SHELL COVE BOATHARBOUR OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Issue No. 5
DECEMBER 2007
# Shell Cove Boatharbour Operation Environmental Management Plan

## Issue No. 5
**DECEMBER 2007**

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Note: This document is preliminary unless it is approved by a principal of Patterson Britton & Partners.

Document Reference: rp4717-81_cjt_070517_boatharbour_operation_emp.doc

Time and Date Printed 18 April 2008, 2:13 PM

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1 BACKGROUND

1.1 INTRODUCTION

Shellharbour City Council and Australand Holdings Limited propose to develop a boatharbour and marina at Shell Cove, south of the township of Shellharbour on the NSW South Coast. The proposed development comprises a community with 3,000 residential allotments, a 300 berth boatharbour, 18 hole championship golf course, district retail centre, community facilities and open space networks.

This document, the Operation Environmental Management Plan (OEMP), sets out the environmental management practices, monitoring and mitigation measures for the operation of the boatharbour component of the development. Note that environmental issues relating to construction of the boatharbour are dealt with in a separate document, the *Shell Cove Boatharbour Construction Environmental Management Plan* (CEMP) (PBP, 2007).

This OEMP addresses the requirements of Condition 15(d) of the Development Consent Conditions (as modified), Condition 3 of the 1998 Conditions of Concurrence and the 2007 Conditions of Concurrence.

1.2 PROJECT DESCRIPTION

1.2.1 Scope

This project involves the construction of a boatharbour consisting of inner and outer harbour basins located behind an existing beach dune system in what is currently a degraded swamp, and an access channel across the beach as shown in Figure 1. Included in the boatharbour project are:

- inner and outer harbour basins;
- boardwalk/promenade surrounding the inner and outer harbours;
- 470m long rock breakwater on the northern side of the access channel;
- 282m long rock groyne on the southern side of the access channel;
- dune rehabilitation and beach nourishment;
- land platform works for hotel, shopping centre, residential development, marina support facilities and dry boat storage surrounding the boatharbour;
- a staged 300 berth floating marina in the inner harbour;
- vessel fuelling facilities and sewage pumpout facilities in the outer harbour;
- a boat lift, hard stand and vessel repair/maintenance facilities located adjacent to the outer harbour; and
- regional boat launching ramp located in the outer harbour;

Construction of the hotel, shopping centre, residential development, marina support facilities and dry boat storage are not covered by this OEMP.
1.2.2 Tenure of completed project

Once construction of the boatharbour is completed, Council will have tenure over the boatharbour itself and associated surrounding land including: the beach, public boardwalks and promenades, the marina offices and repair and maintenance facilities, the boat ramp, boat ramp approaches and boat ramp car park.

It is envisaged operation of the marina and vessel repair and maintenance facilities will be put out to tender and facilities leased to the successful tenderer. The successful tenderer will be subsequently referred to as the ‘Marina Operator’.

1.3 STATUTORY AND LEGISLATIVE FRAMEWORK

1.3.1 Conditions of Consent

Development consent for the project was originally granted by the Minister of Urban Affairs and Planning under Part 4 of the Environmental Planning and Assessment Act, 1979 on 26 November 1996. The form of the development and Conditions of Consent have subsequently been modified several times, as per the dates below:

- original development consent 26 November 1996;
- modified on 9 November 2001;
- modified on 6 September 2004; and
- modified on 31 October 2006.

The complete Conditions of Consent (as modified) are given in Appendix A.

In particular, Condition 15 requires that Environmental Management Plans (EMPs) be prepared for each of four elements of the project. These elements are: the Boatharbour, Shadforth Wetland System, the acoustic barriers adjacent to the Quarry Haul Road and relocation of landfill from Shellharbour Swamp. This condition also lists a number of individual management plans and programs that must be prepared as part of each EMP. The requirements of the individual management plans and programs are listed in each of the relevant management plans in Section 3.

1.3.2 Conditions of Concurrence

The Minister for Land and Water Conservation granted original concurrence for the project under Section 41 of the Coastal Protection Act 1979 on 19 March 1998, subject to a set of Conditions of Concurrence. Concurrence for the modified development was granted on 18 September 2007 with an additional five Conditions of Concurrence.

The complete Conditions of Concurrence are given in Appendix B.

Condition 3 of the 1998 conditions requires that an EMP be prepared for the boatharbour entrance works and beaches and lists a number of individual management plans and programs that must be prepared as part of this EMP. The 2007 conditions include further requirements for the individual plans relevant to the operation of the boatharbour. The
requirements of the individual management plans and programs are listed in each of the relevant management plans in Section 3.

1.3.3 Environment Protection Licence

The Environment Protection Authority NSW (EPA, now part of DECC) has issued an Environment Protection Licence (EPL No.12426 as amended 17 January 2007) to Australand for the boatharbour construction under the Protection of the Environment Operations Act 1997 (POEO Act). Specifically, the EPL authorises and regulates:

- construction of a marina and associated facilities;
- dredging works;
- marinas and boat repair facilities;
- waste facilities – land filling;
- waste facilities – large-scale landfill; and
- inert waste land filling.

The full text of the EPL is included in Appendix C.

The EPL currently sets out a framework for the regulation of the boatharbour construction. It is understood that, upon completion of the boatharbour construction works, the EPL will be modified to regulate the operation of the boatharbour and transferred into the name of Shellharbour City Council. While it is envisaged that the EPL will be updated and expanded, the relevant requirements of the current EPL have been incorporated into this OEMP.

1.3.4 Other Relevant Legislation and Regulations

All activities carried out on site shall comply with all relevant legislation, regulations and guidelines. These include but are not limited to the following:

- Shellharbour City Council LEP, 2000;
- Tree Preservation Order, made under the Shellharbour City Council LEP, 2000;
- Local Government Act, 1993;
- Illawarra Regional Environmental Plan No. 1;
- Protection of the Environment Operations Act, 1997 (POEO Act);
- Dangerous Goods Act, 1975;
- Environmental Planning and Assessment Act, 1979 (EP&A Act);
- Heritage Act, 1977;
- Coastal Protection Act, 1979;
- Fisheries Management Act, 1994;
- Environment Protection and Biodiversity Conservation Act, 1999;
- Threatened Species Conservation Act, 1995;
- Native Vegetation Conservation Act, 1997;
- Waste Minimisation and Management Act, 1995;
- Water Management Act, 2000
- Waste Avoidance and Resources Recovery Act, 2001;
- Roads Act, 1993;
- National Parks and Wildlife Act, 1974;
• Environmentally Hazardous Chemicals Act, 1985;
• Australian Standards and Codes of Practice; and
• other relevant legislation.

1.4 CONTEXT OF THE OEMP

This OEMP has been prepared to meet the requirements of Condition 15 of the Conditions of Consent (as modified) and Condition 3 of the 1998 Conditions of Concurrence, as they apply to the operation of the boatharbour.

Issues relating to the construction phase of the boatharbour, including water quality, sediment control, acid sulfate soils, noise and vibration, heritage and dune stabilization, are addressed separately in the *Shell Cove Boatharbour Construction Environmental Management Plan* (CEMP) (Patterson Britton, 2007).

This document provides information on environmental issues, mitigation measures, monitoring, compliance standards, corrective actions, reporting and auditing proceedings relating to the operation of the Boatharbour. For the purpose of this document, the operation of the boatharbour is considered to commence upon practical completion of the boatharbour construction contract.

Additionally, this document requires the Marina Operator to prepare a detailed Marina Plan of Management (MPM) for their operation to ensure that all appropriate environmental management controls are implemented.

This OEMP has been developed from the following documents:

• *Environmental Impact Statement, Shell Cove Boatharbour/Marina, Shadforth Wetland, Haul Road Landfill*, LFA (Aust) Pty Ltd, 1995 (EIS, 1995);
• the subsequent Commission of Inquiry;
• Shell Cove Boatharbour Conditions of Consent, as modified up to 31 October 2006;
• Shell Cove Boatharbour and Marina, Concurrence under Section 41 of the *Coastal Protection Act 1979*, dated 19 March 1998 and 18 September 2007;
• Environment Protection Licence No.12426 issued under the *Protection of the Environment Operations Act 1997*, as modified 17 January 2007; and

1.5 OBJECTIVES OF THE OEMP

The objectives of this OEMP are to:

• avoid environmental impacts from the operation of the boatharbour where possible;
• minimise impacts that are unavoidable;
• ensure that the works are carried out in accordance with appropriate environmental statutory requirements;
• ensure that the Marina Operator prepares a Marina Plan of Management (MPM) for their operation of the marina which, as a minimum, should address all issues raised within this OEMP and the Conceptual Marina Plan of Management;
• ensure that operation of the marina is conducted in accordance with the MPM and principles outlined in this OEMP and that any corrective actions are performed in a timely and appropriate manner; and
• respond to changes in environmental conditions through review of the monitoring and control programs.

This OEMP integrates the various environmental management commitments, conditions and statutory requirements that cover the boatharbour operation. The OEMP includes management strategies with agreed performance criteria for specified acceptable levels of environmental harm.

1.6 STRUCTURE AND USE OF THIS OEMP

The OEMP forms a practical guide to identifying, addressing and managing environmental impacts associated with the operation of the boatharbour to ensure that the Proponent (Shellharbour City Council), the Marina Operator, their contractors and subcontractors and the marina users comply with the environmental conditions of approval for the project and that the environmental risks are properly addressed and managed.

This OEMP has been prepared in accordance with the Conditions of Consent and Concurrence to enable its utilisation as a management tool for all personnel involved in the operation of the boatharbour/marina at Shell Cove. In particular, this document contains an outline of:

• background information on the project;
• statutory and regulatory requirements for the activities;
• responsibilities of the Proponent and Marina Operator in regards to the implementation of this OEMP;
• procedures for reporting and auditing of environmental management activities;
• requirements of the Marina Operator’s Marina Plan of Management (MPM);
• management plans required by the Conditions of Consent and Conditions of Concurrence for individual issues, including identification of key environmental issues, management strategies that ensure minimal impact on the environment, compliance standards, monitoring required and corrective action if required;
• procedures for the implementation, monitoring and management of control provisions necessary to protect the environment;
• a summary of monitoring requirements, trigger values and corrective actions; and
• the required environmental auditing program.

The Marina Operator shall use this OEMP as a critical reference in the preparation of their MPM and the Proponent shall use this OEMP as a critical reference for approval of the MPM and when inspecting marina operations.

Tables 1.1 and 1.2 below indicate where each of the sub-plans and programs required by the Conditions of Consent and Conditions of Concurrence can be found within this OEMP and the
CEMP. Where the plan or program is not relevant to the operation of the boatharbour, this is duly noted.

**Table 1.1 EMP Sections Addressing Conditions of Consent**

<table>
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<th>Conditions of Consent Clause:</th>
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<th>Operational Phase</th>
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<td>(i) Air Quality Management Plan</td>
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<td>(ii) Water Quality Management Plan</td>
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<td>(iii) Erosion and Sediment Control Plan</td>
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<tr>
<td>(iv) Acid Sulphate Soil Management Plan</td>
<td>CEMP Section 4.6</td>
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<tr>
<td>(v) Noise Management Plan</td>
<td>CEMP Section 4.7</td>
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<tr>
<td>(vi) Archaeological and Heritage Protection Plan</td>
<td>CEMP Section 4.8</td>
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<td>(vii) Construction Program</td>
<td>CEMP Section 4.2</td>
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<td>(viii) Monitoring Program</td>
<td>CEMP Section 5</td>
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<td>(ix) Landscaping Plan(^1)</td>
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<td>(xii) Auditing Program</td>
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**Note:** 1. Conditions of consent require a Landscaping Plan in relation to the construction of acoustic barriers adjacent to the Quarry Haul Road only, not the Boatharbour construction.
Table 1.2  EMP Sections Addressing Conditions of Concurrence

<table>
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<td>CEMP Section 6</td>
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| **2007 Conditions:**                                   |                    |                   |
| Wave Conditions in Entrance                            | na                 | Section 3.3       |
| Beaches North and South of Entrance                     | na                 | Section 3.4       |
| Breakwater and Groyne Structures                        | na                 | Section 3.2       |
| Water Quality Monitoring                                | na                 | Section 3.1       |
| Compliance                                              | na                 | Section 4         |
2 IMPLEMENTATION OF THE OEMP

2.1 GENERAL

The responsibility for environmental management lies with several parties:

- Shellharbour City Council (the Proponent and Landowner)
- Australand Holdings Limited
- the Marina Operator – to be appointed.

Shellharbour City Council (SCC) is the landowner of the boatharbour site and the applicant for the development consent and concurrence. As such SCC is responsible for preparation of the EMP documentation, which comprises the CEMP and this OEMP. Under condition 15 of the Conditions of Consent, the EMPs must be approved by the Director General of the Department of Infrastructure, Planning and Natural Resources (DIPNR) (now Department of Planning (DoP)) in consultation with the Shell Cove Compliance Committee before construction commences. Under condition 3 of the Conditions of Concurrence, the relevant sections of the EMPs must also be approved by the Department of Land and Water Conservation (DLWC) (now Department of Environment and Climate Change (DECC)).

Australand is the Project Manager and joint developer with Shellharbour City Council and as such has a role in the preparation of the CEMP and the OEMP.

Overall environmental management of the boatharbour once operational will be the responsibility of Shellharbour City Council as the landowner. Responsibility for environmental management with respect to marina operations is delegated to the Marina Operator through the Marina Plan of Management (MPM), as described below.

2.2 RESPONSIBILITIES OF THE PROPOINENT

Shellharbour City Council as Proponent and Landowner has the following roles and responsibilities in the implementation of this OEMP:

- preparation and continuing development of the OEMP for the boatharbour;
- appoint a suitably qualified marina operator;
- review and approve the Marina Operator’s MPM, and any revisions submitted by the Marina Operator;
- conduct regular site visits and audits to ensure the Marina Operator is implementing and complying with this OEMP and the MPM;
- conduct on-going evaluation of the Marina Operator’s performance;
- review corrective action and incident reports from the Marina Operator;
- monitor and manage water quality within the boatharbour and the boatharbour’s impact on the coastal waters as per this OEMP; and
• monitor and manage public land within the development including the boat ramp, breakwaters and groyne, access channel and beach areas adjacent to the entrance in accordance with this OEMP.

2.3 RESPONSIBILITIES OF THE MARINA OPERATOR

The Marina Operator shall prepare a MPM in accordance with this OEMP. The MPM (including any revisions) must be submitted to the Proponent for approval at least 30 days prior to the commencement of operations. Operations shall not commence before approval is received from the Proponent. The MPM must be implemented and become an integral part of the marina management activities. This will include, but not be limited to, training all personnel, site induction, undertaking environmental monitoring and reporting and ongoing review of the MPM.

The Marina Operator as a minimum should:

• ensure compliance with this OEMP and their MPM;
• ensure compliance with environmental legislation, regulations, standards and codes;
• review environmental impacts as operations continue and update the MPM accordingly;
• investigate incidents and initiate corrective and preventative actions;
• ensure employees and subcontractors comply with requirements of this OEMP and their MPM;
• implement corrective actions in response to failure to meet a compliance standard or upon request of the Proponent;
• issue non-conformance reports and corrective action reports for non-compliance with the MPM;
• report all incidents to the Proponent;
• undertake regular internal audits to verify compliance with this OEMP and the MPM; and
• report annually to the Proponent on the environmental performance of the marina operations including incidents, non conformances, and audit results.

The Marina Operator must provide details of staff responsible for the on site implementation of this OEMP and their MPM, and provide a brief description of each person’s roles and responsibilities.

The Marina Operator shall comply with all statutory requirements in all respects including registrations, health and safety, water pollution control, dust control and noise emission limitations, as laid down by the WorkCover Authority, DECC and other relevant national, State and Local authorities.

2.4 COMMUNICATION AND COMMITTEES

The Shell Cove Compliance Committee was established under Condition 5(a) of the Conditions of Consent and has consultation and compliance roles in reporting and implementing the CEMP and OEMP. The Committee comprises representatives of the DoP (Chair), DECC (encompassing former entities EPA and DLWC), one local community representative, one Aboriginal community representative, the Community Liaison Officer and a Council technical officer.
The Committee reports to the Minister for Planning on a six monthly basis on compliance with the Conditions of Consent, and that report is made publicly available by the Department of Planning and Shellharbour City Council.

2.5 AMENDMENT OF THE OEMP

In accordance with Condition 15 (e) of the Development Consent Conditions, the OEMP may be updated or amended prior to or during the course of boatharbour construction or operation subject to the approval of the Director General of the Department of Planning.
3 INDIVIDUAL MANAGEMENT PLANS – OPERATION PHASE

3.1 WATER QUALITY AND ENVIRONMENT MANAGEMENT PLAN

This section addresses the Conditions of Consent clause 15(d)(ii), the 1998 Conditions of Concurrence clause 3(iii) and the 2007 Condition of Consent relating to water quality monitoring.

The Water Quality Management Plan required by the Conditions of Consent and the Marine Environment Management Plan required by the Conditions of Concurrence have been combined in this plan as they have significant overlap in scope and the issues involved in each are strongly interrelated.

3.1.1 Requirements

The Conditions of Consent require a Water Quality Management Plan to be prepared and state that:

The Plan shall provide details relative to:

- compliance standards;
- remedial action;
- mitigation measures;
- monitoring and testing programs for water quality, groundwater, and indicators such as the colonisation of sediments and structures associated with the development;
- contingency measures to improve water quality should monitoring and testing show water quality does not satisfy relevant water quality guidelines or standards;
- downstream impacts associated with this development;
- biological monitoring;
- the proposed drainage system and stormwater treatment measures;
- criteria for the use of the flushing pump (if it is required as a contingency measure); and
- measures to prevent draw-down from adversely impacting on actual/potential acid sulphate soil.

A number of the Conditions of Consent requirements are relevant only to the construction of the boatharbour, not the operation of the boatharbour. As such these requirements are addressed in the CEMP.

The 1998 Conditions of Concurrence require a Marine Environment Management Plan to be prepared and state that:
The plan shall provide details about:
- compliance standards;
- remedial actions which will include contingency planning;
- mitigation measures;
- monitoring program;

The plan is to be based on the marine and water quality monitoring program outlined in Appendix 11 of the EIS and as modified by the Commission of Inquiry.

The 2007 Conditions of Concurrence further require:

Council will undertake a water quality monitoring program for the water within the boat-harbour at some periodic intervals after the construction of the marina to check the need of the flushing pipe system as proposed in the original design. The requirements of this condition are to be incorporated in the Environmental Management Plan which is required to be lodged with the Shell Cove Compliance Committee prior to the commencement of construction of the boat harbour.

The current Environment Protection Licence (EPL) for the project (EPL 12426 as amended 17 January 2007) contains a number of clauses which are relevant to marine water quality and the marine environment, as listed below. The full text of the EPL is included in Appendix C.

<table>
<thead>
<tr>
<th>Clause</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2.6</td>
<td>Recording Site Activities</td>
</tr>
<tr>
<td>R5</td>
<td>Requirements to report to the EPA with a summary of monitoring results</td>
</tr>
</tbody>
</table>

### 3.1.2 Potential Environmental Impact

Water quality and marine environment impacts in the boatharbour or adjacent coastal waters during operation may result from:

- altered stormwater quality and quantity discharging to the boatharbour and coastal waters, potentially leading to elevated nutrient levels and algal blooms;
- discharges from vessels in boatharbour including oily bilge water, sewage and/or gross pollutants;
- copper leaching from vessel antifouling paint;
- fuel spills and other pollutant discharges from marina operations; and
- acid runoff or groundwater discharge from oxidisation of acid sulphate soils (ASS);

The EIS and subsequent investigations have predicted that copper from antifouling and nutrients from stormwater will be the pollutants of most potential concern in the boatharbour.
3.1.3 Management Strategy and Mitigation Measures

Stormwater
The catchment of the former swamp will discharge into the boatharbour. Pollutants typically of concern in stormwater from urban catchments include nutrients (principally nitrogen and phosphorus), suspended solids and gross pollutants.

The proposed drainage system in the residential and commercial developments surrounding the boatharbour incorporates detention basins and riparian corridors as shown in Figure 2. Water quality treatment measures incorporated into the drainage system include wetlands, bioretention swales, bioretention basins, and gross pollutant traps, as shown in Figure 2. These measures have been designed with the objective of reducing the nutrient, suspended solid and gross pollutant load to the receiving waters post development as compared to the existing case. It is noted that a quantity of suspended sediment will reach the boatharbour and will beneficially interact with dissolved copper while still meeting the stormwater quality objectives.

Notwithstanding the stormwater treatment devices to be incorporated into the drainage system, Council shall undertake the following mitigation and management activities to ensure that stormwater runoff has minimal impact on the water quality of the boatharbour and adjacent coastal waters:

(a) Council shall ensure that developers operating within the boatharbour catchment take all appropriate measures to control the water quality of runoff or other water discharged from construction sites.

(b) Once the proposed drainage system has been constructed and handed over to Council, Council shall monitor the performance of the water quality treatment devices and undertake all necessary maintenance to ensure they function effectively.

Discharge from Vessels
Discharges from vessels in the boatharbour could include bilge water, sewage and gross pollutants. Bilge water potentially contains fuel, oils, metals, suspended solids and non-native and potentially harmful flora and fauna (in the case of foreign vessels). In order to limit pollutants discharged from vessels, the

(c) The Marina Operator shall provide pump-out facilities which direct discharges to the sewer system and will implement a ban on the discharge of sewage or other pollutants to the boatharbour (refer to the Conceptual Marina Plan of Management, Appendix D for details).

