Adelaide Beach Management Review Implementation (ABMRI) Outcomes

Summary Report

Government of South Australia
Department for Environment and Water

Contents

Introduction

In 2022, the Adelaide Beach Management Review (ABMR) was established by the incoming Government to fulfil an election commitment made in response to local community concern over sand management practices on Adelaide's beaches.

An Independent Advisory Panel (the Panel) was appointed to oversee the review, which focused on three goals:

- Maintain sandy beaches
- Minimise community disruption
- Avoid environmental harm.

Key outputs included a desktop scientific review undertaken by Bluecoast Consulting Engineers and a program of community engagement undertaken by URPS, which informed the ***ABMR Independent Advisory Panel Report***. The Independent Advisory Panel's Report made the following recommendations:

Recommendation 1: Restore West Beach with external sand within 5 years

1.1 Investigate dredging using offshore sand, including verifying the availability of suitable sand source/s (volume, grain size and composition), assessment of environmental impacts, and viability of operations and approvals.

1.2 Replenish West Beach with 550,000m^3 of sand using quarry sand, or until restoration using an offshore sand source is found to be viable from an environmental, economic and social perspective.

Recommendation 2: Recycle sand between northern beaches and West Beach

2.1 Investigate the feasibility of dredging nearshore or nearby sand deposits as a long-term, sustainable method to deliver sand recycling. This should include verifying the availability of suitable sand in the littoral zone, as well as the operational viability and constraints for environmental approvals.

a. If viable, assess against sand recycling pipeline option to determine the best long-term, sustainable sand recycling option.
b. If not viable, seek relevant approvals to implement the sand recycling pipeline.

2.2 In the interim, implement sand recycling via sand carting using trucks to manage the build-up of sand at the northern beaches.

On 20 May 2024, the Government approved the Panel's recommendations to:

- Confirm feasibility of dredging by implementing an operational trial
- Maintain West Beach with quarry sand
- Report back to Government with advice on feasibility of dredging and how to implement Panel's recommendations

At the time, the recommendation to recycle sand via truck (in the interim) to manage the build-up of sand of the northern beaches was not endorsed.

The Department for Environment and Water (DEW) was tasked with implementing the actions approved by Government.

Overview of Project Outcomes

In implementing the Panel's recommendations, DEW:

- Commenced the restoration of West Beach with external sand
- Evaluated the feasibility of dredging, including through sand source investigations and an operational trial of dredging
- Evaluated the feasibility of the designed sand pumping pipeline to achieve the Panel's recommendation to recycle 90,000m^3 sand per annum to West Beach

The full suite of project reports developed by the project can be found in **Attachment A**, including a summary of each technical report's objectives and findings.

The project built on the community engagement program undertaken through the ABMR. There were extensive public communications about the dredging trial, and targeted engagement through two community consultative groups with particular interest in the project.

Restoration of West Beach with external sand

In line with the Panel's recommendation, since July 2023 approximately 400,000 m^3 of external sand has been delivered to West Beach and Henley South. The sand is taken from approved quarries and regular testing is undertaken to ensure that the sand being delivered is fit for purpose and meets the strict Environment Protection Authority (EPA) guidelines. In November 2024, DEW commissioned an independent audit of the quarry sand used for replenishment at West Beach, whereby sand placed on site was re-analysed. The audit testing confirmed the veracity of the regular testing process and the suitability of the quarry sand as a suitable sand source for replenishment.

Sand source investigations

Targeted sand source investigations was the recommended next step from ***Bluecoast's 2023 scientific review***.

Between March and October 2024 a comprehensive series of field sampling was undertaken to confirm viable sand sources. This included sampling of external sand sources (to support the restoration recommendation) and within the metropolitan beach management area (to support the recycle recommendation).

The extensive sand source investigations were undertaken to confirm suitability of proposed sites in relation to:

- Physical and geochemical property analysis of sand
- Suitability of benthic habitat (e.g. bare sand).
- Total available sand within each identified area
- Sustainability – how quickly the sand would recover when removed.

A complete summary of the sand source investigations is provided in Appendix C of the following report: ***Sand Management Using Dredgers – Sand Sourcing and Other Feasibility Assessments Report – ABMRI*** (Bluecoast, May 2025).

The investigations confirmed that there is sufficient sand to meet the objective of both the restore and recycle program requirements. Sustainable volumes per borrow area have been proposed by Bluecoast to ensure that not too much sand is taken per site to ensure that those areas remain resilient.

