BLACK POINT LAUNCHING RAMP

ENVIRONMENT MANAGEMENT PLAN – SAND MANAGEMENT

Prepared for:

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Limitations Statement

The sole purpose of this report and the associated services performed by Coppock & Associates Pty Ltd ("the Company") is to prepare an environment plan for the management of sand associated with the operation of the Black Point launching ramp on Yorke Peninsula, South Australia in accordance with the scope of services set out in the contract between the Company and the District Council of Yorke Peninsula ('the Client'). That scope of services was defined by the requests of the Client, by the time and budgetary constraints imposed by the Client.

In preparing this management plan, the Company has relied upon and presumed accurate certain information (or absence thereof) relative to the site configuration and structures provided by the Client, government officials and authorities, and others identified herein. Except as otherwise stated in the report, the Company has not attempted to verify the accuracy or completeness of any such information.

This management plan has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the provisions of the agreement between the Company and the Client.

The Company accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this plan by any third party.

Revision History

Revision	Date	Comment	Approved by
A	11/02/14	Draft issue for Client review	G J Coppock
0	13/02/14	Final issue	G J Coppock

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Black Point Launching Ramp
Environmental Management (Sand Management)

1 Introduction

The District Council of Yorke Peninsula (Council) is proposing to redevelop the launching facilities at Black Point on Yorke Peninsula approximately 20 kilometres from the district centre of Ardrossan in order to provide improved facilities to ensure boating safety in addition to capitalising on the potential growth in boating tourism.

The existing launching ramp and associated car and trailer park is located at the northern extremity of the township. The site is exposed from the north through to the south east but protected from the south through west to north by the land mass of Yorke Peninsula.

The existing facilities comprise a low gradient single lane concrete ramp accessed via a single lane bituminized roadway leading from the car/trailer parking area at the head of the cliff revetment to the Black Point beach.

The ramp is in poor condition with fracture of the ramp platform noted in several locations. The ramp does not extend to deep water with the toe of the ramp exposed at low tide, and then extending to sand and clay. Further**,** the single lane access road prohibits dual use of the ramp**;** and a 10° “dog-leg” in the ramp makes manoeuvring of vehicle/ trailer combinations in reverse difficult and often hazardous to ramp users and pedestrians.

2 Purpose of this document

This document details the strategies to be adopted by Council to address relevant legislation and approval conditions and outlines actions to be taken by Council and its contractors to mitigate potential environmental impacts due to the movement of sand at the ramp and its nearby environs.

This document further defines the roles and responsibilities of the Council and its contractors for procedures to be employed to minimise the effects of sand movement as a result of the construction of the ramp on the natural environment.

3 Scope of works

The detailed drawings describe the scope of works which is summarised as:

- Demolition and removal to disposal of the existing launching ramp
- Salvaging of existing foreshore revetment protection for reuse in the new development

- Provision of a manoeuvring area at the head of the ramp to enable safe vehicle/ trailer manoeuvring
- Construction of a new two lane launching ramp
- Provision of improved foreshore protection revetments
- Widening of the single lane access road to a straight, dual lane configuration
- Widening and straightening of the existing roadway to allow pedestrian access
- Provision of new stepped concrete walkway from the manoeuvring area to the beach
- Provision of a concrete ramp near the head of the ramp to the foreshore to allow emergency vehicle access.
- Provision of stormwater interception and treatment.

4 The site

Physical conditions

The township of Black Point is located on the eastern coastline of Yorke Peninsula approximately 20 km from the district centre of Ardrossan. The existing launching ramp and associated car and trailer park is located at the northern extremity of the township on a broad and expansive bay fronting to Gulf St Vincent. The site is exposed from the north through to the south east but protected from the south through west to north by the land mass of Yorke Peninsula. Refer to Plate 1

Plate 1 Aerial view of Black Point and the launching site

Topography and bathymetry

The shoreline immediately north and south of the launching facility comprises a broad beach frontage to Gulf St Vincent with elevated cliff facing. Extensive seagrass meadows exist off-shore.

