AUSTRALAND CORPORATION (NSW) PTY LTD

SHELL COVE BOATHARBOUR CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Issue No. 11
AUGUST 2014

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Note: In August 2007, Patterson Britton & Partners was acquired by WorleyParsons. Reference to Patterson Britton & Partners should be taken as a reference to WorleyParsons except where this relates to documents or activities prior to August 2007. During the completion of the CEMP the names of a number of government agencies have changed. Names have been updated where relevant.

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1 BACKGROUND

1.1 INTRODUCTION

Australand Corporation (NSW) Pty Ltd (Australand) and Shellharbour City Council propose to develop a boatharbour and marina at Shell Cove south of Shellharbour on the New South Wales south coast. The Shell Cove development comprises a community with 3,000 residential allotments, 300 berth boatharbour, 18 hole championship golf course, district retail centre, community facilities and open space networks.

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

This CEMP addresses the requirements of Condition 15 of the Development Consent Conditions (as modified) and the requirements of Condition 3 of the Development Concurrence Conditions.

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;
- regional boat launching ramp located in the outer harbour;
- 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 construction 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; and
- a boat lift and hardstand area for vessel maintenance.

Construction of the hotel, shopping centre, residential development, marina support facilities and dry boat storage are not covered by this CEMP.

1.2.2 Proposed Construction Methodology

Inner and Outer Harbours

Construction of the boatharbour is complicated by the presence of acid sulfate soils under the existing swamp. The ASS consists of actual ASS (AASS) overlying potential ASS (PASS). It is proposed to remove the AASS either in the wet using a small cutter suction dredger or in a moist condition utilising conventional earthmoving plant, and rebury this material below the boatharbour floor. PASS will be excavated 'in the moist' by conventional earthmoving plant and managed in two ways; by disposal offsite in a DECCW licensed landfill and by neutralisation onsite and subsequent incorporation in the earthworks.

In order to generate the space required for reburial of AASS, excavation of the boatharbour will proceed to approximately 4m below the design bed level and will be conducted in a staged manner within bunded compartments. Where excavation of rock is required, 'ripping' with bulldozers will be used as far as practical and blasting will only be used if necessary to achieve required storage volumes.

Access Channel

The landward part of the access channel across the existing beach will be excavated in the dry within a coffer dam using conventional earthmoving plant. The seaward portion of the access channel will be excavated using a cutter suction dredger once the breakwater has been constructed, as the breakwater is required to provide shelter to the dredging operation.

Breakwater and Groyne

The landward part of the breakwater and groyne structures across the existing beach will be constructed in the dry within a coffer dam by excavators and conventional earthmoving plant. The portion of the structures seaward of the beach will be constructed by trucks end-tipping core material and excavators placing armour rock working off the landward part of the structure and building in a seaward direction.

Boatharbour Edge Treatments

Boatharbour edge treatments will be constructed in the dry before flooding of the boatharbour.

Land Platform

The land platform will be constructed by filling over the existing surface using conventional earthmoving plant. Where ASS exists beneath the land platform it will be capped in situ and surcharged with soil stockpiles to speed consolidation, except in areas of low finished level where it will be 'chased out' and managed as per the boatharbour excavation.

Staging of the Boatharbour Construction

The boatharbour development will be constructed in three stages. There may be a period of up to several years between the completion of each stage and commencement of the subsequent stage.

The proposed staging is outlined in **Section 4.2.2**. This CEMP pertains to activities in all three stages.

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; modified on 31 October 2006;
- modified on 25 November 2008; and
- modified on 25 August 2010.

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 4.**

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 lists a number of individual management plans and programs that must be prepared as part of this EMP. The requirements of the individual management plans and programs are listed in each of the relevant management plans in **Section 4.**

1.3.3 Environment Protection Licence

The Environment Protection Authority NSW (EPA) has issued an Environment Protection Licence (EPL 12426 as amended 9 September 2013) to Australand for the boatharbour construction under the *Protection of the Environment Operations Act 1997* (POEO Act). Specifically, the current EPL authorises and regulates:

- beach coffer dam;

- breakwater and groyne; and
- major earthmoving.

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

The EPL contains a framework for the regulation of the boatharbour construction including requirements in relation to construction noise and vibration, blasting, water quality, erosion and sediment control, ASS, odour control, dust control as well as monitoring and reporting requirements.

While it is envisaged that the EPL will be updated and expanded, the relevant requirements of the current EPL have been incorporated into this CEMP.

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;
- The requirements of NSW Maritime in regard to navigation safety;
- 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 CEMP

This CEMP has been prepared to meet the requirements of Condition 15 of the Conditions of Consent (as modified) and the relevant Conditions of Concurrence, as they apply to the construction phase of the boatharbour.

Issues relating to the operational phase of the boatharbour, including water quality, beach nourishment and marina management, are addressed separately in the *Shell Cove Boatharbour Operation Environmental Management Plan* (OEMP) (Patterson Britton, 2007).

This document is a 'framework' EMP which provides information on environmental issues, mitigation measures, monitoring, compliance standards, corrective actions, reporting and auditing proceedings relating to the construction of the Boatharbour. Additionally, this document requires the lead Contractor for both the Boatharbour and Marina construction to prepare a detailed Site EMP (SEMP) for individual activities related to their Contract scope of works. Any reference to the SEMP within this document refers to the Contractor's SEMP.

This CEMP 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 25 August 2010;
- Shell Cove Boatharbour and Marina, Concurrence under Section 41 of the *Coastal Protection Act 1979*, dated 19 March 1998 and 12 February 2007; and
- Environment Protection Licence No.12426 issued under the *Protection of the Environment Operations Act 1997*, as modified up to21 December 2012.

1.5 OBJECTIVES OF THE CEMP

The objectives of this CEMP are to:

- ensure that the Contractor prepares a site specific SEMP for their works which, as a minimum, should address all issues raised within this framework and the Contract;
- ensure that the works are carried out in accordance with appropriate environmental statutory requirements;
- ensure environmental impacts are avoided where possible;
- ensure that unavoidable environmental impacts are reduced to as low a level as practical;
- ensure that sufficient monitoring is conducted to quickly identify environmental impacts of the construction;
- ensure that any necessary 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.

1.6 STRUCTURE AND USE OF THE CEMP

As well as fulfilling the requirements of the Conditions of Consent/Concurrence, this document is a management tool for all personnel involved in the activities associated with the development 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 Contractor and Site Superintendent in regards to the implementation of this CEMP;
- procedures for reporting and auditing of environmental management activities;
- requirements of the Contractor's SEMP;
- an outline for each of the management plans required by the Conditions of Consent 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 during the project;
- summary of monitoring requirement trigger values and corrective actions; and
- required environmental auditing program.

The Contractor shall use this CEMP as a critical reference in the preparation of the SEMP and the Site Superintendent shall use this CEMP as a critical reference for approval of the SEMP and when inspecting works.

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 CEMP and the separate OEMP. Where the plan or program is not relevant to the construction of the boatharbour, this is duly noted.

Note that terrestrial aspects (such as stormwater management) of the Water Quality Management Plan required by the Conditions of Consent have been combined with the required Erosion and Sediment Control Plan in a 'Terrestrial Water Quality and Sediment Control Plan' as they have significant overlap in scope. Marine aspects (such as downstream impacts) of the required Water Quality Management Plan have been combined with the Marine Environment Management Plan required by the Conditions of Concurrence in a 'Marine Water Quality and Environment Management Plan' as they have significant overlap in scope.

Table 1.1 EMP Sections addressing Conditions of Consent

Conditions of Consent Clause:	Construction Phase	Operational Phase
15.(d)		
(i) Air Quality Management Plan	Section 4.3	n/a
(ii) Water Quality Management Plan	Section 4.4 and Section 4.5	OEMP Section 3.1
(iii) Erosion and Sediment Control Plan	Section 4.4	n/a
(iv) Acid Sulfate Soil Management Plan	Section 4.6	n/a
(v) Noise Management Plan	Section 4.7	n/a
(vi) Archaeological and Heritage Protection Plan	Section 4.8	n/a

Conditions of Consent Clause:	Construction Phase	Operational Phase
(vii) Construction Program	Section 4.2	n/a
(viii) Monitoring Program	Section 5	OEMP Section 4
(ix) Landscaping Plan[1]	n/a	n/a
(x) Conceptual Marina Plan of Management	n/a	OEMP Appendix D
(xi) Beach Nourishment/Rehabilitation Plan	Section 4.9	OEMP Section 3.4
(xii) Auditing Program	Section 6	OEMP Section 5

Table 1.2 EMP Sections addressing Conditions of Concurrence

1998 Conditions of Concurrence Clause:	Construction Phase	Operational Phase
3.		
(i) Acid Sulfate Soil Management Plan	Section 4.6	n/a
(ii) Construction Program	Section 4.2	n/a
(iii) Marine Environment Management Plan	Section 4.5	OEMP Section 3.1
(iv) Monitoring Program	Section 5	OEMP Section 4
(v) Beach Nourishment/Rehabilitation Plan	Section 4.9	OEMP Section 3.4
(vi) Auditing Program	Section 6	OEMP Section 5

[1] Development Consent Conditions require a Landscaping Plan only in relation to the construction of acoustic barriers adjacent to the Quarry Haul Road, not for the construction of the Boatharbour. Restoration and landscaping for the boatharbour is covered in the 'Construction Program'.

2 IMPLEMENTATION OF THE CEMP

2.1 GENERAL

The responsibility of environmental management lies with a number of parties. These comprise:

- Shellharbour City Council – the landowner;
- Australand Corporation (NSW) Pty Ltd – Project Manager for Shellharbour City Council;
- Site Superintendent/s – to be appointed; and
- Contractor/s and Subcontractors – to be appointed.

Shellharbour City Council (SCC) is the landowner of the project site and the applicant for the development consent and concurrence. As such SCC is responsible for preparation of the EMP, which comprises this CEMP and the 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 prepared to the satisfaction of the Department of Land and Water Conservation (DLWC) (now , Office of Environment and Heritage OEH)) and other relevant agencies as identified.

Australand is the Project Manager and joint developer with Shellharbour City Council and as such is responsible for the appointment of the Site Superintendent and the Contactors for the construction works.

The Site Superintendent represents the Project Manager on site. The Site Superintendent will supervise the day-to-day activities of the Contractor. The Site Superintendent shall undertake regular inspections and compliance audits of all aspects of work including environmental management procedures. The Site Superintendent is responsible for approval of the SEMP, including any amendments, in accordance with this CEMP.

The Contractor will be responsible for environmental management of the works including preparation and implementation of the Site Environmental Management Plan (SEMP). Details of the requirements of the SEMP are outlined below in **Section 3**.

All works shall be implemented in accordance with this CEMP and the SEMP for the full duration of the project; from site establishment through demobilisation. However, the SEMP may be revised as required throughout the course of the project or during any project task, to better align the management of the works with changing site and project conditions. Also, the SEMP must be revised to reflect any updates or amendments to this CEMP.

2.2 RESPONSIBILITIES OF THE CONTRACTOR

The Contractor shall prepare a SEMP in accordance with this CEMP and their scope of works. The SEMP must be consistent with the requirements of the CEMP and the EPL. Where a conflict exists, the requirements of the EPL shall take preference. The SEMP (including any revisions), must be submitted to the Site Superintendent for approval at least 14 days prior to the commencement of works. Works shall not commence before approval is received from the Site Superintendent. The SEMP must be implemented and become an integral part of the construction 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 SEMP.

The Contractor as a minimum should:

- ensure compliance with this CEMP and their SEMP;
- ensure compliance with environmental legislation, regulations, standards and codes;
- review environmental impacts as the works progress and update the SEMP accordingly;
- investigate incidents and initiate corrective and preventative actions;
- ensure employees and Subcontractors comply with requirements of this CEMP and their SEMP;
- implement corrective actions in response to failure to meet a compliance standard or upon request of the Site Superintendent;
- issue non-conformance reports and corrective action reports for non-compliance with the SEMP;
- report all incidents to the Site Superintendent; and
- undertake internal audits once per month to verify compliance with this CEMP and the SEMP.

The Contractor must provide details of staff responsible for the onsite implementation of this CEMP and their SEMP, and provide a brief description of each person's roles and responsibilities.

The Contractor 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, EPA and other relevant national, State and Local authorities.

2.3 RESPONSIBILITIES OF THE SITE SUPERINTENDENT

The Site Superintendent is Australand's on-site representative. The Site Superintendent shall monitor the implementation of the EMP and SEMP. The roles and responsibilities of the Site Superintendent include, but are not limited to:

- review and approve the SEMP (and any revision) submitted by the Contactor;
- conduct regular site visits and informal audits to ensure the Contractor is implementing and complying with the requirements of this CEMP and the SEMP;
- conduct an on-going evaluation of the Contractor's performance;
- issue non-conformance reports;
- review corrective action reports;
- act on any incidents or emergencies; and
- attend independent environmental audits.

2.4 RESPONSIBILITIES OF THE PROJECT MANAGER

As Project Manager, Australand's responsibilities include:

- appointment of appropriately qualified Site Superintendent and Contractor;
- monitoring the performance of the Site Superintendent and Contractor for duration of construction; and
- management of the site between construction stages, including ensuring compliance with all environmental management plans at these times.

2.5 COMMUNICATION AND COMMITTEES

Under Condition 4 of the Conditions of Consent, an appropriately qualified community liaison officer has been appointed by SCC 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 has been established to enable this function when the officer is unavailable. This officer is a representative on the Shell Cove Compliance Committee.

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 EMP.

The Shell Cove Compliance Committee was established by the Director General of the Department of Urban Affairs and Planning (DUAP) and comprises representatives of the DoP (Chair), OEH, 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.

2.6 AMENDMENT OF THE CEMP

In accordance with Condition 15 (a) of the Development Consent Conditions and Condition 4 of the Conditions of Concurrence, the CEMP 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 Planning and the DLWC (now OEH) respectively.

If the CEMP is updated or amended, the Contractor shall accordingly amend or update the SEMP and submit to the Site Superintendent for approval.

3 SITE ENVIRONMENTAL MANAGEMENT PLAN REQUIREMENTS

As outlined in **Section 2**, the Contractor shall prepare a SEMP in accordance with this CEMP, the Conditions of Consent, the Conditions of Concurrence, the Conditions of the Contract and all relevant legislation, regulations and guidelines. The SEMP should include at least the following elements:

1. details of the Contractor's environmental management system;
2. details of the Contractor's organisational structure, authorities and responsibilities;
3. statutory obligations, regulatory/legislative requirements;
4. register of project specific licences and permits;
5. contract requirements;
6. construction methodology;
7. environmental management plans;
8. emergency response management;
9. environmental monitoring program;
10. training;
11. records;
12. reporting; and
13. environmental management audit process.

The following Sections outline in detail the SEMP requirements.

3.1 CONTRACTOR'S ENVIRONMENTAL MANAGEMENT SYSTEM

The contractor shall provide details of their organisation's environmental management system and policy and provide details of how environmental risks are identified and managed.

3.2 CONTRACTOR'S ORGANISATIONAL STRUCTURE

The Contractor shall provide an organisational chart showing job functions and lines of responsibility relating to environmental management.

3.3 STATUTORY AND LEGISLATIVE OBLIGATIONS

During the course of the project, the Contractor shall comply with all applicable environmental regulatory and legislative requirements. The Contractor shall present in the SEMP all general, legal and other requirements for this project as follows:

Source of Requirement	Nature of Source	Key Requirements
Environment Protection and Biodiversity Conservation Act (2000)	Legislation	Protection of threatened species

3.4 REGISTER OF PROJECT SPECIFIC LICENCES AND PERMITS

In performing the works, the Contractor shall apply for, obtain, renew, comply with and provide copies to the Site Superintendent of, all approvals. The Contractor shall maintain a register of all permits and licences required, including information on:

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

3.5 CONTRACT REQUIREMENTS

During the course of the project, the Contractor shall comply with all applicable contract requirements including the Conditions of Consent, and the Conditions of Concurrence.

3.6 CONSTRUCTION METHODOLOGY

The Contractor shall prepare a detailed statement of their proposed construction methodology for the boatharbour and all associated works in the contract. On the basis of the construction methodology the Contractor shall complete a risk assessment and identification of the potential environmental impacts associated with the work.

3.7 ENVIRONMENTAL MANAGEMENT PLANS

To enable effective control and monitoring of identified potential impacts, the Contractor shall document the measures to be undertaken to manage each of the identified potential impacts in the individual issue-based management plans and programs required by the Conditions of Consent.

Minimum requirements for individual management plans are outlined in **Section 4**.

Each management plan shall outline potential environmental impacts, management strategy and mitigation measures, monitoring, compliance standards, reporting and corrective actions.

3.8 EMERGENCY RESPONSE MANAGEMENT

An emergency response plan shall be developed and implemented by the Contractor as part of the SEMP. The procedures in the emergency response plan shall be designed to ensure the safety of all personnel and minimise the impact of any significant pollutant release to the environment. In preparing this plan, the Contractor 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;

- flood exceeding the capacity of stormwater channels and diversions;
- fire; and
- coastal storm/erosion event threatening breakwater and groyne construction activities.

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

In the event of an emergency, the Site Superintendent shall be notified as soon as possible once immediate actions required to ensure personnel safety and damage control have been undertaken. In the event of a spill or pollution release the EPA shall be informed.

After the event, the Contractor shall provide the Site Superintendent with a full report on the incident including rectification plan to repair damage and an action plan to minimise the risk of any reoccurrence.

3.9 ENVIRONMENTAL MONITORING PROGRAM

The Contractor's Environmental Monitoring Program shall include parameters, methods of testing, frequency/timetabling, compliance standards, contingency plans/corrective actions, and quality assessment programs as per **Section 5**.