Additional sand from outside of the system has also been identified and offers the opportunity to both restore West Beach, as well as top up recycle volumes if required.

Operational dredge trial

In line with the Panel's recommendation, a dredging trial was conducted between July 2024 and December 2025. This trial consisted of on-ground dredging operations during October and November 2024 and a monitoring and assessment program that commenced in July 2024. The operational component of the trial was completed in December 2025. As part of the on-ground dredging operations, sand was dredged from two locations;

- an area south of the North Haven Marina, which was delivered by barge to West Beach; and
- an area around the West Beach Boat Harbour, which was delivered by a pipeline and diffuser to West Beach.

Operations were regulated by the Environment Protection Authority (EPA) through a licence and an approved Dredge Management Plan (DMP).

The following criteria were assessed over the past twelve months to inform the success of the dredge trial:

- **Coastal management effectiveness** – how effective the placement of sand was in increasing beach widths, increasing the total sand volume for the West Beach cell and/or providing protection from coastal hazards. This work is captured in the ***ABMRI Dredge Trial Coastal Monitoring Report*** (Hatch, Dec 2025).

  Monitoring results have shown that over the one-year period, the sand placed in the nearshore has 'held' well (i.e. sand placed during the dredge trial has been retained).

  This is notable given that 2025 was an abnormally stormy year, with several significant high-water events (i.e. sand was more likely to move on quite quickly due to increased wave and tidal energy).

- **Environmental impact** – harm to the environment and risk of impacts are mitigated as far as practicable to protect marine water quality and ecology. This work is summarised in the ***ABMRI Dredge Trial – Report on Operational and Environmental Feasibility of Dredging*** (Swash, March 2025).

There were no notifiable environmental incidents associated with the ABMRI dredge trial. The trial was successfully implemented in accordance with the EPA approved Dredge Management Plan (DMP) and the associated Seagrass Monitoring Plan, Water Quality Monitoring Plan and Noise Monitoring Plan.

- **Water quality –** Monitoring comprised a combination of surface monitoring using monitoring buoys and benthic loggers deployed on benthic frames. The water quality monitoring plan included triggers that were set by the EPA and carried out in accordance with the EPA license and DMP. Water quality parameters remained consistent with background levels, with no triggers close to being approached. Detailed analysis of the water quality monitoring program is provided in ***ABMRI Dredge Trial – Water Quality Monitoring Report*** (EPIC, Feb 2025).
- **Noise –** compliance with the relevant noise criteria was achieved at both the sand collection and placement sites as detailed in the ***ABMRI Dredge Trial – Noise Monitoring Report*** (Sonos, Feb 2025).
- **Odour and visual amenity** – no odour complaints are known to have been made to DEW. No onshore placement of sand was undertaken within the trial, which may be more likely to result in potential odour or visual amenity complaints.
- **Marine mammals** - Marine mammals were sighted once during the trial, with two bottlenose dolphins observed transiting near the dredge. Their behaviour indicated no interaction or disturbance from dredging activities, and no adverse impacts to marine mammals were identified during the observation period. As detailed in the ***ABMRI Dredge Trial – Marine Mammal Observations Report*** (CooE, Dec 2024).
- **Seagrass** – As per the EPA approved DMP, seagrass has been sampled on three separate occasions. This included immediately before and after the operational component of the trial, in addition to a 12-months post-dredge survey which was completed in December 2025. While the final report is not due until March 2026, the immediate post-dredge monitoring did not detect a measurable, short-term impact of the dredging on seagrass cover, density, or community composition across the Northern Management Area. The final report will be published on the DEW website once it has been finalised.

  It's important to note that the nearshore sand source locations identified by Bluecoast for a long-term recycling program do not have any seagrass present. The identified borrow areas consist of bare sand only and occur in the active zone of the beach where sand moves as a result of wave and tidal energy where extensive seagrass meadows are unlikely to consistently persist.

- **Operational viability and efficiency** – plant and equipment are available and capable of dredging and placing sand to meet the objectives of both the restore and recycle recommendations.

The operational feasibility assessment for dredging is captured in the ***ABMRI Dredge Trial – Report on Operational and Environmental Feasibility of Dredging*** (Swash, March 2025), and further explored in ***Sand Management Using Dredgers – Sand Sourcing and Other Feasibility Assessments Report – ABMRI*** (Bluecoast, May 2025).

