the automated flow valve.</p>
In regards to observation bore YEO40, an RRG member enquired about the status of this bore being removed from the groundwater level targets under the success targets contained in the REPP	<p>YEO40 was historically a trigger bore under Barwon Water's extraction licence. However, this bore is not considered to be suitable as a success target bore given the bores history.</p> <p>This bore was replaced in 2006 due to bore integrity issues. The replacement bore, while also being installed in the Lower Tertiary Aquifer, was installed to a slightly different depth/lithology and subsequently water levels within the new bore are not reflective of the previous bore. As such, using the historic water levels from the original bore to set a groundwater level target for the replacement bore is not practicable.</p> <p>As an alternative, groundwater level targets have been set for a range of bores. Noting that the water levels at YEO40 will continue to be monitored and reported on as part of the Annual Reporting Process.</p>
RRG members enquired as to whether the current conditions would contribute to a faster recovery of the groundwater levels	<p>While the wet weather helps, the amount of groundwater recharge depends on the rainfall intensity/duration, infiltration rate and soil saturation. During significant rainfall events large proportions of this water become runoff and ends up in the rivers/streams rather than infiltrating into the ground. If we continue to get steady rain over a long period of time this will support accelerated improvements, however heavy rain over a short period is not likely to significantly increase the rate of groundwater level recovery.</p>
RRG members reiterated that invasive remedial actions should be kept as a last resort	<p>As outlined in the REPP, contingency measures are aimed at mitigating the potential for high-risk events while the primary remedial actions take effect.</p> <p>The risk-based contingency approach will include specific triggers for the implementation of contingency measures to minimise invasive actions, to the extent practicable.</p>
An RRG member enquired about the indigenous history of the site, including the indigenous name for the swamp	<p>TBA – Barwon Water to discuss with Eastern Maar during out next routine catch up.</p>

## Success Targets

Following completion of the REPP, the interim success targets that were presented in the REPP underwent a review in 2021 to account for any additional data obtained since development of the REPP. The revised success targets have not yet been accepted by SRW and are likely to be finalised as part of the upcoming REPP updates that are required to address feedback received from Southern Rural Water and account for the current 'state of knowledge' given the technical works completed since the approval of the REPP.

An update on progress against the relevant success targets will be provided in the Annual Report along with the supporting monitoring data.

## Technical Reports and Investigations

Relevant technical and investigation reports that have been completed for Boundary Creek, Big Swamp and as part of the Surrounding Environment Investigation can be accessed from the dedicated Boundary Creek Remediation webpage via the following link:

<https://www.yoursay.barwonwater.vic.gov.au/boundary-creek>

## Contingency Measures

Table 7 outlines the contingency measures identified during the design and implementation of the REPP. It is noted that no contingency measures have been implemented to date.

**Table 7 Contingency Measures Identified**

Contingency Measure	Status
Downstream treatment – preferred method being a sodium hydroxide (NaOH) dosing plant	<p>The design of the downstream contingency measure was submitted to Southern Rural Water on 30 July 2021.</p> <p>Following submission Barwon Water received feedback from Southern Rural Water and the ITRP requiring further information before this could be progressed any further and requested investigation of a novel upstream treatment systems. Given the commencement of the upstream treatment investigation, the downstream treatment option was put on hold until the feasibility of the upstream treatment system could be ascertained.</p> <p>Following completion of the Upstream Treatment Investigation in June 2022, Barwon Water are currently reviewing the downstream treatment design with the aim of submitting a revised design to Southern Rural Water by 30 June 2023.</p>

Contingency Measure	Status
Upstream treatment – using caustic magnesia (MgO)	<p>Barwon Water have since ruled out the use of the proposed semi-passive caustic magnesia treatment system. This decision was supported by Southern Rural Water and the Independent Technical Review Panel (ITRP) in their response received on 29 August 2022 and is based on a range of technical, social, environmental and economic factors including:</p> <ul style="list-style-type: none"> <li>• The inability of the proposed system to meet the intended objectives</li> <li>• The potential for further harm to the environment and ecological values to occur</li> <li>• The novelty and untested nature of such a system in a similar environment</li> <li>• The cost and time that would be required to conduct sufficient laboratory testing and trials to identify and validate a suitable reagent and design</li> <li>• The improvements in conditions (e.g. water levels, quality and ecological condition)</li> <li>• Significant stakeholder feedback and concern relating to: <ul style="list-style-type: none"> <li>• Potential risks</li> <li>• The inclusion of the 'do no harm' principle</li> <li>• Minimising engineering interventions, and</li> <li>• Preference to facilitate natural recovery processes</li> </ul> </li> </ul>

## REPP Amendments

A draft of the revised REPP is due to be submitted to Southern Rural Water by 31 December 2022. Noting that the success targets and triggers for the implementation of contingency measures will still need to be confirmed following the completion of the Ecological Risk Assessment and Paleoecology Study that are due to be completed by 30 June 2023.

