

Gippsland Lakes Entrance Sand Management Study

Study Brief

1. Background

1.1. Overview

Lakes Entrance is the entrance to Gippsland Lakes, Australia's largest permanent inland waterway. A significant commercial fishing fleet operate from Lakes Entrance, and the importance of the recreational boating industry is growing.

The current entrance was constructed over a century ago to provide a fixed point of entry for vessels. A consequence of that construction has been the growth of a large sand-bar just outside the entrance which requires regular dredging to maintain an adequate channel depth. Historically the entrance has been hazardous to mariners, and although the record of incidents has improved significantly over the last decade, it continues to be regarded as 'difficult and dangerous'.

1.2. Studies undertaken to date

There have been numerous studies undertaken in the last thirty years or more that have collected information on hydrology, sand movement, wave and wind actions and other natural processes that has been used to reach a better understanding of the coastal processes impacting on both the entrance and inside the lakes themselves. The emphasis has been on developing solutions to increase the reliability of the entrance as a safe channel, and by extension, Lakes Entrance as a desirable port.

The primary focus of this study is to compare the options for the management and maintenance of the Bar and the Entrance to significantly improve navigability and to clearly identify the best option in terms of social, economic and environmental impacts and benefits

Consultants undertaking this study will be required to be familiar with the range of applicable studies and reports that have previously been undertaken and to have the skills necessary to interpret and distil the findings and technical data in those reports.

2. Project Management

This study is funded by a grant from the Commonwealth Government to East Gippsland Shire. Gippsland Ports is managing the project.

3. Time lines

The project is to be completed by 31st December 2003.

4. Project Description (from DOTARS funding agreement)

The project is a feasibility study for the redevelopment of the Lakes Entrance port to improve the ocean access to Lakes Entrance to accommodate larger recreational and commercial vessels.

The study will define what is required particularly with respect to marine and coastal engineering and establish the required supporting port infrastructure and the projected impacts and benefits. It will include an economic analysis of the benefits of improved ocean transport for the region.

The study will build on an earlier and successful trial and implementation of the sand transfer system that is now moving sand from the inner channels back to the sea. The engineering analysis will include these earlier workings and will be largely based on utilizing the already established equipment.

The outcome will be a concise proposal defining exactly what is required for a sustainable solution. Initial indications are that there are workable and cost effective solutions. The community will be fully involved in the study.

5. Scope

5.1. Sand Management Options

The scope of the study is based on the outcomes of a workshop held at Lakes Entrance on 27/11/02 at which it was agreed the options for managing sand at the entrance to be included in this study are:

- Phase out sand management at the entrance all together - i.e. 'do nothing';
- Maintain the status quo - i.e. continue dredging and STS as at present;
- Install a sand by-passing system outside the entrance;
- Dredge and maintain a 5m x 80m trench through the bar.
- Remove the bar, in part or in full.

(These are referred to in this study brief as the "sand management options").

5.2. Assumptions

For the purpose of the study, unless otherwise specified, a 20-year time frame will be adopted. It will be assumed that climate change has limited impact and commercial fishing maintains its current level of operations.

5.3. Study Components

The study of the sand management options will include the following components:

- Social/Economic
- Technical
- Financial
- Environmental
- Risk

It is proposed that where necessary, Gippsland Ports will sub-contract a number of the components of the study to experts in the relevant fields. Some components of the study cannot be undertaken until others have been completed.

It is proposed to first undertake the technical components of the study and then refine the specifications of the other study components based on the outputs from the technical components.

5.3.1. Social and Economic Component

Report on the social and economic impact (favourable or unfavourable) of any significant change to the ocean access channels at Lakes Entrance.

Geographically this should cover the impacts on Lakes Entrance, East Gippsland Shire and Victoria as a whole.

Scope

- Analyse three scenarios for ocean access.
 1. Access remains as is.
 2. Access significantly deteriorates.
 3. Access significantly improves.

Report on the range and value of existing and proposed related facilities and the impact of the above scenarios on them.

The report is to consider, for each scenario:

- The potential to increase/decrease existing and future employment opportunities.
- The impact on existing businesses, and future business opportunities.

Some suggested inputs include but should not be limited to:

- Lakes Entrance fishing industry.
- Lakes Entrance boat builders
- Lakes Entrance Business & Tourism Association.
- East Gippsland Tourism Campaign Committee
- Tourism Victoria
- Department of Innovation Industry and Regional Development
- East Gippsland Shire Council.
- Gippsland Coastal Board
- Offshore oil industry.
- Offshore yachting and boating sources.
- Coastal shipping opportunities.
- Offshore charter fishing.
- Death/injury/capital loss statistics related to crossing the Bar.
- Australian Quarantine Service

5.3.2. Technical Components

5.3.2.1. Phase out sand management ie 'do nothing'

Report on the implications of shutting down the present sand management operations and doing nothing to keep the entrance open. Specifically address:

- The operations and maintenance requirements of Gippsland Ports.
- The operations of the commercial fishing industry.
- The demand for facilities elsewhere in the region.

5.3.2.2. *Maintain the status quo*

Report on the existing situation including:

- Current operational procedures.
- Identify benefits and shortcomings of the current procedures.
- Compilation and analysis of the total current annual costs including:
 - April Hamer.
 - Sandpiper.
 - Sand Transfer System.
- Estimate of the future annual costs over the next 20 years.
- Condition report on the dredge ‘April Hamer’. The report to include
 - Current valuation.
 - Expected remaining useful life.
 - Estimated cost of maintaining the vessel (in excess of present routine maintenance costs) that will enable the vessel to operate at the current service level over this period.
 - Estimate of valuation in 20 years.

- Identify cost effective alternative vessels or vessel operation arrangements (if any) to the April Hamer and the Sandpiper.