(d) The Marine Operator shall supply bilge water absorbing pads to all vessels and implement a ban on bilge water discharge to the boatharbour.

Copper Leaching from Antifouling Paint
Copper leaching from copper-based antifouling paint on moored vessels is expected to be the dominant source of copper in the boatharbour. A small amount of copper may also
enter the boatharbour from stormwater runoff and bilge water accidentally discharged from vessels, however these quantities are expected to be insignificant compared to antifouling paint.

Once in the water column, labile copper (the most bioavailable and toxic form) can be removed by flushing to the coastal waters, complexing with colloids or organic molecules, or by binding to suspended solids and settling to the bed. The preferred strategy for minimising the concentration of labile copper in the boatharbour is to facilitate complexing and binding to suspended sediments as opposed to artificial flushing which may increase the impact of copper on the aquatic ecosystems outside the entrance.

The following mitigation measures are required to minimise copper load to the boatharbour and minimise the impact of copper on the ecosystems of the boatharbour and adjacent coastal waters:

(e) In-water hull cleaning of vessels painted with any biocide including copper-based antifouling will be banned (refer to the Conceptual Marina Plan of Management, Appendix D for details).

(f) Prohibit the use of any biocide including copper-based antifouling on in-water infrastructure.

(g) The Marina Operator will implement a first flush and wash down water collection and treatment system and solid waste collection system on the maintenance hardstand to ensure that copper generated from cleaning and maintenance activities does not enter the boatharbour (refer to the Conceptual Marina Plan of Management, Appendix D for details).

(h) The Marina Operator and the Council shall consider the use of non-copper antifouling strategies such as boat lifts (a small floating dock within the marina berth which lifts the vessel out of the water while not in use) and fouling-release type hull coatings (coatings of teflon or similar material which marine organisms have difficulty adhering to).

(i) Consistent with attainment of water quality standards in the catchment, sustain, as far as practical, the pre-development suspended solids load to the boatharbour.

**Fuel and other Spills**
Spills of fuel, oil, sewage, grey water, solid or liquid waste, paint, cleaning products or chemicals have the potential to adversely impact on the water quality within the boatharbour. In order to minimise the occurrence and impact of spills the following measures shall be adopted:

(j) The Marina Operator will implement measures, policies and procedures to prevent spills to the boatharbour (refer to the Conceptual Marina Plan of Management, Appendix D for details).
(k) Marina staff shall immediately investigate the source of any spill and take steps to prevent further spillage and clean up or remove spilt material, in the case where the spill is from marina property, marina users, or results from marina operations. In the case that the source of the spill is identified as being outside marina property and control, the Marina Operator shall immediately notify the Council.

**Acid Runoff or Discharge**

Acid sulfate soil (ASS) adjacent to the boatharbour will be consolidated and capped in situ, except for a relatively small area with a low finished surface level where the ASS will be removed. The removal and handling of ASS during the construction phase is dealt with in the CEMP. The consolidation and capping of the in situ ASS has the following beneficial effects which will ensure that no significant oxidisation of ASS will occur:

- consolidates ASS down the profile;
- causes the watertable to rise;
- decreases the rate of transport of oxygen into the soil profile;
- decreases the hydraulic conductivity of the soil; and
- increases the capillary fringe thickness above the watertable.

### 3.1.4 Monitoring and Compliance Standards

The EIS recommended that water quality and biological monitoring programs be implemented at the onset of boatharbour operation with the following objectives:

- documentation of colonisation of the new boatharbour habitat;
- assessment of the behaviour of the boatharbour water quality under various weather/hydraulic conditions plus longer term behaviour of water quality as boatharbour and residential occupancy increases;
- documentation of possible alterations to boatharbour habitat and biological communities in response to long term water quality change; and
- identification of long term impacts on downstream waters (Bass Point Embayment).

Four water quality and marine environment monitoring programs are required to meet the objectives identified in the EIS:

- extension of pre-construction marine water quality monitoring;
- extension of pre-construction biological monitoring;
- boatharbour colonisation monitoring; and
- copper bioaccumulation monitoring.

**Extension of Pre-Construction Marine Water Quality Monitoring**

The marine water quality monitoring program is an on-going, long term program covering the pre, during and post-construction phases of the project which aims to identify long term impacts of the boatharbour construction and operation on the downstream waters in the Bass Point Embayment. This program will be the responsibility of Australand during the construction phase and Council during the operation phase.
Water quality monitoring will be conducted at each of eight sites within the Bass Point Embayment used in the pre and during-construction monitoring, as shown in Figure 3, as well as three additional sites within the boatharbour; one in the channel, one in the outer harbour and one in the centre of the inner harbour, and one freshwater site on the major stormwater inflow to the boatharbour, as shown in Figure 1. The following measurements and samples will be taken:

- full-depth (profile) measurement of temperature (T), salinity (S), acidity (pH), dissolved oxygen (DO) and turbidity (NTU);
- surface and bottom water samples analysed for suspended solids concentrations, both total suspended solids (TSS) and volatile suspended solids (VSS);
- surface and bottom water samples analysed for nutrients; oxides of nitrogen (NOx), total nitrogen (TN), ortho phosphate (OP) and total phosphorus (TP) and for Chlorophyll-a (Chlor-a) (surface water sample only);
- surface and bottom water samples analysed for total copper (TC) and, if required, dissolved copper (DC) and ionic (labile or bioavailable) copper (LC); and
- surface and bottom water samples analysed for total hydrocarbons (TH) (harbour sites only).

Measurement and sample collection will be conducted in accordance with ANZECC/ARMCANZ (2000) sampling procedures and sample analysis undertaken by a NATA registered laboratory.

Marine water quality monitoring results will be analysed to detect impacts of the boatharbour operation on water quality using the pre and during-construction water quality results and extended before/after control/impact techniques.

Monitoring is to be undertaken every 6 months once the boatharbour is operational. The monitoring program is to be subject to the review of the Shell Cove Compliance Committee.

**Extension of Pre-Construction Biological Monitoring**

The biological monitoring program is an on-going, long term program covering the pre, during and post-construction phases of the project which aims to identify possible long term impacts of the boatharbour construction and operation on the downstream waters in the Bass Point Embayment. This program will be carried out by Australand during the construction phase and by Council during the operation phase.

There are eight biological monitoring sites located on shallow sub-tidal rocky reef habitat (2 sites immediately outside the entrance, 4 close reference sites and 2 far reference sites) as shown on Figure 3. At each site the benthic community structure will be monitored using photo-quadrant techniques consistent with methodology used pre and during-construction.

Biological monitoring results will be analysed to detect boatharbour operation impacts on benthic community structure using the pre and during-construction biological monitoring results and extended before/after control/impact techniques.
Biological monitoring is to be undertaken by an appropriately qualified marine biologist once every 6 months following practical completion of the boatharbour. The monitoring program is to be subject to the review of the Shell Cove Compliance Committee.

**Boatharbour Colonisation Monitoring**
The boatharbour colonisation monitoring aims to document the colonisation of the new boatharbour habitat and possible alterations to boatharbour habitat and biological communities in response to long term water quality change. This program will be the responsibility of the Council.

A pilot colonisation study will be conducted by an appropriately qualified marine biologist to aid in the design of the full colonisation monitoring. The pilot colonisation study will be conducted at suitable rock structures on the Illawarra coast, such as the recently constructed Lake Illawarra training walls, prior to the connection of the boatharbour to the coastal waters. This study will investigate marine epibiota in the intertidal and shallow subtidal zones and be used to determine sample size and methodology for the full study.

The full colonisation study will commence at practical completion of the boatharbour and be undertaken at a number of sites on the breakwater and the rock and concrete walls of the outer and inner harbours, including a reference site on the seaward side of the breakwater, as shown in Figure 1. At each site intertidal and subtidal study stations will be established on the harbour sides as well as a benthic site on the harbour bottom.

The full colonisation study will consist of surveys conducted every 6 months by an appropriately qualified marine biologist, subject to the findings of the pilot study. The monitoring program is to be subject to the review of the Shell Cove Compliance Committee.

**Copper Bioaccumulation Monitoring**
The copper bioaccumulation monitoring aims to investigate the impact of copper on aquatic ecology within the boatharbour. This program will be the responsibility of the Council.

A pilot bioaccumulation study will be undertaken by an appropriately qualified marine biologist in existing Illawarra boat harbours to select suitable sessile benthic species from the point of view of habitat tolerances (i.e. able to tolerate a range of water quality conditions) and bioaccumulation potential. Suitable collection sites exist in Kiama and Wollongong harbours. A number of suitable long-lived species will be collected and analysed for copper concentration. The pilot study would be used to determine sample size and study design for the full study.

Subject to the findings of the pilot study, the full bioaccumulation study will commence within 6 months of commencement of marina operations and collection of organisms would be undertaken at sites in vicinity of, but not at, the colonisation sites, as well as on the reef immediately outside the entrance and at a suitable reference site, as shown in Figure 1.
If the bioaccumulation study detects significant copper bioaccumulation an ‘oyster watch’ study, using the methodology developed by the EPA, may be undertaken to confirm the source and impact of the copper accumulation.

Organism collection and analysis of copper bioaccumulation will be conducted by an appropriately qualified marine biologist every 6 months, subject to the findings of the pilot study. The monitoring program is to be subject to the review of the Shell Cove Compliance Committee.

**Compliance Standards**
The ANZECC/ARMCANZ (2000) default trigger values for protection of the aquatic ecosystem have been adopted as water quality trigger values. It is noted that the guidelines allow for the development of site specific trigger values based on the biological effects data collected at the site.

Compliance standards and the trigger values for protection of the aquatic ecosystem are given in Table 3.1 below.

### Table 3.1 Compliance Standards for Water Quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measurement Location</th>
<th>Compliance Standard</th>
<th>Default Trigger Values*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrients</td>
<td>boatharbour</td>
<td>no occurrence of algal blooms</td>
<td>80th percentile of measurements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TN: 300 µg/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TP: 30 µg/L</td>
</tr>
<tr>
<td>Copper</td>
<td>boatharbour</td>
<td>development of an aquatic ecosystem with a similar biodiversity and species abundance as other similar harbours in the Illawarra region</td>
<td>90% of species protected: median of measured copper concentrations*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.0 µg/L</td>
</tr>
<tr>
<td></td>
<td>outside entrance</td>
<td>no significant impact on aquatic ecosystem</td>
<td>95% of species protected: median of measured copper concentrations*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.3 µg/L</td>
</tr>
</tbody>
</table>

* From ANZECC/ARMCANZ (2000)

# Guidelines are specified in terms of labile (bioavailable) copper, however total copper may be used to demonstrate compliance.

**Reporting**
Monitoring results will be included in the 6 monthly monitoring report provided to the Shell Cove Compliance Committee.

### 3.1.5 Corrective Actions

**Nutrients**
If the measured concentration of nutrients in the boatharbour or adjacent coastal waters is determined to be in excess of the relevant trigger value, the Council shall:
• repeat the sampling and take further samples at representative locations to
determine the extent of the exceedence (the 80\textsuperscript{th} percentile of measured values
should then be compared to the trigger value); and

• review the marine environment monitoring data (water quality, biological,
colonisation and bioaccumulation monitoring) and report to the Shell Cove
Compliance Committee on the impact of nutrients on the aquatic ecosystem and
whether the compliance standards are being met.

If an algal bloom occurs or the Shell Cove Compliance Committee deems that the
compliance standards are not being met in the boatharbour, the Council shall investigate
the source of the nutrients and take steps to reduce the nutrient load to the boatharbour,
such as improving the efficiency of water quality treatment devices in the catchment, or
otherwise lower the risk of algal blooms.

\textit{Copper}

If the concentration of labile (bioavailable) copper in the boatharbour or adjacent coastal
waters is determined to be in excess of the relevant trigger value, the Council shall:

• repeat the sampling and take further samples at representative locations to
determine the extent of the exceedence (the median of measured values should then
be compared to the trigger value); and

• review the marine environment monitoring data (water quality, biological,
colonisation and bioaccumulation monitoring) and report to the Shell Cove
Compliance Committee on the impact of copper on the aquatic ecosystem and
whether the compliance standards are being met.

In the event that the Shell Cove Compliance Committee deems that the compliance
standards are not being met, the Council shall take the following steps as necessary to
achieve compliance:

• investigation of the sources of copper load to the boatharbour to identify any
unknown or illegal sources which could be reduced;

• reduce the copper load from antifouling such as encouraging marina users to
switch to non-copper-based antifouling systems, or capping the total wetted
surface area of copper antifouled vessels in the harbour;

• increase the complexed and particulate fractions of the total copper (and thus
reducing the labile fraction) by managing the catchment drainage system and
water quality treatment devices so as to sustain the pre-development supply of
suspended solids and complexing agents (colloids and organic molecules); and

• increase the flushing of the boatharbour by forcing circulation in the inner harbour
or forcing exchange between the inner harbour and the coastal waters.
Spills/Gross Pollutants
All spills or incidents of gross pollutants in the boatharbour resulting from marina operations must be immediately cleaned up by the Marina Operator. Any such spills for which the EPA require reporting, or effect an area greater than one berth, are of a toxic substance, cause fish kills or involve fuel are considered significant and the Marina Operator shall notify the EPA and supply Council with an incident report within one week detailing the source and nature of the spill, steps taken to clean up or mitigate the spill and steps taken to ensure the incident is not repeated.

In the case that a spill to the boatharbour is not related to marina operation then the Council shall investigate the spill, notify the EPA if required and take steps to ensure the spill does not reoccur.
3.2 BREAKWATER STRUCTURES MAINTENANCE PLAN

This section addresses the 2007 Condition of Concurrence relating to monitoring of the breakwater and groyne structures.

3.2.1 Requirements

The 2007 Condition of Concurrence states that:

*Council will undertake detailed monitoring of the newly constructed breakwater and groyne structures during the period after its construction for possible settlements of the rocks due to scouring by wave and tidal actions and top up with additional rocks in case of excessive reduction in the height of the structure due to the settlement. Council will also monitor the structures for damages caused by extreme event storms and undertake the necessary repair works. The requirements of this condition are to be incorporated in the Construction Program and Monitoring Program which are required to be lodged with the Shell Cove Compliance Committee prior to the commencement of construction of the boat harbour.*

3.2.2 Issues

The breakwater and groyne are rubble mound structures located to the north and south of the boatharbour entrance as shown on Figure 1. There are two separate processes affecting these structures that require monitoring to determine maintenance requirements: settlement and storm damage. These processes are discussed separately below.

**Settlement**

Settlement of the structures may lead to destabilising of armour layers, breakup of the roadway and increased overtopping. Settlement can be caused by a number of processes including:

- scour by wave and tide action;
- ‘shake down’ by wave action;
- consolidation of underlying sediments, particularly the layer of soft estuarine silt/clay below the breakwater; and
- shear failure of underlying sediments, particularly relevant to the breakwater due to the layer of soft estuarine silt/clay.

Scour by waves and tides is only expected to affect primarily the parts of the structures exposed to wave action (tidal currents in the entrance are very low), such as the head and seaward sides of the structures. It is noted that in many of these areas toe berms are provided which are designed to settle preferentially in response to scour and thereby protect the remainder of the structure from the effects of scour.

‘Shake down’ refers to the settling of armour rock more tightly into the surrounding rock as small movements are induced by wave action. Shake down is expected to occur as a function of storm events.
Both consolidation and shear failure of underlying sediments could affect the breakwater from chainage 0 (existing Bass Point tourist road) out to chainage 300 (start of ‘hook’). Most consolidation is predicted to occur within 2 years of construction. The risk of shear failure is higher soon after construction as the shear strength of the soft sediments will increase over time due to consolidation.

**Storm Damage**

Large waves associated with design storm events or more severe storms will cause some movement of armour on the structures. It is noted that the head and seaward side of the breakwater trunk have a ‘berm’ profile (a so-called ‘Icelandic berm’) that is designed to accommodate a level of armour movement without any loss of functionality.

### 3.2.3 Monitoring and Compliance Standards

Breakwater and groyne monitoring programs as described below will be the responsibility of the Council. The Contractors ‘as completed’ survey of the structures shall be used as the baseline for measuring change.

**Settlement**

The monitoring of settlement shall involve both inspections and survey.

Inspections shall be carried out by a recognised coastal engineer every 6 months from practical completion of the boatharbour for 5 years or as required by the Shell Cove Compliance Committee. The inspections shall comprise walk over and photographing of the structure crests and inspection and photographing of the seaward and channel sides of the structures by boat. Signs of settlement such as cracks in the roadway will be noted and the photographs analysed to detect movements in the armour rocks. A system of reference marks shall be fixed on the structures to aid in the photographic comparisons.

Surveys will be conducted by an appropriately qualified surveyor at one year, two years and five years after practical completion of the boatharbour, or at other times if deemed necessary by the coastal engineer after inspections. Surveys shall define the sub-aerial surface of the structures with a level of accuracy sufficient to detect displacement of primary armour units (1.5m diameter boulder) and vertical movements of the crest of 50mm. A full survey may involve a combination of land based survey and aerial survey, such as photogrammetry.

Compliance standards for settlement and trigger values for maintenance are summarised in **Table 3.2**. Explanation of the measurement locations is given in **Figures 1 and 4**.

At the seaward ends of the structures where overtopping occurs, the crest level must be maintained to preserve overtopping performance, so smaller absolute settlement values are allowed. On the landward sections of the structures overtopping is less of an issue so larger settlements of the crest can be tolerated. Maintaining the safety and functionality of the roadway is more critical in the landward areas.
On the side slopes of the structures it is important to maintain the integrity of the armour layers. Settlement can lead to voids opening up in the armour which reduce the stability of the entire armour layer.

The toe berm and Icelandic berm on the seaward side and head of the breakwater can tolerate large amounts of settlement so long as the side slope above the berm is not undermined.

**Table 3.2 Compliance Standards for Settlement**

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Compliance Standard</th>
<th>Trigger Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakwater</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chainage 0 to 300</td>
<td>roadway and crest</td>
<td>maintain roadway functionality</td>
</tr>
<tr>
<td>(landward end)</td>
<td>seaward side upper</td>
<td>maintain armour integrity</td>
</tr>
<tr>
<td></td>
<td>slope (above berm)</td>
<td>and channel side</td>
</tr>
<tr>
<td>chainage 300 to head</td>
<td>roadway and crest</td>
<td>maintain overtopping performance and roadway functionality</td>
</tr>
<tr>
<td>(seaward end)</td>
<td>seaward side upper</td>
<td>maintain armour integrity</td>
</tr>
<tr>
<td></td>
<td>slope (above berm)</td>
<td>and channel side</td>
</tr>
<tr>
<td><strong>Groyne</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chainage 0 to 220</td>
<td>roadway and crest</td>
<td>maintain roadway functionality</td>
</tr>
<tr>
<td>(landward end)</td>
<td>seaward side and</td>
<td>maintain armour integrity</td>
</tr>
<tr>
<td></td>
<td>channel side</td>
<td></td>
</tr>
<tr>
<td>chainage 220 to head</td>
<td>roadway and crest</td>
<td>maintain overtopping performance and roadway functionality</td>
</tr>
<tr>
<td>(seaward end)</td>
<td>seaward side and</td>
<td>maintain armour integrity</td>
</tr>
<tr>
<td></td>
<td>channel side</td>
<td></td>
</tr>
</tbody>
</table>

**Storm Damage**

Monitoring of storm damage shall involve inspections and survey utilising the same methodology as for the settlement monitoring.

An inspection of the structures should be carried out after storms where the significant wave height recorded at the Port Kembla waverider buoy exceeds 6m for 6 hours or 7m for 1 hour (approximately 5 years average recurrence interval). Survey of the structures should be carried out if deemed necessary after the inspection by a recognised coastal engineer.

Compliance standards and trigger values for storm damage are specified in terms of damage for conventional 2-layer sections and in terms of reshaping for berm sections, as given in **Table 3.3**. Explanation of the measurement locations is given in **Figures 1 and 4**.
and the acceptable reshaping envelope is given in Figure 4. ‘Damage’ is defined as the percentage of armour units displaced from the 2 layers of primary armour over a 25m length of armoured face.

Table 3.3  Compliance Standards for Storm Damage

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Compliance Standard</th>
<th>Trigger Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakwater</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chainage 0 to 300</td>
<td>seaward side upper slope (above berm) and channel side</td>
<td>maintain armour layer integrity</td>
</tr>
<tr>
<td>(landward end)</td>
<td><strong>Icelandic berm</strong></td>
<td>moderate reshaping</td>
</tr>
<tr>
<td>chainage 300 to head</td>
<td>seaward side upper slope (above berm)</td>
<td>maintain armour layer integrity</td>
</tr>
<tr>
<td>(seaward end)</td>
<td>channel side</td>
<td>maintain armour layer integrity</td>
</tr>
<tr>
<td><strong>Groyne</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chainage 0 to head</td>
<td>seaward side and channel side</td>
<td>maintain armour layer integrity</td>
</tr>
</tbody>
</table>

3.2.4  Maintenance

**Settlement**
If it is considered based on the inspections and survey that the settlement trigger values have been exceeded, then maintenance works as recommended by a recognised coastal engineer shall be carried out on the structures. These works may include, as required:

Breakwater chainage 0 – 300:
- repair and re-levelling of roadway slabs;
- placing rock in voids in armour layer; and
- placing additional rock in toe berm to prevent undermining of slope armour.