Southward of the facility, the bay folds into a natural rock promontory, Black Point.

The seabed is generally stable with little evidence such as sand ripples indicating active processes although it is noted that the foreshore is regressive with amendments to land tiles to the foreshore frontage contemplated by Coast Protection Board. The seabed consists of fine to medium (0.125mm to 0.250mm) grains, slightly silty clayey sands of variable thickness over intermittent limestone and rubble outcrops particularly in the offshore sea grass meadows.

Based on available information, seabed levels in the immediate area of the facility range from $0.00m_{LAT}$ to $-2.5m_{LAT}$ off shore.

Tides and currents

Astronomical tides are the main cause of water level variation within Gulf St Vincent but meteorological conditions and other factors may cause variations for tidal predictions.

Bye (1976) suggests that due to the dual connection of Gulf St Vincent with the open sea of Investigator Strait an apparent standing oscillation is set up between the two ingressing tidal waves within the Gulf. Refer to Figure 1

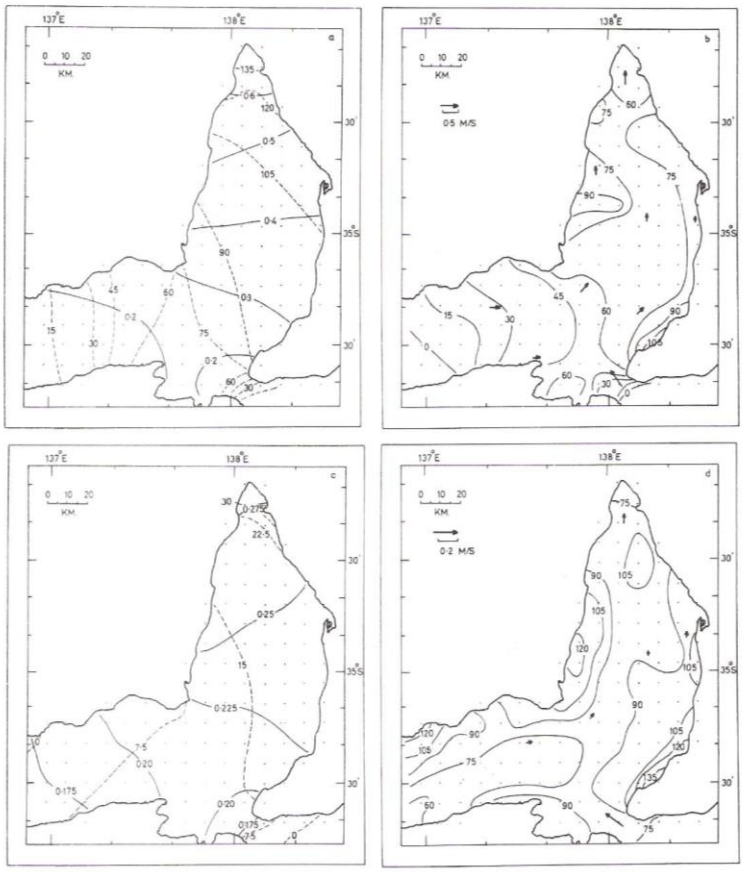

Figure 1: Simulated tidal circulations (Bye 1976)

Tidal currents are associated with tidal elevations but apart from data collected from the wave recording station off Marino very few continuous current observations have been made in Gulf St Vincent. Predicted tidal stream generated by computer modelling however show maximum M2 tidal currents of about 0.7m/s in Backstairs Passage with about 0.25m/s in Investigator Strait and the western part of Gulf St Vincent (Bye 1976)

General (non-tidal) circulation of Gulf St Vincent and Investigator Strait is caused by three factors being:

- Local wind
- Local exchange of heat and water across the sea surface; and
- Circulation in the deep ocean adjacent to the South Australian Sea.