Comparison of alternative sand management methods

In line with the Panel's recommendations, dredging was assessed against the alternative option of management by Pipeline, or Sand Pumping System (SPS) and sand carting by truck - to confirm the best long -term, sustainable sand recycling option.

This comparison was made in the context of the Panel's goals to maintain sandy beaches, minimise community disruption and avoid environmental harm.

Pipeline / Sand Pumping System (SPS)

A review of the existing design of the SPS pipeline ('Portion A', from West Beach to Semaphore) was undertaken by Hatch (***Sand Pumping System Feasibility Assessment Report,*** HATCH, April 2025). The aim of the review was to:

- confirm the feasibility of the designed SPS to achieve the Panel's recommendation to recycle 90,000m^3 per annum to West Beach from northern beaches; and
- if required, outline any changes required to achieve this.

The review of the SPS confirmed that the previously designed pipeline could not successfully recycle 90,000m^3 of sand to West Beach. To achieve the required volume of sand to be recycled, the following additions would be required:

- the existing (Torrens Outlet to West Beach) pipeline is reactivated; and
- the previously designed and approved pipeline from the Torrens Outlet to Bower Road, Semaphore is extended to Largs North.

If constructed, the revised pipeline (Current portion A and proposed Portions B and C) would have required the following infrastructure assets

- ***Sand Collection Units (5 intake locations, heavy equipment and trucks on beaches feeding into SCUs)***
  - *Torrens outlet*
  - *Semaphore*
  - *2 x Largs Bay*
  - *Largs North*
- ***Pumping Stations***

  Portion A (currently approved)
  - *Bower Road (Semaphore Park)*
  - *Mirani Court (West Lakes Shore)*
  - *Moredun St (Tennyson)*
  - *Terminus St (Grange)*
  - *End of Henley Beach Road (adjacent to toilet block Henley Beach South)*
  - *End of Burbridge Road (West Beach)*

Proposed Portions B and C (additional)

- *Strathfield Terrace (Largs North)*
- *Everard Street (Largs Bay)*
- *Hall St (Semaphore)*

- ***Discharge Outlets***
  - *Mirani Court, West Lakes*
  - *Moredun St, Tennyson*
  - *Terminus St, Grange*
  - *Adjacent toilet blocks, Henley Beach South*
  - *Lexington Rd, Henley Beach*
  - *5 discharge locations between Torrens Outlet and West Beach Boat Harbour*

Sand carting by truck

The program of work that would be required to deliver a long-term recycling program between the northern beaches and West Beach using trucks was documented by DEW to compare opportunities and constraints against alternative sand management methods (***ABMRI -Recycling of Sand By Truck in the Northern Management Area Report***, DEW, April 2025).

The required fleet of earth moving equipment including dump trucks, road trucks and beach scraping equipment was outlined including the duration and frequency of the equipment needed on the beaches and roads per sand collection and sand placement site. For example, two dump trucks would be required on the beach at each site and up to 15 road truck would be needed to transport the sand between northern beaches and West Beach. Each road truck would deliver up to seven loads each per day resulting in around 100 total return road truck trips between the northern beaches to West Beach and return.

Given the significant disruption to beach users, at both the sand collection locations and sand placement area, this method was considered the most disruptive to communities and not in line with the Panels' recommended objectives.

Summary of Key Findings

Response to Recommendation One:

A suitable external sand source has been identified which is located immediately north of the Outer Harbour channel, as shown in Figure 1. It is feasible to restore West Beach with the identified sand source by the method of dredging.