Breakwater chainage 300 – head:
- repair and re-levelling of roadway slabs;
- raising crest level by placing additional armour on crest;
- placing rock in voids in armour layer; and
- placing additional rock at the toe to prevent undermining of channel side armour.

Groyne chainage 0 – 220:
- repair and re-levelling of roadway slabs;
- placing rock in voids in armour layer; and
- placing additional rock at the toe to prevent undermining of slope armour.
Groyne chainage 220 – head:
- repair and re-levelling of roadway slabs;
- raising crest level by placing additional armour on crest;
- placing rock in voids in armour layer; and
- placing additional rock at the toe to prevent undermining of slope armour.

**Storm Damage**
If it is considered, based on the inspections and survey, that storm damage exceeds the trigger values, then maintenance works as recommended by a recognised coastal engineer to ensure compliance standards are met shall be carried out on the structures. These works may include, as required:

Breakwater chainage 0 – 300:
- placing rock in voids in armour layer; and
- placing additional rock in toe berm to prevent undermining of slope armour.

Breakwater chainage 300 – head:
- reshaping of berm using in situ rock or placing of extra rock on the berm;
- placing rock in voids in armour layers; and
- placing additional rock at the toe to prevent undermining of channel side armour.

Groyne chainage 0 – head:
- placing rock in voids in armour layers; and
- placing additional rock at the toe to prevent undermining of slope armour.
3.3 ACCESS CHANNEL AND ENTRANCE WAVE MONITORING PROGRAM

This section addresses the 2007 Condition of Concurrence relating to the monitoring of wave conditions in the entrance and access channel.

3.3.1 Requirements

The 2007 Condition of Concurrence states that:

*Shellharbour City Council will monitor wave conditions at the entrance and within the channel and if the wave conditions fail to meet the relevant safety criteria (as defined in section 3 of the Patterson Britton & Partners December 2005 report), Council will be required to carry out appropriate works to the extent necessary to provide wave climate amelioration that meets the agreed criteria. A wave condition monitoring report, as part of the overall monitoring report mentioned in the 1998 concurrence, shall be prepared by a recognised coastal engineering consultant and presented to the Shell Cove Compliance Committee every six months for as long as required to satisfy the Committee. The report is also to be available to the public.*

3.3.2 Monitoring and Compliance Standards

The Council is responsible for wave climate monitoring in the access channel and entrance in order to establish compliance with the design criteria. Monitoring will commence within 3 months of practical completion of the boatharbour and continue for a minimum of 12 months and as long as required by the Shell Cove Compliance Committee.

**Access Channel**

Wave climate monitoring of the access channel shall be undertaken in the region of the so-called ‘B3’ and ‘B4’ locations used to assess wave climate compliance in the 2006 section 96 application (PBP 2005), as shown on **Figure 1**. Monitoring shall consist of continuous or near-continuous measurements of wave height and period suitable for comparison with the specified wave climate criteria. Monitoring shall be performed in a manner which does not interfere with navigation in and out of the boatharbour, such as deployment of a low-profile sea bed mounted pressure sensor or similar.

The compliance standards for wave climate are as specified in the EIS (LFA, 1995) and PBP (2005):

- $H_s$ should not exceed 2m more than once per year; and
- $H_s$ should not exceed 1m more than 5 times per year.

Where $H_s$ is significant wave height and an event is taken to be 4 to 6 hours duration.

**Entrance**

No specific criteria for wave climate were specified in the EIS or PBP (2005), however the EIS noted that avoidance of wave breaking in the entrance was essential for safety and predicted that, for the proposed design at that time (that is the EIS design), waves would break in the entrance 2.5 hours per year on average, which was considered acceptable.
The compliance standard for the final adopted entrance design is that vessels navigating the entrance shall experience a level of safety with respect to wave breaking that is at least equivalent to EIS design.

The monitoring of entrance wave conditions shall involve a number of observation exercises conducted during storms and focused on wave breaking behaviour in the entrance (the area between the heads of the breakwater and groyne). Observations shall be made by a recognised coastal engineer, from the breakwater trunk, for a period of at least 1 hour and shall be videotaped for further analysis. The period of observations shall be extended as required to ensure the influence of tidal level (water depth) is assessed.

Initially, observation exercises shall be triggered by a prediction of 5m or greater significant wave height offshore during daylight hours (approximately 3 month average return interval). The trigger for subsequent exercises may be adjusted based on previous observations with a view to observing 4 storms with a range of magnitudes covering at a range of tidal levels in a year.

Observations shall be analysed to describe in detail the wave breaking behaviour in the entrance and its implications for the safety of vessels navigating the entrance. On the basis of this analysis, thresholds for dangerous entrance conditions shall be developed in terms of forecast offshore wave heights and Port Kembla waverider buoy wave heights. This information shall be posted in prominent locations at the boat ramp and marina.

**Reporting**
A report on the wave climate monitoring prepared by a recognised coastal engineer shall be provided to the Shell Cove Compliance Committee every 6 months. This report shall include, among other things, recommendations in relation to the need for continued monitoring and any works required to ensure compliance with the compliance standards.

### 3.3.3 Corrective Action

In the event that the wave climate is deemed not to meet the specified compliance standards, Council shall carry out works to ameliorate the wave climate to the extent necessary to meet the standards.
3.4 BEACH NOURISHMENT/REHABILITATION MANAGEMENT PLAN – OPERATION PHASE

This section addresses the Conditions of Consent clause 15(d)(xi), the original Conditions of Concurrence clause 3(v) and the further Conditions of Concurrence, second dot point, for the modified development.

3.4.1 Requirements

The Conditions of Consent require a Beach Nourishment/Rehabilitation Management Plan to be prepared in consultation with and to the satisfaction of the Department of Environment and Climate Change (formerly Department of Land and Water Conservation) and state that:

The Beach Nourishment/Rehabilitation Management Plan shall provide detail on:
- the sand fillet to be created along the breakwater;
- the proposed works to the dune system;
- beach access;
- landscaping;
- mitigation measures;
- monitoring;
- triggers for beach nourishment to proceed;
- beach cleaning; and
- beach and surf patrolling.

The Conditions of Consent wording is the same as that of Clause 3(v) of the original Conditions of Concurrence. The wording of the second dot point in the further Conditions of Concurrence for the modified development states that:

- Council will monitor the beaches at the north and south of the entrance of the marina, especially during the period immediately after construction of the entrance structures and undertaking the entrance channel dredging, and undertake the necessary sand nourishment to rectify erosion and recession. Council shall continue to monitor and nourish the beaches until stable well nourished beaches are established. The requirements of this condition shall be incorporated in the draft Beach Nourishment/Rehabilitation Plan which is required to be lodged with the Shell Cove Compliance Committee prior to the commencement of construction of the boat harbour entrance works.

Aspects of the Beach Nourishment/Rehabilitation Management Plan fall into both the Construction and Operational phases of the project. Both the Construction phase and the Operational phase requirements are briefly outlined below for convenience.

Beach Nourishment/Rehabilitation Management Plan (Construction phase)

- the sand fillet to be created along the breakwater;
- the proposed works to the dune system;
- beach access during construction;
landscaping as part of construction;
mitigation measures during construction;
monitoring during construction;
beach cleaning during construction; and
beach and surf patrolling during construction.

Beach Nourishment/Rehabilitation Management Plan (Operation phase)

• beach access;
• landscaping;
• mitigation measures;
• monitoring;
• triggers for beach nourishment to proceed;
• beach cleaning; and
• beach and surf patrolling.

Operational aspects only are addressed in this document. Construction aspects of the project are addressed in the CEMP.

3.4.2 Environmental Impact

Impacts on the beach environment during operation may result from:

• indiscriminate access;
• beach erosion and shoreline recession;
• litter and other gross pollutants;
• beach safety.

3.4.3 Management Strategy and Control Measures

Beach Access
A total of three pedestrian accessways should be provided to Shellharbour South Beach off Boollwarroo Parade adjacent to the Shell Cove development, generally as shown in Figure 4.25 of the EIS. These accessways shall be the board and chain type and comply with the Coastal Dune Management Manual (DLWC, 2001).

The existing level of pedestrian access to Harbour Entrance Beach should be retained.

Landscaping
Landscaping works undertaken within the dune system along Shellharbour South Beach and Harbour Entrance Beach, for example as part of any rehabilitation / restoration following storm damage, shall be generally in accordance with the Coastal Dune Management Manual (DLWC, 2001).

Monitoring
Beach monitoring shall be undertaken to gain further knowledge of beach behaviour and to assist in the design and implementation of beach renourishment activities. Monitoring shall include:
- continuation of beach surveys on Shellharbour South Beach and Harbour Entrance Beach established for monitoring purposes during the construction of the boatharbour, conducted initially at three monthly intervals and following significant beach erosion events. The surveys in the case of the beach profiles shall extend between the seaward edge of the vegetated dune system to nominally -2 m AHD. The interval between surveys may be extended with the prior approval of the Shell Cove Compliance Committee based on a recommendation by a recognised coastal engineer;

- preparation of a report every 12 months for submission to the Shell Cove Compliance Committee, prepared by a recognised coastal engineer that includes:
  - graphical comparison of historical surveys;
  - interpretation of any beach changes over time in the context of natural and anthropogenic influences, including the effects of climate change;
  - photographs of any beach and dune erosion, and recovery, or other features of interest for understanding beach behaviour;
  - a recommendation as to whether beach renourishment should be undertaken and identification of whether the need for renourishment is due to the impacts of the boatharbour development or is due to other factors such as climate change;
  - if renourishment is recommended, proposed details of the quantity of material, source of material, method of placement, location of placement (cross shore and alongshore) and the environmental control requirements during placement;
  - a recommendation as to whether the extent and frequency of monitoring should be varied, having regard to the interpretation of any beach changes over time and the relative influence on beach behaviour of the boatharbour development and other factors.

**Triggers for beach nourishment to proceed**

There is no single trigger for beach renourishment to proceed. The recommendation regarding beach renourishment in the annual report to the Compliance Committee, prepared by a recognised coastal engineer, shall have regard to the following factors:

- trends apparent in a comparison of historical surveys;
- any localised beach readjustments which may be a consequence of the boatharbour entrance works;
- recent storm history and storm history over the period of monitoring record;
- influence of climate change, in particular shoreline recession due to sea level rise;
- available beach width for recreational amenity including any concerns raised by the community;
- likelihood and timing of natural beach recovery in the event that the beach width is depleted.

A quantity 10,000 m³ of sand, recovered from the boatharbour access channel and entrance works and compatible with Shellharbour South Beach and Harbour Entrance Beach, shall be stockpiled for the purpose of possible future beach nourishment on the land platform east of the boatharbour and suitably stabilised. The need for retention of the stockpile shall
be addressed in the annual report to the Shell Cove Compliance Committee prepared by a recognised coastal engineer.

**Beach Cleaning**

Beach cleaning shall continue to be undertaken on a manual basis by Council appointed lifeguards as part of their normal duties and by a purpose built cleaning machine operated by Council on a needs basis for removal of substantial items such as litter and seaweed following major storms.

Waste receptacles shall be positioned near the landward end of beach accessways.

**Beach and surf patrolling**

Council shall continue to appoint lifeguards to patrol Shellharbour South Beach (north of the boatharbour entrance) seven days a week, 9am – 5pm over the six week Christmas holidays and on weekends 9am – 5pm between the end of Christmas holidays through to 20 April. Flags shall continue to be placed on the northern end of the beach which is the area of community focus and the safest location for swimming.

In the case of Harbour Entrance Beach, Council may, subject to annual budget allocation and consistency with other beaches in the local government area:

- patrol the beach;
- declare the beach to be an un-patrolled beach.

The level of patrolling on Shellharbour South Beach and Harbour Entrance Beach shall be subject to annual review having regard to patronage of the beaches, any safety incidents and other relevant factors determined by Council.

### 3.4.4 Monitoring and Compliance Standards

Compliance standards are set out in Table 3.4.

**Table 3.4 Compliance Standards for Beach Nourishment /Rehabilitation**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Compliance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach access</td>
<td>Board and chain type access is provided to Shellharbour South Beach off Boolwarroo Parade adjacent to the Shell Cove development at a total of three locations, complying with the Coastal Dune Management Manual (DLWC, 2001).</td>
</tr>
<tr>
<td>Landscaping</td>
<td>The techniques adopted comply with the Coastal Dune Management Manual (DLWC, 2001).</td>
</tr>
<tr>
<td>Monitoring</td>
<td>All specified monitoring requirements are satisfactorily carried out.</td>
</tr>
<tr>
<td>Triggers for beach nourishment to proceed:</td>
<td>Adoption of the recommendation in the annual report to the Shell Cove Compliance Committee prepared by a recognised coastal engineer and implementation of the renourishment works.</td>
</tr>
</tbody>
</table>

(a) if renourishment is necessary due to the impacts of the boatharbour development.
### Requirement Compliance Standard

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Compliance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) if renourishment is necessary due to other factors such as climate change</td>
<td>Development by Council of a strategy to deal with climate change on a LGA wide basis and implementation of the Council approved strategy for Shellharbour South Beach and Harbour Entrance Beach.</td>
</tr>
<tr>
<td>Beach cleaning</td>
<td>Shellharbour South Beach and Harbour Entrance Beach are clean of litter and other objectionable substances.</td>
</tr>
<tr>
<td>Beach and surf patrolling</td>
<td>An acceptable level of beach safety is maintained.</td>
</tr>
</tbody>
</table>

#### 3.4.5 Corrective Actions

**Beach access**

Should the board and chain accessways to Shellharbour South Beach not comply with the Coastal Dune Management Manual (DLWC, 2001) works shall be undertaken to ensure compliance.

**Landscaping**

Should landscaping activities not comply with the Coastal Dune Management Manual (DLWC, 2001), reshaping and/or revegetation works shall be undertaken to ensure compliance.

**Monitoring**

Should monitoring activities not be undertaken as specified, the monitoring activities shall be revised to ensure compliance.

The recognised coastal engineer may recommend to the Shell Cove Compliance Committee that the monitoring specification be varied. The recommendation must provide supporting reasons. No modification by Council to the monitoring activities can be made without the prior approval of the Compliance Committee.

**Triggers for beach nourishment to proceed**

(a) if renourishment is necessary due to the impacts of the boatharbour development:

If renourishment is not implemented within a reasonable time period (six months) after adoption of a recommendation to this effect by the Compliance Committee, Council must act immediately to undertake the works;

(b) if renourishment is necessary due to other factors such as climate change:

If Council has not developed a strategy to deal with climate change on a LGA wide basis and implemented the strategy within a reasonable time period (12 months) after adoption of a recommendation to this effect by the Compliance Committee, Council must act immediately to do so.
Beach cleaning
Should Shellharbour South Beach and Harbour Entrance Beach exhibit litter and other objectionable substances Council shall arrange for beach cleaning by manual means or by a purpose built beach cleaning machine as appropriate.

Beach and surf patrolling
Should the level of safety on Shellharbour South Beach and/or Harbour Entrance Beach become a concern within the community or to the Council appointed lifeguards, Council shall consider increasing the level of patrolling on these beaches.
3.5 REQUIREMENTS FOR MARINA PLAN OF MANAGEMENT

As outlined in Section 2, the Marina Operator shall prepare a Marina Plan of Management (MPM) in accordance with this OEMP, the Conditions of Consent, the Conditions of Concurrence, the Conditions of the Contract and all relevant legislation, regulations and guidelines. The MPM should include at least the following elements:

1. statutory obligations, regulatory/legislative requirements;
2. register of licences and permits;
3. policies and procedures for operation of the marina;
4. emergency response management;
5. training;
6. records;
7. reporting; and
8. environmental management audit process.

The following Sections outline in detail the MPM requirements. A conceptual Marina Plan of Management focused on policies and procedures for the safe and environmentally responsible operation of the marina is given in Appendix D.

3.5.1 Statutory and Legislative Obligations

During the operation of the marina, the Marina Operator shall comply with all applicable environmental regulatory and legislative requirements. The Marina Operator shall identify in the MPM all general, legal and other requirements for this project as follows:

3.5.2 Register of Licences and Permits

In operation of the marina, the Marina Operator shall comply with all required approvals. The Marina Operator shall maintain a register of all required permits and licences, including, as required, information on:

- regulatory authority;
- licence/permit reference;
- purpose;
- licence holder; and
- expiry/renewal date.

3.5.3 Policies and Procedures

The MPM shall include all policies and procedures for the safe and environmentally responsible operation of all aspects of the marina including:

- training and induction of staff and marina users;
- safety;
- fire prevention;
- navigation;
- antifouling;
• hull cleaning;
• solid waste;
• liquid waste;
• hazard management;
• water quality;
• fuelling operations;
• noise and general amenity;
• storms;
• medical emergencies;
• insurance;
• foreign vessels;
• boat lift operations;
• vessel maintenance hardstand;
• car parking; and
• marina maintenance.

3.5.4 Emergency Response Management

An emergency response plan shall be developed and implemented by the Marina Operator as part of the MPM. The procedures in the emergency response plan shall be designed to ensure the safety of all personnel and marina users and to minimise the impact of any significant pollutant release to the environment. In preparing this plan, the Marina Operator shall undertake an assessment of emergency scenarios, the procedures to be followed by site personnel and the training of site personnel in emergency response techniques.

The emergency scenarios considered shall include but not be limited to:

• spill or leakage of chemicals, fuel or wastewater of unacceptable quality;
• collision and or sinking of a vessel within the harbour;
• medical emergencies;
• fire either on marina facilities or onboard a vessel; and
• coastal storm event threatening marina infrastructure or berthed vessels.

Material and equipment to be used by the Marina Operator for emergency response must be present, in an operational state and in sufficient quantities at all times to ensure that all likely contingencies can be properly managed immediately.

A procedure shall be developed for the rapid notification of the NSW Fire Brigades HAZMAT section, or other emergency services, where the Marina Operator is not able to adequately respond to an emergency.

In the event of a spill or pollution release the EPA shall be informed.
After the event, the Marina Operator shall provide the Council with a full report on the incident including rectification plan to repair damage and an action plan to prevent any avoidable reoccurrence.

3.5.5 Training

The Marina Operator shall ensure that all staff required to implement the MPM are properly trained in the procedures required by the MPM.

3.5.6 Records

The Marina Operator shall establish, document and maintain a quality system based on the international standard ISO 9001 as a means of ensuring that compliance is achieved with the MPM and statutory/legislative requirements. In addition, The Marina Operator shall keep records of staff training, environmental and safety incidents and internal auditing of the environmental management system.

3.5.7 Auditing

The Marina Operator shall conduct annual internal audits of their environmental management system to ensure that the requirements of this OEMP, the MPM and relevant licences and permits are being adhered to. Results of the internal audits are to be provided to the Council annually.

The Council will also arrange for external auditing of the Marina Operator’s environmental performance.

Details of the Marina Operator’s auditing procedures, including a forward schedule of environmental audits, shall be included in the MPM.
4 MONITORING PROGRAM

This section addresses the Conditions of Consent clause 15(d)(viii) and Condition of Concurrence clause 3.(iv).

4.1 MONITORING PROGRAM REQUIREMENTS

Conditions of Consent clause 15(d)(viii) and Condition of Concurrence clause 3.(iv) state that:

The [Monitoring] Program shall include a compilation of the monitoring programs identified in the abovementioned Plans, set out in report format and specifying:

- compliance standards;
- timetabling;
- method of testing and monitoring;
- contingency plans; and
- quality assessment program.

A monitoring report shall be presented to the Shell Cove Compliance Committee every 6 months and shall be publicly available.
### 4.2 MONITORING PROGRAM OUTLINE

#### Table 4.1 Water Quality and Environment Management Plan

<table>
<thead>
<tr>
<th>Monitoring Program</th>
<th>Method</th>
<th>Compliance Standard</th>
<th>Trigger Value</th>
<th>Location</th>
<th>Monitoring Period</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Contingency Plans / Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension of pre-construction marine water quality monitoring</td>
<td>refer management plan Section 3.1</td>
<td>Nutrients in boatharbour: no occurrence of algal blooms</td>
<td>Nutrients in boatharbour: TN: 300 µg/L, TP: 30 µg/L</td>
<td>sites within Bass Point Embayment and boatharbour, refer Figures 1 and 3</td>
<td>from practical completion for as long as required by SCCC.</td>
<td>6 months</td>
<td>Council</td>
<td>• repeat and additional sampling&lt;br&gt;• review marine environment data (water quality, biological, colonisation and bioaccumulation) and report to SCCC on compliance standards&lt;br&gt;• investigate source of pollution&lt;br&gt;• take steps to reduce pollution load&lt;br&gt;• take steps to reduce impact on aquatic ecosystem</td>
</tr>
<tr>
<td>Extension of pre-construction Biological monitoring</td>
<td>refer management plan Section 3.1</td>
<td>Copper in boatharbour: development of an aquatic ecosystem with similar biodiversity and species abundance as similar Illawarra harbours</td>
<td>Copper in boatharbour: 3 µg/L&lt;br&gt;Copper outside entrance: 1.3 µg/L</td>
<td>sites within Bass Point Embayment refer Figure 3</td>
<td>from practical completion for as long as required by SCCC</td>
<td>6 months</td>
<td>Council</td>
<td></td>
</tr>
<tr>
<td>Boatharbour colonisation monitoring</td>
<td>refer management plan Section 3.1</td>
<td>Copper, outside entrance: no significant impact from operation detected</td>
<td></td>
<td>sites within boatharbour and reference sites refer Figure 1</td>
<td>from practical completion for as long as required by SCCC</td>
<td>6 months</td>
<td>Council</td>
<td></td>
</tr>
<tr>
<td>Boatharbour bioaccumulation monitoring</td>
<td>refer management plan Section 3.1</td>
<td></td>
<td></td>
<td>sites within boatharbour and reef refer Figure 1</td>
<td>beginning within 6 months of commencement of marina operations and continuing for as long as required by SCCC</td>
<td>6 months</td>
<td>Council</td>
<td></td>
</tr>
</tbody>
</table>

Notes: ‘SCCC’ is the Shell Cove Compliance Committee.