3.10 TRAINING

The Contractor shall ensure that all staff required to implement the SEMP are properly trained in the procedures required by the SEMP.

3.11 RECORDS

The Contractor shall establish, document and maintain a quality system as a means of ensuring that compliance is achieved with the SEMP and Contract requirements. The Contractor shall prepare a quality manual covering the requirements of the international standard ISO 9001, or approved alternatives.

3.12 REPORTING

The Contractor shall report on implementation of the SEMP at regular progress meetings with the Site Superintendent. Monitoring results will be supplied to the Site Superintendent and EPA as per the requirements detailed in the individual management plans (**Section 4**) and the monitoring program (**Section 5**).

3.13 AUDITING

The Contractor shall develop an auditing program to undertake internal audits of environmental management once per month, to verify compliance with this CEMP and the SEMP, as specified in **Section 6**.

4 INDIVIDUAL MANAGEMENT PLANS – CONSTRUCTION PHASE

4.1 INTRODUCTION

An Environmental Management Plan is a useful way of integrating and implementing the various environmental management commitments, conditions and statutory requirements that projects must observe. An EMP includes management strategies with agreed performance criteria for specified acceptable levels of environmental harm. This CEMP forms a practical guide to identifying, addressing and managing environmental impacts associated with the works to ensure the Project Manager, Site Superintendent/s, Contractors and Subcontractors comply with the environmental conditions of approval for the project and that the environmental risks are properly addressed and managed.

The EMPs required to manage environmental issues during the Boatharbour construction comprise:

- construction program;
- air quality;
- terrestrial water quality and sediment control;
- marine water quality and environment;
- acid sulfate soil;
- noise and vibration;
- archaeological and heritage protection;
- beach nourishment/rehabilitation;
- monitoring; and
- auditing.

4.2 CONSTRUCTION PROGRAM

This section addresses the Conditions of Consent clause 15(d)(vii) and Conditions of Concurrence clause 3(ii).

4.2.1 Requirements

The Conditions of Consent require a Construction Program to be prepared and state that:

...it [the Construction Program] shall provide details relative to:

- *timetabling, in particular, the date of completion of construction 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 the 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.*

The March 1998 Conditions of Concurrence also require a Construction Program to be prepared and state that:

...it [the Construction Program] 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.*

The September 2007 Conditions of Concurrence include the following additional conditions relevant to the Construction Program:

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 boatharbour.

This condition is principally relevant to the operation of the boatharbour post-construction, not the construction of the boatharbour. As such this condition is addressed in the OEMP.

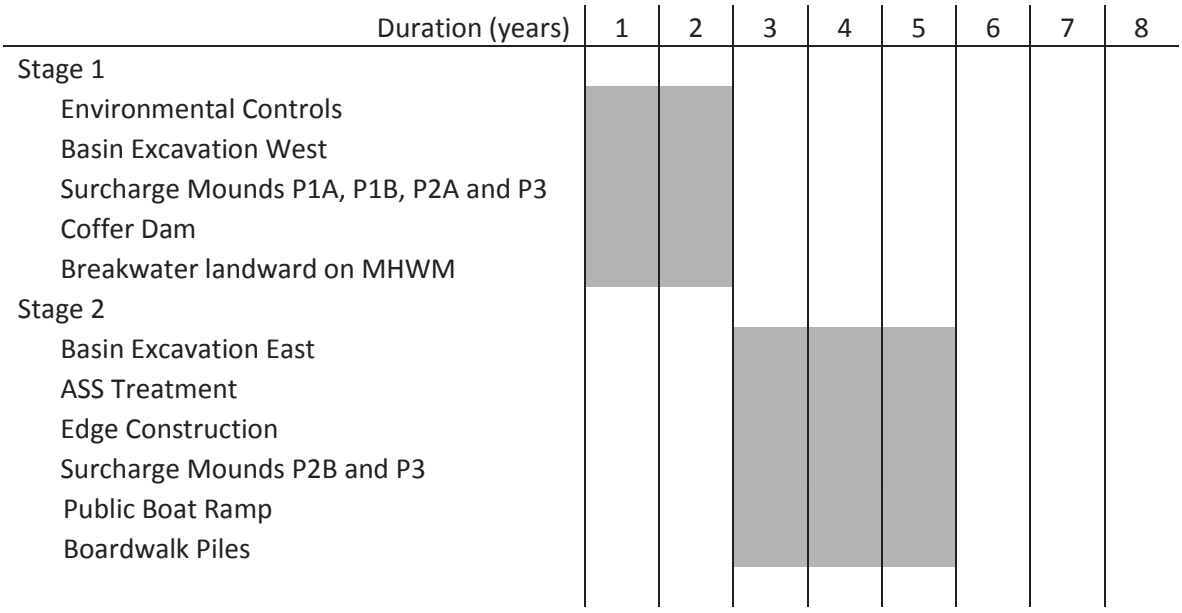
The current Environment Protection Licence (EPL) for the project (EPL 12426 as amended 9 September 2013) contains a number of clauses relating to matters covered in the Construction Program, as listed below. The full text of the EPL is included in **Appendix C**.

Clause	Title
O1	Activities must be carried out in a competent manner
O2	Maintenance of plant and equipment
O3	Dust
O4	Processes and management

The Contractor shall prepare a detailed Construction Program addressing these requirements as part of their SEMP, based on this document and their proposed methodology for the works.

4.2.2 Timetabling

A simplified construction program is included below.



Duration (years)	1	2	3	4	5	6	7	8
Stage 3								
Breakwater and Groyne Seaward of MHWM								
Boardwalk								
Navigation Aids								
Dredging of Entry								

4.2.3 Flora and Fauna Protection Plan

4.2.3.1 Requirements

In addition to the requirements of the Conditions of Consent and Conditions of Concurrence listed above, the Contractor's SEMP and work methods shall comply with relevant legislation and regulations including:

- Environment Protection and Biodiversity Conservation Act, 1999;
- Threatened Species Conservation Act, 1995;
- Native Vegetation Conservation Act, 1997; and
- National Parks and Wildlife Act, 1974.

The Contractor shall address the requirements for Flora and Fauna protection in their SEMP, based on their work methods and this CEMP.

4.2.3.2 Potential Environmental Impact

Impacts on the flora and fauna will result from alterations to habitats within the project area, particularly vegetation removal. These include:

- complete removal of Shellharbour Swamp;
- clearing of vegetation and topsoil from grassland habitat surrounding the swamp to allow stockpiling, surcharging and development; and
- disturbance to dune and beach areas associated with breakwater and channel construction and dune construction and reshaping.

4.2.3.3 Threatened Species

A number of threatened species of fauna listed in the schedules of the *National Parks and Wildlife Act* 1974 or the *Threatened Species Conservation Act* 1995 have been recorded in the area or may use the area (EIS Appendix 11, 1995 and Kevin Mills and Associates, 2005):

Amphibians
- Green and Golden Bell Frogs

Birds
- Little Tern
- Sanderling
- Large Sandy Plover

- Sooty Oystercatcher
- Pied Oystercatcher
- Painted Snipe
- Australasian Bittern
- Swift Parrot
- Orange-Bellied Parrot

Mammals
- Grey-Headed Flying-Fox

The Green and Golden Bell Frog has not been recorded at the site since approximately 1990. Targeted investigations in 1995 and 2005 failed to find Bell Frogs and concluded that they are not present at the site and could not breed at the site (Kevin Mills and Associates, 2005). Further studies were conducted in 2010 in relation to the suitability of the wetlands on the site for provision of habitat for Bell Frogs. This study concluded that the wetlands on the site were not suitable for the species to breed because of the abundance of introduced fish (Kevin Mills and Associates, 2010).

All of the other threatened species, except the Sooty Oystercatcher, are thought to visit the area only occasionally and are not thought to breed in the area. The Sooty Oystercatcher regularly forages on the rock platforms at the southern end of Shellharbour South Beach. No threatened or endangered species of flora, or ecological communities have been identified at the site (EIS Appendix 11, 1995).

4.2.3.4 Management Strategy and Control Measures

Because the boatharbour construction involves complete removal and large scale alterations to the wetland habitat within the study area, environmental impact mitigation measures focus on the creation of suitable alternative wetland habitat – specifically the already constructed Shadforth Wetland and rehabilitated Tongarra Creek saline wetlands. Refer to the *Shadforth Wetland Environmental Management Plan* (SMEC, 2003) for details of the environmental management of this compensatory wetland.

Notwithstanding the construction of the compensatory wetland, it is the responsibility of the Contractor to ensure that impacts on flora and fauna, particularly the endangered fauna is minimised during construction. The following mitigation measures, at a minimum, shall be adopted by the Contractor during construction.

General

(a) The Contractor shall minimise vegetation clearance where possible.

(b) Ensure construction activity is confined to fenced off construction areas.

(c) Topsoil shall be stripped from earthworks areas and stockpiled. At the completion of earthworks, topsoil shall be relaid and vegetated as per the detailed design.

(d) All machinery and materials entering the site shall be free of weeds and soil potentially containing seeds to prevent the introduction of weeds.

4.2.3.5 Monitoring and Compliance Standards

On the boatharbour site, the Water Quality and Sediment Control Plan – Terrestrial Areas **(Section 4.4)**, the Marine Water Quality and Environment Management Plan **(Section 4.5)** and the Beach Nourishment/Rehabilitation Plan **(Section 4.9)** all contain monitoring and compliance standards relevant to the protection of flora and fauna. No further monitoring specifically for flora and fauna is required.

Compliance standards for flora and fauna protection are given in **Table 4.1**.

Table 4.1 Compliance Standards for Flora and Fauna Protection

Parameter	Standard	Measurement Location
Endangered Fauna	No harm to endangered Fauna	Entire site
Weed Management	No new noxious weed species on site at the completion of works and no increase in abundance of current noxious weed species at completion of works.	Entire site

4.2.3.6 Corrective Actions

On the boatharbour site, the Water Quality and Sediment Control Plan – Terrestrial Areas **(Section 4.4)**, the Marine Water Quality and Environment Management Plan **(Section 4.5)** and the Beach Nourishment / Rehabilitation Plan **(Section 4.9)** all contain corrective actions relevant to the protection of flora and fauna. No further corrective actions specifically for flora and fauna are required.

4.2.4 Marine Environment Protection

Details of marine environment protection measures, monitoring, compliance standards and corrective actions are given in the Marine Water Quality and Environment Management Plan **(Section 4.5)**.

4.2.5 Restoration and Landscaping

Dune Area
The dune area shall be stabilised by planting of native species upon completion of the dune construction works, as described in the Beach Nourishment/Rehabilitation Plan **(Section 4.9)**.

Boat Ramp Area
The boat ramp car park will be constructed as part of this project. Landscaping in this area, including planting, may be staged. As a minimum the area will be stabilised with turf grass.

Land Platform
The remainder of the land platform surrounding the boatharbour shall be stabilised using appropriate temporary vegetative restabilisation techniques as per the Water Quality and Sediment Control Plan – Terrestrial Areas **(Section 4.4)**.

4.2.6 Emergency Procedures

Emergency procedures shall be prepared by the Contractor as part of their SEMP, as described in **Section 3.8**- Emergency Response Management.

4.2.7 Traffic Management and Route Selection Plan

4.2.7.1 Requirements

The Contractor shall address the requirements for traffic management and route selection in their SEMP, based on their work methods and this CEMP.

4.2.7.2 Potential Environmental Impact

Traffic management and route selection will potentially impact on the surrounding community and environment through generation of extra traffic on roads and noise associated with this traffic.

4.2.7.3 Management Strategy and Control Measures

The Contractor shall implement all traffic control measures required by the Contract from the commencement of site operations and shall maintain such measures throughout the duration of the Contract. The Contractor shall be responsible for traffic management and route selection within the site and for minimising the impact of construction traffic on surrounding areas.

The Contractor shall implement the management strategies and mitigation measures described below as a minimum. The location of site access gates is shown indicatively on **Figure 1**.

(a) Where possible, construction traffic should access the site via the gates on Shellharbour Road and the Quarry Haul Road to minimise impacts on surrounding residential areas. Trucks hauling PASS soil and rock to and from the site shall use the gate on the Quarry Haul Road. Gate to Cove Boulevard and gate to Boollwarroo Parade should only be used for emergencies.

(b) Appropriate signage shall be installed at all gates to warn public road users of construction traffic, in accordance with AS 1742.3-2002 *Manual of uniform traffic control devices - Traffic control devices for works on roads*

(c) A shaker ramp and wash down bay shall be installed at gates where construction traffic leaves the site to prevent soil being tracked onto public roads.

(d) Route selection within the site shall minimise vehicle conflicts and maximise safety of construction personnel. Routes within the site shall be documented and clearly marked on the ground.

(e) All vehicle operators on the site shall be briefed on site safety procedures including routes and traffic flow.

(f) The Contractor shall maintain public access to Bass Point along Boollwarroo Parade/Bass Point Tourist Road, or the alternative public access road (construction of the alternative public access road is a separate project that will take place concurrently with the boatharbour construction). The Contractor may temporarily restrict access along Boollwarroo Parade/Bass Point Tourist Road or the alternative public access road through the site for public safety or operational reasons with the prior approval of the Site Superintendent and Shellharbour City Council, but such restrictions shall be kept to a minimum. The public shall be notified of all changes and restrictions to access along Boollwarroo Parade/Bass Point Tourist Road by advertisements in the local newspaper and signs erected on the road at least one week before changes come into effect.

4.2.7.4 Monitoring and Compliance Standards

Details of required noise monitoring for construction activities are given in the Noise and Vibration Management Plan in **Section 4.7**. No further monitoring of traffic and route selection is required.

Any traffic accidents involving construction vehicles resulting from traffic management or route selection must be reported to the Site Superintendent.

Compliance standards for traffic management and route selection are given in **Table 4.2**.

Table 4.2 Compliance Standards for Traffic Management and Route Selection

Parameter	Standard	Measurement Location
Accidents	Zero traffic accidents involving construction vehicles resulting from traffic management or route selection	Entire site, haul routes off site and surrounding areas.

4.2.7.5 Corrective Actions

In the event of traffic accidents involving construction vehicles or complaints from the public about construction traffic the Site Superintendent may require the Contractor to review their traffic management plan and route selection.

4.2.8 Site Familiarisation Program

The Contractor shall induct all personnel involved on the project before they commence work on site. The induction shall cover as a minimum:

- environmental aspects and impacts of the construction work;
- environmental management responsibilities;
- environmental controls and mitigation measures;
- occupational health and safety management and procedures;
- emergency management and procedures; and
- traffic management within the site.

4.3 AIR QUALITY MANAGEMENT PLAN

This section addresses the conditions of consent clause 15 (d)(i)

4.3.1 Requirements

The Conditions of Consent require an Air Quality Management Plan to be prepared and state that:

The Air Quality Management Plan shall provide detail on:

- *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.*

The Contractor shall prepare a detailed Air Quality Management Plan addressing these requirements as part of their SEMP, based on this document and their proposed methodology for the works.

In addition, the Contractor shall conduct site works in a manner that ensures that the air quality complies with the relevant statutory requirements. The standards that the Contractor shall comply with include but are not limited to:

- NSW EPA (2001) *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW.*

4.3.2 Potential Environmental Impact

Air quality impacts during construction are likely to result from:

- smoke / fumes emitted from plant and equipment;
- dust and windblown soil, sediment from cleared land and construction process; and
- potential odour from acid sulfate soils both on site and during transport to the offsite disposal location.

4.3.3 Management Strategy and Mitigation Measures

The Contractor shall ensure that all activities carried out on site will be in accordance with this CEMP and the Contract from the beginning of the construction works throughout the duration of the works. It is the responsibility of the Contractor to ensure that all equipment used and all facilities erected are designed and operated to control the emissions of smoke, dust, fumes and other air pollutants into the atmosphere.

The following mitigation measures, at a minimum, shall be adopted by the Contractor during construction.

General

(a) Work shall be confined to working hours of 7:00am to 6:00pm Mondays to Fridays and 7:00am to 5:00pm Saturdays. No works shall take place on Sundays or public holidays. These hours may be varied only with prior written permission of the EPA.

(b) Emergency work may be carried out by the Contractor outside normal working hours provided that:

i. the Site Superintendent is satisfied that the proposed work is of an essential nature and cannot be carried out during normal working hours; and
ii. the Contractor submits a report summarising the event to the site Superintendent within 24 hours commencement of the event.

(c) At all times the Contractor shall seek to minimise the potential for the generation of dust, odours and noxious vapours.

(d) At all times the Contractor shall consider the prevailing weather conditions in which all work is undertaken and modify and/or cease site operations where necessary in the case of adverse weather conditions such as high wind conditions.

(e) Standard health and safety procedures for construction staff at the site should be implemented, including requirements for personal protective equipment (e.g. masks) where dust generation is unavoidable.

(f) There shall be no burning of any material at the site.

Plant and Equipment

(g) The Contractor shall minimise unnecessary movement of machinery.

(h) Restrict construction traffic to defined roads onsite, where practical and implement a speed limit. The Contractor will have to nominate a speed limit in their SEMP.

Smoke and Fume Emissions

(i) All plant and equipment must not emit unacceptable levels of smoke/fumes and ensure that they comply with EPA licence conditions for air quality standards.

(j) The operation of any plant and equipment found emitting visible smoke/fumes for periods longer than a designated time period should be suspended until acceptable levels can be achieved. The Contractor will have to nominate an appropriate time period in their SEMP.

Dust and Wind Blown Sand

(k) Appropriate dust and windblown sand suppression measures should be implemented to ensure that unacceptable levels of dust are not generated by construction activities.

(l) Minimise areas disturbed by works at any given time, including the progressive rehabilitation of disturbed areas following earthworks.