5.3.2.3. *Bar Removal/Reduction*

Report to include proposals, cost estimates and recommendations covering the following scenarios for works on the bar and related channels.

1. Removal of the Bar to adjacent beach profiles. Note: Volume estimates to be supplied by Gippsland Ports.
2. Part removal of the bar to a depth at low tide of 5m. Note: Volume estimates to be supplied by Gippsland Ports.
3. Cut and maintain a channel through the Bar of similar depth, width and service level as now (3m x 80m). All dredge spoil to be disposed of away from the Bar (minimum 1 km to East and West of Entrance)
4. Cut and maintain a channel through the Bar of 5m depth, 80m width and with a service level ‘significantly’ greater than now. All dredge spoil to be disposed of away from the Bar. (minimum 1 km to East and West of Entrance)

The report may present more than one proposal for each of the scenarios.

The report is to cover methodology, suggested prime contractors/operators and cost estimates for each of the scenarios.

Where proposals require any input from 3rd parties other than the suggested prime contractor/operator they are to be clearly identified and defined. Where there is a requirement for support equipment such as dredgers or support infrastructure such as new vessel docking facilities, these should be clearly identified and technically specified.

Cost estimates are to be accurate to within +/- 10%.

Limits of responsibility and liability for suggested prime contractor/operators are to be listed, including possible Force Majeur conditions.

Proposals should take into account, but not be limited to, the following.

- The operational and environmental conditions and constraints existing in the area.
- EPA spoil dumping requirements.
- Use of or replacement of existing Gippsland Ports assets and staff.
- Impact on Port shipping during dredging.
- Estimated time frame for achieving proposals.

Some suggested inputs

- Lawson & Treloar report on Bar volumes 17/02/03.
- BJM report on Sand Transfer System pumping capacity dated 28/02/02.

5.3.2.4. Installation of a Sand By-Pass System outside the Entrance.

Assumption.

It will be assumed that the trials of a sand shifter system undertaken in 2000 on the eastern side of the Entrance training wall, successfully demonstrated that such a system would have a beneficial impact in reducing the migration of sand into the entrance. No further research is required by this study on the appropriateness of the sand shifter or sand by-pass concept.

The report is to include at least one proposal for the design and cost of a bi-directional by-pass system based on previous sand shifter trials for the following two alternatives:

- integrated with the internal, existing sand transfer system (STS).
- independent of the internal system

Costs estimates to be accurate within +/- 10%, and specify clearly any limits of supply and or responsibility and to be based on the following options.

- Gippsland Ports to build, own and operate.
- Contractor to build, Gippsland Ports to own and operate.
- Contractor to build and operate.
- Other variations on the theme.

The proposal is to include a breakdown of total costs which covers:

- Preparation of detail design and build specifications
- Project build management
- Individual supply contracts

The proposal is to include:

- System description with process flow diagrams.
- System controls and modes of operation including proposed integration with the STS.
- Description and location of hardware additions to the STS, including pipe work, valves, additional pumps, etc.

- Calculations for pipeline hydraulic gradients, additional electrical power and any other services not currently provided for at the proposed sites.
- Proposals for safety/security at the by-pass sumps and slurry discharge locations.
- Estimated life, maintenance and operating costs.
- Surveillance and monitoring system.

The proposal is also to include diagrams and a description of the system which is suitable for presentation to the general public.

Special consideration should be given to the following,

- Proposal should not exceed the current electrical installed capacity at the STS pump station.
- The possibility of a future extension of the system to accept dredged slurry from the Bar via an offshore (possibly floating) pipeline.
- The Western side of the Entrance is a National Park, therefore the installed hardware on this side should be kept to a minimum and should not require the provision of any electrical power (other than small solar power generators). The need for minimum equipment maintenance on this Western side should be addressed.

5.3.2.5. Bar & Channel Dynamics

Report to include forecasts of the effect on the Bar and navigation channels adjacent to and through the Bar for each sand management option (with and without the installation a sand shifter by-pass system) including:

- Estimation of the size of the bar. Calculations to be based on GP bar survey dated 9 Feb. 2000.
- Calculation of a series of volume reductions vs time for the bar to re-establish to a point that it will require maintenance to assure stated access channel depth.

Report to include analysis of the extent of the need to retain the operation of April Hamer and/or the Sandpiper in conjunction with each of the sand management options (with and without the installation of the sand shifter by-pass system).

5.3.3. Financial Components

Identify and analyse the capital and recurrent costs of each of the sand management options and identify funding sources including applicable Commonwealth and State funding programs.

More details on the financial assessment are provided in section 5.3.2.

5.3.4. Environmental Components

Outline for each of the sand management options the expected environmental, planning and statutory impacts on:

- Coastal processes - including the coastal barrier dune system
- Marine flora and fauna
- Gippsland Lakes

- Lakes Entrance
- Other

Estimate any resulting cost implications.

5.3.5. *Risk Components*

Undertake a risk assessment on each of the sand management options for a 5, 20 and 50 year timeframe. The risk assessment is to be confined to the exposure of Gippsland Ports and or the State /Commonwealth Governments.

6. *Outcome*

The outcome of the study will be a report that brings together the components specified for the sand management options and provides recommendations for the future management of the ocean and lakes navigation channels adjacent to the Entrance.

The options and recommendations will be fully costed.

The report will include a summary matrix table of *social, economic and environmental* benefits, costs and risks for each sand management option.

The report will also include an Executive Summary that is suitable for presentation to the general public.

The report is to be delivered in electronic [CD] (two copies) and hard copy (12 copies) versions.

Unless otherwise specifically agreed, the report and accompanying studies and data is to be in the ownership of Gippsland Ports.

Geoff Kohlman
Chief Executive Officer
29/5/03