

Boundary Creek, Big Swamp and surrounding environment

Quarter 1 – 30 June 2020

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Introduction

In June 2017, Barwon Water acknowledged that historic management of groundwater pumping had an environmentally significant impact in the Boundary Creek catchment. Reductions in flows caused by groundwater extraction coupled with a drier climate and supplementary flows not reaching the intended area, all contributed to the drying out of Big Swamp. This resulted in the activation of acid sulfate soils and ongoing release of acidic water to the lower reach 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.

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 01 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 late February 2020, Southern Rural Water (SRW) accepted Barwon Water's REPP, which will be delivered under two parallel work packages:

- The **Boundary Creek and Big Swamp Remediation Plan** to address remediation of confirmed impact in the Boundary Creek catchment resulting from historical management of groundwater extraction.
- The **Surrounding Environment Investigation** to investigate whether other areas within the regional groundwater system have been impacted by historical management of groundwater extraction.

Key requirements 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 Annual Report is required to be submitted to SRW and made publicly available by 30 September each year.

This quarterly update is the first since implementation of the REPP commenced on 01 March, 2020 and provides a high-level update on progress to date with implementation of the REPP.

In addition to the information contained in the quarterly updates, the Annual Report will also provide more detail on outcomes from further technical investigations, monitoring that has been undertaken and the data collected, and tracking against the REPP success targets.

Q1 update on implementation of REPP

Quarterly Updates outline actions completed during the reporting period and highlight any major milestones to be achieved in the following quarter. Stakeholder engagement and feedback will also be covered in these updates.

Remediation of Boundary Creek and Big Swamp

The REPP outlined the below plan for remediation (refer Figure 1). Barwon Water has been working to collect a full seasonal data set to allow updating of the groundwater-surface water and geochemical models in order to better inform the detailed design for the Remediation of Boundary Creek and Big Swamp. As outlined in the REPP, additional monitoring was necessary for collection of a full seasonal cycle to inform the setting of indicators and measures of success as recommended by Southern Rural Water and its Independent Technical Review Panel in review of the scope of works. Specific actions undertaken are outlined in Table 1.