(m) Use water carts to keep haulage roads moist during operational hours.

(n) Spray disturbed areas with a fine spray of water during earthworks activities.

(o) Ensure all watering equipment, including sprays, sprinklers and water carts are adequately maintained and readily available during the works.

Potential Odour from Acid Sulfate Soils

It is recommended that appropriate suppression measures be employed to ensure that unacceptable levels of odour *(associated with sediment exposure ie acid sulfate soils)* are minimised during construction activities. The following mitigative measures may be appropriate to minimise odour emissions during construction:

(p) Apply odour suppressants to the odorous sediment to minimise the amount of odour emission when levels of odour exceed trigger values.

(q) Minimise the size of the exposed odorous sediment area.

(r) Add lime to sediment in order to reduce odour emissions.

4.3.4 Monitoring and Compliance Standards

The Contractor should undertake regular inspections of the site and the construction activities in order to visually monitor dust and odour emissions from the construction activities. Appropriate action should be undertaken to mitigate unacceptable dust and odour generation.

An air quality monitoring program shall be undertaken in order to monitor the Contractor's compliance with air quality standards at the nearest residence and to demonstrate that site works being undertaken are not having any adverse effect on the surrounding air quality. The air quality monitoring program shall be undertaken by the Contractor throughout the Contract period. The monitoring program shall include dust monitoring and odour assessments. Trigger values are to be observed during monitoring in order to determine if air quality exceeds unacceptable limits (refer **Table 4.3**).

Table 4.3 Compliance Standards for Air Quality

Parameter	Trigger Values	Measurement Location
Dust	Monthly dust deposition rate < 4g / m^2 / month or 2g / m^2 / month over background levels nearest residence	One location representative of homes at Boollwarroo Parade
	Monthly dust deposition rate < 4g / m^2 / month or 2g / m^2 / month over background levels nearest residence	One location representative of homes at Sophia Street
	Monthly dust deposition rate < 4g / m^2 / month or 2g / m^2 / month over background levels nearest residence	One location representative of homes at eastern end of Shell Cove Estate
Dust complaints	Public complaints of nuisance dust	Surrounding community
Odour complaints	Public complaints of odours	Surrounding community

In the event that air quality does not meet the air quality standards, the air quality shall be considered unacceptable and the Contractor must act immediately to rectify the unacceptable air quality in the shortest possible time.

Odour assessments should be performed using a sensory approach at the source, along the boundaries of the site and at the surrounding local resident's receptor sites. In addition, the Contractor shall keep a log of the odour observations and these results shall be reported to the Site Superintendent in a monthly report.

The Contractor shall provide the Site Superintendent with a monthly report that will summarise the air quality observations for smoke and fume emissions, dust and wind blown sand, and odour emissions.

4.3.5 Corrective Actions

In the event of unacceptable air quality above the trigger values, initially, the Contractor shall suspend any activity that generates unacceptable dust, odours or gases and implement further mitigation measures before the activity is resumed. Once acceptable levels of air quality have been attained, the activity may recommence. It is recommended that monitoring is undertaken once the activity recommences to ensure that unacceptable air quality levels are not exceeded again.

4.4 WATER QUALITY, EROSION AND SEDIMENT CONTROL PLAN – TERRESTRIAL AREAS

This section addresses the Conditions of Consent clauses 15(d)(ii) and (iii).

The terrestrial aspects of the Water Quality Management Plan and the Erosion and Sediment Control Plan required by the Conditions of Consent have been combined in this plan as they have significant overlap in scope and the issues involved in each are strongly interrelated.

4.4.1 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 sulfate soil.*

The Conditions of Consent also require an Erosion and Sediment Control Plan to be prepared and state that necessary controls are to be installed prior to the commencement of earthworks.

The current Environment Protection Licence (EPL) for the project (EPL 12426 as amended 9 September 2013) contains a number of clauses specifically related to terrestrial water quality and erosion and sediment control, as listed below. The full text of the EPL is included in **Appendix C**.

Clause	Title
P1	Location of monitoring/discharge points and areas
L1	Pollution of Waters
L2	Concentration Limits
O4	Processes and Management
M2	Requirement to monitor concentration of pollutants discharged
R2	Notification of Environmental Harm

The Contractor shall prepare Progressive Erosion and Sediment Control Plans (PESCPs) for specific elements of the works addressing these requirements as part of their SEMP, based on this CEMP, their proposed methodology for the works and NSW Department of Housing (2004) *Managing Urban Stormwater: Soils and Construction* (the 'Blue Book').

PESCP's shall be prepared as detailed plans that clearly define the nature and locations of the sediment and erosion controls, and are accompanied by supporting documentation to demonstrate the sediment and erosions controls are compliant. Preparation and/or review of PESCPs shall be carried out by a suitably qualified and experienced organisation with expertise in the design of sediment erosion controls. Approval of the PESCPs by the Superintendent shall be used as hold points for commencement of any associated works.

4.4.2 Potential Environmental Impact

Terrestrial water quality impacts during construction may result from:

- erosion of sediment from disturbed earth in excavations, stockpiles and haul roads;
- disturbance caused by construction traffic;
- discharge of turbid stormwater captured in sediment control structures or site works;
- acid runoff or discharge from oxidisation of acid sulfate soils (ASS);
- pollution from spills of ASS, sewage, solid waste, fuel, oil, chemicals or other construction material.

4.4.3 Management Strategy and Control Measures

The Contractor shall implement all water quality, erosion and sediment control measures required by this CEMP and the Contract from the commencement of site operations and shall maintain such measures throughout the duration of the works. The Contractor shall be responsible for maintaining acceptable water quality in the waters discharged from the site and for minimising the impact on surrounding areas, including the marine environment, of the construction works.

The Contractor shall implement the management strategies and mitigation measures described below as a minimum. The general arrangement of proposed stormwater diversions is shown indicatively on **Figures 3A to 3I**.

General

(a) Prior to construction of the boatharbour, a 3m high bund shall be erected around the boatharbour construction site to control runoff and noise, as required by Condition of Consent no 16. The bund shall:
    - not contain any ASS, all material used in the bund must maintain a pH greater than 5.5;
    - be planted with grass or equivalent soil stabiliser agents to prevent erosion during storm events; and
    - dust from the bund must be controlled.

    Construction of the bund in a staged manner is acceptable providing runoff and noise are effectively managed in accordance with the relevant requirements of this CEMP at all times.

Erosion Control

(b) Erosion control measures must be installed prior to any other earthworks or site disturbance.

(c) Upslope diversion drains shall be used to divert clean stormwater around disturbed areas.

(d) Soil stockpiles shall not be placed within 30m of a watercourse.

(e) The Contractor shall install an effective combination of sediment filters, barriers and/or basins downslope of all disturbed areas.

(f) Disturbed areas shall be stabilised as soon as practical. Temporary vegetative restabilisation shall be applied on areas of disturbed soil outside the boatharbour excavation bare for longer than 28 days.

(g) All temporary and permanent drainage diversions shall be stabilised immediately.

(h) All sediment and erosion measures are to be maintained in effective condition until the works are completed and the site stabilised.

Clean Stormwater Management

'Clean' stormwater is water which flows into the site from the catchment or falls on undisturbed areas of the site.

(i) An area of the existing swamp around the bridge shall be maintained in its current form for as long as practical during construction. This section of swamp will receive 'clean' stormwater and periodically breakout across the beach in a manner similar to the current hydraulic regime.

(j) It may be necessary to periodically open the swamp outlet via mechanical means. Prior to opening:

- all necessary environmental controls shall be in place to prevent pollution of the clean water system due to construction work; and
- approval shall be sought from Shellharbour City Council via the pathways determined by Australand and Council.

The EPA shall be notified of any opening of the Shellharbour Swamp entrance. This applies for both natural and artificial openings of the entrance.

(k) A second area within the proposal Access Channel/ coffer dam area shall be developed when required to discharge clean water across the beach in a similar manner to the initial channel to the north. This channel shall be maintained during construction for the duration of the Works.

(l) 'Clean' stormwater flows from the catchment upstream of the site shall be diverted around the outside of the bund, and any other disturbed areas, where practical, or conveyed through the construction site in a manner isolated from construction activities, and into the remaining area of the existing swamp, as shown indicatively in

Figures 3A to 3G. Stormwater diversion channels shall be constructed and stabilized as per the Blue Book before construction activities commences.

(m) When the remnant swamp is filled in, the 'clean' stormwater shall be generally diverted to the boatharbour.

Dirty Stormwater Management

'Dirty' stormwater is water which falls on disturbed areas of the site.

(n) 'Dirty' stormwater generated on disturbed areas shall be collected in sediment basins (which may include the boatharbour excavation) that are positioned downstream of the disturbed area to prevent sediment entering the 'clean' stormwater system. Water collected in sediment basins can be disposed of via:

- evaporation;
- use for dust suppression;
- use for irrigation of revegetated areas; or
- discharge to the 'clean' stormwater system after treatment to remove sediment, gross pollutants, and any excess acidity and testing to confirm compliance with EPL criteria.

(o) The design and construction of sediment basins shall follow the recommendations of the Blue Book.

(p) The design storage capacity of sedimentation basins or traps shall be reinstated within 5 days of the cessation of a rainfall event that causes runoff to occur on or from the site.

(q) The contractor shall record:

- the date, location and quantity of flocculants and neutralizing agents applied to sediment basins;
- the date, location and quantity of any water discharged from sediment basins to the 'clean' surface water system including test results confirming compliance with EPL requirements for release; and
- the date, location and quantity of any sediment removed from sediment basins.

Construction Traffic

(r) Minimise vehicle activity on disturbed surfaces during and after wet weather.

(s) Traffic on site shall be restricted to defined roads where possible.

(t) Measures shall be installed to prevent the carrying of mud or dirt onto public roads.

(u) Watercourse crossings shall be constructed in a manner which prevents sediment from washing into the watercourse.

Acid Runoff/Discharge from ASS

(v) Excavation of ASS shall be conducted in wet or moist conditions to prevent oxidisation. Refer to Acid Sulfate Soil Management Plan in **Section 4.6** for details.

(w) ASS remaining outside the boatharbour footprint is to be 'chased out' in areas of low finished surface level where the ASS would be exposed. In other areas the ASS outside the boatharbour footprint is to be consolidated and capped in situ to minimise the actual watertable drawdown and prevent oxidisation. Refer to the Acid Sulfate Soil Management Plan in **Section 4.6** for details.

(x) Areas of exposed ASS shall be isolated from the 'clean' stormwater system by bunds. Runoff from such areas shall be collected, tested and, if necessary, treated to ensure compliance with EPL criteria.

Spills

(y) All fuels, oils, paints and other chemicals stored on site shall be contained in a bunded area constructed to comply with the requirements of:

- Australian Standard AS 1940-2004: *The Storage and Handling of Flammable and Combustible Liquids*; and,
- Australian Standard AS 4452-1997: *The Storage and Handling of Toxic Substances*.

The bunded area must be constructed with an impervious floor and must not be fitted with a drain valve.

(z) The Contractor shall conduct weekly site inspections as well as additional inspections immediately after wet weather to ensure no spills of fuel, oil, soil or construction material have taken place.

(aa) The Contractor shall immediately clean up all spills detected.

(bb) Sewage effluent must not be disposed of on site. A licensed waste pump-out contractor must remove all sewage waste from the site.

Landfill Cell Pond

The Landfill Cell Pond may be used by the Contractor for management of 'dirty' stormwater and groundwater from dewatering activities until such time as it cannot function effectively due to it being in filled. At this time, alternative approved means for management of 'dirty' water shall be in place.

4.4.4 Monitoring and Compliance Standards

Surface Water Quality Monitoring

The objectives of the terrestrial surface water quality monitoring program are to monitor and report the character of water discharged from the site, confirm the effectiveness of erosion control measures and ensure early detection of pollution to the 'clean' surface waters.

The total suspended solids or turbidity, acidity (pH) and presence of oils and grease in surface waters shall be monitored upstream and downstream of the construction works. The upstream monitoring locations will be selected on the largest watercourses entering the site from the urban area to the west and to the north, close to but outside the influence of the works. Upstream monitoring points will also be located to sample runoff entering the site from the south-west and from the landscape mound to the south. The downstream monitoring locations shall be in the remaining portion of the swamp at the Boollwarroo Parade bridge, and the proposed second discharge location in the Access Channel area, while the swamp is still receiving stormwater. In addition, the apparent colour of the surface water shall be monitored at the downstream monitoring location.

The frequency of monitoring shall be conducted weekly if marine water or swamp discharge turbidity is <5NTU, and daily if marine water or swamp discharge turbidity is >5NTU.

Sediment Basin Compliance Monitoring
Suspended solids concentration in all sediment basins shall be monitored to ensure effective treatment of 'dirty' stormwater prior to any discharge to the 'clean' stormwater system.

In addition, the acidity (pH) of all potentially acidic water from the boatharbour shall be monitored and corrected if necessary before discharge into the 'clean' surface water system.

Water from a sediment basin may be discharged to the Landfill Cell Pond without prior treatment, in which case compliance standards for the Landfill Cell Pond will apply.

Landfill Cell Pond
The following parameters shall be monitored in any discharge from the Landfill Cell Pond, unless otherwise directed by the Site Superintendent:

- biochemical oxygen demand (BOD);
- nitrate;
- nitrogen (ammonia);
- oil and grease;
- acidity (pH); and
- total suspended solids or turbidity.

Monitoring should occur daily during any discharge from the Landfill Cell Pond to the 'clean' water system.

Compliance standards for discharges from the Sediment Basins shall apply as set out in **Table 4.4**.

Table 4.4 Compliance Standards for Sediment Basins

Parameter	Compliance Standard
Oil and grease	Not Visible
Acidity	pH 4.0 to 8.5
Total suspended solids	50 mg/L

Notes:
1. Total suspended solids may be measured as turbidity provided that a statistical correlation is developed between NTU and TSS. Ongoing verification of this correlation shall be undertaken during the works.
2. Any exceedence of the concentration limits specified for pH, turbidity and total suspended solids is permitted if such a discharge occurs solely as a result of a "rainfall event" on the site and that rainfall event exceeds the 5 year ARI rainfall event.

Erosion and Sediment Control Inspections
The Contractor shall regularly inspect the condition of stormwater, erosion and sediment control measures to ensure their integrity at intervals not less than:

- within two days of the cessation of any rainfall event that results in 20 mm or more rain falling at the site in any 24 hour period;
- daily during periods of extended rainfall; or
- weekly during dry weather periods.

The Contractor shall record all such inspections and resulting observations, including the following information:

- the date and time of the inspection;
- details of the use of any flocculants;
- dates and times when sediment was cleaned out;
- whether any water pollution control structures had their design exceeded;
- any maintenance requirements.

Rainfall
Rainfall shall be measured and recorded, in millimetres per 24 hours, at the same time each day, at the Shell Cove project office or other location within the site. These measurements shall be used to determine compliance with conditions where rainfall is specified.

Reporting
The Contractor shall provide the results of all rainfall, surface water quality and sediment basin monitoring as well as sediment basin treatment records and erosion control inspection records in the monthly monitoring summary to the Site Superintendent no later than the 3rd day of each month.

4.4.5 Corrective Actions

If any parameter at the downstream surface water quality location falls outside the trigger value range, the Contractor shall:

- immediately conduct an investigation to determine the source of the pollution;

- unless the source of the pollution is upstream of the site, the Contractor shall instigate works to rectify the water quality in the shortest practical time; and
- take steps to prevent the discharge of polluted water to the marine environment by diverting such water into the boatharbour excavation or other effective measures.

Water in sediment basins or the boatharbour excavation or the Landfill Cell Pond which exceeds trigger values shall receive further treatment and testing before discharge to the 'clean' surface water system.

4.4.6 Management and Actions between Construction Stages

Environmental management of the site between Stage 1 and Stage 2 and between Stage 2 and Stage 3, including maintenance of all water quality, erosion and sediment control measures, monitoring activities, and implementation of corrective actions if required, shall be the responsibility of Australand.

4.5 MARINE WATER QUALITY AND ENVIRONMENT MANAGEMENT PLAN

This section addresses the Conditions of Consent clause 15(d)(ii) and Conditions of Concurrence clause 3(iii).

The marine aspects of 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.

4.5.1 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 sulfate soil.*

The 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.

A number of the Conditions of Consent and Conditions of Concurrence requirements are relevant only to the operation of the boatharbour, not the construction of the boatharbour.

As such these requirements are addressed in the OEMP (refer **Tables 1.1** and **1.2**).

The current Environment Protection Licence (EPL) for the project (EPL 12426 as amended 9 September 2013) 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**.

Clause	Title
P1	Location of monitoring/discharge points and areas
L1	Pollution of waters
O4	Processes and management
M2	Requirement to monitor concentration of pollutants discharged
R2	Notification of environmental harm

The Contractor shall prepare a detailed Marine Water Quality and Environment Management Plan addressing these requirements as part of their SEMP, based on this document and their proposed methodology for the works.

4.5.2 Potential Environmental Impact

Water quality and marine environment impacts during construction may result from:

- discharge of turbid stormwater from the construction site;
- acid runoff or discharge from oxidisation of acid sulfate soils (ASS);
- turbidity generated by breakwater construction and channel dredging (cutter suction dredge) in marine waters;
- release of turbid, fresh, acidic and/or deoxygenated water from boatharbour when connection to the coastal waters is made; and
- pollution from spills of ASS, sewage, solid waste, fuel, oil, chemicals or other construction material.

4.5.3 Management Strategy and Mitigation Measures

The Contractor shall implement all water quality and marine environment protection measures required by this CEMP and the Contract from the commencement of site operations and shall maintain such measures throughout the duration of the works. The Contractor shall be responsible for maintaining acceptable water quality in the waters discharged from the site and for minimising the impact on the marine environment from the construction works.