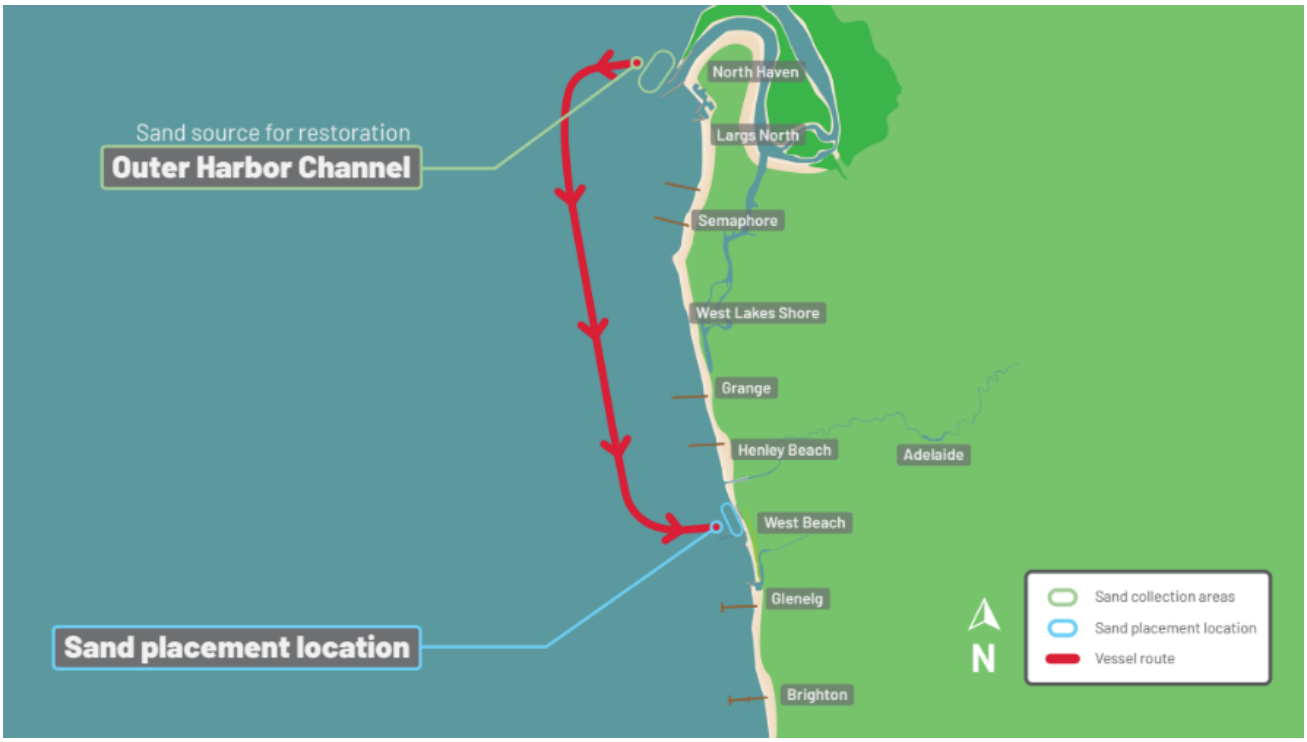

Figure 1. Sand source for restoration, vessel route and placement location.

Over 1,000,000m^3 of fit for purpose sand for beach replenishment has been confirmed from this location (***Sand Management Using Dredgers – Sand Sourcing and Other Feasibility Assessments Report – ABMRI***, Bluecoast, May 2025)

Moving this sand via dredge is confirmed as being operationally feasible, with multiple methods and types of equipment suitable for application. There are several suitable contractors able to perform the dredging program. The operational program is likely to take 16-24 weeks to complete, operating up to 24 hours a day, 7 days a week.

The approval pathway is well understood. The dredging program would be regulated by the Environment Protection Authority (EPA) through a licence and an approved Dredge Management Plan (DMP). The DMP covers the methods for dredging, sand placement, and how any potential impacts on the environment, public health, and local communities will be managed.

Potential environment impacts, such as turbidity, were investigated during the dredge trial. This included a water quality monitoring program. The investigations have confirmed that potential environmental impacts of dredging can be managed.

Through the operational trial of dredging and the program of delivering external quarry sand by truck, approximately 170,000m^3 of external sand was applied to the restoration of West Beach during 2024/2025.

Response to Recommendation Two:

Recycling sand via dredging has been confirmed as a feasible and effective method of sand management for Adelaide's beaches. The investigations have confirmed the availability of suitable sand in the littoral zone within the system, with viable locations shown in Figure 2.

Figure 2. Sand sources for recycling and vessel route.

Investigations have demonstrated that there are feasible longer-term methods and equipment suitable for sand management by dredge. The operational program is likely to be an average of 16 weeks per year, operating up to 24 hours a day, 7 days a week.

The approvals pathway is well understood. The long-term dredge program would be regulated by the EPA through a licence and an approved DMP.

The investigations confirmed that potential environmental impacts can be managed. Ongoing monitoring and collaboration with the EPA will ensure potential longer term impacts are understood and adaptative management measures are applied.