The revised REPP will be updated to:

- Take into consideration the feedback received from Southern Rural Water and the Independent Technical Review Panel
- Account for the additional knowledge and understanding that has been gained since the implementation of the REPP began in March 2020
- Account for the outcomes of workshops held with the community and stakeholder Remediation Reference Group (RRG) on 8 June 2022 and 16 December 2022 that were conducted to:

- Check in on vision, objectives and actions outlined in the Remediation Plan
  - Discuss the proposed changes to the Remediation Plan and incorporation of previous community and stakeholder feedback, and
  - Understand the current community sentiment
- Simplify and streamline the REPP document whilst still meeting the requirements of the Section 78 Notice

## Progress Report

Table 8 outlines the actions that have been completed, are currently in progress, or are yet to commence as part of implementation of the REPP through to the end of the 2022/23 monitoring and reporting period (1 July 2022 to 30 June 2023). It is important to note that additional tasks may be added as they are identified during the implementation of the REPP.

**Table 8 Action Register**

#	Activity	Due Date	Status	Health Indicator	Comments
1.0	Meeting with SRW to be held at the Barwon Water office to develop work plan towards confirming priority actions relating to feedback provided.	30-Apr-20	Complete	Complete	Complete
2.0	Complete autumn macro-invertebrates survey	30-Jun-20	Complete	Complete	Report now complete and is now uploaded on website
3.0	Complete soil incubation testing	31-May-20	Complete	Complete	Report has been finalised and is now uploaded on website
4.0	Submit quarterly report to SRW and publish to website	30-Jun-20	Complete	Complete	Completed and uploaded to website
5.0	Scoping of SW-GW technical work packages required to inform detailed design and address feedback register	30-Nov-20	Complete	Complete	Complete
6.0	Complete installation of additional monitoring assets required to inform the Surrounding Environment Investigation	30-Jun-22	In progress	At Risk	The installation of 21 additional groundwater bores and the development of 4 pre-existing groundwater bores was completed in June 2022. 4 of 5 proposed stream Gauges have now been installed. The Barongarook Creek stream gauge and the reinstatement of the East Barwon stream gauge remain outstanding as we continue to negotiate relevant approvals and access.
7.0	Conclusion of monitoring period enabling the capture of a full seasonal cycle of data to inform updates to the groundwater-surface water model and geochemical model.	31-Jul-20	Complete	Complete	The data collected from this work has since been included in the relevant technical reports
8.0	REPP Feedback Work plan - Submission and Acceptance	31-Jul-20	Complete	Complete	Completed

#	Activity	Due Date	Status	Health Indicator	Comments
9.0	Governance Framework - Submission and Acceptance	31-Jul-20	Complete	Complete	Completed
10.0	Barwon Water Communications and Engagement Plan	Ongoing	In progress	On track	Remediation Reference Group meetings continue to be held quarterly. Two community information session were also held in May 2022. Plan continues to be adapted based on outcomes and outputs of project.
11.0	Submit updated REPP to capture the work plan for addressing the feedback register. SRW to accept the updated REPP.	31-Dec-22	In progress	On track	Barwon Water has since committed to submitting a draft revised REPP to Southern Rural Water by 31 December 2022. Noting that the success targets and triggers for the implementation of contingency measures will be confirmed following the completion of the Ecological Risk Assessment and Paleoecology Study that are due to be completed by 30 June 2023.
12.0	Submit annual report to SRW and publish to Your Say website	30-Sep-20	Complete	Complete	Completed
13.0	Remediation Reference Group Meeting	2-Dec-20	Complete	Complete	Completed
14.0	Establish vegetation monitoring for Boundary Creek and Big Swamp Remediation Plan	31-Dec-20	Complete	Complete	Completed
15.0	Update groundwater-surface water model	31-Dec-20	Complete	Complete	Completed and uploaded to website
16.0	Submit quarterly report to SRW and publish to Your Say website	31-Dec-20	Complete	Complete	Completed
17.0	Remediation Reference Group Meeting	17-Mar-21	Complete	Complete	Completed
18.0	Submit quarterly report to SRW and publish to Your Say website	31-Mar-21	Complete	Complete	Completed
19.0	Remediation Reference Group Meeting	23-Jun-21	Complete	Complete	Completed