The Contractor shall use all practical means to maintain marine water quality and minimise impact on the marine environment in all works. The Contractor shall implement the management strategies and mitigation measures described below as a minimum.

General

(a) The inner and outer harbours works shall be isolated from the coastal waters by a cofferdam nominally located immediately seaward of Bass Point Tourist Road, until construction of these areas is complete and water quality within the boatharbour is acceptable for a connection to coastal waters to be made.

Loss of Habitat

(b) Before the areas of the swamp within the footprint of the inner and outer harbours are closed off or excavated, nets shall be used to push fish downstream into the section of swamp around the existing bridge outside the footprint of the boatharbour. This activity may occur progressively.

(c) Before construction begins in any section of the swamp, valuable saltmash plants in the area shall be transplanted to Myimbarr constructed wetland, if considered viable based on the recommendation of a suitably qualified ecologist.

(d) Before final draining or closing off of the swamp, a breakout across the beach shall be engineered at a time when water level in the swamp is high and the tide is low to allow fish to escape. Nets shall be used to push fish remaining in the swamp downstream and into the ocean. This may require several attempts. The work should be supervised by a suitably qualified ecologist.

Stormwater and Acid Discharge

(e) The control of water quality in stormwater discharged from the site is dealt with in the Water Quality, Erosion and Sediment Control Plan – Terrestrial Areas and the Acid Sulfate Soils Management Plan in **Sections 4.4** and **4.6** respectively.

Marine Construction

(f) Rock, including core material, used in breakwater and groyne construction shall be as free as practical from fine material (<1 mm) to minimise turbidity generated during the construction of these structures.

(g) Dredged material shall be disposed of on-shore to limit turbidity generated in the coastal waters. Dredged sand may be placed directly on the upper beach for the purpose of dune reconstruction and beach nourishment.

Connection of Boatharbour

(h) Waters within the boatharbour shall be treated to achieve a water quality standard acceptable to EPA before the cofferdam is removed and the boatharbour is connected to the coastal waters and marine environment. The creation of a small breach that allows gradual tidal mixing, or pumping of coastal waters into the boatharbour, may be used to improve water quality within the boatharbour subject to approval from EPA.

4.5.4 Monitoring and Compliance Standards

Four marine water quality and marine environment monitoring programs are required based on the monitoring programs outlined in Appendix 11 of the EIS:

- compliance water quality monitoring;
- site compliance inspections;
- marine water quality monitoring; and
- biological monitoring.

The marine water quality monitoring and biological monitoring programs are on-going, long term programs covering the pre, during and post-construction phases of the project which aim to identify any long term impacts of the boatharbour construction and operation. These programs will be carried out by Australand during the construction phase and are not the responsibility of the Contractor. The compliance water quality monitoring and site compliance inspections are the responsibility of the Contractor.

Compliance Water Quality Monitoring

The Contractor shall monitor water clarity in the coastal waters around the marine works as per **Table 4.5** in order to assess and document the effectiveness of turbidity control measures and to ensure that water quality impacts on the defined bathing area, that is the area between the flags at the north end of Shellharbour South Beach, is minimised. At the time of monitoring the Contractor shall record whether the defined bathing area, or any other part of Shellharbour South Beach or Harbour Entrance Beach, is in use for bathing.

Water clarity shall be monitored by measuring the turbidity of surface water in the surf zone at locations 100m north of the breakwater and 100m south of the groyne. Turbidity measurements may be made on a sample of water or be made in situ. It is acceptable to conduct measurements immediately seaward of the surf zone if required for safety reasons.

During marine construction, water clarity measurements shall be taken daily at a time of day when potential turbidity production is typically at a maximum. During land-only construction, the monitoring shall be carried out once per week during dry weather and daily during wet weather and or a breakout of the swamp. Wet weather is defined as 20mm of rainfall in the previous 24 hours at the site. Breakout means there is water flowing from the site into the surf zone. If monitoring is not undertaken for any reason, for example due to unsafe ocean conditions, a report shall be provided to the Site Superintendent to this effect within 24 hours.

'Marine construction' includes all work on the breakwater and groyne, including the coffer dam, dredging of the access channel, connection of the boatharbour to the coastal waters, dune reconstruction and beach nourishment or any other works potentially causing elevated turbidity in the surrounding coastal waters.

Site Compliance Inspections
The Contractor shall regularly inspect the condition of all turbidity containment structures or control devices to ensure their integrity, as well as the beach on either side of the entrance and the intertidal rocky reef habitat to the south of the entrance to detect any spills or gross pollution. Compliance inspections shall be carried out at intervals not less than:

- during marine construction activities - daily;
- during land-based construction – weekly during dry weather periods and daily during periods of extended rainfall; and
- within two days of the cessation of any rainfall event that results in 20 mm or more rain falling at the site in any 24 hour period.

The Contractor shall record all such inspections and resulting observations, including the following information, as relevant:

- the date and time of the inspection;
- details of the use of any flocculants;
- dates and times when sediment was cleaned out;
- whether any water pollution control structures had their design exceeded;
- any maintenance requirements.

Marine Water Quality Monitoring
The marine water quality monitoring program follows the methodology of the pre-construction water quality monitoring program and is the responsibility of Australand, not the Contractor.

At each of eight water quality sites within the Bass Point embayment, shown in **Figure 4**, 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); and
- 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).

Monitoring is to be undertaken once every 2 months during breakwater and groyne construction, channel dredging and boatharbour connection works. Monitoring is to be undertaken every 3 months during land-based construction works.

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 construction impacts on water quality using extended before/after control/impact techniques.

Monitoring results will be included in the monthly monitoring summary to the EPA, if monitoring has been conducted in the previous month, and the 6 monthly monitoring report provided to the Shell Cove Compliance Committee.

Biological Monitoring
The biological monitoring program follows the methodology of the pre-construction biological monitoring program and is the responsibility of Australand, not the Contractor.

There are eight biological monitoring sites located on shallow sub-tidal rocky reef habitat as shown on **Figure 4**. At each site the benthic community structure will be monitored using photo-quadrant techniques.

Biological monitoring is to be undertaken by a suitably qualified marine ecologist once every 2 months during breakwater and groyne construction, channel dredging and boatharbour connection works. Monitoring is to be undertaken every 3 months during land-based construction works

Biological monitoring results will be analysed to detect construction impacts on benthic community structure using extended before/after control/impact techniques.

In addition to the biological monitoring described above, biological inspections of important coastal and marine habitats closest to the construction works (including sandy beach, intertidal reef, sub tidal reef and sandy seafloor) will be conducted to monitor the effectiveness of control measures. The biological inspections will involve inspection for spills, gross pollution and other site related impacts and basic habitat mapping to identify changes and areas impacted by the works. In the event that pollution or significant habitat change is identified, the EPA and the Contractor will be notified and attempts made to identify the source/cause of the change.

Biological inspections will be carried out at the same frequency as the biological monitoring.

Results from biological monitoring and inspections will be included in the monthly monitoring summary to the EPA, if monitoring has been conducted in the previous month, and the 6 monthly monitoring report provided to the Shell Cove Compliance Committee.

Table 4.5 Compliance Standards for Water Quality

Parameter	Trigger Values	Measurement Location
Water clarity (turbidity)	turbidity > 5 NTU	Surf zone 100m to the north of breakwater and 100m to the south of groyne
Water clarity (colour [apparent])	N/A	As above

Reporting
The Contractor shall provide the results of all compliance water quality monitoring and inspections in the monthly monitoring summary to the Site Superintendent no later than the 3rd day of each month.

4.5.5 Corrective Actions

If levels of turbidity detected by the compliance water quality monitoring exceed the trigger values, the Contractor shall immediately investigate and implement corrective measures to minimise the impact on bathing water quality at the designated swimming area, that is the area between the flags at the north end of Shellharbour South Beach. The measurements shall then be repeated after 3 hours to assess the effectiveness or the corrective measures. This process shall be repeated as required until compliance is achieved.

If the marine water quality or biological monitoring conducted by Australand detects significant impacts on the marine environment due to construction activities, the Site Superintendent may direct the Contractor to modify certain activities until effective measures to protect the marine environment are put in place.

4.6 ACID SULFATE SOIL MANAGEMENT PLAN

This section addresses the Conditions of Consent clause 15(d)(iv).

4.6.1 Requirements

The Conditions of Consent require an Acid Sulfate Soil Management Plan to be prepared in consultation with and to the satisfaction of the Department of Environment, Climate Change and Water (formerly Department of Land and Water Conservation and Environment Protection Authority) and state that:

The Acid Sulfate Soil Management Plan shall provide details on:

- *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;*
- *reporting requirements in the event of results not meeting standards*;
- *earthworks strategy to co-ordinate the neutralisation with the excavation to minimise the stockpiling of untreated acid sulfate soil;*
- *the management of acid sulfate soil stockpiles including their location, volume, duration and treatment; and*
- *measures to mitigate adverse impacts to neighbouring properties from stockpiling of acid sulfate soil including odour impacts.*

The Conditions of Consent also outline two further Conditions (Condition No. 18 and Condition No. 10):

i. *"All excavated actual and potential acid sulfate soils are to be re-buried beneath RL-1.0 metres AHD or neutralised and reused in accordance with the Acid Sulfate Soil Management Plan, or disposed at a DECCW licensed landfill site" (Condition 18);*
ii. *"A 10cm thick cover of protective clean sand is to be placed over the bottom of the completed boatharbour" (Condition 10).*

The Contractor shall prepare a detailed Acid Sulfate Soil Management Plan addressing these requirements as part of their SEMP, based on this document, the relevant Environment Protection Licences, the NSW Acid Sulfate Soil Manual (1998) and the Contractor's proposed methodology for the works.

Additionally, the Contractor shall conduct site works in a manner that ensures the works comply with the relevant statutory requirements.

4.6.2 Potential Environmental Impact

Acid sulfate soil impacts during construction may result from:

- leaching of acid sulfate soils; and
- unreliable identification of the interface between actual acid sulfate soil and potential acid sulfate soil and thus inappropriate management of ASS.

4.6.3 Management Strategy and Control Measures

The Contractor shall ensure that all activities carried out on site shall be in accordance with the Contract. It is the responsibility of the Contractor to ensure that all equipment used and all facilities erected are designed and operated to ensure that there is minimal impact on acid sulfate soil during construction activities. Additionally, the Contractor shall be responsible for meeting all the relevant management strategies and control measures and implementing the corrective actions, if and when necessary.

Acid sulfate soils to be excavated at the site are comprised of actual acid sulfate soils (AASS) and potential acid sulfate soils (PASS). The volume breakdown of ASS into

PASS and AASS is approximately 50% : 50%. Due to construction sequencing a small quantity of PASS (less than 5,000 m^3) would need to be considered with the AASS.

The Conditions of Consent and conditions detailed in the EPLs which the Contractor must comply with in regard to the excavation and disposal of both AASS and PASS are outlined in (a) to (d) below. These management strategies and control measures, at a minimum, shall be adopted by the Contractor during construction.

The Contractor may also undertake the following in accordance with the updated and finalised EPL 12426:

(i) removal and transport of AASS onsite in a moist condition using conventional earthmoving plant.

a) The Contractor must ensure that the interface between the PASS and the AASS can be reliably determined in order that the PASS and AASS is appropriately managed. In addition the Contractor must ensure that the PASS disposed of offsite satisfies the requirements as set out in Section 4.6.3 (d) below.

b) The Contractor must ensure that the AASS proportion of the ASS is disposed of by reburial below the Boatharbour (below a level of -4.0 m AHD under the Inner Harbour) and capped with a 10 cm thick cover of protective clean sand or neutralised and reused. Removal and transport of this material shall be by use of a cutter-suction dredger pumping the material as a slurry through a pipeline unless otherwise approved by EPA (refer (i) above).

c) The PASS component of the ASS disposed of offsite must be disposed of at an EPA licensed landfill. The Contractor must ensure that this material is excavated in a moist condition and transported to the licensed landfill by truck, via the Hanson quarry haul road and then public roads.

d) The Contractor must ensure that the PASS disposed of offsite satisfies all of the requirements for classification as virgin excavated natural material (VENM) except that it contains sulfidic soils. These include the measures that are outlined in the Environment Protection Licence (EPL) for the selected EPA licensed landfill site(s). One such EPA licensed landfill site is the Dunmore Recycling and Waste Facility, the relevant PASS disposal conditions for which are set out below.

EPL No. 5984
Premises: Dunmore Recycling and Waste Facility, Dunmore Waste Depot, Buckleys Road, Blackbutt

Special Condition E1 Special Conditions for disposing of Potential Acid Sulfate Soils (PASS) under water (April 2005)

The Contractor must ensure that the following conditions are adhered to:

E2.1 Operating Conditions

- *Soil that has been assessed by a Certified Practicing Soil Scientist (CPSS) in accordance with the ASSMAC guidelines and determined to be PASS and which satisfies all of the requirements for classification as Virgin Excavated Natural Material (VENM), except that it contains sulfidic soils, and which is disposed of underwater according to this licence may be classified as VENM in accordance with part (b) of the definition of VENM in the Appendix to Schedule 1 to the POEO Act 1997.*

- *The premises must receive documentation for each truck load of PASS received at the premises (see reporting conditions) that demonstrates that the excavation of PASS and its transport and handling was conducted in accordance with the NSW Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, August 1998) to prevent the generation of acid.*

- *Any PASS received at the premises must be placed below the water table within 24 hours of the time of its excavation at the originating site.*

PASS Limit Conditions

- *Any PASS which has dried out, undergone any oxidation of sulfidic minerals or which has a pH of less than 5.5 must not be disposed of at this premise.*

- *The pH of the PASS immediately prior to under-water disposal must be not less than 5.5.*

- *The pH of the water into which the PASS is placed must not be less than 6.0 at any time.*

- *If the pH of the water falls below 6.5 the licensee must not receive any more PASS at the premises until approval to continue is received in writing from the EPA.*

Additionally, the Contractor must ensure that documentation for each truck load of PASS received at the site is provided to the licensee and indicates:

- *the details of the originating site (name, address, owner & developer, contact details);*
- *the details of the transporter (name, address, contact details, vehicle registration);*
- *date and time of the extraction of the PASS;*
- *pH of the PASS at the time of its extraction, and at the time immediately prior to its placement underwater; and*
- *the name of the person (certified practicing soil scientist) who assessed the material and classified it as PASS.*

The following management strategies and control measures shall be adopted by the Contractor in the case of the neutralisation and onsite reuse of the ASS:

- minimise stockpiling of the untreated ASS material;

- if any short term stockpiling of ASS material is required, the maximum period for stockpiling shall be one week;
- ASS material shall be maintained moist to prevent oxidation;
- customised stockpile areas shall be prepared to receive PASS, having appropriate sediment, erosion and leachate controls;
- a thin layer of lime shall be added to the base of the stockpile area prior to placement of the ASS material, should stockpiling be required for the maximum one week period;
- soil, water and groundwater pH shall be monitored;
- prior to final placement in landscaped mounds, the following shall be verified:
  - the neutralising capacity of the treated soil must exceed the existing plus potential acidity of the soil;
  - post neutralisation, the soil pH shall be greater than 5.5;
  - excess neutralising agent should remain within the soil until all acid generation reactions are complete and the soil has no further capacity to generate acidity.

4.6.4 Monitoring and Compliance Standards

The Contractor must ensure that ASS levels are measured prior to and during the removal operation in order to confirm the interface between AASS and PASS. Additionally, the Contractor must ensure that the measurements required for the disposal of PASS at the EPA licensed landfill sites, or for neutralisation and onsite reuse of the PASS, are undertaken, as outlined above in **Section 4.6.3**.

The Contractor shall include these AASS and PASS recordings in the six-monthly monitoring report.

4.6.5 Corrective Actions

If during the course of construction the Contractor becomes aware of or discovers any unexpected impact from acid sulfate soil all work relevant to or affected by the impact of acid sulfate soils must cease immediately. The Contractor must inform the Site Superintendent, who in turn will notify EPA and an appropriate course of action shall be implemented. In the event that neutralising of the ASS sediment is required lime may be used as a mitigative measure.

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4.7 NOISE AND VIBRATION MANAGEMENT PLAN

This section addresses the Conditions of Consent clause 15(d)(v).

Note that Conditions of Consent clause 15(d)(v1) - (v7) apply only to the acoustic barriers adjacent to the Quarry Haul Road and not the Boatharbour construction and, as such, are not addressed in this CEMP.

The required Noise Management Plan has been expanded to cover issues related to vibration from construction activities and blasting.

4.7.1 Requirements

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

The Noise Management Plan shall provide detail on:

- *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.*

The current Environment Protection Licence (EPL) for the project (EPL 12426 as amended 9 September 2013) contains a number of clauses specifically related to noise and vibration, as listed below. The full text of the EPL is included in **Appendix C**.

Clause	Title
L4	Noise limits
L5	Blasting
M2.4	Noise Monitoring Requirements
M8.1	Vibration monitoring

The Contractor shall prepare a detailed Noise and Vibration Management Plan addressing these requirements as part of their SEMP, based on this document and their proposed methodology for the works.

4.7.2 Potential Environmental Impact

Noise and/or vibration impact during construction is likely to result from:

- operation of construction plant and equipment;
- construction traffic to and from site; and
- blasting.

Noise and vibration modelling undertaken by Wilkinson Murray in 2005 for the section 96 modification application has predicted that noise from the construction activities at surrounding residences may slightly exceed guideline values developed using the EPA's *Environmental Noise Control Manual* during some of the construction stages. This is particularly the case during the construction of the breakwater and groyne as well as construction of the noise control bund and surcharge close to the existing village.