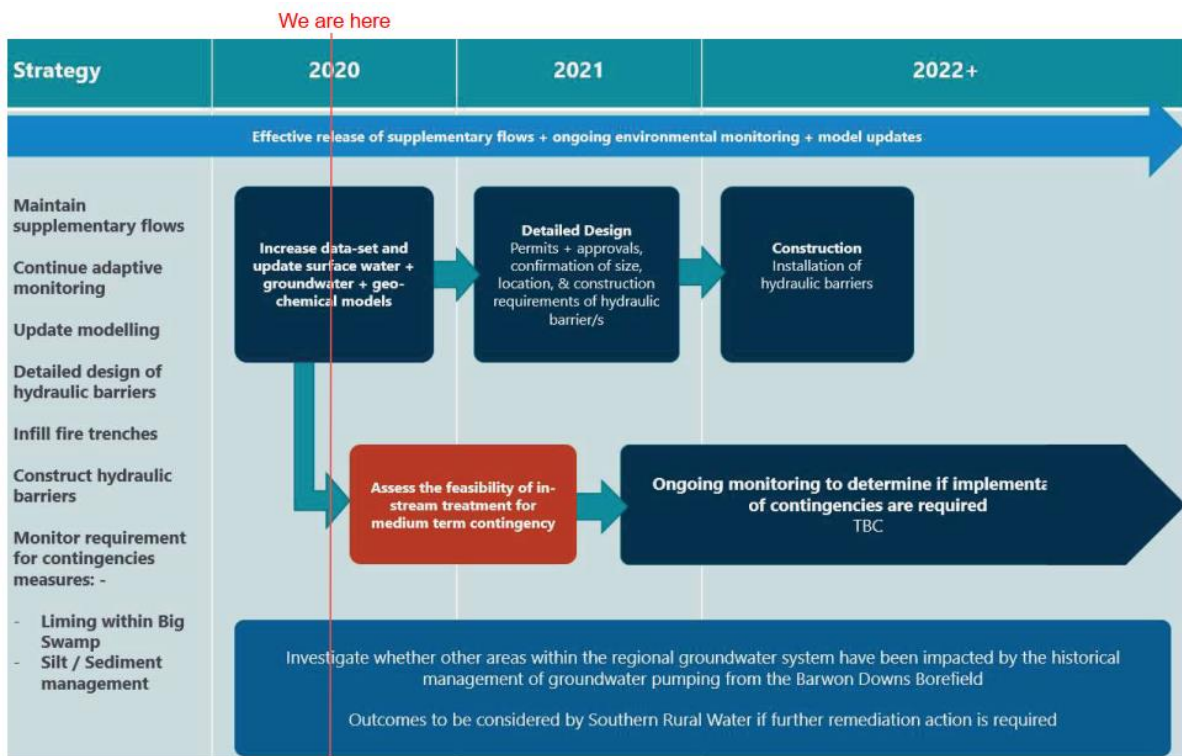


Figure 1: Timeframes for implementation of the REPP

Quarter 1 March-June

Table 1: Q1 completed actions for Boundary Creek and Big Swamp Remediation Plan

| Completed actions - Remediation of Boundary Creek and Big Swamp | Report Link (if applicable) |
|--|---|
| Continuation of monitoring of groundwater levels and groundwater quality in Big Swamp, surface water flows and surface water quality in Boundary Creek and Big Swamp to enable data collection of a full seasonal cycle (i.e. minimum of 12 months of data) and surface water flows at Ten Mile Creek and Yahoo Creek. | |
| Finalisation of the register of feedback on the REPP provided by Southern Rural Water | |
| Completion of the autumn macro-invertebrates survey of the Barwon River & Boundary Creek | https://www.yoursay.barwonwater.vic.gov.au/boundary-creek |
| Appointment of a dedicated Project Manager | |
| Completion of soil incubation testing that was commenced during implementation of the scope of works | https://www.yoursay.barwonwater.vic.gov.au/boundary-creek |
| Commenced preliminary assessment of the data collected through ongoing monitoring (anticipated for completion in December 2020) | |
| Commenced scoping of further technical work to be undertaken to inform detailed design (anticipated for completion in December 2020) | |
| Commenced development of the work plan detailing how Barwon Water will respond to the register of feedback, including prioritisation of actions, the timeframe for responding to each item and the process for reporting and closing out each item (due 31 July 2020) | |
| Commenced development of a communication and engagement plan (due 31 July 2020) | |
| Commenced development of the governance framework (due 31 July 2020) | |
| Two email updates provided to the Remediation Working Group in lieu of face to face meetings with feedback sought on future community engagement | |

Upcoming quarter 2 July-September

Table 2: Q2 upcoming tasks

| Upcoming tasks – Remediation of Boundary Creek and Big Swamp | Due (if applicable) |
|---|---------------------|
| Governance framework to be submitted to and accepted by Southern Rural Water | 31 July 2020 |
| Submission and acceptance of a work plan detailing how Barwon Water will respond to the register of feedback including prioritisation of actions, the timeframe for responding to each item and the process for reporting and closing out each item | 31 July 2020 |
| Communication and Engagement plan to be submitted and accepted by Southern Rural Water | 31 July 2020 |
| Submission of annual report to SRW and report made publicly available | 30 Sep 2020 |
| Submit updated REPP addressing agreed actions in the register of feedback | 30 Sep 2020 |
| Complete preliminary assessment of data to help inform scoping of further technical work required | 31 December 2020 |
| Scoping of technical work packages required to inform detailed design and inform the work plan to address the register of feedback | 31 December 2020 |

Surrounding Environment Investigation

We have also begun work on the Surrounding Environment Investigation (refer Figure 2). Completed actions are outlined below in Table 3.