Given sand recycling by dredge was confirmed as viable, consistent with the Independent Panel's recommendation, the method was assessed against an alternative option, the Sand Pumping System (SPS) pipeline, to determine the best long -term, sustainable sand recycling option.

Whilst both sand management methods (dredging and a SPS) have been confirmed as able to maintain sandy beaches, an important difference between the two methods is the operational flexibility. The SPS has fixed intake and discharge locations, whereas dredging provides greater flexibility (i.e. for sand collection and sand placement).

By nature, our coastal systems are dynamic and our need to respond to a changing climate and build in adaptive planning has never been more important. Dredging offers the operational flexibility to respond to a changing climate that fixed infrastructure (such as a SPS) cannot.

The potential environmental impacts can be managed for both sand management methods. Continual monitoring of environmental and coastal conditions will be important for any long term sand management program.

Community disruption is significantly less via dredging, with equipment being on-water, and overall operational program occurring for fewer months of the year.

The SPS pipeline would require:

- Operational 8-9 months per year
- Community disruption from equipment and works on beach during periods of sand collection
- Fixed infrastructure along the length of the SPS including pumping station, sand intake and discharge location

Whist cost was not a consideration of the Panel's goals, from an economic perspective, dredging has also been confirmed the more sustainable option long term, with no capital costs and a lower ongoing operational cost compared to a SPS.

The table below provides a summary comparison of the sand management methods including timeframes.

Sand management method	Program considerations	Timeframes
Dredging	All sand collection locations have been selected as no seagrass present (i.e. bare sand) and identified as sustainable sand sources No equipment on the beach. Nearshore impacts include short-lived nearshore plume near sand collection location and adjacent to barge filling. Seasonally restricted to between April and October by EPA. Operations can be prolonged due to poor weather.	Operating a total of up to 5 months of every year. Can operate 24 hours a day, 7 days a week (night works may be limited by noise restrictions depending on equipment type).
Sand Pumping Pipeline	Five sand collection locations (Torrens Outlet, Semaphore, 2x Largs Bay, Largs North). During sand collection, beach access will be impacted by sand collection equipment including designated compound and sand scraping area. 5 discharge outlets along West Beach (between Torrens Outlet and West Beach Boat Harbour). Beach impacts during sand placement: • Sand slurry (sand-water mix) is pumped onto the beach from one of the 5 discharge outlets at a time, creating a shallow stream of wet sand across the beach, down to edge of seawater. • Nearshore plume is likely during pumping operations; extent is determined by weather conditions. • Beach access can be affected by sand slurry from pipeline outlet, approx. 10m either side. Where the outlet is not sheltered by a rockwall, a small excavator (e.g. bobcat) may be required to manage scouring/erosion created by sand slurry.	Operating a total of 8 – 9 months every year. The timeframes for duration of works are based on operational windows between 7am to 5pm, Monday to Friday, with no works during school holidays, public holidays, Saturdays and Sundays

Trucking	Dump trucks will drive back and forth along the stretch of beach from 7am to 5pm, Monday to Friday between the harvest and loading locations. For sand collected from Semaphore and Largs Bay/Largs North, road transport will be required. Truck access through local roads and/or dune paths is required to access the beach, with the main truck route south to West Beach likely to be along Military Road. Up to 100 truckloads of sand per day are delivered to West Beach via road and the West Beach Parks/Adelaide Sailing Club access ramp. The dump trucks drive back and forth along West Beach between the loading and placement locations including in front of the West Beach Surf Lifesaving Club. Sand collected at Torrens Outlet will be transported along the beach (i.e. no road trucks required).	5 months per year. 7am to 5pm, Monday to Friday. No works during school holidays, public holidays, Saturdays and Sundays

Next steps

The Department will be working closely with the EPA, PIRSA and other significant stakeholders to design and plan for restoring West Beach by dredge using the identified external sand source.

While there is no connection between dredging and the current algal bloom, the Department will continue to closely monitor the algal bloom situation prior to the dredging program commencing.

The dredging program will not commence until the relevant experts and authorities deem it appropriate to proceed.

The Department will also begin to design and plan for the long-term sand recycling program by dredge. This will involve gaining the relevant regulatory approvals and undertaking community consultation.