Trigger values for copper are specified in terms of labile (bioavailable copper) but total copper may be used to demonstrate compliance.
Table 4.2  Breakwater Structures Maintenance Plan

<table>
<thead>
<tr>
<th>Monitoring Program</th>
<th>Method</th>
<th>Compliance Standard/ Trigger Value</th>
<th>Location</th>
<th>Monitoring Period</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Contingency Plans / Corrective Action</th>
</tr>
</thead>
</table>
| Settlement         | survey, refer management plan Section 3.2 | • maintain roadway functionality  
• maintain armour integrity  
• maintain overtopping performance  
refer Table 3.2 | Breakwater and Groyne refer Table 3.2 | 5 years from practical completion | one year, two years and 5 years after practical completion, and as required by SCCC | Council | • repair and re-levelling of roadway slabs  
• reinstating crest level by placing additional armour on crest  
• placing rock in voids in armour layer  
• placing additional rock at the toe to prevent undermining of armour layer |
| Storm damage       | inspection and survey, refer management plan Section 3.2 | maintain armour layer integrity – refer Table 3.3 | Breakwater and Groyne refer Table 3.3 | ongoing | when the significant wave height at the Port Kembla waverider exceeds 6m for 6 hours of 7m for 1 hour | Council | • reshaping of berm using in situ rock or placing of extra rock on the berm  
• placing rock in voids in armour layers  
• placing additional rock at the toe to prevent undermining of channel side armour |

Notes: ‘SCCC’ is the Shell Cove Compliance Committee.
### Table 4.3  Access Channel and Entrance Wave Monitoring Program

<table>
<thead>
<tr>
<th>Monitoring Program</th>
<th>Method</th>
<th>Compliance Standard/ Trigger Value</th>
<th>Location</th>
<th>Monitoring Period</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Contingency Plans / Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access channel wave climate</td>
<td>refer management plan Section 3.3</td>
<td>Hs should not exceed 1m more than 5 times per year or 2m more than once per year</td>
<td>B3-B4 region</td>
<td>within 3 months of practical completion for as long as required by SCCC</td>
<td>continuous, or near continuous</td>
<td>Council</td>
<td>• works to ameliorate wave climate to the extent necessary to meet the compliance standard</td>
</tr>
<tr>
<td>Entrance wave climate</td>
<td>refer management plan Section 3.3</td>
<td>wave breaking performance equivalent to EIS design</td>
<td>region between the heads of the breakwater and groyne</td>
<td>from practical completion for as long as required by SCCC</td>
<td>4 storm events per year</td>
<td>Council</td>
<td>• works to ameliorate wave climate to the extent necessary to meet the compliance standard</td>
</tr>
</tbody>
</table>

### Table 4.4  Beach Nourishment/Rehabilitation Management Plan

<table>
<thead>
<tr>
<th>Monitoring Program</th>
<th>Method</th>
<th>Compliance Standard/ Trigger Value</th>
<th>Location</th>
<th>Monitoring Period</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Contingency Plans / Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach Nourishment</td>
<td>beach surveys refer management plan Section 3.4</td>
<td>there is no single trigger for beach nourishment to proceed, refer management plan Section 3.4</td>
<td>representative locations alongshore and shall extend between the seaward edge of the vegetated dune system to nominally -2 m AHD</td>
<td>from practical completion for as long as required by SCCC</td>
<td>surveys conducted initially at 3 monthly intervals and following significant beach erosion events</td>
<td>Council</td>
<td>• renourish beach if impacts due to boatharbour are identified</td>
</tr>
</tbody>
</table>
4.3 REPORTING

All monitoring results shall be included in a six-monthly monitoring report to the Shell Cove Compliance Committee.

Monitoring results shall also be reported to the EPA as required by the EPL.
5  AUDITING PROGRAM

This section addresses the Conditions of Consent clause 15(d)(xii) and Condition of Concurrence clause 3.(vi).

5.1 REQUIREMENTS

Conditions of Consent clause 15(d)(xii) and Condition of Concurrence clause 3.(vi) state that the Auditing Program:

Shall provide details about:
• a program for the auditing of the construction and operation of the development;
• the use of an independent auditor; and
• report on whether works are being undertaken in accordance with all requirements.

5.2 MARINA OPERATOR INTERNAL ENVIRONMENTAL AUDITS

The Marina Operator shall conduct annual internal audits of their environmental management system to ensure that the requirements of this OEMP, the MPM and relevant licences and permits are being adhered to. The environmental audit program shall cover the activities of the Marina Operator, it’s consultants and sub-contractors. Results of the internal audits are to be provided to the Council annually. These audits shall assess compliance in terms of:

• regulations and licence conditions;
• monitoring and operational reports required by licences;
• environmental procedures;
• environmental training records; and
• environmental incidents recorded and acted on.

Details of the Marina Operator’s auditing procedures, including a forward schedule of environmental audits, shall be included in the MPM.

5.3 EXTERNAL ENVIRONMENTAL AUDITS

The Council shall organise for a full environmental audit of the entire site and all operational activities, including the marina, to be conducted by an independent environmental management auditor to verify compliance with this OEMP and the MPM at 2 years from practical completion of the boatharbour. The Audit shall be attended by representatives of the Council and Marina Operator. Further external audits shall be carried out if required by the Shell Cove Compliance Committee.
An Audit Report describing the results of the audit shall be prepared and submitted to the Council and Shell Cove Compliance Committee within 10 working days of completion of the audit. Non-conformances shall be described and corrective actions recommended with identified dates for completion.

5.4 CORRECTIVE ACTION

The Council and the Marina Operator shall implement the corrective actions recommended in the time specified and notify the Shell Cove Compliance Committee of the completion of the corrective actions.

The external auditors shall verify the satisfactory implementation of the corrective actions and sign off on the corrective actions or request further work to implement the corrective action if necessary.
6 REFERENCES

LFA (aust) (1995)
Environmental Impact Statement – Shell Cove Boatharbour/Marina, Shadforth Wetland, Haul Road Landfill, prepared for Walker Corporation and Shellharbour City Council, June 1995

Patterson Britton & Partners (2007)
Shell Cove Boatharbour Construction Environmental Management Plan, prepared for Australand Holdings Limited, 2006

Patterson Britton & Partners (2005)
Shell Cove Boatharbour - Section 96 Modification of Consent 95/133 – Support Information, prepared for Australand Holdings Limited, December 2005

ANZECC/ARMCANZ (2000)
Australian and New Zealand Guidelines for Fresh and Marine Water Quality
FIGURE 3

MARINE WATER QUALITY AND BIOLOGICAL MONITORING SITES IN THE BASS POINT EMBAYMENT
BREAKWATER CROSS SECTION B - Chainage 415

BREAKWATER CROSS SECTION F - Chainage 200

BREAKWATER CROSS SECTIONS AND RESHAPING ENVELOPE
APPENDIX A
CONDITIONS OF CONSENT
Shell Cove Boatharbour
Consolidated (for reading only)
2006 Conditions of consent:

SCHEDULE 1

Development Consent granted by the Minister for Urban Affairs and Planning on 26 November 1996 to a Development Application made by Shellharbour City Council for the construction of a 350 berth boatharbour/marina at South Shellharbour Beach, enhancing and enlarging a wetland at Shadforth, and the placement of treated contaminated landfill in engineered cells adjacent to a realigned quarry road, as modified on 9 November 2001, 6 September 2004 and 31 October 2006.

SCHEDULE 2

CONDITIONS

Form of Development

1. The development shall be carried out generally in accordance with:
   (a) the Environmental Impact Statement (EIS) dated June 1995 prepared by LFA (Aust) Pty Limited certified by Alf Lester in accordance with section 77(3) of the Environmental Planning and Assessment Act 1979;
   (b) the Applicant's submissions to the Commission of Inquiry (including its answers to questions);
   (c) the modification application made by Shellharbour City Council on 7 June 2001, the accompanying Statement of Environmental Effects (SEE) prepared by LFA (Pacific) Pty Limited dated May 2001 and the Supplementary Report "Assessment of Environmental Noise Impact of Quarry Haul Road" prepared by Acoustic Logic Consultancy Pty Ltd dated 4 June 2001; and
   (d) the modification application made by Shellharbour City Council on 8 December 2003 with the accompanying Statement of Environmental Effects (SEE) prepared by LFA (Pacific) Pty Limited dated November 2003,
   (e) the modification application made by Shellharbour City Council on 22 December 2005 with the accompanying Statement of Environmental Effects (SEE) prepared by LFA (Pacific) Pty Limited dated December 2005,
   except where conflicted by the following conditions, in which case the following conditions shall apply.
Shadforth Management

2. (a) A Shadforth Management Committee is to be established by the Applicant who will meet the reasonable costs, which shall include administration and publication costs, incurred by the Committee. The Committee shall:

(i) oversee and advise on the Shadforth pilot study referred to in (ii) below;
(ii) oversee and advise on:
   (1) the detailed design; and
   (2) the preparation of a Management Plan;
   for the Shadforth/Tongarra Creek Wetland system. These are to be prepared by the Applicant, in consultation with other relevant agencies, for approval by the Director General of the Department of Urban Affairs and Planning;
(iii) include representatives of the Department of Urban Affairs and Planning (DUAP) (Chair), the Environment Protection Authority (EPA), the Department of Land and Water Conservation (DLWC), NSW Fisheries, Sydney Water, Shellharbour Council, one community representative and one Aboriginal representative; and
(iv) disband twelve (12) months after the practical completion of the Shadforth/Tongarra Creek Wetland, unless otherwise directed by the Director General of the DUAP.

In this condition ‘practical completion’ means finalisation of the civil works and the planting of relevant landscaping as required in the Management Plan for the Shadforth/Tongarra Wetland system.

(b) The pilot study shall be carried out in accordance with a pilot study program to be prepared by the Applicant and approved by the Director General of the DUAP or her nominee on the advice of the Shadforth Management Committee. The pilot program shall include the following:

- transplanting of seagrasses and saltmarsh;
- creation of saltmarsh habitat;
- comparisons of Shadforth Wetland and Shellharbour swamp to include relationships/associations between communities/habitats;
- the criteria against which the pilot is to be judged;
- monitoring and reporting requirements;
- contingency measures if the pilot study fails; and
- impacts of sewage surcharge.

Prior Construction of Shadforth
3. The Shadforth Wetland shall be constructed to the satisfaction of the Director General of the DUAP in consultation with the Shadforth Management Committee. Twelve (12) months after the practical completion of the wetland, the Applicant may, with the approval of the Director General of DUAP, commence work on the construction of the boatharbour/marina. The extraction of waste material (in accordance with the approved EMP required in condition 15(a)) from Shellharbour Swamp and its emplacement in the new single landfill cell may be commenced at any time and need not be deferred until practical completion of the wetland, subject to meeting the requirements of this consent applicable prior to the commencement of these works.

Community Liaison Officer

4. The Applicant shall appoint and keep retained at its cost an appropriately qualified community liaison officer to function as the primary contact point for public enquiries and concerns and to be responsible for advising the public of progress and particular events during the construction period. In addition, a 24 hour telephone service shall be established to enable this function when the officer is unavailable. This officer shall be a representative on the Shadforth Management Committee and Shell Cove Compliance Committee.

Shell Cove Compliance Committee

5. (a) A Shell Cove Compliance Committee shall be established by the Director General of the DUAP or her nominee, comprising representatives of the DUAP (Chair), EPA, DLWC, one local community representative, one Aboriginal community representative, the Community Liaison Officer and a Council technical officer.

(b) The Applicant shall be responsible for the reasonable costs, which shall include administration and publication costs incurred by the Committee.

(c) The Committee shall report to the Minister for Urban Affairs and Planning on a six monthly basis on compliance with these conditions of consent, and that report shall be publicly available from the Department of Urban Affairs and Planning and Shellharbour Council.

Bank Guarantee

6. (a) The applicant shall lodge a bank guarantee with the Minister for Urban Affairs and Planning, prior to commencing any works, to ensure the establishment of Shadforth Wetland. The purpose of the bank guarantee is to indemnify the Minister for Urban Affairs and Planning against the cost of implementing any works to remedy default in the carrying out of any works or any remedial measures directed by the Minister for Urban Affairs and Planning in order to establish Shadforth Wetland in accordance with this development consent. The bank guarantee shall be in the amount of $1 million. The bank guarantee shall be released by the Minister for Urban Affairs and Planning, on the advice of the Director General of DUAP, as follows:-

(i) 50% of the amount upon practical completion of the Shadforth Wetland; and
(ii) the remaining 50% of the amount upon the expiration of 12 months after practical completion of the Shadforth Wetland.

(b) The applicant shall lodge a bank guarantee with the Minister for Urban Affairs and Planning, prior to commencing construction of the boatharbour, to ensure acceptable water quality resulting from the excavation and reburial of acid sulphate soil at the boatharbour. The guarantee is to indemnify the Minister against the cost of implementing any works required to remedy default in the carrying out of the excavation and re-burial of acid sulphate soils or any remedial works directed by the Minister relating to the excavation and reburial of acid sulphate soils at the boatharbour to ensure acceptable water quality. The bank guarantee shall be in the amount of $1 million. The bank guarantee shall be released by the Minister, on the advice of the Shell Cove Compliance Committee as follows:

(i) 50% of the amount upon practical completion of the excavation and re-burial of acid sulphate soils at the boatharbour site; and

(ii) the remaining 50% of the amount upon the expiration of six (6) months after practical completion of the excavation and reburial of acid sulphate soils at the boatharbour site.

In this condition, "acceptable water quality" means water quality which meets the compliance standards contained in the Acid Sulphate Soil Management Plan referred to in condition 15(d)(iv)."

Hours of Construction

7. Work shall be confined to the normal working hours, namely 7.00am to 5.00pm Mondays to Fridays and 7.00am to 1.00pm Saturdays. No work shall take place on Sundays or Public Holidays. These hours may be varied with the prior written consent of the Environment Protection Authority.

Release of Water from the Site

8. The applicant shall gain approval from the EPA to release any water from the site during the construction.

Construction in Accordance with Environmental Management Plans and Conditions of Consent

9. The Applicant shall ensure that all contractors working on the site shall be made fully aware of the relevant conditions of consent and approved environmental management plans, and shall carry out relevant works accordingly.

Boatharbour Capping
10. A 10cm thick cover of protective clean sand is to be placed over the bottom of the completed boatharbour.

**Corrosion**

11. All structures vulnerable to corrosion are to be given special protective coatings against localised acid generation.

**Navigational Aids**

13. All structures and channels are to be marked with suitable navigational aids, including lighting and signage, installed and maintained by the Applicant to the satisfaction of NSW Waterways Authority.

**Aboriginal Relics**

14.(a) The Applicant shall protect all portions of the Shellharbour Aboriginal midden site identified as being of relatively high archaeological value in Figure 20 of Appendix 6 of the EIS in accordance with the Archaeological and Heritage Protection Plan prepared in accordance with this consent.

**Environmental Management Plan (EMP)s**

15 (a) An Environmental Management Plan (EMP) shall be prepared for each of the four components: the boatharbour, Shadforth/Tonganra Creek Wetland System, the acoustic barriers adjacent to the Quarry Haul Road, and the extraction of waste material from Shellharbour Swamp and its emplacement in the single landfill cell. The EMPs for the boatharbour, extraction of waste from Shellharbour Swamp and construction of the landfill cell, and the construction of acoustic barriers adjacent to the Quarry Haul Road shall be prepared by the Applicant for approval by the Director General of DIPNR, in consultation with the Shell Cove Compliance Committee. The EMP for the Shadforth/Tonganra Creek Wetland System shall be prepared by the Applicant, for approval by the Director General of DIPNR, in consultation with the Shell Cove Compliance Committee and the Shadforth Management Committee.

(b) An Environmental Management Plan for each of the four components shall be approved before construction of each respective component.

(c) All works shall be undertaken in accordance with each respective Environmental Management Plan for the boat harbour, the Shadforth/Tonganra Creek wetland system, the acoustic barriers adjacent to the quarry haul road and the extraction of waste material from Shellharbour Swamp and its emplacement in the single landfill cell components of the proposed development.

(d) Each of the environment management plans shall contain the following relevant elements:
(i) An Air Quality Management Plan to be prepared by the applicant in consultation with the EPA. The Plan shall provide details about:

- dust and air emissions resulting from earthworks operations;
- potential sources of air pollution;
- management systems to monitor and control pollution;
- compliance standards;
- mitigation measures;
- remedial action; and
- monitoring

(ii) A Water Quality Management Plan to be prepared by the applicant in consultation with the EPA and DLWC. The plan shall provide details relative to:

- compliance standards;
- remedial action;
- mitigation measures;
- monitoring and testing programs for water quality, groundwater, and indicators such as the colonisation of sediments and structures associated with the development;
- contingency measures to improve water quality should monitoring and testing programs show water quality does not satisfy relevant water quality guidelines or standards;
- downstream impacts associated with this development;
- biological monitoring;
- the proposed drainage system and stormwater treatment measures;
- criteria for the use of the flushing pump (if it is required as a contingency measure); and
- measures to prevent draw-down from adversely impacting on actual/potential acid sulphate soil.

(iii) An Erosion and Sediment Control Plan to be prepared by the Applicant in consultation with the DLWC and any controls shall be installed prior to the commencement of any earthworks.

(iv) An Acid Sulphate Soil Management Plan to be prepared by the Applicant in consultation with the EPA and DLWC. It shall provide details about:

- procedures during construction;
- mitigation measures;
- remedial measures;
- monitoring and testing program;
- contingency plans including the amount of neutralising agent to be stored on the site at any given time; and
- reporting requirements in the event of results not meeting standards.

(v) A Noise Management Plan to be prepared by the applicant in consultation with the EPA and shall provide details about:
- compliance standards;
- steps to be taken to minimise noise including muffling and acoustically baffling all plant and equipment;
- mitigation measures; and
- on-going monitoring and reporting procedures during construction.

(v1) The Applicant shall undertake compliance noise monitoring within one month of completion of each stage of construction of the acoustic barriers along the Quarry Haul Road.

(v2) The compliance noise monitoring required by Condition (v1) shall identify the 40 dB(A) $L_{eq}$ and 45 dB(A) $L_{eq}$ noise contours generated by quarry traffic on the Quarry Haul Road measured on the residential side of the acoustic barriers. The acoustic report identifying the above noise contours shall be submitted to the Director-General prior to construction of residences within the areas defined by the above noise contours.

(v3) No land is to be sold by the Applicant between the currently mapped 45 dB(A) $L_{eq}$ (without the acoustic barriers) noise contour and the Quarry Haul Road until the relevant stage of construction of the acoustic barriers is completed.

(v4) The Applicant shall apply restrictions on the title of residential lots adjacent to the Quarry Haul Road that fall within the 40 dB(A) $L_{eq}$ and the 45 dB(A) $L_{eq}$ noise contours following the completion of the relevant stage of the acoustic barriers. The restrictions on title will require that any dwelling constructed on the affected residential lots shall be required to install acoustic treatment to ensure that noise levels within residences adjacent to the Quarry haul Road do not exceed 40 dB(A) $L_{eq}$.

(v5) The restrictions on title are to note that the identified lots that fall within the 40 dB(A) $L_{eq}$ and 45 dB(A) $L_{eq}$ noise contours are exposed to noise emanating from the Quarry Haul Road.

(v6) The Applicant shall maintain the acoustic barriers to ensure that they continue to comply with the identified EPA noise criteria set out in Condition 15 (d) (v4) and the relevant building codes and standards.

(v7) The Applicant shall undertake noise monitoring within the Killalea State Park adjacent to Killalea Lagoon following completion of construction of the acoustic barriers and report the results within the Noise Management Plan (Condition 15 (d) (v)).

(vi) An Archaeological and Heritage Protection Plan to be prepared by the Applicant in consultation with the local Aboriginal community and NPWS and shall include details relative to:
- maintenance;
- management;
- monitoring; and
- remedial measures.

(vii) A Construction Program to be prepared by the Applicant in consultation with the Director General of the Department of Urban Affairs and Planning or her nominee and it shall provide details relative to:

- timetabling, in particular, the date of completion of construction of stages of the acoustic barriers along the Quarry Haul Road is to be notified to the Director-General within two weeks of the completion of construction of each stage;
- flora and fauna protection;
- marine environment protection;
- compliance standards;
- mitigation measures;
- steps to be taken to prevent accidental kills of endangered fauna (notably Green and Golden Bell Frogs);
- monitoring;
- remedial action;
- restoration and landscaping;
- emergency procedures;
- traffic management and route selection; and
- site familiarisation program.