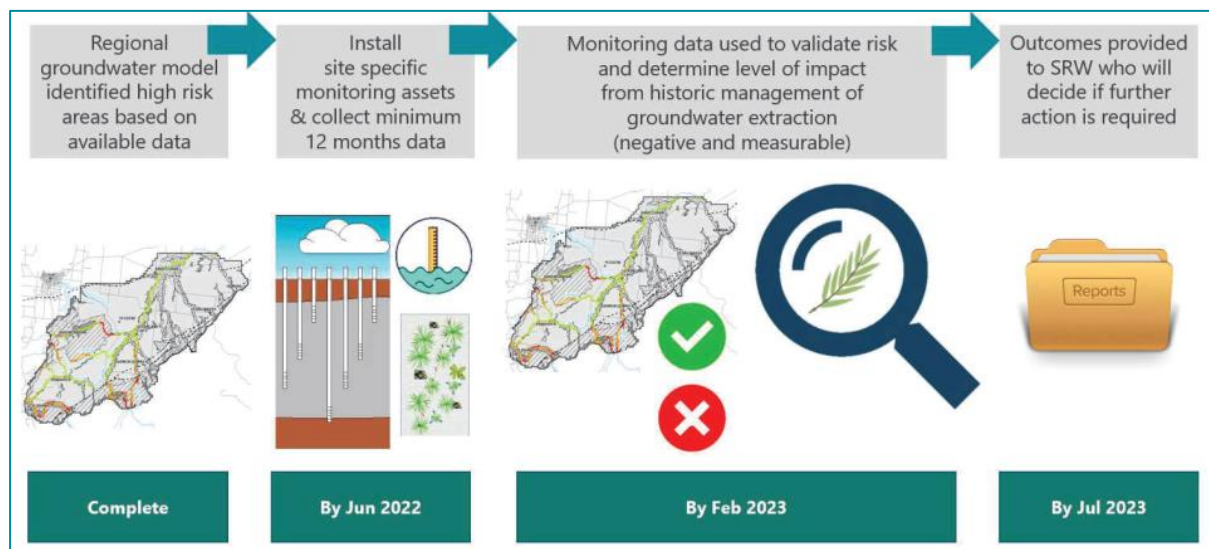


Figure 2: Process overview for the Surrounding Environment Investigation

Quarter 1 March-June

Table 3: Q1 completed actions for the Surrounding Environment Investigation

| Completed actions – Surrounding Environment Investigation | Link (if applicable) |
|---|----------------------|
| Continued collection of streamflow data for Yahoo and Ten Mile Creeks (tributaries of Loves Creek) | |
| Finalisation of the register of feedback on the REPP provided by Southern Rural Water * | |
| Appointment of a dedicated Project Manager* | |
| Commenced design of planning for installation of new stream gauges on: <ul style="list-style-type: none"> • East Barwon River • West Barwon River • Barwon River downstream confluence with Boundaary Creek • Gellibrand River • Barongarook Creek | |
| Stream gauge site inspection undertaken with the CCMA and Arthur Rylah Institute to assess requirements for maintaining fish passage whilst meeting the objective of ensuring critical low flow data can be captured. This includes: <ul style="list-style-type: none"> • Not creating a physical barrier to fish movement • Not installing infrastructure that changes fish behaviour • Not creating shading/darkness that would impact fish movement • Maintaining/re-creating natural streambed profiles • Not installing infrastructure that changes flow profiles and increases stream velocities | |
| Engaged Streamology to assess stream gauge locations and gauge designs from a geomorphology perspective to determine ability to achieve objectives for collection of accurate low flow data whilst meeting fish passage requirements identified during the initial site inspections | |
| Commenced of planning for installation of additional observation bores to accompany new stream gauges | |
| Commenced development of the work plan detailing how Barwon Water will respond to the register of feedback, including prioritisation of actions, the timeframe for responding to each item and the process for reporting and closing out each item (due 31 July 2020) | |
| Commenced development of a communication and engagement plan (due 31 July 2020)* | |
| Commenced development of the governance framework (due 31 July 2020)* | |
| Two email updates provided to the Remediation Working Group in lieu of a face to face meeting and feedback sought on future community engagement* | |

* Also shown in Table 1 Remediation of Boundary Creek and Big Swamp.

Upcoming quarter 2 July-September

Table 4: Q2 upcoming tasks

| Upcoming tasks – Surrounding Environment Investigation | Due (if applicable) |
|--|---------------------|
| Progress planning for installation of additional stream gauges and observation bores in Summer 2020/21 | 31 December 2020 |
| Governance framework to be submitted to and accepted by Southern Rural Water* | 31 July 2020 |
| Submission and acceptance of a work plan detailing how Barwon Water will respond to the register of feedback including prioritisation of actions, the timeframe for responding to each item and the process for reporting and closing out each item* | 31 July 2020 |
| Communication and Engagement plan to be submitted and accepted by Southern Rural Water* | 31 July 2020 |
| Submit updated REPP addressing agreed actions in the register of feedback* | 30 Sept 2020 |

* Also shown in Table 2 Remediation of Boundary Creek and Big Swamp.

Issues register

This section 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 |
|--|------------|-------------|
| COVID-19 pandemic limits/delays engagement with stakeholders and the community | Low | Low |
| COVID-19 pandemic impacts availability of appropriate consultants or contractors to undertake required work for implementation of the REPP | Low | Low |

Community engagement

The coronavirus (COVID-19) pandemic has presented challenges in meeting community groups in traditional settings. Barwon Water is currently reviewing the way we work with the community to ensure engagement meets the requirements of the Victorian Government's COVID-19 guidelines. This will continue to be considered as part of the work to finalise the communication and engagement strategy for implementation of the REPP.