Figure 2 shows circulation in Gulf St Vincent due to a) wind and b) wind and density gradients (Bye 1976)

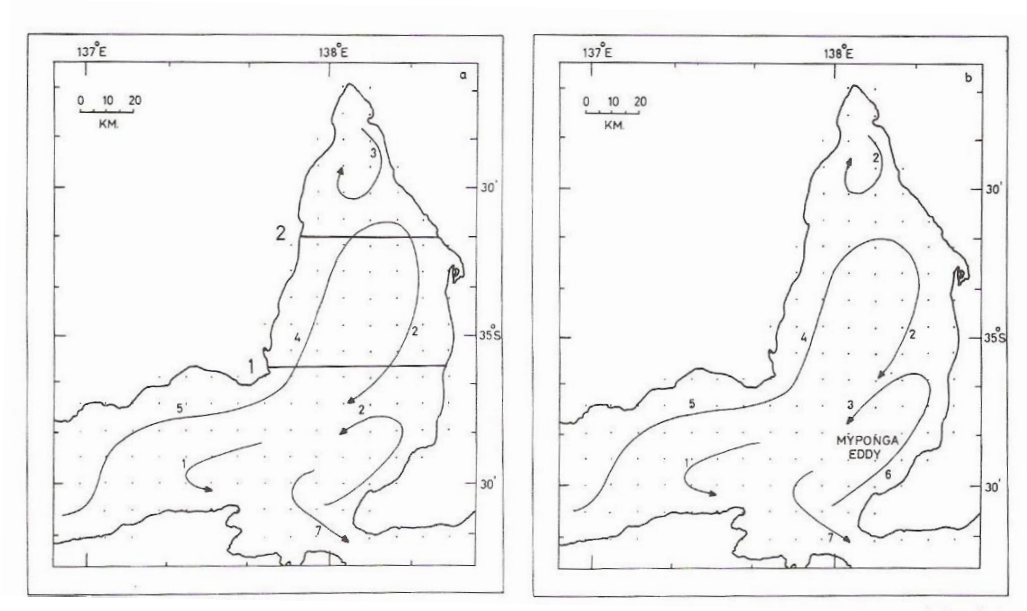

Figure 2 Mean annual circulation patterns (Bye 1976)

Thee circulation patterns indicate that sand movement is typically northward along the western coastline of Gulf St Vincent and thus the subject of this management plan.

Soils

A detailed soils investigation has not been undertaken in the analysis for this report but from a review of available geological mapping, soils forming the sea floor are expected to be silt and sand sediments of the Holocene period overlying Permian sediments and rock of the geological Cambrian period (McBriar and Giles 1984). This supports earlier studies by Shepard & Sprigg (1976) describing Gulf St Vincent as “pre-eminently a “carbonate” sedimentary province relating primarily to an almost complete lack of significant quantities of terrestrial erosion products entering the basin in rivers”.

Waters (1976) analysed samples of sea bottom sediments and Figure 3 shows the distribution of mean grain size in Phi units and the percentage of terrigenous (quartz and clay) material