(viii) A Monitoring Program to be prepared by the Applicant in consultation with the Director General of the Department of Urban Affairs and Planning or her nominee. The Program shall include a compilation of the monitoring programs identified in the abovementioned plans, set out in a report format and specifying:

- compliance standards;
- timetabling;
- method of testing and monitoring;
- contingency plans; and
- quality assessment program

A monitoring report shall be presented to the Shell Cove Compliance Committee every six months and shall be publicly available.

(ix) A Landscaping Plan to be prepared by the Applicant in consultation with the Director General of the Department of Urban Affairs and Planning and the Director General of the NPWS or their nominees regarding the landscaping plan for the quarry haul road acoustic barriers. The landscaping plan shall provide details about:

- landscaping details for the haul road and its relationship to the protected flora; and
- consultation with NPWS regarding the plant species of high conservation value near the quarry haul road.
(x) A Conceptual Marina Plan of Management to be prepared by the Applicant. It shall include principles for the operation of the marina in an environmentally responsible way.

(xi) A Beach Nourishment/Rehabilitation Plan to be prepared by the Applicant in consultation with the Director General of the Department of Land and Water Conservation or his nominee. It shall provide details about:

- the sand fillet to be created along the breakwater;
- the proposed works to the dune system;
- beach access;
- landscaping;
- mitigation measures;
- monitoring;
- triggers for beach nourishment to proceed;
- beach cleaning; and
- beach and surf patrolling.

(xii) An Auditing Program to be prepared by the applicant in consultation with the Shell Cove Compliance Committee and the Shadforth Management Committee. It shall provide details about:

- a program for the auditing of the construction and operation of the development;
- the use of an independent auditor; and
- report on whether works are being undertaken in accordance with all requirements.

(e) The plans identified in this condition may be updated or amended prior to or during the course of construction subject to the approval of the Director General of the Department of Urban Affairs and Planning.

External bund walls

16. (a) Prior to the construction of the boatharbour, a bund shall be erected around the boatharbour construction site to control runoff and noise. The bund must not contain acid sulphate soil and dust from the bund must be controlled.

(b) The bund shall be planted with grass or equivalent soil stabiliser agents to prevent erosion during storm events.

(c) All material used in the construction of external bund walls must maintain a pH of greater than 5.5.

Operation of marina

17. Boats shall not be moored at the harbour until essential services (i.e. power, water, sewerage facilities) are established.

Re-burial of Acid Sulphate Soils
18. All excavated actual and potential acid sulphate soils are to be re-buried beneath RL-1.0 metres AHD or disposed at a DEC licensed landfill site.

**Condition 19.**

The acoustic barriers to the Quarry haul Road shall be constructed to include the following aesthetic treatments:

a. A textured treatment shall be included in the acoustic barriers to the Quarry Haul Road to minimise the starkness of the concrete panels facing the residential areas;

b. Landscaping shall be undertaken adjacent to the acoustic barriers for a distance of 100m from the intersection of the Quarry Haul Road with Shellharbour Road to minimise visual impacts;

c. Landscaping shall be undertaken along the southern boundary of the Quarry Haul Road in areas where no acoustic barriers are proposed to minimise visual impacts from Killealea State Park; and

d. Landscaping areas shall be appropriately maintained for a period of six months or until establishment of the landscape.
Minister for Land and Water Conservation
Determination of Proposed Entrance, Breakwater and Groynes to the
Proposed Boatharbour and Marina at Shell Cove

Under Section 41 of the Coastal Protection Act, 1979, and pursuant to the Coastal Protection (Non-Local Government Areas) Regulation 1994, I the Minister for Land and Water Conservation determine the activity referred to below in Schedule 1 by granting concurrence to the activity subject to the conditions and reasons therefore set out in Schedule 2.

The approval conditions will mitigate against any potential adverse environmental impacts that the activity may have.

In making this determination I have:

1. taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of this activity, specifically including matters relating to the development and its impact on the coastal zone as required under section 44 of the Coastal Protection Act, 1979.

This has been done as evidenced by the Clause 91 report.

2. considered the effect of the activity on:-

   i. any conservation agreement entered into under the National Parks and Wildlife Act 1974 (NPWA) and applying to the whole or part of the land to which the activity relates.

   No such conservation agreement exists.

   ii. any plan of management adopted under the NPWA for the conservation area to which the agreement relates.

   There is no such plan of management.

   iii. any joint management agreement entered into under the Threatened Species Conservation Act 1995.

   There is no such joint management agreement.

3. considered the effect of the activity on any wilderness area (within the meaning of the Wilderness Act 1987) in the locality in which the activity is intended to be carried on.

   There is no wilderness area in the locality.

4. considered the effect of the activity on:
i. critical habitat.

Critical habitat has not as yet been defined for the species found in the vicinity of the proposed development listed as endangered or threatened under the Threatened Species Conservation Act, 1995, or listed as protected under the Fisheries Management Act, 1994.

ii. populations and ecological communities of threatened species, their habitats and whether there is likely to be a significant effect on those species, populations or ecological communities, or those habitats.

This has been investigated and, given the scale of change caused by the activity, there will be nil or negligible impact on these species.

iii. any other protected fauna or protected native plants within the meaning of the National Parks and Wildlife Act 1974.

Six marine mammals, the leathery turtle and six coastal birds on the Schedule 12 lists of the National Parks and Wildlife Service occur in the area. However, all use these waters as part of far greater habitats or ranges, most of them moving through the area seasonally or infrequently. Given the scale of change caused by the activity in relation to the habitat ranges of the above fauna species it is considered there will be nil or negligible impact on these fauna.

HON RICHARD AMERY
MINISTER FOR AGRICULTURE
MINISTER FOR LAND AND WATER CONSERVATION

Date: 19 MAR 1998
SCHEDULE 1

APPLICANT: Shellharbour City Council

ACTIVITY: The carrying out of work in, on, over or under land involving the construction of a breakwater, two (2) groynes, dredging and beach nourishment.

LAND: Land below low water mark including land that is currently Crown Land.

NOTE: This approval becomes effective from the date of notification to the proponent.
SCHEDULE 2

Conditions of Approval

1. The development shall take place in accordance with the proposals set out in the EIS dated June 1995, the Applicant's submissions to the Commission of Inquiry (including their answers to questions), and as may be modified by the conditions of this consent and specifically:

   i. the applicant shall ensure that all contractors working on the site are made fully aware of the relevant approval conditions and approved environmental management plans, and carry out relevant works accordingly;

2. No activities are to take place until:-

   i. all other necessary approvals from relevant government authorities have been obtained for activities associated with the breakwater, groyne and dredging, including that for the release of water from the boatharbour entrance during construction;

   ii. detailed construction drawings and a construction schedule in respect to development below low water mark have been approved by the Director General or nominee of the Department of Land and Water Conservation;

   iii. a bank guarantee has been lodged with the Minister for Land and Water Conservation. The guarantee is to indemnify the Minister against the cost of implementing any works required to remedy default in the carrying out of the construction of the breakwater and groynes or any remedial works directed by the Minister relating to the breakwater and groynes. The bank guarantee shall be in the amount of $1 million.

       The bank guarantee shall be released by the Minister, on the advice of the Shell Cove Compliance Committee as follows:

       (i) 50% of the amount upon practical completion of the entrance breakwater and groynes; and

       (ii) the remaining 50% of the amount upon the expiration of six (6) months after practical completion of the construction of the breakwater and groynes;

   iv. In the event that Shellharbour City Council acquires the subject land under the Land Acquisition (Just Terms Compensation) Act, 1991, then the Minister for Local Government shall replace the Minister for Land and Water Conservation in clause 2 (iii)
3. An Environmental Management Plan shall be prepared for the boatharbour entrance works by the applicant in consultation with and to the satisfaction of the Shell Cove Compliance Committee and the Department of Land and Water Conservation prior to construction starting. The Environmental Management Plan shall include:

i. an Acid Sulphate Soil Management Plan prepared by the Applicant in consultation with and to the satisfaction of the Environment Protection Authority and the Department of Land and Water Conservation. It shall provide details about:

- procedures during construction;
- mitigation measures;
- remedial measures;
- monitoring and testing program;
- contingency plans including the amount of neutralising agent to be stored on the site at any given time; and
- reporting requirements in the event of results not meeting standards;

ii. a Construction Program prepared by the Applicant in consultation with and to the satisfaction of the Department of Land and Water Conservation and it shall provide details relative to:

- timetabling;
- flora and fauna protection;
- marine environment protection;
- compliance standards;
- mitigation measures;
- steps to be taken to prevent accidental kills of endangered fauna;
- monitoring,
- remedial action,
- restoration and landscaping,
- emergency procedures,
- traffic management and route selection, and
- site familiarisation program;

iii. a Marine Environment Management Plan prepared by the Applicant in consultation with and to the satisfaction of New South Wales Fisheries and the National Parks and Wildlife Service. The plan shall provide details about:

- compliance standards;
- remedial actions which will include contingency planning;
- mitigation measures;
- monitoring program;
The plan is to be based on the marine and water quality monitoring program outlined in Appendix 11 of the EIS and as modified by the Commission of Inquiry.

iv. a Monitoring Program prepared by the Applicant in consultation with and to the satisfaction of the Department of Land and Water Conservation. The Program shall include a compilation of the monitoring programs identified in the above mentioned plans, set out in a report format and specifying:

- compliance standards;
- timetabling;
- method of testing and monitoring;
- contingency plans; and
- quality assessment program.

A monitoring report shall be presented to the Shell Cove Compliance Committee every six months and shall be publicly available;

v. a Beach Nourishment/Rehabilitation Plan prepared by the Applicant in consultation with and to the satisfaction of the Department of Land and Water Conservation. It shall provide details about:

- the sand fillet to be created along the breakwater,
- the proposed works to the dune system;
- beach access,
- landscaping,
- mitigation measures;
- monitoring,
- triggers for beach nourishment to proceed;
- beach cleaning; and
- beach and surf patrolling;

vi. an Auditing Program prepared by the applicant in consultation with and to the satisfaction of the Shell Cove Compliance Committee. It shall provide details about:

- a program for the auditing of the construction and operation of the development;
- the use of an independent auditor; and
- report on whether works are being undertaken in accordance with all requirements,

4. All activities must be carried out in accordance with the provisions of the Environmental Management Plan which may be updated or amended prior to or during the course of construction subject to the approval of the Department of Land and Water Conservation.

5. During the course of harbour entry construction, in the event that any maritime relics are uncovered all work is to be stopped in that area and the Heritage
Office immediately informed for advice on procedures for continuation of the works.

6. Reasons for Conditions

To ensure that:-

i. the activity takes place in accordance with the proposals which have been through due process;

ii. the proposals are sufficiently detailed to satisfy the determining authorities that the activities will not unduly adversely affect the environment, and

iii. the detailed plans and proposals are adhered to

It should be noted that in addition to this approval, and compliance with its conditions, all other authorities must be obtained, and in particular -

1. approvals from the Environment Protection Authority in relation to:
   - the Clean Air Act, 1961;
   - the Clean Waters Act, 1970;
   - the Noise Control Act, 1975;
   - the Marine Pollution Act, 1987;

2. approvals from the National Parks and Wildlife Service in relation to:
   - the provisions of s90 of the National Parks and Wildlife Act, 1974. Under s90 of the Act it is an offence to knowingly damage or destroy Aboriginal relics without the prior permission of the Director-General of the NPWS.

3. approvals from the New South Wales Waterways Authority in relation to:
   - the Rivers and Foreshores Act, 1948 (namely s23), and
   - the Maritime Services Act, 1935 (namely s13T),

4. approvals from New South Wales Fisheries in relation to:
   - the Fisheries Management Act, 1994,

5. approvals from the Department of Local Government in relation to:
COASTAL PROTECTION REGULATIONS 2004
Under the
COASTAL PROTECTION ACT 1979

NOTIFICATION OF MINISTER’S CONCURRENCE (SECTION 41)

To: Shellharbour City Council

Addressed to: Australand Holdings Limited
              PO Box A148
              SHELLHARBOUR 2529

Ref: Coastal Protection Act 1979
Concurrence to Shellharbour City Council for realignment and shortening of the
breakwater, minor changes to the northern groyne and deletion of the Southern
Groyne and the flushing pipe system.

Notice is hereby given under Section 41 of the Coastal Protection Act 1979, that the
concurrence of the Minister for Climate Change, Environment and Water is granted to the
above application from Shellharbour City Council, received by the Department of Natural
Resources (now the Department of Environment and Climate Change) on 3rd of November
2006 (with additional requested material received in mid January 2007, 11 May 2007, 19
June 2007 and 27 July 2007), pursuant to Section 40 of the Coastal Protection Act 1979. This
concurrence supersedes the previous concurrence dated 19 February 2007 for the above
mentioned modifications.

Conditions of concurrence (in addition to those attached to the original concurrence and
which are still valid):

- Shellharbour City Council will monitor wave conditions at the entrance and within
  the channel and if the wave conditions fail to meet the relevant safety criteria (as
defined in section 3 of the Patterson Britton & Partners December 2005 report),
Council will be required to carry out appropriate works to the extent necessary to
provide wave climate amelioration that meets the agreed criteria. A wave condition
monitoring report, as part of the overall monitoring report mentioned in the 1998
concurrence, shall be prepared by a recognised coastal engineering consultant and
presented to the Shell Cove Compliance Committee every six months for as long as
required to satisfy the Committee. The report is also to be available to the public.

- Council will monitor the beaches at the north and south of the entrance of the marina,
especially during the period immediately after construction of the entrance structures
and undertaking of the entrance channel dredging, and undertake the necessary sand
nourishment to rectify erosion and recession. Council shall continue to monitor and
nourish the beaches until stable well nourished beaches are established. The
requirements of this condition shall be incorporated in the draft Beach
Nourishment/Rehabilitation Plan which is required to be lodged with the Shell Cove
Compliance Committee prior to the commencement of construction of the boat
harbour entrance works.

- Council will undertake a detailed monitoring of the newly constructed breakwater
and groyne structures during the period after their construction for possible
settlements of the rocks due to scouring by wave and tidal actions and top up with
additional rocks in case of excessive reduction in the height of the structure due to
the settlement. Council will also monitor the structures for damages caused by extreme event storms and undertake the necessary repair works. The requirements of this condition are to be incorporated in the Construction Program and Monitoring Program which are required to be lodged with the Shell Cove Compliance Committee prior to the commencement of construction of the boat harbour.

- Council will undertake a water quality monitoring program for the water within the boat-harbour at some periodic intervals after the construction of the marina to check the need of the flushing pipe system as proposed in the original design. The requirements of this condition are to be incorporated in the Environmental Management Plan which is required to be lodged with the Shell Cove Compliance Committee prior to the commencement of construction of the boat harbour.

- Compliance against the above conditions of concurrence shall be assessed by the Shell Cove Compliance Committee. The makeup of the Committee shall include all the relevant stakeholders, including Shellharbour City Council and the Department of Environment and Climate Change.

Dated this 18th day of September 2007.

Brian Dooley
Director
Floodplain Management and Coastal Support

Delegate of the
Minister for Climate Change, Environment and Water
APPENDIX C
ENVIRONMENT PROTECTION LICENCE
Dear Sir

VARIATION OF ENVIRONMENT PROTECTION LICENCE NO 12426

We refer to the above licence and enclosed Notice issued under the Protection of the Environment Operations Act 1997. This Notice varies the conditions of the licence as an outcome of our consideration of your request to reduce the thickness of the clay liner in the new waste containment cell.

Following a recent site inspection, we have also agreed to add a condition to the licence which provides for the dewatering of earthworks subject to the provision of a dewatering, sediment control structure.

The Department has now issued the Notice.

The variation takes effect as specified in the Notice.

For further information regarding the enclosed Notice, please contact the designated officer above.

Yours sincerely

William Dove 21 August 2007

WILLIAM DOVE
Acting Manager Illawarra
Environment Protection and Regulation

Enc: Notice 1074555

(N10707/AUSTRALAND CLAY LINER 558.DOC)
NOTICE OF VARIATION OF LICENCE NO. 12426

BACKGROUND

A. AUSTRALAND CORPORATION (NSW) PTY LTD ("the licensee") is the holder of Environment Protection Licence No. 12426 ("the licence") issued under the Protection of the Environment Operations Act 1997 ("the Act"). The licence authorises the carrying out of Sched Dev Work/Prem Based Sched Activity at Bass Point Tourist Road, SHELL COVE, NSW.

B. On 25 May 07 the EPA received an application for the variation of the licence.

C. The licensee applied to reduce the thickness of the waste cell liner from 700mm to 500 mm on the basis that the volumetric flow rate through the reduced thickness will be less than that for the benchmark, on the proviso that the liner's permeability is less than $8.3 \times 10^{-10} \text{ m/s}$. The licensee has measured the permeability of the clay and have advised that the permeability of the clay is less than this number and no greater than $1.5 \times 10^{-10} \text{ m/s}$.

D. Also a condition has been added to provide for dewatering of earthworks which are not in contact with putrescible waste or leachate. This condition allows for dewatering provided a sediment control dewatering structure is used.

E. This licence remains consistent with the outcomes of the Commission of Inquiry and other planning processes which have led to the consent for the works.

VARIATION OF LICENCE NO. 12426

1. By this notice the EPA varies licence No. 12426 as set out in the Appendix. The Appendix contains a copy of the provisions of the licence marked with the variations that are made to it by this notice.

2. The variations to the licence are indicated in the following way:
   - if a strike through mark appears through any word or other text (eg. Solids or) this indicates that the word or other text is deleted from the licence by this notice; and
Licence Variation

Mr Peter Jamieson
Acting Head Regional Operations Unit
Metropolitan
(by Delegation)

INFORMATION ABOUT THIS NOTICE

- This notice is issued under 58(5) of the Act.
- Details provided in this notice, along with an updated version of the licence, will be available on the EPA’s Public Register (http://www.environment.nsw.gov.au/prpoeo/index.htm) in accordance with section 308 of the Act.

Appeals against this decision

- You can appeal to the Land and Environment Court against this decision. The deadline for lodging the appeal is 21 days after you were given notice of this decision.

When this notice begins to operate

- The variations to the licence specified in this notice begin to operate immediately from the date of this notice, unless another date is specified in this notice.
- If an appeal is made against this decision to vary the licence and the Land and Environment Court directs that the decision is stayed the decision does not operate until the stay ceases to have effect or the Land and Environment Court confirms the decision or the appeal is withdrawn (whichever occurs first).
Sectio~


Environment Protection Licence

Licence - 12426

<table>
<thead>
<tr>
<th>Licence Details</th>
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<tbody>
<tr>
<td>Number: 12426</td>
</tr>
<tr>
<td>Anniversary Date: 13-April</td>
</tr>
<tr>
<td>Review Due Date: 13-Apr-2009</td>
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</tbody>
</table>

<table>
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<tr>
<th>Licensee</th>
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</thead>
<tbody>
<tr>
<td>AUSTRALAND CORPORATION (NSW) PTY LTD</td>
</tr>
<tr>
<td>PO BOX A148</td>
</tr>
<tr>
<td>SHELLHARBOUR NSW 2529</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Licence Type</th>
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<tr>
<td>Premises</td>
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<tbody>
<tr>
<td>SHELL COVE</td>
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<tr>
<td>Bass Point Tourist Road</td>
</tr>
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<td>SHELL COVE NSW 2529</td>
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</tr>
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<table>
<thead>
<tr>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan</td>
</tr>
<tr>
<td>Level 3, NSW Govt Offices, 84 Crown Street</td>
</tr>
<tr>
<td>WOLLONGONG NSW 2500</td>
</tr>
<tr>
<td>Phone: 02 4224 4100</td>
</tr>
<tr>
<td>Fax: 02 4224 4110</td>
</tr>
<tr>
<td>PO Box 513 WOLLONGONG EAST</td>
</tr>
<tr>
<td>NSW 2520</td>
</tr>
</tbody>
</table>
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Information about this licence

Dictionary
A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee
Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:
- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions
The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence
This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review
The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA
For each licence fee period you must pay:
- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.
The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

**Transfer of licence**

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

**Public register and access to monitoring data**

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

**This licence is issued to:**

AUSTRALAND CORPORATION (NSW) PTY LTD
PO BOX A148
SHELLHARBOUR NSW 2529

subject to the conditions which follow.

**1 Administrative conditions**

**A1 What the licence authorises and regulates**

**A1.1** This licence authorises the carrying out of the scheduled development work listed below at the premises listed in A2.
Construction of a Marina and associated Facilities

**A1.2** This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-
based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

<table>
<thead>
<tr>
<th>Scheduled Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dredging Works</td>
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<tr>
<th>Fee Based Activity</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert Waste Landfilling (77)</td>
<td>0 - All</td>
</tr>
</tbody>
</table>

A1.3 The licensee must not carry on any scheduled activities until the scheduled development works are completed, except as elsewhere provided in this licence.

A1.4 The conditions of this licence refer to scheduled development works for the construction of a Marina and associated works.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

- SHELL COVE
- Bass Point Tourist Road
- NSW
- 2529
- LOT 8031 & 8032 DP 1072187, LOT 1 & 2 DP 1022866, LOT 206 DP 857030, LOT 1168 DP 1076113
Premises Details
The premises covered by this licence is shown in Figure 1 (DWG4717-2-059, issue E contained in the licence application.