Assuming the use of conventional explosives, Wilkinson Murray have predicted the vibration at surrounding residences associated with blasting in the Boatharbour to be within guideline values for annoyance/discomfort and structural damage. The use of penetrating cone fracture (PCF) blasting should further lower vibration and overpressure levels (approximately 50%) and is the preferred approach. It is noted that all these predictions need to be calibrated for site-specific conditions using trial blasts.

4.7.3 Management Strategy and Mitigation Measures

The Contractor shall implement all noise and vibration mitigation measures required by this CEMP and the Contract from the commencement of site operations and shall maintain such measures throughout the duration of the works. The Contractor shall be responsible for limiting all noise and vibration emitted from the site.

The Contractor shall use all reasonable and feasible mitigations to minimise noise and vibration levels in all works. The Contractor shall implement the following mitigation measures as a minimum.

General

(a) Work shall be confined to working hours of: 7:00am to 6:00pm Mondays to Fridays and 7:00am to 5:00pm Saturdays. No works shall take place on Sundays or public holidays. These hours may be varied with the prior written permission of the EPA.

(b) Prior to the commencement of the boatharbour works, a 3m high noise and runoff control bund shall be constructed around the site, as shown indicatively on **Figure 1**. Construction of the bund in a staged manner is acceptable providing noise and runoff are effectively managed in accordance with the relevant requirements of this CEMP at all times. As construction of the noise attenuation bund may expose nearby residents to noise and vibration levels above guideline values, residents within 500m shall be informed of the potential noise exposure and its likely duration by letter drop.

(c) Stockpiles, bunds, plant storage and start up areas shall be located to provide noise shielding to surrounding residents as far as is practical and consistent with other requirements of this CEMP.

(d) Emergency work may be carried out by the Contractor outside normal working hours provided that:

- the Site Superintendent is satisfied that the proposed work is of an essential nature and cannot be carried out during normal working hours; and
- the Contractor submits a report summarising the event to the Site Superintendent within 24 hours commencement of the event.

Construction Plant and Equipment

(e) The quietest practical plant and methodologies shall be selected for each element of the works.

(f) All plant used on site shall be fitted with best-practice silencers.

(g) All items of mobile plant shall be fitted with appropriate reversing alarms. Preference shall be given to those types of reversing alarms that adjust output sound levels based on the prevailing ambient noise level, especially where works are carried out in close proximity to residential areas.

(h) The Contractor shall ensure that all plant and noise attenuation equipment is well maintained.

(i) Maintenance and/or repairs of plant and equipment may be carried out by the Contractor outside the normal working hours provided that:
- plant and equipment subject to maintenance/repairs and compounds for overnight parking of vehicles and mobile plant, shall be located at least 300m from noise sensitive premises;
- the Contractor can demonstrate that noise levels at the site boundaries are not adversely impacted;
- no heavy machinery shall be operated during this period;
- noise generated by maintenance/repair works outside normal working hours shall be inaudible at any noise sensitive premises; and
- the Contractor shall cease maintenance/repair work outside normal working hours if noise emission becomes audible at any noise sensitive premises.

Construction Traffic

(j) Except in the case of emergency, equipment delivery or delivery of manufactured construction materials, all heavy vehicles shall enter and leave the site via site access gates nominated by the Superintendent that minimise disruption to existing residential amenity (refer **Figure 1**).

(k) Construction traffic to and from the site shall occur during normal working hours. Exceptions may be made for oversized plant items.

Blasting

(l) Rock excavation will be carried out by 'ripping' to the fullest extent practical to minimise or avoid blasting.

(m) Blasting may only be conducted between the hours of 9am to 5pm Mondays to Fridays.

(n) The Contractor shall obtain prior approval of the blast design and blast time from the Site Superintendent before conducting any blasts.

(o) Best practice shall be adopted in all areas of blast design and execution to ensure the 'blow outs' resulting in high blast overpressure or risks to safety do not occur.

(p) If blasting is necessary, the first blasts conducted will be trial blasts located as far as possible within the boatharbour footprint from surrounding residences. The trial blasts will use Penetrating Cone Fracture (PCF) techniques. These trial blasts will be monitored to allow for the developing site-specific overpressure and vibration predictive equations which will in turn allow improved prediction and design to be undertaken for blasting at more sensitive locations.

(q) A siren shall be activated at the site for 30 seconds at least 5 minutes prior to each blast.

(r) Residents within 400 m of blast locations shall be informed of by letter drop before blasting takes place of the likely times, frequency and duration of blasting and precautions being taken to ensure that the limits set by the EPL are being complied with.

4.7.4 Monitoring and Compliance Standards

Construction Noise and Vibration

The Contractor shall conduct a noise monitoring program at the site for the full duration of construction works to ensure that noise levels emitted from the site are consistent with approvals and that noise mitigation measures operate effectively.

Attended noise monitoring shall take place at least once per week, at the time of day of typical greatest noise emission. Monitoring shall consist of noise measurement over a 15 minute working period including the parameters L_{A90}, L_{A10}, and L_{Aeq}. Measurements are to take place at the site boundary adjacent to the residential locations specified in **Table 4.6** below or at the most affected residential locations. In addition to recording the noise level measurements, parameters such as: date, time, weather conditions during measurements and the number of plant and activities are to be noted. The Contractor shall maintain detailed records of all attended noise monitoring and include the test reports in the monthly summary of monitoring results provided to the Site Superintendent. The Site Superintendent may require additional noise measurement to be undertaken if complaints about noise are received.

Attended noise measurements allow the identification of unusual noises not related to the construction activities (such as a revving motorcycle engine). If such noises are present during monitoring, the monitoring may be repeated when the non-construction noise has ceased.

Trigger values for construction noise given in **Table 4.6** are based on the background levels measured by Wilkinson Murray in 2005 plus 10 dBA, as per EPA's *Environmental Noise Control Manual.* 5dBA must be added to the measured noise levels if the noise is substantially tonal or impulsive in character. Due to substantial residential development in the area since the Wilkinson Murray background measurements were taken, background levels may be reassessed to reflect current conditions if required.

During the initial stages of work by potentially vibration causing plant (including vibrating rollers and pile drivers) vibration monitoring should be undertaken at the nearest residential monitoring location to confirm that vibration is below the relevant guideline values. The Site Superintendent may require the Contractor to conduct additional vibration monitoring as required by the EPL, if they believe vibration levels may be above the guideline values. Trigger values, given in **Table 4.6**, are based on British Standard BS6472 for daytime low probability of adverse comment in residential buildings, as required by the EPL.

All noise and vibration monitoring results shall be incorporated into the Contractor's monthly monitoring summary to be provided to the Site Superintendent by the 3rd day of the following month.

Blasting

The Contractor shall monitor noise (overpressure) and vibration for all blasts to ensure that overpressure and vibration at surrounding residences meet guideline values. Measurements are to take place at the site boundary adjacent to the residential locations specified in **Table 4.6** or at other representative locations agreed with the Site Superintendent and EPA. Records and measurements for each blast shall include:

- blast details;
- time and date of each blast;
- the location at which measurements were taken;
- the ground vibration for each blast;
- the airblast over pressure for each blast;
- evidence that during the last 12 months a calibration check has been carried out on each blast monitor to ensure the accuracy of the reported data; and
- the waveform for the ground vibration and overpressure for each blast.

The trigger levels for overpressure and vibration are based on the 'annoyance and discomfort' criteria from the guidelines produced by the Australia and New Zealand Environment Conservation Council, which state:

- *the maximum overpressure from Blasting should not exceed 115dB re 10^{-5} Pa for more than 5% of blasts in any year, and should not exceed 120dB re 10^{-5} Pa for any blast; and*
- *the maximum peak particle ground velocity should not exceed 5mm/s for more than 5% of blasts in any year, and should not exceed 10mm/s for any blast.*

These criteria shall be the compliance standards for blasting.

The Contractor shall provide the EPA and the Site Superintendent with all blast monitoring results and records within 24 hours of each blast. All blast monitoring results shall be incorporated into the Contractor's monthly monitoring summary to be provided to the Site Superintendent by the 3rd day of the following month.

Table 4.6 Compliance Standards for Noise and Vibration

Parameter	Trigger Values	Measurement Location
construction noise	$L_{Aeq,15\ min}$: 51 dBA	nearest residence on Boollwarroo Parade
	$L_{Aeq,15\ min}$: 46 dBA	nearest residence on Mary, William or Sophia Streets
	$L_{Aeq,15\ min}$: 43 dBA	nearest residence on Whitsunday or Apollo Drives
construction vibration	(vibration dose value as per BS6472) : 0.4 $m/s^{1.75}$	all locations as per construction noise

Parameter	Trigger Values	Measurement Location
blast overpressure	115dB re 10^{-5} Pa	all locations as per construction noise
blast vibration	5mm/s (peak particle velocity)	all locations as per construction noise

4.7.5 Corrective Actions

Construction Noise and Vibration
In the event that construction noise or vibration trigger values are exceeded, the Contractor shall undertake community liaison and consultation in order to identify and implement any additional reasonable and feasible mitigation options.

In the event that construction noise or vibration trigger values are exceeded after all reasonable and feasible mitigation measures have been implemented, the Contractor shall take steps to minimise the impact on residents including:

- provide information to affected residents about the times when excessive noise and/or vibration are planned to occur;
- monitor vibration levels in accordance with the noise monitoring requirements (frequency and locations); and
- provide results of noise and/or vibration monitoring to the affected residents.

Blasting
In the event of blast overpressure of vibration being above the trigger values the Contractor shall adjust the blast design to the Site Superintendent's satisfaction before any further blasts are conducted.

4.8 ARCHAEOLOGICAL AND HERITAGE PROTECTION PLAN

This section addresses the Conditions of Consent clause 15(d)(vi).

4.8.1 Requirements

The Conditions of Consent require an Archaeological and Heritage Protection Plan to be prepared in consultation with the local Aboriginal community and OEH and state that:

The Archaeological and Heritage Protection Plan shall provide detail on:

- *maintenance;*
- *management;*
- *monitoring; and*
- *remedial measures.*

As part of their SEMP, the Contractor shall address these requirements and those outlined in the Archaeological and Heritage Protection Plan (referenced from Joe Kamminga report).

The Contractor shall conduct site works in a manner that ensures that the works comply with the relevant statutory requirements. These include but are not limited to:

- *National Parks and Wildlife Act 1974;*
- *NSW Heritage Act 1977;* and
- Conditions specified in any issued s.87 permit or s.90 consent.

Australand has obtained a permit under s.87 and consent under s.90 in accordance with the *National Parks and Wildlife Act* 1974.

4.8.2 Potential Environmental Impact

Archaeological and heritage site impacts during construction may result from:

- unauthorised works and activities within identified archaeological and heritage sites; and
- excavation of undiscovered objects outside these sites.

For the purposes of this section, artefacts of archaeological and heritage significance includes heritage of Aboriginal (Indigenous) and post-European settlement.

4.8.3 Management Strategy and Mitigation Measures

The Contractor shall ensure that all activities carried out on site will be in accordance with the Contract. It is the responsibility of the Contractor to ensure that all equipment used and all facilities erected are designed and operated to ensure that there is no damage to any Aboriginal artefacts, such as Aboriginal middens and/or heritage objects encountered during construction activities. Additionally, the Contractor shall be responsible for meeting all the relevant management strategies and control measures and implementing the corrective actions, if and when necessary.

Four areas have been identified to be of archaeological significance:

1. AHIMS Site 52-5-207;
2. AHIMS Site 52-5-436 (now removed by archaeologist);
3. AHIMS Site 52-5-437 (now removed by archaeologist); and
4. AHIMS Site 52-5-438.

Management strategies and mitigation measures are outlined below for general archaeological and heritage management and specifically for the four sites. These four sites are illustrated in **Figure 1**.

The following mitigative measures, at a minimum, for the two remaining sites, shall be adopted by the Contractor during construction.

Project Area in general

(a) The Contractor shall ensure that all personnel are trained during site induction procedures and be made aware of the potential for Aboriginal artefacts and/or heritage objects to be found.

(b) In order to avoid inadvertent churning of possible Aboriginal and/or heritage objects, the Contractor shall ensure that all site works and vehicle movements are restricted to defined roads where possible.

(c) The Contractor and Sub-contractors involved in construction activities will be advised in writing about the conditions specified in the s.87 permit and the s.90 consent to ensure that they adhere to all permit and consent conditions relevant to their work activities.

(d) Contractors/construction personnel that will be involved in site stripping or excavation tasks will be required to undergo a cultural heritage induction as part of the development site induction process before commencing groundbreaking construction work.

(e) The excavation of beach sand required to create the boatharbour entrance to a depth of RL 0.49m AHD will be monitored by representative(s) of the Aboriginal community and a qualified archaeologist.

(f) In areas which have been identified as having archaeological significance the Contractor must ensure that the area is fenced off for protection against disturbance by construction equipment. The extent of the site will need to be determined by a specialist archaeological consultant and the exact location will be identified with the location indicated on the design plans.

(g) Aboriginal objects evident on the ground surface at AHIMS Sites 52-5-436, 52-5-437 and 52-5-438 must be collected and taken to a place of safety by representative(s) of the Aboriginal community under supervision of a qualified archaeologist and in accordance with relevant conditions specified in the s.87 permit and/or the s.90 consent.

(h) If Aboriginal ancestral remains (human remains) are identified during development activities, work shall cease in the immediate area of these remains. The Contractor must ensure that OEH will be notified as soon as practicable, and any directions given by OEH must be put into force.

Proposed salvage and protection measures for AHIMS Site 52-5-207 (shell midden and associated lithic scatter)

All portions of AHIMS Site 52-5-207 identified as being of relatively high archaeological value will be preserved and protected from potential impact by development activities. The proposed protection and conservation measures detailed below are based on an evaluation of the current condition of, and the ascertained current and potential threats to, the midden deposit and the sand dune containing the midden deposit.

(i) The Contractor shall ensure that a fence will be constructed under supervision of a qualified archaeologist to create a boundary and buffer between the northernmost portion of the midden identified in the EIS as having relatively high archaeological value and the works activities area for the creation of the boatharbour entrance and

breakwater. No development activities involving disturbance of subsurface sediments or vehicular traffic will be permitted on the sand dune south of this fence line (part of the Exclusion Area).

(j) The Contractor shall ensure that the existing fence lines south of the abovementioned new fence and along the eastern margin of the sand dune and the eastern margins of Bass Point Tourist Road (and associated parking areas) will be maintained where possible. In locations where the existing fence line cannot be preserved a new fence will be constructed to provide a minimum 5 m buffer from the high archaeological value area of shell midden. No development activities involving vehicles or disturbance of subsurface sediments will be permitted between these fence lines (the Exclusion Area).

(k) A representative(s) of the Aboriginal community and a qualified archaeologist will ensure that the excavation of sediment will be monitored for areas of Site 52-5-207 not identified as being of relatively high archaeological value. A representative sample of Aboriginal objects located during this monitoring will be collected and taken to a place of safety. If an Aboriginal site is identified and assessed as having high overall heritage value by the qualified archaeologist, in consultation with the participating Aboriginal community representative(s), work will cease in the immediate area of this identified cultural deposit and at least a representative sample will be salvaged.

(l) The sediment and any cultural material in and around the two areas of inferred midden deposit will be excavated by earthmoving equipment, and transported and redeposited to the Pioneer Mound or other deposition site within the Project Area or offsite.

(m) If during the abovementioned monitoring activities, any other type of Aboriginal site (specifically a site that is seen to comprise more than a single Aboriginal artefact, manuport or shell) is identified and assessed as having high archaeological integrity and overall heritage value by the qualified archaeologist in consultation with the participating Aboriginal community representative, development work will cease in the immediate area of this site. A representative sample or the area of highest salvage potential will then be archaeologically excavated by broad-area or test pit method and/or by relocating bulk sediment to an appropriate long-term storage location. The proposed storage location shall be selected in consultation with the participating Aboriginal community representative(s).

(n) The contractor must ensure that existing fencing of the sand dune containing the shell midden horizons will be retained.

Proposed salvage and protection measures for AHIMS Site 52-5-436
(not required, site removed by archaeologist)

Proposed salvage measures for AHIMS Site 52-5-437
(not required, site removed by archaeologist)

Proposed salvage and protection measures for AHIMS Site 52-5-438
AHIMS Site 52-5-438 and the general area around this site have been impacted by dam construction and heavy earthmoving equipment. AHIMS Site 52-5-438 comprises five artefacts. Some or all of the natural sediment and any unsalvaged Aboriginal objects within and around the area of the artefacts will be disturbed or damaged by works activities.

(o) It is proposed that the approximate five identified stone artefacts on this site, or those still evident on the ground surface, be collected and taken to a place of safety.

4.8.4 Monitoring and Compliance Standards

The Contractor must ensure that all monitoring measures are undertaken as described in **Section 4.8.3.**

Additionally, the Contractor must ensure that an inventory will be prepared that details the contents of the collections of Aboriginal objects. The inventory will include information about the original location of artefacts and their physical and cultural attributes.

Accordingly, the collection of objects and its inventory will be deposited with Aboriginal organisation(s), if required by the conditions of the s.87 permit and/or s.90 consent under the provision of a OEH Care Agreement for Aboriginal Objects, or alternatively, with the Australian Museum as directed by OEH pursuant to the relevant conditions of the s.87 permit and/or s.90 consent.

In addition, details of the inventory and any other relevant monitoring must be compiled in the six-monthly monitoring report in accordance with conditions of consent which states that:

"a Monitoring Report shall be presented to the Site Superintendent and the Shell Cove Compliance Committee every 6 months and shall be publicly available".