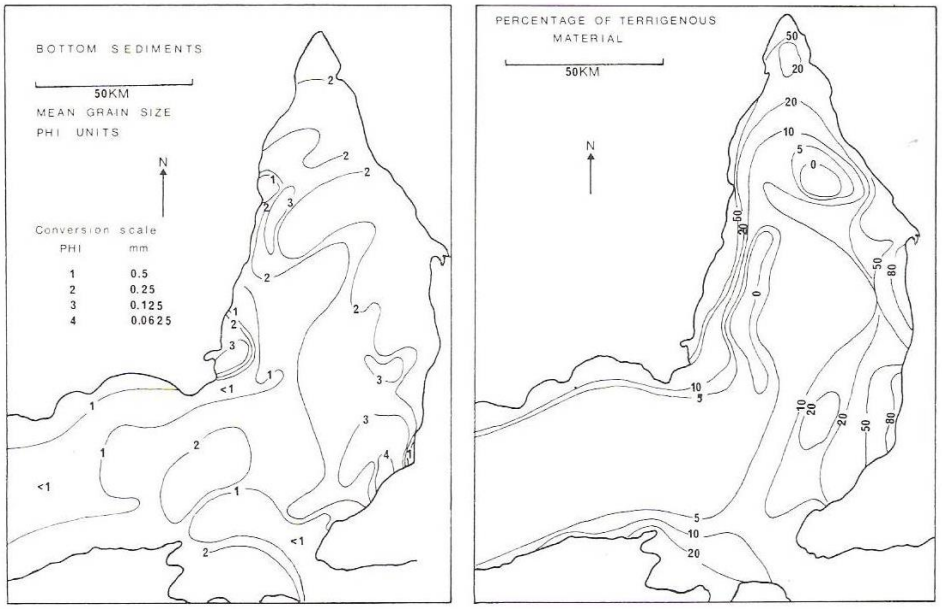

Figure 3 Bottom sediments & Terrigenous material (Waters 1976)

Marine ecology

An environmental survey of selected areas to the eastern coastline of Yorke Peninsula was commissioned by the Council in 2003. Whilst the survey, undertaken by consultants Kellogg Brown & Root Pty Ltd, did not include Black Point, samples were taken from coastal waters at Ardrossan and Pine Point.

The dominant marine vegetation was narrow-leaf strap weed (*Posidonia sinuosa*) in dense beds in deeper water with wire weed (*Amphibolis antarctica*) and wide-leaf strap weed (*Posidonia australis*) present in shallower water.

Fish and invertebrates present appeared to be limited by the dense offshore seagrass beds with blue swimmer crab (*Portunus pelagicus*) common together with high backed abalone (*Haliotis cyclobates*), a small non-commercial species common on all hard substrates.

5 Sand management

The broad environmental objective for sand management is to comply with or exceed all relevant environmental legislation and best practices relative to the works and to ensure that any potential adverse environmental impacts are avoided, managed or mitigated to ensure environmental harm does not result.

There is no history of the management of sand at Black Point.

The ramp location appears to be close to a neutral point in regard to sand transportation within the bay, and there is little historical evidence of build- up/erosion of beach sand over the existing ramp. From casual observation and anecdotal evidence slight movement of sand occurs on a seasonal basis with a maximum height differential of 400mm at the existing ramp observed.

As a condition of Development Approval, a formal sand monitoring and management programme be initiated. This programme is to include:

- Regular survey of beach cross sections at predetermined locations either side of the launching ramp
- Installation of monitoring poles approximately 100 metres either side of the ramp with graduated markings to enable rapid visual recording of sand levels
- Sand carting protocols when a pre-determined trigger point is reached
- Pre and post sand carting surveys to determine volumes of sand removed.

Survey

It is important that historical records are kept in regard to the fullness and size of the beaches particularly the up drift side of the ramp.

The historical record is to include:

- A survey immediately before any sand carting, when a trigger point is reached
- A survey immediately after any sand carting is completed
- A survey at intervals not exceeding 12 months between the above.

The surveys are to extend from above the vegetation line at the top of the beach to a depth of one (1) metre below low water level and should include enough information and cross sections to fully define the beach. If cross sections alone are used, these should be set up to be repeatable at the same locations.

All surveys shall relate to AHD and MGA94 using permanent survey marks.

Sand collection locations

Sand is to be collected from the beach above Mean Sea Level (MSL) immediately south of the launching ramp with access provided by the emergency access ramp provided.

The entire beach should be closed to the public when sand carting is in progress.

Trigger points for sand carting

The object of sand management and carting is to prevent sand building up on the beach to the extent that it overflows the beach and blocks the launching area. Similarly on the up drift side of the ramp, loss of sand may cause safety issues with the ‘drop off’ from the ramp to a receding beach.

Hence the trigger to commence sand carting is when the sand reaches nominated levels marked on the beach monitoring poles.

Plate 2 shows a typical sand monitoring pole.

Plate 2 Typical beach sand monitoring pole

Sand placement locations

It is recommended that placement of sand be onto the main town beach at its southern extremity in addition to immediately north of the ramp if regression of that beach is recorded.