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:

Waste Facilities - landfilling in designated areas

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

A5 The documents:


are not to be taken as part of the documentation in A4.1, other than those parts specifically referenced in this licence.

Note: For the purposes of this licence the abbreviation:

a) "LEMP" is defined as the document titled " Final Report, Landfill Environmental Management Plan, Shell Cove Waste Containment Cell, Prepared for Australand. URS Australia Pty Ltd, 20 December 2005;" and

b) "EMP" is defined as the document Report, Shell Cove Waste Relocation Environmental Management Plan, Prepared for Australand Holdings Limited, URS Australia Pty Ltd, November 2005.

b) "SCWCC" is defined as Shell Cove Waste Containment Cell, as defined in Section 1.1 of the LEMP.
2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

<table>
<thead>
<tr>
<th>EPA Identification no.</th>
<th>Type of Monitoring Point</th>
<th>Type of Discharge Point</th>
<th>Description of Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dust Deposition</td>
<td>Air</td>
<td>Representative of homes at Boolwarroo Pde, Shellharbour Village</td>
</tr>
<tr>
<td>2</td>
<td>Dust Deposition</td>
<td>Air</td>
<td>Representative of homes at Sophia St, Shellharbour Village</td>
</tr>
<tr>
<td>3</td>
<td>Dust Deposition</td>
<td>Air</td>
<td>Representative of homes at the eastern end of the new Shellcove Estate</td>
</tr>
</tbody>
</table>

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.
### Water and land

<table>
<thead>
<tr>
<th>EPA Identification no.</th>
<th>Type of monitoring point</th>
<th>Type of discharge point</th>
<th>Description of location</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Groundwater monitoring</td>
<td></td>
<td>Monitoring bore labelled MW01 in drawing No: C-003 &quot;Waste Cell: Existing Contours and Cell Layout Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
<tr>
<td>5</td>
<td>Groundwater monitoring</td>
<td></td>
<td>Monitoring bore labelled MW02 in drawing No: C-003 &quot;Waste Cell: Existing Contours and Cell Layout Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
<tr>
<td>6</td>
<td>Groundwater monitoring</td>
<td></td>
<td>Monitoring bore labelled MW03 in drawing No: C-003 &quot;Waste Cell: Existing Contours and Cell Layout Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
<tr>
<td>7</td>
<td>Groundwater monitoring</td>
<td></td>
<td>Monitoring bore labelled MW04 in drawing No: C-003 &quot;Waste Cell: Existing Contours and Cell Layout Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
<tr>
<td>8</td>
<td>Groundwater monitoring</td>
<td></td>
<td>Monitoring bore labelled MW05 or relocated MW05 in drawing No: C-003 &quot;Waste Cell: Existing Contours and Cell Layout Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
<tr>
<td>9</td>
<td>Groundwater monitoring</td>
<td></td>
<td>Monitoring bore labelled MW06 in drawing No: C-003 &quot;Waste Cell: Existing Contours and Cell Layout Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
<tr>
<td>10</td>
<td>Leachate monitoring</td>
<td></td>
<td>Leachate collection pit on Drawing C-014 &quot;Waste Cell Leachate Collection Layer and Top of Liner Contour Plan&quot; dated 26 October 2005, as provided in the LEMP.</td>
</tr>
</tbody>
</table>

### Limit conditions

#### L1 Pollution of waters

**L1.1** Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

#### L2 Load limits

**L2.1** Not applicable.

**L2.2** Not applicable.

#### L3 Concentration limits

**L3.1** Not applicable.
L3.2 Not applicable.

L3.3 Not applicable.

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L5.2 Only the following types of waste may be disposed of at the premises:

- Material classified as inert or solid waste excavated from the 'Old Landfill' shown on DWG No. 005-FIG5 titled "Haul Route" and contained in the Shell Cove Waste Relocation Environmental Management Plan Report.
- VENM may be used to achieve final construction levels.

L5.3 The SCWGC must be completed with final capping in place, within 7 months of the commencement of excavation of the 'Old Landfill' except otherwise extended by delays beyond the control of the licensee.

L5.4 Any leachate (including wastewaters generated by contact with waste filled areas) must only be disposed of in accordance with a sewerage system operator's trade waste guidelines, or sewage treatment plant receive system.

Surface stormwater run-off from up-slope catchment areas must be diverted away from the 'Old Landfill' excavation.

L6 Noise Limits

L6.1 Hours of Operation

L6.1.1 All work at the premises must be conducted between the following hours:
- Blasting 9am to 5pm Mondays to Fridays.
- Other Activities 7am to 6pm Mondays to Fridays, 8am to 1pm Saturdays.
- No construction on Sundays and Public Holidays.

L6.1.2 The hours of operation permitted by this licence may be varied where there is no significant impact on the ambient levels outside the premises or at any noise sensitive location. The licensee must
provide evidence that no significant impact occurs prior to a variation being granted for the hours of operation.

L6.2 For any exceedance of the background noise level by more than 10 dB(A) the licensee must undertake community liaison and consultation in order to identify and implement any additional reasonable and feasible noise mitigation options.

L6.3 Where vibration resulting from construction and operation at the premises cannot be limited to the evaluation criteria presented in British Standard BS6472 for low probability of adverse comment, at any affected residential dwelling, the licensee must:
(a) implement all feasible and practical measures to minimise the impact on affected residents, and
(b) provide information to potentially affected residents about times when vibration is planned to occur, and
(c) monitor vibration levels in accordance with the noise monitoring conditions of this licence, and
(d) provide the results of vibration monitoring to the affected residents.

L7 Blasting Limits

L7.1 Ground vibration peak particle velocity from the blasting operations at the premises must not:
(a) Exceed 5mm/sec for more than five per cent of the total number of blasts over a period of 12 months; and
(b) Exceed 10 mm/sec at any time.

The overpressure level from blasting operations at the premises must not:
(a) Exceed 115 dB(Lin Peak) for more than five per cent of the total number of blasts over a period of 12 months; and
(b) Exceed 120 dB(Lin Peak) at any time.

4 Operating conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.
O3  Dust Control

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O3.2 Dust from the haulage of material must be suppressed at all times.

O4  Odour

O4.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

O5  Blasting Operations

O5.1 A siren must be activated at the site for 30 seconds at least five minutes prior to each blast. All residents within a 400 metre radius of a blast must be advised by a letter drop, before blasting operations commence of the likely times, frequency and duration of blasting and precautions being taken to ensure that the limits set in this licence are being complied with.

O6  Water Pollution Control

O6.1 Sewage effluent must not be disposed of on-site. A licensed waste pump-out contractor must remove all sewage wastes from the site.

O6.2 Leachate must not be discharged to surface waters.

Note: For the purpose of this licence, leachate is defined as any waters that have come in contact with putrescible waste.

O6.3 Measures must be installed to prevent the carry over of mud or dirt onto public roads beyond the premises boundary.

O6.4 All fuels, oils, paints and other chemicals stored on site must be contained in a bunded area constructed to comply with the requirements of:

a) Australian Standard AS 1940B1993: The Storage and Handling of Flammable and combustible Liquids
b) Australian Standard AS 4452B1997: The Storage and Handling of Toxic Substances
c) the Dangerous Goods Act 1975.

The bund must be constructed with an impervious floor and must not be fitted with a drain valve.
06.5 Any vehicular crossings of water courses and streams must be constructed in a manner that prevents sediment from washing into the water course or stream.

06.6 Any acid sulphate soils disturbed during the project must be managed in accordance with the document titled "ACID SULPHATE SOIL MANUAL, ASSMAC 1998".

06.7 Diversions must be installed and maintained to prevent off-site surface water run-off from entering disturbed areas of the site.

06.8 Erosion and sediment control measures must be installed prior to any other earthworks or site disturbance.

06.9 An effective combination of sediment filters, barriers and/or basins at the down slope boundary of the disturbed area must serve all disturbed areas.

06.10 Sediment traps must be cleaned out when their capacity is reduced by 30 per cent.

06.11 Temporary and permanent constructed drainage around the site must be stabilised immediately.

06.12 Stockpiles must not be placed within 30 metres of any watercourse.

06.13 All disturbed areas including stockpiles, earth mounds and batters must be progressively stabilised as soon as practicable.

06.14 All stormwater inlet pits must be fitted with sediment traps until stabilisation of the contributing surface areas is achieved.

06.15 All soil erosion and sediment controls, and other water pollution control measures, on the premises must be inspected:

(a) Within two days of the cessation of any rainfall event that results in 20 mm, or more, of rain falling on the premises in any 24 hour period;
(b) Daily, during periods of extended rainfall;
(c) Weekly, during dry weather periods, to ensure the integrity of the control measures.

The licensee must record all such inspections and resulting observations.

06.16 The haulage of excavated material from the Old Landfill to the SCWCC must not use public roads in Shellharbour Village and Shell Cove Estate.

06.17 Temporary vegetative restabilisation techniques must be applied to any disturbed soil to prevent areas remaining bare for more than 28 days.

06.18 A suitable diversion structure with a height of not less than 2.6m AHD must be maintained to effectively convey any stormwater flows from upstream of the premises, through the premises thereby effectively bypassing the excavation of the 'Old Landfill'. This diversion structure must be stable prior to the commencement of excavation.

The area of excavation of the 'Old Landfill' must be maintained and operated to prevent discharges of any water from the premises.
06.19 The Temporary Sedimentation Basin shown in DWG 001-FIG1 Rev C (titled Waste Containment Cell: Stage 1 – Cell Construction) must be constructed prior to any general earthworks at the waste cell and in accordance with the following specifications:

(a) All stormwater runoff from the construction of the waste cell must report to the TSB.
(b) The batter slopes of the TSB must not be less than 2.5:1 h:v.
(c) The embankments and TSB surrounds must be immediately revegetated.
(d) A stable overflow spillway must be provided to protect the embankment.
(e) The capacity of the pond must not be less than 750 cubic metres.

06.20 Earthworks may be dewatered provided:

(a) A dewatering structure is used to minimise the export of sediment, and
(b) The area of earthworks being dewatered does not contain wastes or leachate.

07 Shell Cove Waste Containment Cell (SCWCC)

07.1 The SCWCC must incorporate:

(a) the leachate barrier and leachate collection and disposal systems detailed in Sections 4.2.1 and 4.2.2, and drawings C-014, C-031 and C-032 of the LEMP, with the exception that the leachate barrier must be at least 500mm in thickness and have a permeability of less than $8 \times 10^{-10}$ m/s;
(b) the capping system detailed in Section 4.2.3 and drawings C-010, C-020, C-021, C-030 and C-033 of the LEMP; and
(c) the landfill gas collection and venting system detailed in Section 5.2.1 and drawings C-016 and C-033 of the LEMP.

07.2 The drainage media in the leachate collection and conveyance system must be of relatively uniform grain size greater than 20 millimeters, non reactive in mildly acidic conditions, free of carbonates that could form encrustations around the collector pipes and exhibit a permeability of greater than 10-3 m/s.

07.3 The testing, surveys, documentation and certification regimes detailed in the document "Shell Cove Waste Containment Cell Construction Quality Assurance Plan, URS 9 November 2006" (the CQA plan) must be implemented. Further within 30 days of completion of installation of the capping system the DEC must be provided with a copy of the report proposed in Section 4 of the CQA plan. This report must also provide:

- a summary outlining any non compliance with the design and specifications required by conditions 07.1 and 07.2, and
- information to demonstrate that any non compliance/s, were within satisfactory tolerances to ensure acceptable long term performance of the Shell Cove Waste Containment Cell (SCWCC).

07.4 The leachate disposal system must not be installed until the licensee has:

(a) provided the EPA with proposed:
- measures to ensure that at all times, especially in the event of failure of the submersible pump, that there are no overflows from the leachate collection pit;
- measures to ensure that the submersible pump is automatically shut down when the temporary leachate storage tank is filled to its capacity; and
design details for a bund around the temporary leachate storage tank, and proposed subsequent inspection and maintenance protocols, in accordance with or equivalent to AS 4452; and
(b) received written approval to install the measures and implement the protocols referred to in a) of this condition.

Note: An automated cut off valve up stream of the leachate collection pit would be a suitable measure to ensure there are no overflows from the leachate collection pit.

O7.5 All waste disposed of at the SCWCC must be covered daily with a minimum thickness of 150mm of cover material. Cover material must be either virgin excavated natural material or the material detailed in Section 3.3.4 of the LEMP, provided that it does not contain any asbestos.

O7.6 The leachate collection pit must be fitted with an automatic pumping system and level control to prevent overflows.

O7.7 The leachate collection system must be maintained and operated to prevent any liquids overflowing from this system.

5 Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
(a) in a legible form, or in a form that can readily be reduced to a legible form;
(b) kept for at least 4 years after the monitoring or event to which they relate took place; and
(c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns.
### POINT 1

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Units of measure</th>
<th>Frequency</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble solids</td>
<td>grams per square metre per month</td>
<td>Monthly</td>
<td>Australian Standard 3580.10.1-1991</td>
</tr>
</tbody>
</table>

### POINT 2

<table>
<thead>
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<th>Pollutant</th>
<th>Units of measure</th>
<th>Frequency</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble solids</td>
<td>grams per square metre per month</td>
<td>Monthly</td>
<td>Australian Standard 3580.10.1-1991</td>
</tr>
</tbody>
</table>

### POINT 3

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Units of measure</th>
<th>Frequency</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble solids</td>
<td>grams per square metre per month</td>
<td>Monthly</td>
<td>Australian Standard 3580.10.1-1991</td>
</tr>
</tbody>
</table>

### POINTS 4,5,6,7,8,9

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Units of measure</th>
<th>Frequency</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Biochemical oxygen demand</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Cobalt</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Conductivity</td>
<td>micrograms per centimetre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Copper</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Manganese</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Nickel</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Nitrate</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Nitrogen (ammonia)</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Standing Water Level</td>
<td>metres</td>
<td>Quarterly</td>
<td>In situ</td>
</tr>
<tr>
<td>Total Phosphorus - filtered sample</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Total dissolved solids</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Total organic carbon</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Zinc</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>pH</td>
<td>pH</td>
<td>Quarterly</td>
<td>Probe</td>
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**Deleted: m2/**
**POINT 10**

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<tr>
<th>Pollutant</th>
<th>Units of measure</th>
<th>Frequency</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Biochemical oxygen demand</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Cobalt</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Conductivity</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Copper</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Manganese</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Nickel</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Nitrate</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Nitrogen (ammonia)</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Standing Water Level</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Total Phosphorus - filtered sample</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Total dissolved solids</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Total organic carbon</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>Zinc</td>
<td>milligrams per litre</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
<tr>
<td>pH</td>
<td>pH</td>
<td>Quarterly</td>
<td>Grab sample</td>
</tr>
</tbody>
</table>

**M2.2 Rainfall Monitoring**

M2.2.1 Rainfall must be measured and recorded in millimetres per 24 hour period, at the same time each day. For the purpose of this licence the Shell Cove project office is considered an acceptable rainfall monitoring location.

Note: The rainfall monitoring data collected in compliance with this condition can be used to determine compliance with some of the limit conditions of this license.

**M2.3 Landfill Gas Monitoring**

M2.3.1 Sub-surface landfill gas monitoring must be undertaken in accordance with section 5.3.2 and appendix E of the LEMP.

M2.3.2 Surface landfill gas monitoring must be undertaken in accordance with section 5.3.3 and appendix E of the LEMP.

**M2.4 Noise Monitoring**

M2.4.1 The licensee must monitor on at least one day every week basis (or at any other time interval specified in writing by the EPA), all noise and vibration levels (if applicable) caused by the site work.
when measured at the boundary of the nearest sensitive receiver(s). Measurements of noise ($LA_{90}, T$, $LA_{10}, T$ and $LA_{10}, T - LA_{90}, T$), must be conducted over a 15 minute working period.

Note: Monitoring at more than one location may be required depending on the location of the works and the nearest receivers.

**M2.5 Blast Monitoring**

M2.5.1 Each blast must be monitored and recorded at the boundary of the two nearest residential premises (one each from the Shellharbour Village and new Shell Cove estate) or other noise sensitive receivers.

The written record must include:
(a) the time & date of each blast;
(b) the location at which the noise was measured;
(c) the ground vibration for each blast;
(d) the airblast overpressure for each blast;
(e) evidence that during the past twelve month period, a calibration check had been carried out on each blast monitor to ensure the accuracy of the reported data; and
(f) the waveform for the ground vibration and overpressure for each blast.

**M2.6 Recording site activities**

M2.6.1 The following information must be recorded by the licensee:

(a) Rainfall events (per 24 hour period) and whether any water pollution structures have had their design exceeded;
(b) The date of inspections of the soil erosion and sediment controls and the state of the controls during the inspection;
(c) The date, location, and quantity of flocculant applied to the pond(s);
(d) The date and quantities of any water discharges and sediment removal from the sediment basin(s).

**M3 Testing methods - concentration limits**

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

(a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
(b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
(c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".
Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

Groundwater and leachate monitoring must be undertaken in accordance with the procedures detailed in appendix D of the LEMP.

**M4 Recording of pollution complaints**

The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

The record must include details of the following:

(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made.

The record must be produced to any authorised officer of the EPA who asks to see them.

**M5 Telephone complaints line**

The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

Conditions M5.1 and M5.2 do not apply until 3 months after:

(a) the date of the issue of this licence or
(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.
M6 Requirement to monitor volume or mass

M6.1 Not applicable.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
   (a) a Statement of Compliance; and
   (b) a Monitoring and Complaints Summary.
   A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
   (a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
   (b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
   (a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
   (b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later
than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

(a) the licence holder; or
(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
(a) where this licence applies to premises, an event has occurred at the premises; or
(b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
R3.3 The request may require a report which includes any or all of the following information:

(a) the cause, time and duration of the event;
(b) the type, volume and concentration of every pollutant discharged as a result of the event;
(c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
(d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
(f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
(g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Landfill Gas Monitoring Reporting

R4.1 The licensee must notify the EPA within 24 hours, and provide written notification within 7 days, if the results of the sub surface landfill gas monitoring required by condition M2.3.1 indicate methane concentrations greater than 1.25% v/v.

R5 Requirement to report to the EPA with a summary of monitoring results

R5.1 A report summarising the results of air, noise and water monitoring must be forwarded to the EPA no later than the 7th day of each month. Blasting results must be faxed within 24 hours of the blasting taking place.

Monitoring required for the purposes of the closure of the new waste cell must be reported quarterly. The first month of the first quarter must not be later than the date of issue of this licence.

The frequency of reporting can be reviewed after a request from the licensee to the EPA.

General conditions

G1 Copy of licence kept at the premises

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at
Pollution studies and reduction programs

U1 ASSESSMENT & CONTROL OF ODOURS

U1.1 The aim of this PRP is to determine whether there is a potential odour problem for nearby residential areas and if so, to design and implement measures to minimise the impacts of the odours.

U1.2 PART 1 - ASSESSMENT OF ODOURS
(a) From the time when the 'Old Landfill' is opened up and waste is exposed the licensee must complete a log of odour observations. These observations must continue for a duration of 20 consecutive days and be used to assess compliance with the odour conditions of this licence and to assess the risks of odours impacting residential areas under favourable wind conditions.
(b) Within 30 days of opening the 'Old Landfill' the licensee must submit the log of odour observations to the Authority together with an assessment of actual and potential odour impacts on the nearest residential areas.

PART 2 - CONTROL OF ODOURS
If PART 1 identifies that there is a risk of odours impacting residential areas, the licensee must install measures including but not limited to the following, for the purposes of preventing offensive odours and minimising odour emissions from the source:
(a) Minimise the handling of odourous wastes near to residential areas.
(b) Locate odourous stockpiles away from residential areas.
(c) Cover stockpiles to reduce the escape of odours.
(d) Apply odour suppressants.

Special conditions

E1 Not applicable.