4.8.5 Corrective Actions

If during the course of construction the Contractor becomes aware of or discovers any unexpected Aboriginal or heritage relic/object, all work likely to affect the relic/object must cease immediately. The Contractor must inform the Site Superintendent, who in turn will notify the OEH and an appropriate course of action will then be implemented.

4.9 BEACH NOURISHMENT/REHABILITATION MANAGEMENT PLAN – CONSTRUCTION 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.

4.9.1 Requirements

The Conditions of Consent require a Beach Nourishment/Rehabilitation Management Plan to be prepared in consultation with and to the satisfaction of the OEH(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 boatharbour 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:

<u>Beach Nourishment/Rehabilitation Management Plan (Construction phase)</u>

- 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.

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

The Contractor shall prepare a detailed construction phase Beach Nourishment / Rehabilitation Management Plan addressing the above requirements as part of their SEMP, based on this document, the Contractor's proposed methodology for the works, and generally in accordance with the following:

- *NSW Coastal Protection Act 1979;*
- Coastline Management Manual (NSW Government, 1990); and
- Coastal Dune Management – A Manual of Coastal Dune Management and Rehabilitation Techniques (NSW Department of Land and Water Conservation, 2001).

4.9.2 Potential Environmental Impact

Impacts on the beach environment during construction may result from a number of aspects of the project:

- partial restriction of beach access;
- disturbance of the beach and dunes to provide temporary construction fencing so as to restrict public access and define the limits of construction activity;
- construction of the cofferdam and subsequent excavation and dredging of the beach and dunes and construction of the breakwater and groyne;
- creation of a temporary flood outlet channel across the beach on the northern or southern side of the cofferdam;
- beach nourishment including creation of the beach fillet adjacent to the breakwater;
- placement of gross pollutants or other foreign material on the beach due to construction activities.

4.9.3 Management Strategy and Control Measures

The Contractor shall ensure that all activities carried out on site are in accordance with the Contract. It is the responsibility of the Contractor to ensure that construction activities

minimise damage to the beach and dune system, minimise disruption to beach users and do not impact avoidably on beach amenity and safety. Additionally, the Contractor shall be responsible for meeting all the relevant management strategies and control measures and implementing the corrective actions, if and when necessary. As a minimum, the Contractor shall implement the following control measures throughout the works (mitigation measures are noted where appropriate):

Creation of the sand fillet along the breakwater

a) The sand fillet shall be created as shown on construction issue of the Drawings, using sand compatible with the beach from the Boatharbour access channel and entrance works.

Proposed works to the dune system

b) Works to the existing degraded dune system to the north of the Boatharbour entrance shall be as shown on the construction issue of the Drawings.

c) Disturbance to the existing dune system beyond the limits of the works shall be minimised. Adequate temporary protective barriers shall be erected and maintained around areas that are not to be disturbed such that they are clearly visible to all persons engaged on work on the site.

d) Rehabilitation of temporary disturbance to the existing dune system as part of the works shall be undertaken in accordance with techniques set out in the Coastal Dune Management Manual (DLWC, 2001).

Beach Access

e) Disruption to beach access off Boollwarroo Parade and along the beach above low tide level shall be minimised consistent with public and worker safety. Persons shall be employed by the Contractor to control access to ensure safety.

f) Existing pedestrian access points to the beach off the Boollawarroo Parade car park approximately 300 m north of the boatharbour access channel shall be retained by the Contractor from the commencement of construction of the boatharbour.

Landscaping

g) Landscaping of the dunes, where required, shall be undertaken generally in accordance with the techniques set out in the Coastal Dune Management Manual (DLWC, 2001).

h) Rebuilding and reshaping of dunes shall be undertaken to ensure a natural profile and smooth transition between existing and rehabilitated dunes and between the dune systems and the breakwater and groyne.

Monitoring

i) Monitoring shall be undertaken during construction and comprise:

- monitoring of beach behaviour;
- monitoring of dune disturbance;
- monitoring of beach cleanliness.

j) monitoring of beach behaviour shall include:

- establishment and survey of shore-normal beach profiles along Shellharbour South Beach north of the boatharbour entrance situated at 100 m spacing for the first 400 m and 200 m spacing further north. Details of the locations to be confirmed by the Superintendent;
- determination of the position of mean high water mark and mean low water mark along Shellharbour South Beach over a distance of 200 m north of the breakwater;
- establishment and survey of two shore-normal beach profiles located at approximately the third points of Harbour Entrance Beach to the south of the boatharbour entrance;
- determination of the position of mean high water mark and mean low water mark along Harbour Entrance Beach;
- completion of a survey prior to commencement of the works and then at maximum three monthly intervals and following significant beach erosion events (such events to be determined by the Superintendent), extending in the case of the beach profiles between the seaward edge of the vegetated dune system, or Boollawarroo Parade where a vegetated dune system does not exist, and nominally -2 m AHD;
- graphical presentation of the surveys in a format to be agreed with the Superintendent;
- preparation of a report setting out the findings of the surveys on a progressive basis, ie including historical comparisons.

k) Monitoring of dune disturbance shall include visual inspection of temporary protective barriers and adjacent existing dune systems on a daily basis.

l) Monitoring of beach cleanliness shall include visual inspections of Shellharbour South Beach and Harbour Entrance Beach on a daily basis for identification of gross pollutants or other foreign matter that may be the result of the activities of the Contractor.

Beach Cleaning

m) Shellharbour South Beach and Harbour Entrance Beach shall be kept free of gross pollutants or other foreign matter that, in the opinion of the Superintendent, are the result of activities of the Contractor.

n) All such gross pollutants or other foreign matter shall be collected regularly as they occur, including retrieval from adjacent waters if necessary, and disposed of appropriately. Removal may be by manual means or by machine, such as an excavator with screening bucket.

o) Reasonable access on an as required basis shall be provided for a purpose built beach cleaning machine operated by Shellharbour City Council for removal of gross litter and seaweed deposited on the beaches after major storms.

Beach and Surf Patrolling

p) Council appointed lifeguards will patrol Shellharbour South Beach, north of the boatharbour entrance as determined by annual budget allocations. The current arrangements are:

- seven days a week, 9am – 5pm over the six week Christmas school holiday period;
- weekends between the end of Christmas holidays to 20 April, 9am – 5pm;
- surveillance activity will be focussed on the area of the flags which are always located at the northern end of the Shellharbour South Beach;
- casual surveillance will be undertaken of the remainder of the beach areas further south.

q) The Contractor shall cooperate with Council appointed lifeguards and develop procedures, approved by the Superintendent, to ensure beach safety is not adversely impacted due to the works.

4.9.4 Monitoring and Compliance Standards

Throughout the Contract period the Contractor shall ensure that work is undertaken in accordance with the Beach Nourishment / Rehabilitation Management Plan including the monitoring activities outlined in **Section 4.9.3**.

Compliance standards are set out in **Table 4.7**.

Table 4.7 Compliance Standards for Beach Nourishment / Rehabilitation

Requirement	Compliance Standard
Creation of sand fillet along the breakwater	Extent of fillet complies with the Drawings at the time of practical completion
Proposed works to dune system	Rehabilitation of existing degraded dune system north of the Boatharbour entrance complies with the Drawings at the time of practical completion. Adequate protective barriers are installed and maintained, disturbance to the existing dune system beyond the limits of the works are minimised and any disturbance is immediately rehabilitated. All rehabilitation complies with techniques set out in the Coastal Dune Management Manual (DLWC, 2001)
Beach Access	Retain existing level of pedestrian access to the beach from the public car park off Boollawarroo Parade 300 m north of the boatharbour access channel. Satisfactory level of beach access is maintained consistent with public and worker safety.

Requirement	Compliance Standard
	Satisfactory access management is provided by the Contractor.
Landscaping	Techniques comply with the Coastal Dune Management Manual (DLWC, 2001) and provide natural smooth transitions between existing natural systems and completed works.
Monitoring	All specified monitoring activities are satisfactorily carried out.
Beach Cleaning	Shellharbour South Beach and Harbour Entrance Beach are free of gross pollutants or other foreign matter that, in the opinion of the Superintendent, are the result of activities by the Contractor. Reasonable access is provided to the Council operated purpose built beach cleaning machine.
Beach and Surf Patrolling	No avoidable impact on beach safety due to the works.

4.9.5 Corrective Actions

Creation of sand fillet along the breakwater
Should the sand fillet along the breakwater not comply with the Drawings at the time of practical completion, the Contractor shall take measures to reshape the beach to achieve the specified fillet unless, in the opinion of the Superintendent, the actual shape represents a more stable and satisfactory outcome based on the results of the monitoring of beach behaviour.

Proposed works to the dune system
Should the rehabilitation of the degraded dune system north of the boatharbour entrance not comply with the Drawings at the time of practical completion, the Contractor shall take measures to reshape and/or revegetate the dune to achieve the specified outcome.

Should protective barriers be damaged or become deteriorated they shall be immediately reconstructed.

Should disturbance to the existing dune system beyond the limits of the works occur these areas shall be immediately rehabilitated in accordance with techniques set out in the Coastal Dune Management Manual (DLWC, 2001).

Beach Access
Should the level of management of beach access, in the opinion of the Superintendent, be insufficient to ensure adequate safety of beach users, the Contractor shall take immediate measures such as employment of additional persons to ensure safety.

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

Monitoring

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

Beach Cleaning
Should Shellharbour South Beach and Harbour Entrance Beach not be free of gross pollutants or other foreign material that, in the opinion of the Superintendent, are the result of activities by the Contractor, all such pollutants and materials shall be immediately removed including any in the adjacent waters.

Beach and Surf Patrolling
Should any incidents arise, due to the works, that lead to an actual or potential adverse impact on beach safety these shall be immediately investigated and reported to the Superintendent and existing procedures revised where required to ensure no reoccurrence.

5 MONITORING PROGRAM

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

5.1 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.*

The current Environment Protection Licence (EPL) for the project (EPL 12426 as amended 9 September 2013) contains a number of requirements for monitoring (EPL chapter 5) and reporting (EPL chapter 6). The full text of the EPL is included in **Appendix C**.

The Contractor shall prepare a detailed Monitoring Program addressing these requirements and any additional requirements in this CEMP as part of their SEMP, based on their proposed methodology for the works. Responsibility for implementing the monitoring program rests primarily with the Contractor as set out in **Tables 5.1** to **5.6**.

5.2 MONITORING RECORDS

As a minimum, the following records must be kept for all samples and measurements required as part of this monitoring program or any of the Individual Management Plans:

- the date on which the sample/measurement was taken;
- the time at which the sample/measurement was taken;
- the location at which the sample/measurement was taken; and
- the name of the person who collected or made the sample or measurement.

5.3 MONITORING PROGRAM OUTLINE

The tables in this section contain an outline of all environmental monitoring activities required by this CEMP.

Table 5.1 Air Quality Monitoring Outline

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility	Contingency Plans / Corrective Action
Plant Compliance	Refer management plan Section 4.3	As per Section 4.3.4	Each item of plant on site, refer management plan section 4.3	During construction	Once before commencing work	Contractor	• Minimise unnecessary movement of machinery • Restrict construction traffic to defined roads onsite, where practical
Smoke and Fume Emissions	Refer management plan Section 4.3	As per EPA licence conditions for air quality standards	Each item of plant on site, refer management plan section 4.3	During construction	Once per month	Contractor	• Perform maintenance of plant where necessary • Implement measures to minimise impact
Dust and Wind Blown Sand	Refer management plan Section 4.3	< 4g / m^2 / month or 2g / m^2 / month over background levels, refer Table 4.3	Nearest residences as per Table 4.3	During construction	Once per month	Contractor	• Implement dust and windblown sand suppression measures • Perform maintenance of water equipment to ensure readily available during works
Potential Odour from ASS	Refer management plan Section 4.3	Public complaints, refer Table 4.3	Surrounding community	During construction	Once per month	Contractor	• Implement appropriate measures to minimise potential odour emissions from ASS

Table 5.2 Water Quality, Erosion and Sediment Control Monitoring Outline

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility (refer Note 1)	Contingency Plans / Corrective Action
Surface Water Quality	water sample and visual inspection refer management plan Section 4.4	no compliance standard (test for oil and grease, pH, TSS and turbidity). Compliance is effected by limits on discharge from Landfill Cell Pond	representative locations in surface water system up and downstream of construction activities.	during construction	weekly if marine water or swamp discharge turbidity is <5NTU, daily if marine water or swamp discharge turbidity is >5NTU	Contractor	• investigate cause • implement works to rectify water quality • prevent discharge from site by diversion into boatharbour (refer Note 2)
Sediment Basins	water sample	minimum design standard – 'Blue Book'. The design storage capacity of sedimentation basins or traps shall be reinstated within 5 days of the cessation of a rainfall event that causes runoff to occur on or from the site. Early detection of potential to pollute 'clean' surface waters. Oil and grease: not visible Acidity: pH 4.0 to 8.5 TSS: <50mg/L (refer Note 3)	sediment basins and boatharbour excavation	prior to any direct release to clean surface water system	daily during any direct release to clean surface water system	Contractor	• further treatment and testing prior to any direct release to clean surface water system

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility (refer Note 1)	Contingency Plans / Corrective Action
Landfill Cell Pond	water sample	Oil and grease: not visible Acidity: pH 4.0 to 8.5 TSS: <50mg/L (refer Note 3)	Discharge point from Landfill Cell Pond to remnant swamp (near Boollwarroo Parade bridge)	during construction	daily during any discharge	Contractor	• investigate cause • prevent discharge from Landfill Cell Pond to clean surface water system
Erosion and Sediment Control Inspections	visual inspection	all measures in place and functional with design storage capacity reinstated within 5 days of the cessation of a rainfall event that causes runoff to occur on or from the site	entire site	during construction	within 24 hours of the cessation of a rainfall event causing runoff to occur on or from the site, daily during extended rain, weekly during dry weather	Contractor	• repair, reinstate, upgrade or clean out works as required
Rainfall	rain gauge	n/a	representative location on site	during construction	daily	Contractor	n/a

Notes: 1. Between construction Stages 1 and 2, and Stages 2 and 3, the responsibility shall transfer from the Contractor to Australand.
2. Does not apply to the natural runoff entering the site through upstream boundaries and flowing through the site in 'clean water' bypass channels.
3. See notes to Table 4.4.

Table 5.3 Marine Water Quality and Environment Monitoring Outline

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility	Contingency Plans / Corrective Action
Compliance Water Quality	turbidity measurement and colour (apparent) (refer management plan Section 4.5)	turbidity <5 NTU	surf zone 100m north of Breakwater and 100m south of groyne	during construction	• during marine construction – daily • during land construction – weekly during dry weather and daily during wet weather (refer Note 1) and/or a breakout of the swamp	Contractor	• investigate cause • implement measures to minimise impact on bathing area • modify activity until effective controls are implemented
Site Compliance Inspections	visual inspection	turbidity control devices in place, no spills or gross pollution	beach, rocky shore and coastal waters surrounding site	during construction	within 24 hours of the cessation of a rainfall event causing runoff to occur on or from the site, daily during extended rain, weekly during dry weather	Contractor	• immediately rectify and report any spills or pollution • repair, reinstate, upgrade or clean out works as required
Marine Water Quality	refer management plan Section 4.5	no significant impact from construction detected	sites within Bass Point Embayment	ongoing	every 2 months during marine works, every 3 months during land works	Australand	• investigate cause of impact • direct Contractor to modify work methods to minimise impact
Biological	refer management plan Section 4.5	no significant impact from construction detected	sites within Bass Point Embayment	ongoing	every 2 months during marine works, every 3 months during land works	Australand	• investigate cause of impact • direct Contractor to modify work methods to minimise impact

Notes: 1. 'Wet weather' is defined as 20mm or more of rainfall in 24 hours at the site gauge.
2. Ambient water clarity is to be measured 500m from works and entrance.