#	Activity	Due Date	Status	Health Indicator	Comments
20.0	Submit quarterly report to SRW and publish to Your Say website	30-Jun-21	Complete	Complete	Completed and uploaded to website
21.0	Submission of detailed design of the hydraulic barriers outlining proposed controls or actions and any revisions to success measures/targets.	1-Jul-21	Complete	Complete	Complete. Submitted to Southern Rural Water on 1 July 2021
22.0	Update Hydro geochemical model	31-Jul-21	Complete	Complete	Completed and uploaded to website
23.0	Complete detailed design of contingency measure and feasibility assessment for up-stream for new upstream treatment method	31-Jul-21	Complete	Complete	<p>Barwon Water have since ruled out the use of the proposed semi-passive caustic magnesia treatment system. This decision was supported by Southern Rural Water and the Independent Technical Review Panel (ITRP) in their response received on 29 August 2022.</p> <p>Following completion of the Upstream Treatment Investigation in June 2022, Barwon Water will progress responding to Southern Rural Water and ITRP feedback on the downstream treatment option that was submitted to Southern Rural Water on 30 July 2021, with the aim of submitting a revised design to Southern Rural Water by 30 June 2023.</p>
24.0	Remediation Reference Group Meeting	8-Sep-21	Complete	Complete	Completed
25.0	Submit annual report to SRW and publish to Your Say website	30-Sep-21	Complete	Complete	Completed and uploaded to website
26.0	Remediation Reference Group Meeting	9-Dec-21	Complete	Complete	Completed
27.0	Submit quarterly report to SRW and publish to Your Say website	31-Dec-21	Complete	Complete	Completed and uploaded to website

#	Activity	Due Date	Status	Health Indicator	Comments
28.0	Completion of upstream treatment investigation and development of Trial Plan	14-Jan-22	Complete	Complete	Complete. Submitted to SRW on 14 Jan 2022.  Barwon Water have since ruled out the use of the proposed semi-passive caustic magnesia treatment system. This decision was supported by Southern Rural Water and the Independent Technical Review Panel (ITRP) in their response received on 29 August 2022.
29.0	Remediation Reference Group Meeting	21-Mar-21	Complete	Complete	Completed
30.0	Submit quarterly report to SRW and publish to Your Say website	31-Mar-22	Complete	Complete	Completed and uploaded to website
31.0	Hosted community information session in Winchelsea	10-May-22	Complete	Complete	Completed
32.0	Hosted community information session in Colac	17-May-22	Complete	Complete	Completed
33.0	Remediation Reference Group Meeting	8-Jun-22	Complete	Complete	Completed
34.0	If trial plan is approved undertake upstream treatment trial	30-Jun-22	Complete	Complete	Barwon Water have since ruled out the use of the proposed semi-passive caustic magnesia treatment system. This decision was supported by Southern Rural Water and the Independent Technical Review Panel (ITRP) in their response received on 29 August 2022.
35.0	Decision on implementation of full scale upstream treatment, hydraulic barriers and downstream treatment	30-Jun-22	Complete	Complete	
36.0	Submit quarterly report to SRW and publish to Your Say website	30-Jun-22	Complete	Complete	Completed and uploaded to website
37.0	Remediation Reference Group Meeting	21-Sep-22	Complete	Complete	Completed
38.0	Submit quarterly report to SRW and publish to Your Say website	30-Sep-22	Complete	Complete	Completed and uploaded to website



#	Activity	Due Date	Status	Health Indicator	Comments
39.0	Submit annual report to SRW and publish to website	30-Sep-22	Complete	Complete	Completed and uploaded to website
40.0	Remediation Reference Group Meeting	16-Nov-22	Complete	Complete	Completed
41.0	Submit quarterly report to SRW and publish to Your Say website	31-Dec-22	Complete	Complete	Completed and uploaded to website
42.0	Amend the REPP based on the current state of knowledge and adaptive management approach	31-Dec-22	In progress	On track	On track for an interim draft to be submitted to Southern Rural Water by 31 December 2022