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration limit] Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples.


activity Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment...
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>actual load</td>
<td>Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998</td>
</tr>
<tr>
<td>AM</td>
<td>Together with a number, means an ambient air monitoring method of that number prescribed by the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.</td>
</tr>
<tr>
<td>AMG</td>
<td>Australian Map Grid</td>
</tr>
<tr>
<td>anniversary date</td>
<td>The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.</td>
</tr>
<tr>
<td>annual return</td>
<td>Is defined in R1.1</td>
</tr>
<tr>
<td>Approved Methods Publication</td>
<td>Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998</td>
</tr>
<tr>
<td>assessable pollutants</td>
<td>Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998</td>
</tr>
<tr>
<td>BOD</td>
<td>Means biochemical oxygen demand</td>
</tr>
<tr>
<td>CEM</td>
<td>Together with a number, means a continuous emission monitoring method of that number prescribed by the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.</td>
</tr>
<tr>
<td>COD</td>
<td>Means chemical oxygen demand</td>
</tr>
<tr>
<td>composite sample</td>
<td>Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.</td>
</tr>
<tr>
<td>cond.</td>
<td>Means conductivity</td>
</tr>
<tr>
<td>environment</td>
<td>Has the same meaning as in the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>environment protection legislation</td>
<td>Has the same meaning as in the Protection of the Environment Administration Act 1991</td>
</tr>
<tr>
<td>EPA</td>
<td>Means Environment Protection Authority of New South Wales.</td>
</tr>
<tr>
<td>flow weighted composite sample</td>
<td>Means a sample whose composites are sized in proportion to the flow at each composites time of collection.</td>
</tr>
<tr>
<td>grab sample</td>
<td>Means a single sample taken at a point at a single time</td>
</tr>
<tr>
<td>hazardous waste</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>industrial waste</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>inert waste</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
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<td>licensee</td>
<td>Means the licence holder described at the front of this licence</td>
</tr>
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<td>load calculation protocol</td>
<td>Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998</td>
</tr>
<tr>
<td>local authority</td>
<td>Has the same meaning as in the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>material harm</td>
<td>Has the same meaning as in section 147 Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>MBAS</td>
<td>Means methylene blue active substances</td>
</tr>
<tr>
<td>Minister</td>
<td>Means the Minister administering the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>mobile plant</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>motor vehicle</td>
<td>Has the same meaning as in the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>O&amp;G</td>
<td>Means oil and grease</td>
</tr>
<tr>
<td>percentile [in relation to a concentration limit of a sample]</td>
<td>Means that percentage (e.g. 50%) of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.</td>
</tr>
<tr>
<td>plant</td>
<td>Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.</td>
</tr>
<tr>
<td>pollution of waters [or water pollution]</td>
<td>Has the same meaning as in the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>premises</td>
<td>Means the premises described in condition A2.1</td>
</tr>
<tr>
<td>public authority</td>
<td>Has the same meaning as in the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>regional office</td>
<td>Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence</td>
</tr>
<tr>
<td>reporting period</td>
<td>For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.</td>
</tr>
<tr>
<td>reprocessing of waste</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>scheduled activity</td>
<td>Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>solid waste</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>TM</td>
<td>Together with a number, means a test method of that number prescribed by the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.</td>
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<tr>
<td>treatment of waste</td>
<td>Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>TSP</td>
<td>Means total suspended particles</td>
</tr>
<tr>
<td>TSS</td>
<td>Means total suspended solids</td>
</tr>
<tr>
<td>Type 1 substance</td>
<td>Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements</td>
</tr>
<tr>
<td>Type 2 substance</td>
<td>Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements</td>
</tr>
<tr>
<td>utilisation area</td>
<td>Means any area shown as a utilisation area on a map submitted with the application for this licence</td>
</tr>
<tr>
<td>waste</td>
<td>Has the same meaning as in the Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>waste code</td>
<td>Means the waste codes listed in Appendix 5 of the EPA document A Guide to Licensing Part B.</td>
</tr>
</tbody>
</table>
Environment Protection Licence

Licence - 12426

waste type Means Group A, Group B, Group C, inert, solid, industrial or hazardous waste

Mr Paul Wearne
Environment Protection Authority
(By Delegation)
Date of this edition - 17-Jan-2007

End Notes

1 Licence varied by notice 1067984, issued on 17-Jan-2007, which came into effect on 17-Jan-2007.
APPENDIX D
CONCEPTUAL MARINA PLAN OF MANAGEMENT
SHELL COVE
CONCEPTUAL
MARINA PLAN OF MANAGEMENT

Issue No. 3
NOVEMBER 2007

Document Amendment and Approval Record

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<th>Description of Amendment</th>
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<th>Verified by [date]</th>
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Note: This document is preliminary unless it is approved by a principal of Patterson Britton & Partners.

Document Reference: app d - conceptual marina plan of management.doc

Time and Date Printed 8 November 2007, 5:07 PM

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1 INTRODUCTION

1.1 BACKGROUND

The Shell Cove marina will be situated within the Shell Cove boatharbour on the NSW south coast. This Conceptual Marina plan of Management has been prepared prior to construction of the boatharbour and appointment of a Marina Operator in accordance with Condition of Consent 15(d)(x) for the boatharbour project.

This is a ‘framework’ document for the guidance of the Marina Operator, focused on environmental aspects of the marina operation. It is envisaged that this document will form the basis of a Marina Plan of Management prepared by the Marina Operator once the construction of the boatharbour and marina is completed. Note that this document does not detail all required safety measures for the marina operation.

1.2 MARINA DESCRIPTION

It is proposed that the Shell Cove Marina will comprise the following elements:

- a floating marina with berths for up to 300 vessels located in the inner harbour;
- an administration building incorporating facilities for marina users, restaurant, shops and car park located on the western side of the inner harbour;
- a boat lift, maintenance hardstand, workshops and car parking located on the southern side of the outer harbour;
- a fuelling pontoon located on the southern side of the outer harbour;
- a two lane public boat ramp with car/trailer parking or the southern side of the outer harbour.

1.3 MANAGEMENT OBJECTIVES

The Shell Cove Marina is a key facility in the Shell Cove Boatharbour development. The Marina Management Plan will assist all Marina users to enjoy the safe use of the Marina facilities and services including all navigable waterways whilst observing the rules and regulations designed to protect the marine and local environment. The management objectives of Shell Cove Marina are broad and diverse, covering all facets of Marina operation so that Marina staff, users and residents can utilise the Marina in a safe and functional and environmentally sustainable manner.

I. Ensure that all Marina management and staff, including permanent, part-time and casual, are comprehensively trained in all facets of marina operations and maintenance, including safety, hazard management, navigation, medical emergencies, environmental protection and amenity preservation.
II. Provide systems and procedures for the protection and safety of all persons utilising the Marina and its facilities as well as the protection of Marina property and the property of Marina users, including boat owners and guests.

III. Prevent degradation of water quality and amenity by implementing controls regarding solid and liquid waste accumulation, antifouling paints and by-products, vessel cleaning and water pollution.

IV. Preserve the general amenity for marina users, guests and residents by limiting noise emissions, and other disturbing influences.
2 REQUIREMENTS OF GOVERNMENT AUTHORITIES

The conditions of consent stipulate that ‘A Conceptual Marina Plan of Management’ is to be prepared that includes ‘principals for the operation of the marina in an environmentally responsible way.’

In addition to the conditions attached to the development consent, regard is also given to the requirements of regulatory authorities in connection to the issues relating to marina operations. Principally, the marina operation will be subject to an Environment Protection Licence issued by the Environment Protection Authority NSW (EPA, now part of DECC). Other regulatory issues include:

a. **New South Wales Health**
   - Fuel or oil spillage from fuelling pontoon
   - Fuel and oil spillage – prevention of spreading
   - Discharge of waste including soil and chemical closet wastes from mooring boats
   - Sewage pump-out – accidental spillage
   - Collection, on a regular basis, and disposal of visible garbage or other materials in the marina waters
   - Collection, storage and removal of garbage in the marina

b. **NSW Maritime**
   - Navigation lights
   - Noise
   - No discharge of vessel outlets in the marina
   - Pump-out facilities and maintenance thereof
   - Prevention of oil and fuel spillage
   - Fire extinguishing appliances – maintenance thereof and restriction of use
   - Living aboard vessels for extended periods (not permitted at the marina)

c. **NSW Department of Environment and Climate Change**
   - Chemical control in relation to organo-tin wastes
   - Noise
   - NSW Environmental legislation

2.1 REGISTER OF LICENCES AND PERMITS

[this section to be completed by the Marina Operator in accordance with the *Shell Cove Boatharbour Operational Environmental Management Plan* (Paterson Britton & Partners, 2007)]
3 POLICIES AND PROCEDURES

3.1 TRAINING AND INDUCTION

Efficient, environmentally responsible and safe operation of marinas requires that Marina staff are adequately trained. Shell Cove Marina will ensure that all Marina management, staff, subcontractors, tenants and users are provided with appropriate and comprehensive training and instruction in the safe use and management of the Marina, including elements concerning safety, hazard management, emergency preparation and response, waste management, water quality control, management of navigation and vessel movement, user amenity and marina bylaws compliance.

As a minimum, the following polices in regard to training and induction should be adopted:

- Provide initial site inductions for all new staff members covering all areas and aspects of marina operation and maintenance, especially concerning the areas of guest service, environmental management, emergency response, storm procedures, fuelling procedures and fire and hazard response.

- Provide additional comprehensive training for operations staff (including casual and part time) regarding environmental management, emergency response, first aid, storm procedures, fuelling procedures and fire and hazard response.

- Provide all new marina users and tenants with an induction covering marina bylaws and the user’s responsibilities in regards to safety and the environment.

- Provide site inductions for external contractors covering environmental management, emergency response procedures.

- Conduct regular emergency response drills to ensure training effectiveness.

- Conduct individual performance appraisals of staff to maintain skill levels and ensure adequate training is provided.

- A review and update training procedures and training manuals in response to staff and user feedback and incident reports.

3.2 SAFETY

Effective safety management ensures the protection of all persons as well as the property of the marina and users. It includes the safety and protection of marina personnel, marina users, tourists, local residents and the general public.

As a minimum, the following policies and procedures in regard to safety should be adopted:
• Shell Cove Marina will provide systems and procedures for the protection and safety of all persons utilising the Marina and its facilities as well as the protection of Marina property and the property of Marina users, including boat owners and guests.

• Ensure that the Environmental Management Plan and the Marina Bylaws are issued to all marina tenants and that these are displayed in summary form at various points throughout the marina and its facilities.

• Maintain adequate signposting within the marina highlighting safety issues and providing warnings to vessels navigating in the vicinity.

• Provide and maintain lifesaving equipment such as emergency life buoys (with whistles fitted) and apparatus to facilitate exit from the water.

• Conduct regular inspections of floating pontoons and berthed vessels to confirm mooring line and fendering systems integrity and normal level of vessel at the waterline. Instruct marina berth users in securing their vessels at berths to ensure that no part of the vessel overhangs the defined lease boundaries.

• Ensure boardwalks, gangways and berthing pontoons are free of loose equipment that may hinder safe pedestrian access and movement of emergency personal and equipment.

• Formally notify the NSW Maritime in writing of any incident where a person on a pontoon is knocked off their feet due to the motion of the pontoon. This notification shall comprise of a report investigating the incident and indentifying the likely cause(s).

• In the event of falling in the water accidentally, or responding to a call for help from someone in the water, the following procedure shall be followed:
  - Raise the alarm by calling “Man Overboard” in a loud voice. Continue until help arrives.
  - If possible, throw the person in the water a life buoy from the nearest safety equipment cabinet or moored vessel, whilst holding on to the loose end of the attached retrieval line.
  - Guide the person in the water towards the nearest boarding apparatus or towards the nearest safe exit point and assist them from the water.
  - Report any water safety incident to the Marina Manager promptly.

3.3 FIRE PREVENTION

To ensure personnel and public safety, the marina must practice effective management of hazards that may generate fires, including all fuel storage and delivery, fuelling of vessels and on-board fires due to fuel/gas leakage or explosions. To reduce fire hazards, a number of procedures need to be in place and strictly enforced. The consideration of public safety and the protection of property, including vessels, equipment and other assets, including those of the marina, require comprehensive fire prevention practices.
As a minimum, the following policies in regard to fire prevention should be adopted:

- Prohibit any hazardous behaviour by boat owners, staff or external contractors that may generate a fire or explosion risk. Marina management will clearly spell out all Marina fire prevention procedures to all boat owners, contractors, staff and Marina users.

- Conduct regular training, education and drill sessions in fire fighting techniques and equipment used for all staff members. This will be conducted in conjunction with the local fire brigade.

- Fire prevention practices and evacuation diagrams will be posted at regular intervals throughout and surrounding the Marina. Fire extinguishers, hydrants and hose reels will be placed at regular and easily accessible locations throughout the Marina berths, the foreshore and the Outer Harbour Facilities, as required by NSW Maritime and the fire brigade. An audible fire alarm system will be incorporated on the Marina.

- Electrical work, welding or cutting of metal will be prohibited in the vicinity of the fuel berth, unless a permit is granted from Management and appropriate steps are taken to minimise the risk of igniting fuel.

- Vessels will be regularly inspected for fuel, gas or vapour leaks. Inspection of onshore power cord-sets will also be carried out to ensure safe working conditions.

- All vessels will be required to have a working fire extinguisher onboard.

- Smoking on and surrounding the fuelling berth is strictly prohibited.

- Fuel tanks will be regularly vented to offset pressure changes due to the atmosphere or weather.

- Staff will make marina management immediately aware of any fire hazards.

- In the event of a fire or explosion, the primary responsibility is to ensure that all persons are quickly evacuated to a safe area and fire authorities notified immediately. In the case of injured persons, they should not be moved unless in continued danger. After personnel have been removed, all surrounding mobile property, including boats, and other portable items should be removed to a safe area.

- If a fire or explosion is observed aboard a berthed vessel, marina staff and users must respond as follows:
  - Raise the alarm by calling “fire” in a loud voice until help arrives
  - Assist in moving any injured persons away from danger
  - Ensure fire authorities are notified promptly
  - Assist in fighting the fire as required
3.4 NAVIGATION

Navigation information and regulations provided by a marina are essential to its safe and efficient functioning and operation. Information regarding entrance conditions, channel traffic, speed and no wash zones, channel markers and berthing procedures should be easily obtainable and displayed for all craft using the Marina.

As a minimum, the following policies in regard to navigation should be adopted:

- A chart of the boatharbour showing depths, speed zones and wash restrictions will be displayed at prominent locations throughout the Marina.

- Navigational and speed signs will be placed at the seaward end of the access channel, at the entrance to the Outer Harbour, at the entrance to the Inner Harbour and adjacent to the fuelling berth and public boat ramp to inform boat skippers regarding speed limits, traffic lanes and no wash zones.

- Marina tenants will be educated as part of their marina induction as to the navigation rules. All marina tenants will be required to have a current valid NSW Boat Licence (or equivalent) before berthing at the marina.

- Current navigation warnings and daily weather information will be posted on a daily basis and displayed in a prominent location.

- No anchoring of vessels will be permitted within the entrance, access channel, Inner and Outer Harbours, except in emergencies.

- Any obstructions to navigation within the marina will be removed immediately.

- Any damage to or failure of navigation aids will be reported to the council and NSW Maritime for immediate repair.

- No fishing from vessels or aquaculture will be permitted within the marina or boatharbour.

- During operating hours the Marina will maintain a radio watch to assist approaching vessels with berthing instructions. The Marina radio watch may also provide local weather information, without conflicting with established volunteer coastal organisations.

- Navigation procedures will be set out in the Marina Bylaws and be within the guidelines stipulated in the NSW Maritime Authorities Regulations and Acts.

- The general amenity of the marina will be preserved by the marina staff policing the Marina Bylaws in regard to safe navigation. Marina staff will enforce restrictions on the operation of vessels within the Marina’s navigable waters during special events.
3.5 ANTIFOULING

Antifouling is employed as a means to reduce or remove marine fouling growth, such as barnacles, algae and mussels from attaching to the hull of boats and infrastructure within the Marina. The commonly used copper-based antifouling coatings designed to release copper through passive leaching have broad toxic effects on water quality. Craft moored for long periods release the non-degradable toxic metals which accumulate in the waters, sediments and marine life. The banning of tributyl-tin (TBT) and other toxic biocides for recreational boats, proper cleaning and removal techniques, and the use of alternative environmentally-safe antifouling options are ways in which the detrimental impacts of antifouling can be reduced.

As a minimum, the following polices in regard to antifouling should be adopted:

- Prohibit the use of environmentally hazardous antifouling paints containing TBT, organo-tin and other similarly hazardous components on both vessels berthed at Shell Cove Marina and the in-water infrastructure, such as piles and gangways.

- Prohibit the use of biocides including copper-based antifouling coatings on in-water infrastructure.

- Incorporate in Marina Bylaws that the use, discharge or disposal of such compounds within the Marina is prohibited.

- Any vessel violating this condition shall be banned from the Marina until the offending material is removed.

- The Shell Cove Marina will encourage and support the use and transition to nontoxic antifouling options, such as nontoxic coatings including ‘fouling-release’ silicone and epoxy coatings, and in berth boat lifts.

3.6 HULL CLEANING

Vessel hull cleaning and maintenance involves the cleaning and removal of old paint, biological fouling or rust from the hull of a vessel. This task is essential in maintaining vessel safety, navigability, efficiency and appearance. Hulls can be cleaned both in and out of the water using methods such as manual scrubbing and scraping, pressure water blasting or dry abrasive blasting, scraping and sanding.

The cleaning of vessel hulls can have detrimental effects on the marine environment and water quality. Pollutants derived from copper based antifouling paints can accumulate within the water column and the sediments and ingestion of these by marine life can potentially move the toxic metals further up the food chain.

In-water Hull Cleaning

The process of in-water scraping and scrubbing of hulls coated in copper-based antifouling paint releases copper and possibly introduced species into the water column.
As a minimum, the following policies in regard to in-water hull cleaning should be adopted:

- In-water hull cleaning is prohibited for vessels which have copper or other biocide-based antifouling paints on their hulls.
- In-water cleaning and washing down the topsides of vessels will be permitted using water only, or water mixed with an approved bio-degradable detergent.
- The practice of mooring vessels in slip liners and then adding biocides to the waters within the slip is prohibited.

**Out of Water Hull Cleaning**

Out of water vessel cleaning occurs on the marina hardstands and employs cleaning techniques such as pressure water blasting, dry abrasive blasting, scraping and sanding. Pollution of the surrounding environment can occur through discharges and runoff into the harbour or the release of pollutants into the soil and air.

As a minimum, the following policies in regard to out of water hull cleaning should be adopted:

- Facilities shall be designed and managed so to prevent the discharge, runoff or transport of pollutants derived from cleaning processes, such as abrasive blasting, water blasting and sanding. These facilities must have working and maintained means that capture, contain, treat and dispose of all hull cleaning derived wastes.
- Any spillage, runoff or transportation of contaminated cleaning products will be immediately contained and cleaned.
- Open air dry blasting on the hardstand is prohibited. All dry blasting must take place within the designated covered areas.

### 3.7 SOLID WASTE

Solid waste includes any unwanted or discarded material produced or accumulated by the Marina, the vessels housed within it and the services and facilities located around it. The type of solid waste found in marinas includes garbage derived from boat maintenance and repair, the marina office and store, and the boats themselves.

As a minimum, the following policies in regard to solid waste should be adopted:

- Clearly identifiable and easily located garbage disposal bins will be provided along the marina shoreline and boardwalks and throughout the Outer Harbour facilities. These bins will be emptied regularly into a central garbage collection facility located back from the water.
- Garbage bins and hoppers will be secured to prevent solid wastes from entering the waterway. Bins will be covered and securely fastened and fitted with vermin and bird proof lids.
The garbage collection service will be provided by a licensed garbage collection contractor.

No garbage or solid waste materials will be permitted to be stored on the marina walkways or fingers. Marina users will be notified as to this in the Marina Bylaws and by appropriate signage.

Staff and management will ensure that any visible rubbish or other materials discharged or blown into the water shall be collected and disposed of properly.

Solid waste generated from the maintenance and storage facilities will be prevented from entering the waterway by use of appropriate waste disposal systems and procedures for maintenance and repair.

Encourage recycling by making provisions for separating recyclables and other solid wastes into clearly labelled recycling bins and containers.

The cleaning of fish within the marina or on marina walkways and mooring fingers will be prohibited.

3.8 LIQUID WASTE

Marinas can generate a variety of liquid waste through the activities that occur on marina property and berthings. Liquid materials may be derived from a number of sources, including bilge and grey water and sewerage from boats or other liquid substances such as oils, paints and solvents. If adequate disposal facilities are not available, there is a potential for disposal of liquid waste into the harbour waters.

As a minimum, the following polices in regard to liquid waste should be adopted:

- Shell Cove Marina staff will undertake regular inspections of the harbour waterways for detection of wastes, debris, oil slicks, coloured dye and other such material and will trace the source in order to stop the discharge where possible and report it to the Marina manager.

- Shell Cove Marina will provide a sewage pumpout facility with clear operating instructions for, and weekly inspections that this facility is operating correctly.

- Waste oil collection and storage facilities will be provided at a suitable location onshore, with signposts to clearly show its location and method of safe use.

- No liquid wastes other than those approved by the Council or EPA will be released into the sewer or stormwater drains, nor on the ground or into trenches.

- The varying types of waste oils and liquids will be stored in separate containers that are clearly marked.
• These storage facilities should be over an impermeable surface and covered in a manner that prevents rainwater from entering the containers. To contain spills, curbs or bunds should be installed around areas where liquid material is stored.

• The discharge of sewage or grey water to the waters of the boatharbour is prohibited. This means that toilets and showers onboard vessels which discharge over the side may not be used within the boatharbour. Toilets and showers onboard vessels where the wastewater is collected in holding tanks may be used in boatharbour, provided the wastewater is later disposed of at the sewage pumpout facility or outside the boatharbour in accordance with NSW Maritime regulations.

• Adequate bathroom and shower facilities will be provided adjacent to the berthing areas to compensate for the restrictions on onboard bathroom usage.

• Direct discharge of bilge water to the boatharbour will be prohibited. The marina will supply all vessels with bilge water absorbing pads which will allow bilge water to be collected and disposed of at the pumpout facility.

• The washing of vessels, including in water hull cleaning above the water line and washing down the topsides of vessels will be permitted using water only, or water mixed with an approved bio-degradable detergent.

• The painting of vessels berthed within the marina is prohibited.

3.9 HAZARD MANAGEMENT

There are a wide range of potential hazards at a marina that may impact upon persons, property and the local environment. The identification, control and prevention of hazards are essential to efficient and effective management.

As a minimum, the following polices in regard to the individual hazards should be adopted:

Spills or leaks from berthed vessels or during fuel delivery

• Marina management will conduct regular inspections to monitor the marina berthings and facilities for spills and leaks.