Table 5.4 Acid Sulfate Soil Monitoring Outline

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility	Contingency Plans / Corrective Action
Interface between AASS and PASS	As per Section 4.6	Implement measures to ensure appropriate interface is encountered throughout relevant area as per Section 4.6.3	Representative locations on site	During construction	Prior to and during removal of AASS	Contractor	• Investigate cause • Implement corrective measures • Halt activity until effective controls are implemented
Burial of AASS and small proportion of PASS	As per Section 4.6	Reburial below the Boatharbour (below a level of -4.0 m AHD under the Inner Harbour) and capped with a 10 cm thick cover of protective clean sand, as per Section 4.6.3	Representative locations on site	During construction	During construction	Contractor	• Investigate cause • Implement corrective measures • Halt activity until effective controls are implemented
Transport and disposal of PASS	As per Section 4.6	Satisfies all requirements for classification VENM except that it contains sulfidic soils and as per EPL 5984	As per Section 4.6.3	During construction	As per Section 4.6.3 and as per EPL 5984	Contractor	• Investigate cause • Implement corrective measures • Halt activity until effective controls are implemented
Neutralisation of ASS and reuse	As per Section 4.6	Satisfies requirements as per Section 4.6.3	As per Section 4.6.3	During construction	During construction	Contractor	• Investigate cause • Implement corrective measures • Halt activity until effective controls are implemented

Table 5.5 Noise and Vibration Monitoring Outline

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility	Contingency Plans / Corrective Action
Construction Noise	Sampling method in accordance with AS 2436-2010 Guide to noise control on construction, maintenance and demolition sites	$LA_{eq,15min}$: < background +10 dBA refer Table 4.6	nearest residences as per Table 4.6	during construction	once per week	Contractor	• community liaison to identify additional noise control measures • implement additional noise control measures
Construction Vibration	Sampling method in accordance with Environmental Noise Management Assessing Vibration: A Technical Guideline (DECC, 2006)	vibration dose: < 0.4 $m/s^{1.75}$	nearest residences as per Table 4.6	during construction	once during initial stages of work by plant likely to cause vibration	Contractor	• implement measures to minimise impact on residents • provide residents with information on timing and duration of vibration
Blast Overpressure and Vibration	refer management plan Section 4.7	overpressure: < 115 dB re 10^{-5} Pa vibration: < 5mm/s peak particle velocity	nearest residences as per Table 4.6	during blasting	every blast	Contractor	• modify blast design

Table 5.6 Archaeological and Heritage Monitoring Outline

Monitoring Program	Method	Compliance Standard/ Trigger Value	Location	Monitoring Period	Frequency	Responsibility	Contingency Plans / Corrective Action
General Archaeological and Heritage Compliance	Refer management plan Section 4.8	ensure inventories prepared that details contents of collections of Aboriginal objects, complies with conditions of s.87 s.90 and as per Section 4.8.3	Entire site	During construction	As per Sections 4.8.3 and 4.8.4 and compiled in the six-monthly monitoring report	Contractor	• halt all activities likely to affect relic/object until appropriate actions are implemented
AHIMS site compliance (four sites)	Refer management plan Section 4.8	ensure inventories prepared that details contents of collections of Aboriginal objects, complies with conditions of s.87 s.90 and as per Section 4.8.3 and as per Section 4.8.3 for the four AHIMS sites	AHIMS sites	During construction	As per Sections 4.8.3 and 4.8.4 and compiled in the six-monthly monitoring report	Contractor	• halt all activities likely to affect relic/object until appropriate actions are implemented

5.4 REPORTING

The environmental reporting requirements and responsibilities for the project are as follows:

(a) 6-Monthly Monitoring Report
The Conditions of Consent require a monitoring report to be presented to the Shell Cove Compliance Committee every 6 months and state that the report shall be publicly available. The Contractor shall prepare a report covering all aspects of environmental monitoring undertaken by the Contractor, including monitoring methodologies, instrument calibration and data collected, in the 6 month period. The Contractor's report shall be provided to the Site Superintendent within 2 weeks of the end of the period. Australand will incorporate monitoring undertaken by Australand and provide the complete monitoring report to the Shell Cove Compliance Committee within 4 weeks of the end of the period.

(b) Annual Return
The EPL requires an Annual Return, including a monitoring and complaints summary, to be submitted to the EPA. Australand is responsible for the preparation of the Annual Return

(c) Monthly Monitoring Summary
The EPL requires a report summarising the results of air, noise and water monitoring be forwarded to the EPA within 10 working days of the end of the month. To this end the Contractor shall provide a report summarising the results of air, noise and water monitoring in the previous month (including details of non-compliances with the condition of the EPL and measures taken, or proposed, to prevent recurrence of such a non-compliance) to the Site Superintendent no later than the 3rd working day of the month. Australand is responsible for the provision of the monthly monitoring summary to the EPA.

(d) Blasting Results
The EPL requires the results of blast monitoring to be faxed to the EPA within 24 hours of blasting taking place. Accordingly, the Contractor shall provide blast monitoring results to the EPA and the Site Superintendent within 24 hours.

(e) Notification of Environmental Harm
The EPL requires that the EPA be notified of incidents causing or threatening material harm to the environment in accordance with Part 5.7 of the POEO ACT. In the event of such an incident occurring, the Contractor shall notify the EPA and the Site Superintendent as soon as practical. The EPA must be notified by calling the EPA's Pollution Line on 131 555. The Contractor shall provide written details of the incident to the EPA and the Site Superintendent within 7 days of the incident's occurrence.

(f) Written Event Report
Where the EPA suspects that an event causing or likely to cause material harm to the environment has occurred, the EPA may request a written report on the event. In this situation the Site Superintendent will direct the Contractor to prepare a report to meet the requirements of the EPA. The Contractor shall make all reasonable inquiries into the event and supply the report within the requested time frame.

6 AUDITING PROGRAM

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

6.1 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.*

The Contractor shall prepare a detailed Auditing Program addressing these requirements as part of their SEMP, based on this document and their proposed methodology for the works.

6.2 INTERNAL ENVIRONMENTAL AUDITS

The Contractor shall undertake internal audits once a month to verify compliance with this CEMP and the SEMP. These audits shall assess compliance in terms of:

- regulations and licence conditions;
- monitoring and operational reports required by licences;
- environmental procedures;
- environmental training records;
- environmental reports completed and acted on;
- environmental incidents recorded and acted on; and
- environmental targets being achieved.

The Contractor shall:

- maintain a forward schedule of environmental audits planned;
- conduct the audits or make arrangements for the audits to be carried out ensuring that auditors have no direct responsibility for the construction work being carried out;
- maintain records of all environmental audits; and
- ensure that corrective actions are appropriately implemented.

The environmental audit program shall cover the activities of the Contractor, it's consultants and sub-contractors. It shall be developed with reference to AS/NZS ISO 14010 – 14012 1996: *Guidelines for Environmental Auditing*.

6.3 EXTERNAL ENVIRONMENTAL AUDITS

Australand shall organise for a full environmental audit of the entire site and all activities to be conducted by an independent environmental management auditor at 3 month intervals during the construction period to verify compliance with this CEMP and the SEMP. The Audit shall be attended by the Site Superintendent and representatives of the Contractor.

An Audit Report describing the results of each audit shall be prepared and submitted to the contractor within 5 working days of completion of the audit. Non-conformances shall be described and corrective actions recommended with identified dates for completion.

6.4 CORRECTIVE ACTION

The Contractor shall implement the corrective actions recommended in the time specified and notify the Site Superintendent of the completion of the corrective actions.

The Site Superintendent 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.

7 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

SMEC (2003)
Shadforth Wetland Environmental Management Plan
report prepared for Australand, 2003

DECCW/EPA *Environmental Noise Control Manual*

Kevin Mills and Associates (2005)
Potential impact on threatened fauna – Shell Cove boatharbour, City of Shellharbour
report prepared for Australand, December 2005

Kevin Mills and Associates (2010)
Additional Information to Part 3A Environmental Assessment – report for Australand, August 2010.

FIGURES

LEGEND

- ARCHAEOLOGICAL SITE
- RELATIVE HIGH ARCHAEOLOGICAL VALUE
- RELATIVE LOW ARCHAEOLOGICAL VALUE
- NO ARCHAEOLOGICAL VALUE
- 10m MIDDEN BUFFER
- SITE FENCE (INDICATIVE ONLY)
- SITE ACCESS GATE (INDICATIVE ONLY)
- BUND WALL (INDICATIVE ONLY)
- AREA WHERE BLASTING MAY BE REQUIRED
- (2) INDICATIVE NOISE AND VIBRATION MONITORING SITE
- HAUL ROAD (INDICATIVE ONLY)

NOTES:

LOCATION OF ARCHAEOLOGICAL SITES 52-5-436 AND 52-5-437 TAKEN FROM MICHAEL THERIN REPORT 'INSPECTION OF TWO POTENTIAL ABORIGINAL SITES, SHELL COVE, SHELL HARBOUR' DATED 31.MAY.2005

REMAINDER OF ARCHAEOLOGICAL SITES TAKEN FROM FIGURE 4.38 OF THE ENVIRONMENTAL IMPACT STATEMENT PREPARED BY LFA (AUST.) PTY.LTD. DATED JUNE 1995

SITE	AGD	ISG
52-5-436	304821 E 6170370 N	288243 E 1171119 N
52-5-437	304138 E 6170238 N	287558 E 1171001 N
52-5-438	———	287443 E 1170803 N

SITE FENCE AND GATES ARE INDICATIVE. THE CONTRACTOR IS REQUIRED TO PROVIDE SITE FENCE AND GATES IN CONSULTATION WITH THE SUPERINTENDENT AND MAINTAIN OH & S PROCEDURES

0 100 200 300 400m
1:4000 (A1) 1:8000 (A3)

DRG STATUS : PRELIMINARY, NOT FOR CONSTRUCTION

Issue	Details of Issue	Des'd	Drn	Chk'd	Approved	Date
F	ISSUED FOR AGENCY REVIEW	DHL	VIP	BF	GWB	04.06.12
E	ISSUED FOR AGENCY REVIEW	DHL	GI	GWB	GWB	19.01.11
D	ISSUED TO CLIENT	DHL	GI	GWB		23.12.10
C	ISSUED FOR TENDER	DHL	QN	CJT		02.11.07
B	ISSUED TO CARDNO FOR INFORMATION	CJT	GI	CJT		16.10.07
G	ISSUED FOR AGENCY REVIEW	DHL	ARG	BF	AFN	07.01.13

INITIALS SHOWN IN THE ADJACENT ISSUE RECORDS INDICATE THE STAGES UNDERTAKEN IN THE DRAWING APPROVAL PROCESS. DRAWINGS ARE ONLY TO BE USED WHEN APPROVED BY WORLEYPARSONS AND THEN ONLY AS NOTED FOR DRG STATUS.

WorleyParsons
resources & energy
INFRASTRUCTURE & ENVIRONMENT
LEVEL 12, 141 WALKER STREET, NORTH SYDNEY, N.S.W. 2060
PH: +61 2 8456 7200 - FAX: +61 2 8923 6877 ABN 61 001 279 812

Client
AUSTRALAND CORPORATION PTY LTD
SHELLHARBOUR CITY COUNCIL

Project
SHELL COVE BOATHARBOUR
ENVIRONMENTAL MANAGEMENT PLANS

SHELL COVE

Title
SITE PLAN INCLUDING CONSTRUCTION, ARCHAEOLOGICAL AND NOISE AND VIBRATION INFORMATION

Drawing No.CEMP
FIG-1
Issue
G
Cad File No.
Xref.(s)

A1

PLAN

LEGEND

- BUND WALL (INDICATIVE ONLY)
- COFFER DAM
- EXISTING FLOW PATH/WATER COURSE
- BOATHARBOUR CONSTRUCTION ACTIVITIES
- SURCHARGE MOUNDS
- LANDFILL CELL POND
- MODIFIED EXISTING WATERCOURSE OR NEW DIVERSION CHANNEL.
- CONSTRUCTED FLOW PATH / WATER COURSE
- US — UPSTREAM SURFACE WATER QUALITY MONITORING LOCATION.
- DS — DOWNSTREAM SURFACE WATER QUALITY MONITORING LOCATION.
- DEVELOPMENT UNDER CONSTRUCTION OR CONSTRUCTED
- BOATHARBOUR PRECINCTS POTENTIAL EARLY LAND RELEASE
- APPROXIMATE LOCATION OF EXISTING STOCKPILES

NOTES:

1. SCHEMATIC ONLY, CONTRACTOR TO DETERMINE LAYOUTS AND SIZES TO SUIT WORK METHOD.

0 100 200 300 400m
1:4000 (A1) 1:8000 (A3)

DRG STATUS : PRELIMINARY, NOT FOR CONSTRUCTION

Issue	Details of Issue	Des'd	Drn	Chk'd	Approved	Date
F	ISSUED FOR AGENCY REVIEW	DHL	VIP	BF	GWB	04.06.12
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C	ISSUED FOR TENDER	DHL	QN	CJT		02.11.07
H	ISSUED FOR AGENCY REVIEW	DHL	ARG	BF	AFN	07.01.13
G	ISSUED FOR AGENCY REVIEW	DHL	ARG	GWB	GWB	14.11.12

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Client: AUSTRALAND CORPORATION (NSW) PTY LTD

Project: SHELL COVE BOATHARBOUR ENVIRONMENTAL MANAGEMENT PLANS

SHELL COVE

Title: **PROPOSED STORMWATER DIVERSION STAGE 1**

Drawing No.CEMP: FIG-3A
Issue: H
Cad File No.:
Xref.(s):

A1

W:_INFRASTRUCTURE\PROJECTS\301015\01089_SHELL COVE BOATHABOUR\11.0 DRAWINGS\SKETCHES\FIG-3A_H

FIGURE 3B
STORMWATER DIVERSION - STAGE 2A

STAGE 2A SEQUENCE

I. Final design of Harbour Blvd constructed as part of Wetland #3 and #5 Contract. Channel west of the Noise Bund to merge western flows and pass through the Noise Bund at a single point to the north. Stage 1 Southern channel through the Noise Bund will be discontinued due to land release.

II. Construct new channel east of the Noise Bund to flow south towards Surcharge Area P3. This channel will accommodate 1 in 5 year ARI flows. Greater than 1 in 5 year ARI flows will discharge into the harbour area.

III. Construct new channel (with road adjacent) immediately north of Surcharge Area P3 that requires discharge into the Access Channel area. This requires a culvert structure to be built to pass flows beneath Bass Point Road. The section of channel east of Bass Point Road (and passing through the Coffer Dam) would be of similar construction to the existing channel north of the Coffer Dam. This channel would accommodate western flows passing through the noise bund, and flows from the south.

IV. Construct new channel from the north eastern point of Surcharge Area P1 around eastern edge of the Landfill Cell Pond (near Bass Point Road) to the existing bridge and channel constructed north of the Coffer Dam.

V. Construct additional haul road to cross the harbour footprint near the Inner and Outer harbour transition. This haul road will act as a retention bund in stage 2D. Note that additional haul roads may be required.

NOTE

As an alternative to be decided by the Principal, the culvert structure to be constructed as part of Stage 2A (III) may be deferred until stage 2D. This would require the new channel constructed north of Surcharge area P3 to continue north along the west side of Bass Point Road and discharge at the existing bridge.

LEGEND

- CLEAN WATER FLOW PATH
- HAUL ROAD (INDICATIVE)
- NEW CHANNEL
- PREVIOUS EXCAVATION/SURCHARGE AREA
- SUB STAGE NOTATION

40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

FIGURE 3C
STORMWATER DIVERSION - STAGE 2B

STAGE 2B SEQUENCE

I. Flows do not change from previous stage.

II. Commence Stage 2 excavation of Inner Harbour.

III. Surcharge Edge Treatment area of Surcharge Area P2.

LEGEND

- CLEAN WATER FLOW PATH
- HAUL ROAD (INDICATIVE)
- PREVIOUS EXCAVATION/SURCHARGE AREA
- EXCAVATION
- SURCHARGE
- SUB STAGE NOTATION

40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

FIGURE 3D
STORMWATER DIVERSION - STAGE 2C

STAGE 2C SEQUENCE

I. Flows do not change from previous stage.

II. Continue Stage 2 excavation from Inner Harbour towards Outer Harbour. One of the haul roads that cross the harbour footprint constructed in Stage 2A is to remain (ie be excavated either side). This haul road will also act as a retention bund separating the Inner and Outer Harbour in Stage 2D and beyond.

III. Construct hydraulic structure (weir and low flow culverts/pipes) to connect future Inner Harbour flow (stage 2D) across Haul Road/Retention Bund to the channel adjacent to Surcharge Area P3 (constructed in Stage 2A).

IV. Surcharge remaining Surcharge Area P2 and P3 areas except for channel constructed in Stage 2A. Surcharging the P2 areas will reduce the size of the settlement pond (the Landfill Cell Pond) and eventually completely fill it in. When the settlement pond is filled in to a point where it cannot function effectively, alternative approved means for management of 'dirty' water shall be in place.

LEGEND

- CLEAN WATER FLOW PATH
- HAUL ROAD (INDICATIVE)
- NEW CHANNEL
- PREVIOUS EXCAVATION/SURCHARGE AREA
- EXCAVATION
- SURCHARGE
- SUB STAGE NOTATION

40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

FIGURE 3E
STORMWATER DIVERSION - STAGE 2D

STAGE 2D SEQUENCE

I. Northern flows are directed to the Inner Harbour and flow through the newly constructed hydraulic structure in Stage 2C. The Outer Harbour remains dry.

II. Surcharge remaining eastern area of Surcharge Area P2 that was previously used as a channel.

LEGEND

- CLEAN WATER FLOW PATH
- HAUL ROAD (INDICATIVE)
- PREVIOUS EXCAVATION/SURCHARGE AREA
- EXCAVATION
- SURCHARGE
- FLOODED HARBOUR AREA
- SUB STAGE NOTATION

40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

FIGURE 3F
STORMWATER DIVERSION - STAGE 3A

STAGE 3A SEQUENCE

I. Flows do not change from previous stage.

II. Remove Bass Point Tourist Road north of discharge channel, excavate area to design depth and construct remaining portion of Breakwater (and edge treatment).

III. Construct a sand bund in access channel to act as a plug to the harbour once flooded in the subsequent stage.

LEGEND

- CLEAN WATER FLOW PATH
- HAUL ROAD (INDICATIVE)
- PREVIOUS EXCAVATION/SURCHARGE AREA
- EXCAVATION
- LINK BREAKWATER (AND COMPLETE EDGE TREATMENT)
- FLOODED HARBOUR AREA
- SUB STAGE NOTATION

40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

FIGURE 3G
STORMWATER DIVERSION - STAGE 3B

STAGE 3B SEQUENCE

I. Redirect flows from Inner Harbour into Outer Harbour, and through the access channel immediately south of the Breakwater.

II. Redirect western flows into inner harbour.

III. Install new coffer dam to facilitate removal of remainder of Bass Point Tourist Road and culvert structure, excavation of area to design depth, and construction of remaining portion of Groyne (and edge treatment).