Due to the COVID-19 restrictions Barwon Water was unable to proceed with a scheduled meeting with the Remediation Working Group (RWG) in March, 2020. To ensure ongoing communication with the RWG, two email updates were issued on 30 March and 20 May 2020 to keep them informed of progress with implementation of the REPP. This quarterly update will also form the basis of a third working group update.

The development of a communication and engagement strategy will also consider the ability to use technology to host online meetings with the RWG and supporting members to participate. This approach may mean for some members that the meetings are more accessible because travel times are reduced.

As part of the remediation working group email updates, Barwon Water also sought feedback from the group on preferred methods for engaging with and keeping the community informed of progress going forward.

Barwon Water is seeking to continue focussed engagement with a community and stakeholder Remediation Working Group (RWG), however, the purpose, membership and meeting frequency are all items still to be determined through finalisation of the communication and engagement plan for implementation of the REPP.

Barwon Water will continue to review the way we work and engage with the community to ensure the community remains informed of progress with the REPP.

Success targets

The REPP provided 12 success targets for remediation of Boundary Creek and Big Swamp. An update on progress towards each of these targets will be provided in the Annual Report. Monitoring data, which informs many of the success targets, will also be provided with the Annual Report.

Success targets for the Surrounding Environment Investigation will be developed if impacts are confirmed and remediation determine to be practicable in accordance with the Section 78 Notice.

Technical reports and investigation

Reports for technical work and investigations that have been completed 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 6 will outline any contingency measures confirmed to be required during the detailed design or implementation of the REPP.

Table 6: Contingency measures to be implemented

| Contingency measure | Status |
|---------------------|--------|
| | |
| | |

REPP amendments

Table 7 outlines REPP amendments current as of the time of this report.

Table 7: Amendments to the REPP

| No. | REPP amendments | Status |
|-----|---|----------|
| 1 | REPP updated 27 th February 2020 to include new section capturing SRW feedback on the REPP | Complete |
| | | |
| | | |

Progress report

Table 8 presents actions that have been completed, are currently in progress, or are yet to commence as part of implementation of the REPP. It is important to note that additional tasks may be added as they are identified during implementation of the REPP.

Table 8: Action register

| # | Activity | Due Date | Status | Health Indicator | Comments/Risks |
|-----|--|-----------|-------------|------------------|--|
| 1.0 | <p>Meeting with SRW to be held at the Barwon Water office to develop work plan towards confirming priority actions relating to feedback provided.</p> <p>SRW to accept outcomes of the workshop whereby a register of feedback is confirmed for Barwon Water's response.</p> | 30-Apr-20 | Complete | Complete | Due to restrictions the proposed workshop was not able to be held. Instead, the Feedback Register has been finalised through a series of discussions and review of preliminary comments responding to feedback. A workshop discussion is instead proposed to be undertaken online to inform development of the work plan for addressing the feedback in the register |
| 2.0 | Complete autumn macro-invertebrate survey | 30-Jun-20 | In progress | On track | Report now complete and will be provided on the website along with some summary text of key findings |
| 3.0 | Complete soil incubation testing | 31-May-20 | In progress | Complete | Report has been finalised and is ready for upload to the website |
| 4.0 | Submit Quarterly Update to SRW and publish to website | 30-Jun-20 | In progress | On track | SRW review of template complete. Quarterly Update uploaded to website on 30th June. |
| 5.0 | Scoping of technical work packages required to inform detailed design and to address feedback register | 30-Sep-20 | In progress | On track | Scoping of technical work requirements has commenced |
| 6.0 | Complete installation of additional monitoring assets for the following sites identified as 'high risk' in the Surrounding Environment Investigation | 31-May-21 | In progress | On track | Design of stream gauges underway for installation next summer along with associated observation bores. Design of gauges needs to consider both data accuracy and fish passage objectives |