• Shell Cove Marina will restrict fuel deliveries to Marina operational hours when supervision can be provided. Fuel delivery will not be permitted during times of rain.

• A spill kit clearly labelled and easily accessible will be in place. This spill kit will consist of booms to adequately fit around spill and all adjacent drains and absorbent materials.

• Marina staff and users will be trained in the correct procedures for refuelling. Marina staff will be trained and regularly drilled in spill recovery and containment procedures.
• Dip trays to ensure that minor spills and leaks do not pollute will be in place and will be emptied regularly.

• Marina staff will be trained to avoid overfilling and topping up fuel tanks once the automatic cut-off shows that the tank is full.

**Sinking of vessels**

• Shell Cove Marina will maintain an Ownership Register of vessels to enable ready contact at all times with owners or their nominated representative.

• Marina management will take all necessary action to prevent the sinking of any vessel.

• Establish a security-controlled keyboard and direct all owners to supply an access key for their vessel.
**Fires, explosions and fire water runoff**
- Shell Cove Marina will provide a training program for vessel owners and users in the use of all fire fighting equipment. Staff will be trained in conjunction with the local fire brigade to ensure familiarity with equipment and procedures.

- A regular liaison and consultative meeting shall be undertaken with the local fire brigade service for the purpose of identifying access to the Marina.

- When using flammable liquids observe correct handling procedures and any other activities going on which may present a risk of ignition or explosion.

- After using flammable liquids, facilities must be cleaned out to avoid any ongoing flammable vapours being released. Flammable liquids should be stored in approved flameproof cabinets and flammable store.

**Discharge of sewage and waste**
- Shell Cove Marina will establish procedures for staff and the users of the sewage pump out facility so they are adequately trained in the correct usage of equipment and clean-up procedures.

- Shell Cove Marina will monitor the site to prevent discharges from unfiltered bilge water and all grey water from sinks, showers and other sources.

**Electrical equipment hazards**
- Shell Cove Marina will provide procedures so that Marina users are familiar with the safe use of electrical equipment near water, including the use and testing of earth circuit breakers before each use of power leads connected to berth services.

- Only qualified electricians are permitted to repair or adjust electrical fittings.

- All equipment brought into the site must be tested and tagged in accordance with regulations.

- Every electric supply which portable electric equipment or tools can be connected to or supplies power for should be regularly tested and incorporate safety features.

**Hazardous chemicals**
- Shell Cove Marina will take all appropriate action to ensure the prevention of direct exposure to hazardous chemicals.

- All chemical hazards will be recognised by appropriate and clear signage.

- Procedures as approved by work cover/work safety will be followed for the storage of all paints, solvents, glues, resins or other hazardous materials.

- Marina management will maintain material safety data sheets for all hazardous materials used on site.
3.10 WATER QUALITY

The waters within busy operating marinas have a high potential for pollution and diminished quality due to a number of contributing factors. Point source pollution, urban runoff, solid and liquid waste are just some of the sources of waterway pollution. Poor circulation due to enclosure and improper management can lead to poor water quality within the marina waters.

As a minimum, the following polices in regard to water quality should be adopted:

- Marina staff will conduct periodic inspections of the water surface in the vicinity of the marina and arrange for the prompt removal of any visible pollution.
- Marina staff and management will be trained to deploy booms in the event of an emergency and in the appropriate use of absorbent materials for cleanup activities.
- Clear operating instructions for users at the sewage pump-out facility will be communicated to Marina users and weekly inspections will ensure its proper functioning.
- Ensure that all safeguards implemented for water quality control are effective and water quality is maintained at a high level.
- If required by Council, implement water quality testing programs that test water quality at various points throughout the Inner and Outer Harbours, the access channel and outside the Marina (for comparison). Testing should be carried out by appropriately qualified professionals and conducted as required.

3.11 FUELLING

Fuelling facilities and operations within a marina are essential for a large functioning marina. Strict regulations and procedures for the delivery, storage and supply of fuel must be in place to avoid hazards with the potential to impact upon people, property and the local environment. Fuelling procedures should be closely related to the Marina’s fire management and safety plan.

As a minimum, the following polices in regard to fuelling should be adopted:

- Fuelling will only occur at the fuel berth located in the Outer Harbour of the Marina and performed by authorised Marina staff during specified times only, as per these fuelling procedures.
- Before fuelling commences, all engines (including generators) and auxiliaries must be shut off.
- Boats must be securely fastened to the fuel berth with both bow and stern lines and occupants not required in the fuelling process must leave the vessel.
• All windows, portholes, hatches, etc should be closed to avoid gasoline fumes entering the boat and sinking downwards.

• Smoking is strictly prohibited in the area surrounding the fuelling berth and fire extinguishers must be present and placed in easily accessible locations.

• Fuel spill containment units, including booms and absorbable material will be provided in a containment locker located on the fuel berth.

• Facilities for proper disposal of fuel absorption materials shall be provided.

• The Outer Harbour shall be a ‘no wake’ zone with speed restrictions to minimise vessel instability during refuelling processes.

3.12 NOISE AND GENERAL AMENITY

The amenity of a marina is enjoyed by all its users, including boat owners, crews, passengers, hotel guests, local residents and the public visitors. The maintaining of this amenity, especially in regard to noise emissions which travel further over water, benefits all marina stakeholders.

As a minimum, the following polices in regard to noise and general amenity should be adopted:

• Preserve the local amenity for marina users, guests and residents by controlling noise emissions and other disturbing influences.

• Marina tenants must secure all lines, rigging and halyards so as to prevent avoidable noise from rigging slapping against any part of the vessel. In the event of noise emissions caused by loose rigging or halyard lines on unattended vessels, Marina staff will have the authority to board the vessel and secure the lines.

• Excessive running of engines whilst at the marina berth will not be permitted. Excessive idling and revving of engines will be policed by marina staff. Excessive smoke from engines should be monitored and appropriate preventive action taken.

• Regulations regarding noise emissions and other nuisances originating from vessels berthed at the Marina will be in place. Marina Management will have the right to remove offending vessels from the Marina.

• Users of the Marina will be prohibited from using sound horns or loud hailers whilst in berth. Radios, musical instruments and other noise generating instruments must be kept to a minimum at all occasions.

• Ensure that the visual amenity of the site for all users, visitors and local residents is maintained.
• The washing and drying of clothes on the superstructure and rigging of vessels will be prohibited whilst berthed at the marina.

• The use of jet skis within the Inner Harbour is prohibited.

• Restrictions regarding animals in the Marina will be in place. Animals aboard visiting craft will be subject to the Marina noise regulations and environmental control requirements.

• Alcoholic beverages are not to be consumed within the Marina except on board private vessels or in licensed spaces.

• The volume and cut-off duration of on-board intruder alarm systems and their audible signals will be regulated in the Marina Bylaws.

• Quiet tool selection strategies for regular operational maintenance will be implemented on site where possible.

3.13 STORMS

Marinas are particularly vulnerable to the impacts of storms due to their close proximity to the ocean. Marina users, their vessels and property and the infrastructure of the Marina itself can directly be impacted upon and damaged due to severe storms and adverse weather conditions.

As a minimum, the following policies in regard to severe storms should be adopted:

• Vessels left unattended in the marina will be required to be moored with storm-strength mooring lines and have all equipment on deck firmly secured at all times.

• Regular inspections of mooring lines and deck gear on unattended vessels will be conducted by marina staff to ensure they are adequately prepared for storms at all times.

• A storm preparation procedures and trigger value based on forecast wind speed and/or wave height will be established by Marina Management.

• All operational staff will be trained in storm preparation and emergency procedures.

• Boat owners will be made aware of marina storm preparation procedures through inductions and staff contact.

When a severe storm is forecast:

• The crews of occupied vessels will be informed by marina staff and pre-prepared information bulletins.
• All occupied vessels will be required to take appropriate precautions such as supplementing mooring lines with storm mooring lines, and the removal and stowage below decks of all loose deck equipment and fittings.

• Weather information will be posted daily in a prominent location.

• Fueling operations will be shut down and secured.

• Adequate supplies of emergency equipment will be made readily available, including water, medical supplies, food, torches, rescue equipment, etc. Vessel owners and crew will be made aware of the location of these emergency supplies and equipment.

• If required, all non-essential personal will be evacuated from that Marina and a list of the remaining personal and crews will be complied.

• Regular inspections of mooring lines and vessels will be conducted to check for damage.

• Staff will maintain constant radio watch during the full duration of the storm.

• A post-storm clean-up and/or recovery operation will be conducted on a prioritised basis. All marina infrastructure will be inspected and repaired as needed.

3.14 MEDICAL EMERGENCY

Medical emergencies can occur under a range of circumstance within marinas, ranging from boating accidents to storm induced emergencies. Effective management through provision of services such as quick response, first aid and rescue teams are important in reducing the severity of medical emergencies.

As a minimum, the following polices in regard to medical emergency should be adopted:

• A first aid station will be established within or near the Marina Administration Office with appropriate first aid equipment and supplies.

• All staff will be trained in first aid, and will be refreshed on a yearly basis so that all medical emergencies can be handled as quickly and adequately as possible. The Marina manager shall be responsible for the co-ordination of activities in the event of an emergency.

• Local emergency numbers will be posted at a number of locations throughout the Marina, including the Outer Harbour Fuelling and Maintenance Facilities. They will also state the appropriate course of action to be taken following an emergency call.

• All emergencies will be recorded in a log book and reported to the Marina Director promptly.

• Access for emergency vehicles will be provided for along the foreshore of the Marina.
3.15 INSURANCE

There are a number of risks associated with a recreational and commercial marina operation. Insurance against a range of issues, including loss of revenue or infrastructure, damage, or individual claims by Marina users such as theft, fire, personal injury, property loss or damage is essential for the Marina.

As a minimum, the following policies in regard to insurance should be adopted:

- Shell Cove Marina will be insured so that all risks appropriate to a recreational marina and small commercial port, maintenance facilities and foreshore recreation areas are covered. This will include workers compensation, public liability, third party property damage, fire and storm damage for all marina assets, theft, comprehensive and third party insurance of registered and unregistered vehicles, workboats and mobile equipment.

- All Marina users will be required to be adequately insured, and all commercial vessels to be insured for all forms required by their operating licence, including public liability, third party damage and workers compensation.

3.16 FOREIGN VESSELS

Any vessel not registered in Australia is termed a foreign vessel. Foreign vessels can potentially import a number of negative attributes onto Australia’s shores and into its waters, including drugs, firearms, pest flora and fauna and diseases. As a result, all foreign vessels entering an Australian port must comply with Australian Customs, Immigration and Quarantine regulations and procedures.

As a minimum, the following policies in regard to foreign vessels should be adopted:

- Foreign vessels will not be permitted to enter the Marina unless all Australian Customs, Immigration and Quarantine regulations and procedures have been satisfied and evidence of this is presented to Marina staff.

- Marina management are responsible for adequately training all staff as to the requirements of foreign vessels entering Australian Ports.

- Marina staff will be responsible for obtaining evidence from all foreign vessels as to their compliance with all government regulations and clearances. In the event that the proper authorisation has not been obtained, the appropriate authorities will be notified immediately.

3.17 BOAT LIFT OPERATIONS

Shell Cove Marina will have one mobile 50 tonne boat lift located adjacent to the hardstand able to accommodate vessels up to 30 m in length used for transferring vessels from the harbour to the hardstand for maintenance or repair.
Note that this section applies to the mobile boat lift described above rather than private floating boat lifts that may be deployed within a marina berth to lift a vessel hull clear of the water when not in use in order to prevent fouling.

As a minimum, the following polices in regard to boat lifts should be adopted:

- The boat lift will be operated only by specially trained staff members.
- The vessel will be emptied or all crew prior to lifting. The positioning of gantries and lifting belts and operation of the boatlift will be performed only by trained boat lift operators.
- Marina users and staff (with the exception of boat lift operators) will be prohibited from standing under the boat lift whilst it is in motion.
- During storms or high winds operation of the boat lift will be ceased until safe operating conditions return.
- All lifting and movement of vessels, as well as associated accidents or spills will be logged and reported to the Marina management promptly.

### 3.18 VESSEL MAINTENANCE HARDSTAND

Hardstand facilities are multipurpose facilities utilised for out-of-water storage and maintenance of vessels. Shell Cove Marina will incorporate a maintenance facility providing a range of services. It will include a 2 vessel wet berth or holding pen providing direct access between the vessels within the harbour and the hardstand facility.

As a minimum, the following polices in regard to hardstands should be adopted:

- Shell Cove Marina will ensure that all operations in, on and around the hardstand facilities are carried out so that risk to human life and the environment is minimised.
- Any work such as abrasive blasting, cleaning, sanding or antifouling removal that produces airborne or waterborne pollutants will be carried out over a sealed and bunded area. Where work produces airborne pollutants, dust collectors and tarpaulins or material that will catch and collect the removed material will be in place.
- The entire hardstand area will be bunded and drained into a collection pit system that is not connected to the stormwater. This waste will be collected and disposed of in an approved manner.
- The hardstand area will be kept clean and free of debris at all times to ensure safe operating conditions for the maintenance and movement of vessels.
• Workshop floors will drain into a separate collection pit. All chemicals, paints, coolants and lubricants stored will be done so in covered and bunded areas. A spill kit will be located in close proximity.

• Accidents or spills associated with maintenance activities on the hardstand will be logged and reported to the Marina management promptly.

3.19 CAR PARKING

Car parking facilities are required by the marina to deal with the high volume of vehicles generated by marina users, marina visitors and staff.

As a minimum, the following polices in regard to car parking should be adopted:

• Parking areas will be provided at the main marina in the inner harbour, at the hardstand and fuelling jetty in the outer harbour and at the boat ramp.

• All vehicles must observe speed limit in the car parking areas.

• Disability parking and drop-off zones will be provided close to marina access points.
4 MARINA MAINTENANCE

Shell Cove Marina shall prepare a inspection and maintenance program to ensure regular inspections and maintenance of the following areas under marina control:

a. **Inner Harbour**
   - Floating pontoons
   - Piles
   - Gangways
   - Boardwalks and foreshore
   - Buildings and onshore amenities
   - Car parks, roads and drainage systems
   - Solid waste management equipment
   - Fire fighting, first aid and safety equipment
   - Navigation advisory notices and signs

b. **Outer Harbour fuelling pontoon and fuel storage facilities**
   - Fuel tanks
   - Pipes and connections
   - Valves, gauges, delivery equipment and pumps
   - Fuel spill containment booms
   - Fire fighting, first aid and safety equipment
   - Navigation advisory notices and signs

c. **Outer Harbour maintenance facilities**
   - Hardstand area
   - Boat lift
   - Liquid waste collection systems
   - Maintenance machinery
   - Car park, roads and drainage systems
   - Fire fighting, first aid and safety equipment
   - Hazardous materials storage facilities

All major repairs and maintenance to the floating pontoons of the marina are to be carried out by the manufacture/supplier when the Shell Cove Marina Maintenance team are unable to perform the repairs. The Marina Bylaws will require that all Marina users report a breakdown or malfunction of equipment promptly.

An indicative example of a Inspection Checklist is give below:
Shell Cove Marina Inspection Checklist.

Completed by: ____________________________            date__________________.

<table>
<thead>
<tr>
<th>JOB DESCRIPTION</th>
<th>COMPLETED or EXCEPTION NOTED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Inner Harbour</strong></td>
<td></td>
</tr>
<tr>
<td>Pontoons, piles and gangways</td>
<td></td>
</tr>
<tr>
<td>Inspect for vessel damage to pontoon</td>
<td></td>
</tr>
<tr>
<td>Inspect pontoon connections and hinges</td>
<td></td>
</tr>
<tr>
<td>Check condition of service lines at pontoon connections</td>
<td></td>
</tr>
<tr>
<td>Check connection points of gangways</td>
<td></td>
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<tr>
<td>Check handrails on gangways</td>
<td></td>
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<tr>
<td>Check condition of non-slip plates on gangways</td>
<td></td>
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<tr>
<td>Check gangway hinges and rollers</td>
<td></td>
</tr>
<tr>
<td>Inspect condition of grease on piles</td>
<td></td>
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<tr>
<td>Check condition of mooring lines and connections</td>
<td></td>
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<tr>
<td>Check for any loose waste/garbage</td>
<td></td>
</tr>
<tr>
<td><strong>Boardwalk and foreshore</strong></td>
<td></td>
</tr>
<tr>
<td>Ensure correct location of waste disposal units</td>
<td></td>
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<tr>
<td>Check for rubbish on boardwalk/foreshore</td>
<td></td>
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<tr>
<td>Inspect boardwalk for structural damage</td>
<td></td>
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<tr>
<td><strong>Buildings and amenities</strong></td>
<td></td>
</tr>
<tr>
<td>Check external appearance of buildings</td>
<td></td>
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<tr>
<td>Inspect for any damage fixtures or fittings</td>
<td></td>
</tr>
<tr>
<td>Inspect all onshore amenities</td>
<td></td>
</tr>
<tr>
<td><strong>Car park, roads and drainage systems</strong></td>
<td></td>
</tr>
<tr>
<td>Check for potholes and large cracks</td>
<td></td>
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<tr>
<td>Check for eroded shoulders</td>
<td></td>
</tr>
<tr>
<td>Inspect for drainage obstructions</td>
<td></td>
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<tr>
<td>Check for broken pipes, grates etc</td>
<td></td>
</tr>
<tr>
<td><strong>Solid waste management equipment</strong></td>
<td></td>
</tr>
<tr>
<td>Ensure adequate supply of waste receptacle</td>
<td></td>
</tr>
<tr>
<td>Inspect for regular emptying</td>
<td></td>
</tr>
<tr>
<td>Inspect fittings</td>
<td></td>
</tr>
<tr>
<td><strong>Fire fighting, first aid and safety equipment</strong></td>
<td></td>
</tr>
<tr>
<td>Ensure presence of fire fighting equipment</td>
<td></td>
</tr>
<tr>
<td>Inspect condition of fire fighting equipment</td>
<td></td>
</tr>
<tr>
<td>Inspect location and condition of life buoys</td>
<td></td>
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<tr>
<td>Inspect location and contents of first aid kits</td>
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<tr>
<td>---</td>
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<tr>
<td><strong>Navigation advisory signs</strong></td>
<td></td>
</tr>
<tr>
<td>Inspect all signs</td>
<td></td>
</tr>
<tr>
<td>Clear any obstructions from signs</td>
<td></td>
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<tr>
<td><strong>b. Fuelling pontoon and fuel storage facilities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Fuel tanks</strong></td>
<td></td>
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<tr>
<td>Inspect tanks for leakage</td>
<td></td>
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<tr>
<td>Inspect tank caps and valves</td>
<td></td>
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<tr>
<td><strong>Pipes and connections</strong></td>
<td></td>
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<tr>
<td>Check condition of delivery pipes</td>
<td></td>
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<tr>
<td>Check condition of storage pipes</td>
<td></td>
</tr>
<tr>
<td><strong>Valves, gauges, delivery equipment and pumps</strong></td>
<td></td>
</tr>
<tr>
<td>Check all reticulation lines</td>
<td></td>
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<tr>
<td>Inspect valves and gauges work correctly</td>
<td></td>
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<tr>
<td>Check condition of fuel pumps</td>
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<tr>
<td>Inspect service station dispensers</td>
<td></td>
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<tr>
<td><strong>Fuel spill containment booms</strong></td>
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<tr>
<td>Inspect contents of containment locker</td>
<td></td>
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<tr>
<td>Check integrity of spill booms</td>
<td></td>
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<tr>
<td><strong>Fire fighting, first aid and safety equipment</strong></td>
<td></td>
</tr>
<tr>
<td>Ensure presence of fire fighting equipment</td>
<td></td>
</tr>
<tr>
<td>Inspect condition of fire fighting equipment</td>
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<tr>
<td>Inspect location and contents of first aid kits</td>
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<td>Inspect all signs</td>
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<td>Clear any obstructions from signs</td>
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<tr>
<td><strong>c. Outer Harbour maintenance facilities</strong></td>
<td></td>
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<tr>
<td><strong>Hardstand area and liquid waste collectors</strong></td>
<td></td>
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<tr>
<td>Inspect bunds</td>
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<tr>
<td>Remove any rubbish from hardstand floor</td>
<td></td>
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<tr>
<td>Empty drain trays</td>
<td></td>
</tr>
<tr>
<td>Remove solid material from collection pits</td>
<td></td>
</tr>
<tr>
<td>Clean out drains</td>
<td></td>
</tr>
<tr>
<td>Clean out pits</td>
<td></td>
</tr>
<tr>
<td>Check and empty bins</td>
<td></td>
</tr>
</tbody>
</table>
### Inspect permanent and temporary sealed areas

### Boatlift
- Inspect gantry and lifting belt
- Inspect rails
- Inspect water within boatlift berths for obstructions

### Maintenance machinery
- Inspect water blaster
- Check dust collector apparatus
- Check controls to prevent spray drift

### Car park, roads and drainage systems
- Check for potholes and large cracks
- Check for eroded shoulders
- Inspect for drainage obstructions
- Check for broken pipes, grates etc

### Fire fighting, first aid and safety equipment
- Ensure presence of fire fighting equipment
- Inspect condition of fire fighting equipment
- Inspect location and condition of life buoys
- Inspect location and contents of first aid kits