Sand placement areas shall be:

- Well delineated by use of markers and bunting
- Controlled to prevent public access during operations due to safety considerations
- Sign posted as being soft sand, to warn the public after carting has been completed
- Appropriate notification given to adjacent land owners, occupiers and local businesses
- Sand to be spread levelled at completion to ensure safe sand slopes for public access.

Sand assessment at carting

The sand shall be assessed by a council representative to ensure that is clean and suitable for placement on a public beach. In particular all sand placed on a public beach shall be:

- Be substantially free of weed and vegetative matter
- Contain no animal or fish
- Generally contain no rocks, gravel or stones
- Be composed entirely of sand.

Sand carting volumes

The volumes of sand to be carted each time will be dependent on the performance of the beach over time, and may be adjusted to suit.

The interval between carting will also vary and this will mainly be dependent on storm activity (and hence the amount of littoral sand drift) in the period before carting. Storm activity will result in erosion of sand from the beach and an increase in sand transport in the local area.

It is recommended that the initial sand carting be larger to lower the beach to a level to provide an effective buffer before carting is required again.

General environmental considerations

In addition to DAC, EPA and Coast Protection Board conditions, Council will undertake the sand carting in a responsible manner sensitive to general environmental considerations, and the surrounding town and residents including:

- Control and limitation of blown sand and dust
- Use of best practices in regard to trucking in a residential area
- Control of noise, in particular outside of normal working hours
- Controls on sand placement and dispersion.

Safety requirements for sand carting

The following shall be undertaken during sand carting to ensure safe operations:

- The beach from where the sand is to be collected shall be closed to the public during operations
- Trucks and other plant shall operate on approved routes only and shall not be on public roads wherever possible.
- One directional traffic shall be implemented where possible
- Traffic control shall be implemented
- The beach where carted sand is to be placed shall be closed to the public during operations and shall be sigh posted warning of soft sand
- Placement of sand shall be at approved location only and sand shall be left in a safe condition.

Management of public and community impacts

The following protocols are to be implemented to mitigate impact on the public and the community:

- Written notification shall be given to adjacent occupiers and/or residents five (5) business days prior to any sand management works being undertaken
- Plant and equipment must not be operated before 7.30 AM on any weekday and all works must conclude before 6.00PM
- Work shall not occour on any weekend or public holiday
- All temporary work areas and sand stockpiles within or adjacent to the boat ramp/ beaches/ coastal reserve must be appropriately managed to ensure that public access is restricted (i.e use of temporary fencing and sign posting) and that sand stockpiles are made safe at all times when placed within the beach area.
- All contractors and council employees shall be made aware of the protocol and work limitations.

The EPA and Coast Protection Board also have requirements in regards to removal and transport of sand from the beach. A licence needs to be applied for from EPA/CPB to allow for the ongoing transport of sand.

Methods of sand carting

It is assumed that sand carting shall be undertaken by:

- Collection by front end loader
- Loading into trucks
- Trucked and placed to new location
- Pushed out by front end loader if necessary.

This is considered to be the most cost effective and feasible method of sand management.

Records

Suitable records of sand management and carting shall be kept including:

- All survey records, pre and post carting, and at intervals between as taken
- A record of the volume of sand moved, dates and where collected from and where placed.

These records will assist in planning of future need and methods.

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ATTACHMENT A
BLACK POINT SAND MANAGEMENT ACTION SHEET

Action No.	Report Reference	DAC Reference	Description	Responsible officer	Due date	Initialled when completed
1			Initial survey of beach			
2			Tender & appoint sand contractor/ carter			
3			Evidence of licence and EPA/CPB approval			
4			Sand carting from beach – Initial year (record sand volume moved)			
5			Ensure sand placement area is safe			
6			Post carting survey of beach			
7			Assess beach for sand accretion/ regression			
8			Monitor beach and boat ramp. Provide three(3) monthly reports			
9			Survey beach at twelve (12) monthly intervals			
10			Pre-carting survey			
11			Sand carting from beach – second and subsequent operations (record sand volume moved)			
12			Ensure sand placement area is safe			
13			Post carting survey of beach			

ATTACHMENT B
AERIAL PHOTO - SAND MANAGEMENT