| # | Activity | Due Date | Status | Health Indicator | Comments/Risks |
|------|--|-----------|-------------|------------------|--|
| 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 | In progress | On track | Monitoring of GW levels, stream flows and water quality continues in Big Swamp and Boundary Creek |
| 8.0 | Submission of a work plan detailing how Barwon Water will respond to the register of feedback, including prioritisation of actions, the timeframe for responding to each item and the process for reporting and closing out each item. SRW to accept the work plan. | 31-Jul-20 | In progress | On track | Scoping of technical work to inform requirements for further discussions to ensure feedback is appropriately addressed |
| 9.0 | Endorsement of a governance framework clearly outlining roles and responsibilities of stakeholders involved in the REPP, a decision making process to determine how revisions to the REPP in the form of controls or actions are accepted or rejected and how controls and actions are implemented. SRW to accept the governance framework. | 31-Jul-20 | In progress | On track | Development of Governance framework underway |
| 10.0 | Submit updated REPP to capture the work plan for addressing the feedback register.SRW to accept the updated REPP. | 30-Sep-20 | Not started | | |
| 11.0 | Submit annual report to SRW and publish to website | 30-Sep-20 | Not started | | |
| 12.0 | Establish vegetation baseline monitoring for Boundary Creek and Big Swamp Remediation Plan: <ul style="list-style-type: none"> - engage consultant - undertake vegetation baseline survey - technical review of findings - publish report to website | 31-Dec-20 | Not started | | |
| 13.0 | Update groundwater-surface water model and geochemical model: <ul style="list-style-type: none"> - engage consultants - update models with additional monitoring data - run scenarios to address feedback on REPP / refine remedial works for Boundary Creek and Big Swamp detailed design - technical review of findings - publish report to website | 31-Dec-20 | Not started | | |
| 14.0 | Complete stage 1 detailed design for Boundary Creek and Big Swamp Remediation Plan: <ul style="list-style-type: none"> - obtain / progress permits | | Not started | | |
| 15.0 | Submit quarterly report to SRW and publish to website | 31-Dec-20 | Not started | | |

| # | Activity | Due Date | Status | Health Indicator | Comments/Risks |
|------|---|-----------|-------------|------------------|----------------|
| 16.0 | Submit quarterly report to SRW and publish to website | 31-Mar-21 | Not started | | |
| 17.0 | Infill the existing fire trenches and the agricultural drain at the eastern end of the swamp to allow the swamp to retain more water over the winter months: - obtain necessary permits and approvals - engage contractor - undertake works | 30-Apr-21 | Not started | | |
| 18.0 | Submit quarterly report to SRW and publish to website | 30-Jun-21 | Not started | | |
| 19.0 | Complete feasibility assessment for in-stream contingency measures | 31-May-21 | Not started | | |
| 20.0 | Complete stage 2 detailed design: - specification to confirm size, location and construction requirements for hydraulic barriers | 31-May-21 | Not started | | |
| 21.0 | Submission of detailed design of the hydraulic barriers outlining proposed controls or actions and any revisions to success measures/targets. SRW to accept the detailed design, including proposed actions, controls, and success measures/targets. | 31-Jul-21 | Not started | | |
| 22.0 | Submit annual report to SRW and publish to website | 30-Sep-21 | Not started | | |
| 23.0 | Submit quarterly report to SRW and publish to website | 31-Dec-21 | Not started | | |
| 24.0 | Construction of hydraulic barriers: - engage consultants and contractors - undertake construction | 31-Mar-22 | Not started | | |
| 25.0 | Submit quarterly report to SRW and publish to website | 31-Mar-22 | Not started | | |
| 26.0 | Submit quarterly report to SRW and publish to website | 30-Jun-22 | Not started | | |
| 27.0 | Conclusion of monitoring period for Surrounding Area Investigation enabling the capture of a full seasonal cycle of data (12 month minimum) to inform updates to the groundwater-surface water model and geochemical model. | 31-Jul-22 | Not started | | |
| 28.0 | Submit quarterly report to SRW and publish to website | 30-Sep-22 | Not started | | |
| 29.0 | Update regional groundwater model or build new local scale groundwater models for the Surrounding Investigation Area 'high' risk sites to assess magnitude of impact as a result of historic groundwater management. | 31-Oct-22 | Not started | | |
| 30.0 | Submit quarterly report to SRW and publish to website | 31-Dec-22 | Not started | | |

| # | Activity | Due Date | Status | Health Indicator | Comments/Risks |
|------|---|-----------|-------------|------------------|----------------|
| 31.0 | Review risk assessment for 'high' risk areas for the Surrounding Area Investigation to confirm risk rankings based on updated groundwater model/s | | Not started | | |
| 32.0 | Submit quarterly report to SRW and publish to website | 31-Mar-23 | Not started | | |
| 33.0 | Submit quarterly report to SRW and publish to website | 30-Jun-23 | Not started | | |
| 34.0 | Outcomes of the Surrounding Area Investigation to be provided to Southern Rural Water to determine if further remedial works is required. SRW to decide if further action is required. | 31-Jul-23 | Not started | | |
| 35.0 | Submit annual report to SRW and publish to website | 30-Sep-23 | Not started | | |
| 36.0 | Submit quarterly report to SRW and publish to website | 31-Dec-23 | Not started | | |