Attachment A – ABMRI Project Reports

	Report	Author	Year	Objectives	Findings
Adelaide Beach Management Review	**Adelaide Beach Management Review Independent Advisory Panel - Adelaide Beach Management Scientific Review**	**Bluecoast Consulting Engineers**	**2023**	To undertake a desktop review of sand management options for Adelaide's metropolitan beaches and identify priority next steps.	The desktop review identified dredging as the preferred option and recommended further technical investigations to confirm the feasibility.
Investigations supporting the review of the Dredge Trial	**ABMRI Dredge Trial – Water Quality Monitoring Report**	**EPIC**	**Feb 2025**	To monitor and assess water quality during the dredging trial and evaluate compliance with approved environmental trigger limits.	Monitoring showed turbidity was driven primarily by natural wind and wave conditions. All rolling median turbidity values remained below trigger levels, with no exceedances or need for adaptive management, demonstrating dredging was undertaken without significant water quality impacts.
	ABMRI Dredge Trial – Report on Operational and Environmental Feasibility of Dredging	**SWASH**	**March 2025**	To assess the operational and environmental feasibility of dredging to deliver sand nearshore at West Beach through a targeted trial.	The trial demonstrated dredging is operationally and environmentally feasible, achieving nearshore sand placement with no significant impacts to water quality, seagrass, noise or marine fauna.
	ABMRI Dredge Trial – Marine Mammal Observations	**COOE**	**Dec 2024**	To independently observe and document marine mammal presence	Confirmed no adverse impacts to marine mammals were identified during the observation period.

				and behaviour during dredging operations at North Haven.	
	ABMRI Dredge Trial – Noise Monitoring Report	**Sonus**	**Feb 2025**	To measure and assess noise emissions from dredging activities during the trial.	Noise monitoring demonstrated dredging and associated vessel movements complied with daytime and night-time noise criteria.
	ABMRI Dredge Trial - Coastal Monitoring Report	**HATCH**	**Dec 2025**	To provide a year-long assessment of how effective the sand placement during the trial has performed from a coastal management perspective.	Monitoring confirmed strong seasonal sediment dynamics, an elevated storm activity period (compared to other years) and confirmed the placed nearshore sand 'held well' over the 1 year period. Continued monitoring is recommended.
Dredging Feasibility	Sand Management Using Dredgers – Sand Sourcing and Other Feasibility Assessments Report - ABMRI	**Bluecoast**	**May 2025**	To assess the long-term feasibility of using dredgers for restoring and recycling sand on Adelaide's northern metropolitan beaches, including identifying suitable sand sources.	The assessment confirms dredging is a feasible, flexible and cost-effective method for both restoring West Beach and long-term sand recycling. Suitable external and nearshore sand sources were identified with sufficient volumes and compatible quality.
Pipeline feasibility	Sand Pumping System Feasibility Assessment Report	**HATCH**	**March 2025**	To assess the feasibility of the existing and proposed sand pumping system to	Findings indicate the existing sand pumping system is only partially feasible. Achieving required recycling volumes would require re-

				support long-term sand recycling to West Beach.	instatement of the Cell 3 pipeline and extension of the system northward to Largs North.
Sand carting by truck feasibility	**ABMRI -Recycling of Sand By Truck in the Northern Management Area Report**	**DEW**	**April 2025**	To document the program of work that would be required to deliver a long-term recycling program between the northern beaches.	The method of sand carting is well understood. The required equipment, costs and approvals pathway is clear.
Technical Peer Review	**Adelaide Beach Management Review Implementation Project – Technical Peer Review**	**Tomlinson**	**May 2025**	To independently assess the technical accuracy and robustness of all the technical investigations undertaken to support the Adelaide Beach Management Review recommendations.	The peer review found the supporting technical work to be robust, comprehensive and consistent with best-practice coastal engineering.
Dredge Trail and Feasibility Analysis Summary	**Adelaide Beach Management Review Implementation (ABMRI) - Summary Report**	**DEW**	**January 2026**	This report - detailing the scientific review of Adelaide beach management review implementation recommended by the Adelaide Beach Management Review Independent Advisory Panel.	A report summarising the Adelaide Beach Management Review implementation Process and major findings of each technical report produced.

Published by the Department for Environment and Water.
Government of South Australia
January 2026

ABN 36702093234

Report prepared by:
Department for Environment and Water
Biodiveristy Science, Coast and Information Branch
Biodiversiy and Nature Economy Directorate

www.environment.sa.gov.au

Government of South Australia

Department for Environment and Water