IV. Remove haul road/retention bund.

V. Remove channel (now disused) and north of Surcharge Area P3.

LEGEND

- CLEAN WATER FLOW PATH
- PREVIOUS EXCAVATION/SURCHARGE AREA
- EXCAVATION
- CONSTRUCTION INSIDE NEW COFFER DAM
- FLOODED HARBOUR AREA
- SUB STAGE NOTATION

40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

FIGURE 3H
STORMWATER DIVERSION - STAGE 3C

STAGE 3C SEQUENCE

I. Remove coffer dams.

II. Remove sand plug and clean sand material from access channel (placed in Stage 1).

LEGEND

- CLEAN WATER FLOW PATH
- PREVIOUS EXCAVATION/SURCHARGE AREA
- EXCAVATION
- FLOODED HARBOUR AREA
- SUB STAGE NOTATION

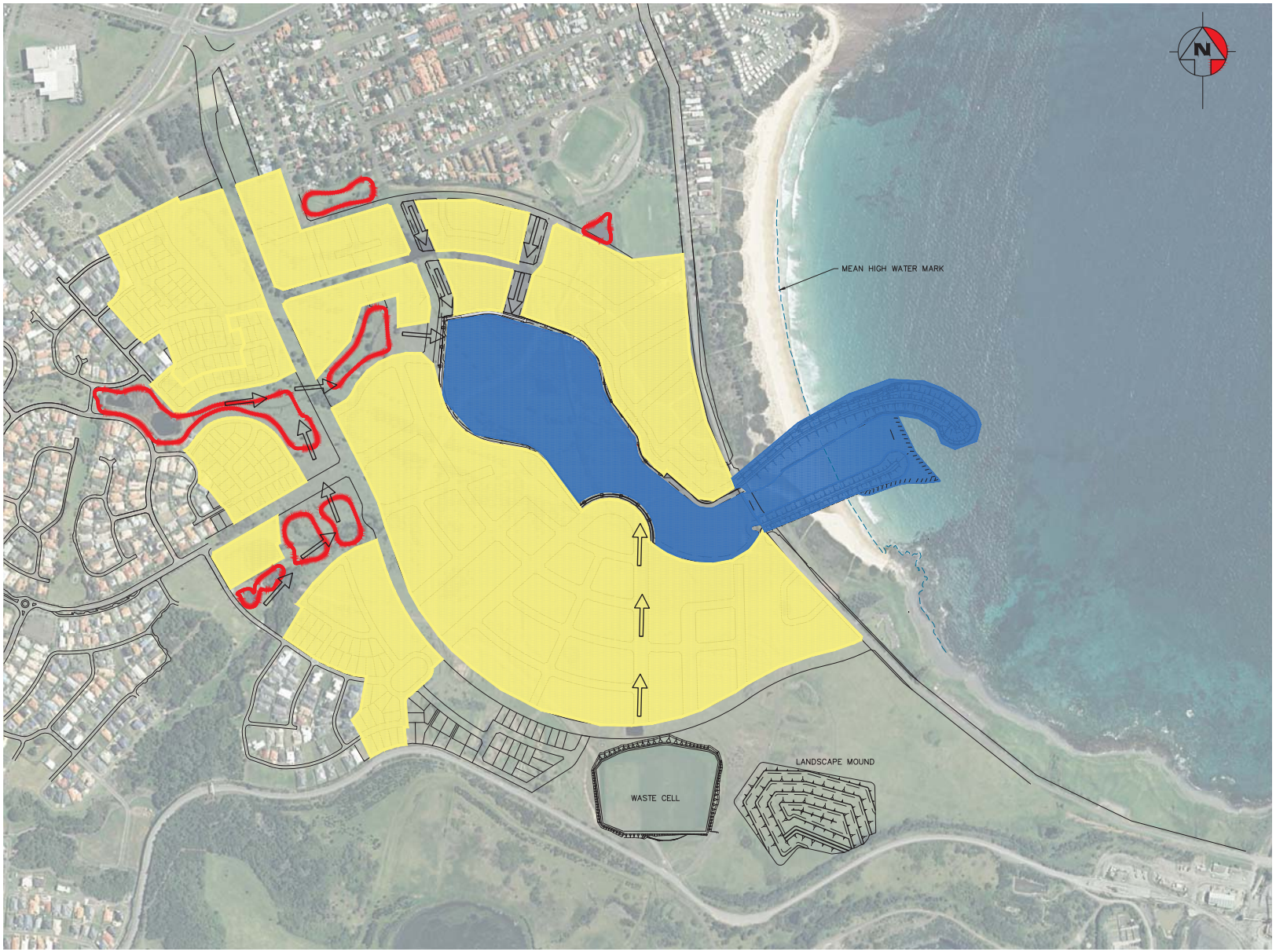
40 0 40 80 120 160 200m

1:2000 (A1) 1:4000 (A3)

NOT FOR CONSTRUCTION

SAVED: 4-Nov-13 PLOTTED: 4-Nov-13 \\HKA-SERVER\Public\CURRENT JOBS\8A0132 - Shell Cove Boat Harbour\TECHNICAL DATA\Staging\working\Water Management Staging Figures 20130616.dwg

Royal HaskoningDHV



LEGEND

- EXISTING SURFACE CONTOUR (2m INTERVAL)
- COMPLETED HARBOUR/ CHANNEL OPEN TO SEA
- CONSTRUCTED FLOW PATH / WATER COURSE
- DEVELOPMENT UNDER CONSTRUCTION OR CONSTRUCTED
- CONSTRUCTED WETLANDS

PLAN

NOTES:

1. SCHEMATIC ONLY, CONTRACTOR TO DETERMINE LAYOUTS AND SIZES TO SUIT WORK METHOD.

0 100 200 300 400m
1:4000 (A1) 1:8000 (A3)

DRG STATUS : PRELIMINARY, NOT FOR CONSTRUCTION

Issue	Details of Issue	Des'd	Drn	Chk'd	Approved	Date
F	ISSUED FOR AGENCY REVIEW	DHL	VIP	BF	GWB	04.06.12
E	ISSUED FOR AGENCY REVIEW	DHL	GI	GWB	GWB	19.01.11
D	ISSUED TO CLIENT	DHL	GI	GWB	GWB	23.12.10
C	ISSUED FOR TENDER	DHL	QN	CJT		02.11.07
H	FIGURE NUMBER CHANGED TO 3I	DHL	ARG	BF		21.10.13
G	ISSUED FOR AGENCY REVIEW	DHL	ARG	BF	AFN	07.01.13

INITIALS SHOWN IN THE ADJACENT ISSUE RECORDS INDICATE THE STAGES UNDERTAKEN IN THE DRAWING APPROVAL PROCESS. DRAWINGS ARE ONLY TO BE USED WHEN APPROVED BY WORLEYPARSONS AND THEN ONLY AS NOTED FOR DRG STATUS.

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Client: AUSTRALAND CORPORATION (NSW) PTY LTD

Project: SHELL COVE BOATHARBOUR ENVIRONMENTAL MANAGEMENT PLANS

SHELL COVE

Title: PROPOSED STORMWATER DIVERSION COMPLETED BOATHARBOUR

Drawing No.CEMP: FIG-3I

Issue: H

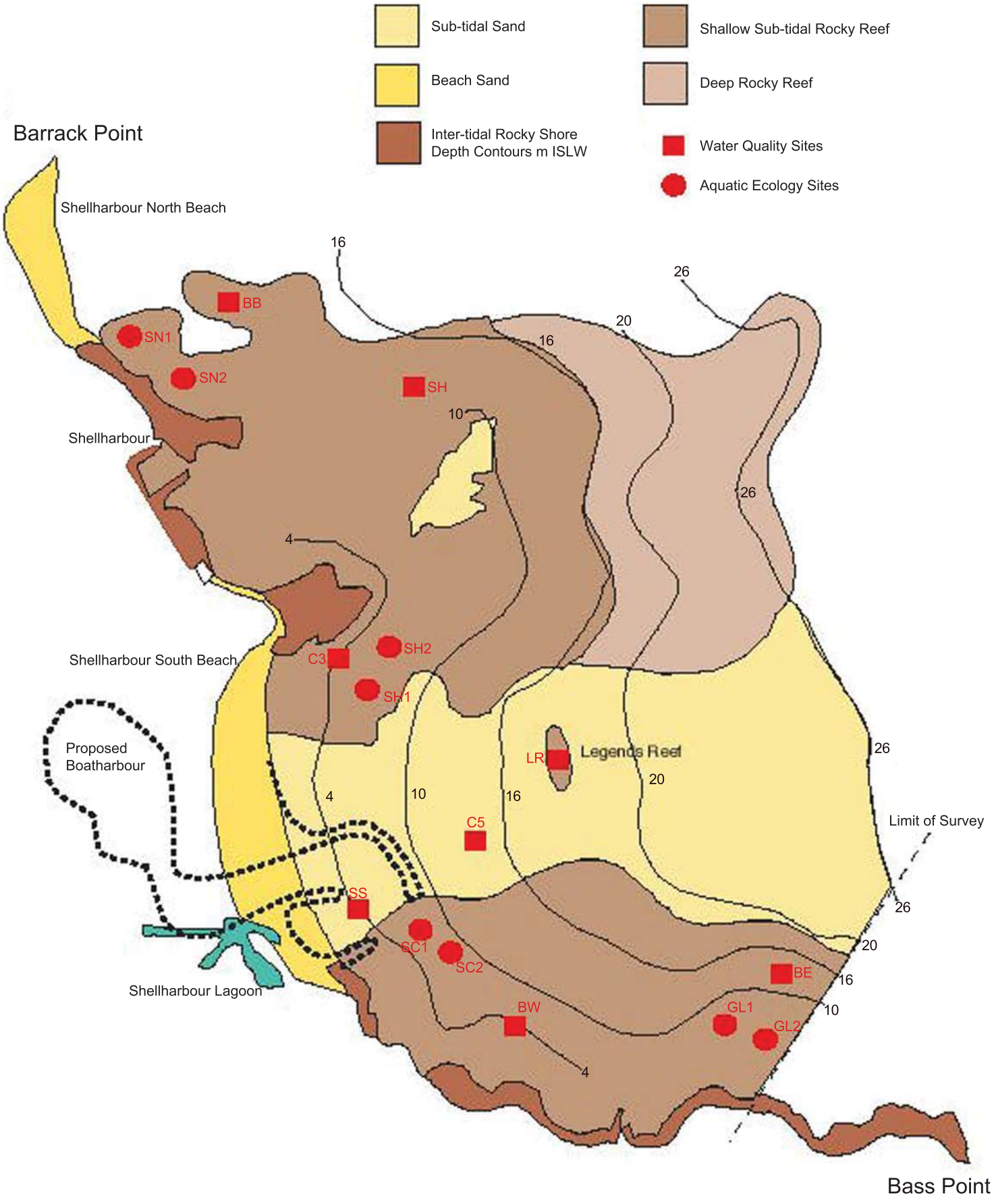
Cad File No.

Xref.(s)

A1

S:\01089_SHELL COVE BOATHABOUR\11.0 DRAWINGS\SKETCHES\FIG-3I_H

FIGURE 4



CONSTRUCTION MARINE WATER QUALITY AND AQUATIC ECOLOGY SAMPLING SITES

Marine Pollution Research Pty Ltd

APPENDIX A
CONDITIONS OF CONSENT

Shell Cove Boatharbour

Consolidated (for reading only)

2010 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, 31 October 2006, 25 November 2008 and 25 August 2010.

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,
   (f) the modification application made by Australand Corporation (NSW) Pty Ltd on 4 June 2008 with accompanying letter dated 29 May 2008,

except where conflicted by the following conditions, in which case the following conditions shall apply.

Note: The general layout of the boatharbour/marina is depicted in Appendix 1.

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 (EMPs)

15.(a) An Environmental Management Plan (EMP) shall be prepared for each of the four components: the boatharbour, Shadforth/Tongarra 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/Tongarra 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/Tongarra 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;
- reporting in the event of results not meeting standards;

- Earthworks strategy to co-ordinate the neutralisation with the excavation to minimise the stockpiling of untreated acid sulphate soil;
- the management of acid sulphate soil stockpiles including their location, volume, duration and treatment; and
- Measures to mitigate adverse impacts to neighbouring properties from stockpiling of acid sulphate soil including odour impacts.

(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 sulfate soils are to be re-buried beneath RL-1.0 metres AHD, or neutralised and reused in accordance with the Acid Sulfate Soil Management Plan, or disposed at a DECCW 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 Killalea State Park; and

d. Landscaping areas shall be appropriately maintained for a period of six months or until establishment of the landscape.

NSW GOVERNMENT | Planning

25 August 2010

Our ref: DA 95/133 (MOD 5)
Contact: Thomas Mithen
Phone: (02) 9228 6443
Fax: (02) 9228 6540
Email thomas.mithen@planning.nsw.gov.au

Mr Glen Colquohoun
Australand Corporation Pty Ltd
PO Box A148
Shellharbour NSW 2529

Dear Mr Colquohoun

RE: Proposed Modification to Development Application No. 95/13377 for the boatharbour/marina at Boollwarroo Parade, South Shellharbour Beach, Shell Cove

I refer to the above modification application to modify DA 95/133 lodged with the Department on 30 April 2010.

I am writing to inform you that the application was approved on 20 August 2010 by the Acting Director Regional Projects, under delegation from the Minister for Planning. The consent is on the basis of the attached Notice of Modification of Development Consent.

Please note the consent operates from the date of this letter.

Should you have any enquiries regarding the above matter, please contact Thomas Mithen on the above details.

Yours sincerely

Alan Bright
Acting Director
Regional Projects

SCHEDULE 1

PART A—TABLE

Application Number:	DA 95/133 (MOD 5)
Application made by:	Australand Corporation Pty Ltd PO Box A148 Shellharbour NSW 2529
On land comprising:	Boollwarroo Parade, South Shellharbour Beach, Shell Cove
Local Government Area	Shellharbour
For the carrying out of:	Construction of a 350 berth boatharbour/marina, enhancement and enlargement of a wetland at Shadforth and placement of treated containinated landfill in engineered cells adjacent to the realigned quarry road.
Section 96 (1A) Application	Modify Condition No. 18 of DA 95/133 to incorporate neutralisation and re-use of acid sulfate soils on the site in accordance with an Acid Sulfate Soil Management Plan.
Development consent granted by:	Acting Director Regional Projects As Delegate of the Minister for Planning
On:	
Type of development:	
S.119 public inquiry held:	No
As modified	9 November 2001 - To allow the erection of acoustic barriers along the haul road instead of engineered landfill cells. 6 September 2004 - To permit the deposition of waste material, extracted from the Shellharbour wetland into a single landfill cell and permit the disposal of actual and potential acid sulfate soils at an EPA licensed landfill site. 31 October 2006 - To change the location and orientation of the boatharbour and change the layout and design of the marina; delete the flushing pipe system; and remove the stop work provisions for indigeneous heritage. 25 November 2008 - To extend the seaward boundary of the development to incorporate the inter-tidal area originally covered by the Part 5 approval into the Part 4 approval.

PART B—NOTES RELATING TO THE MODIFICATION OF DEVELOPMENT CONSENT NO. 95/133

RESPONSIBILITY FOR OTHER APPROVALS / AGREEMENTS

The applicant is solely responsible for ensuring that all additional consents and agreements are obtained from other authorities, as relevant.

Appeals

The Applicant has the right to appeal to the Land and Environment Court under section 97 of the *Environmental Planning and Assessment Act, 1979*. The right to appeal is only valid, for a development application, within **12** months after the date on which the applicant received this notice.

Appeals—Third Party

A third party right to appeal to this development consent is available under Section 123, subject to section 101 of the *Environmental Planning and Assessment Act, 1979.*

Legal notices

Any advice or notice to the consent authority shall be served on the Director-General.

SCHEDULE 2

MODIFICATION DEVELOPMENT CONSENT NO. 95/133

The development consent is modified as follows:

SCHEDULE 2 - CONDITIONS

(a) Modify Condition 18 as follows:

Re-burial of Acid Sulfate Soils

18. *"All excavated actual and potential acid sulfate soils are to be buried beneath RL – 1.0 metres AHD, or neutralised and reused in accordance with the Acid Sulfate Soil Management Plan, or disposed at a DECCW licensed landfill site."*

(b) Modify Condition 15 (d)(iv) as follows;

An Acid Sulfate 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 anygiven time;*
- *Reporting in the event of results not meeting standards;*
- *Earthworks strategy to co-ordinate the neutralisation with the excavation to minimise the stockpiling of untreated acid sulfate soil;*
- *The management of acid sulfate soil stockpiles including their location, volume, duration and treatment; and*
- *Measures to mitigate adverse impacts to neighbouring properties from stockpiling of acid sulfate soil including odour impacts.*

APPENDIX B
CONDITIONS OF CONCURRENCE

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 Wildife 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:

- the Crown Lands Act, 1989.

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

NSW EPA

Our reference: EF13/2571: DOC13/51842:JB
Contact: Jen Byrne (02) 4224 4100

REGISTERED POST
Australand Corporation (NSW) Pty Limited
(Attention: Glenn Colquhoun)
PO Box 4148
SHELLHARBOUR NSW 2529

Dear Mr Colquhoun

SHELL COVE MARINA
VARIATION OF ENVIRONMENT PROTECTION LICENCE NO 12426

I refer to the enclosed Notice prepared under the *Protection of the Environment Operations Act 1997* (POEO Act), varying Australand Corporation (NSW) Pty Limited's (Australand) Environment Protection Licence Number 12426 (licence).

The Environment Protection Authority (EPA) has varied your licence to accommodate additional water monitoring/discharge points and changed the sampling frequency and method at selected water monitoring/discharge points. EPA has also varied a number of conditions to ensure that the licence is appropriate for Stage 1 works and is consistent with the Site Environmental Management Plan.

A draft notice prepared under the POEO Act, which incorporated the proposed amendments, was provided to you on 30 August 2013. EPA met with Australand on 4 September 2013 to discuss the proposed amendments. EPA received confirmation of your acceptance of the proposed changes on 5 September 2013.

The attached Notice under Section 58 of the POEO Act enacts the variation to your licence. An updated copy of your licence will be available once it has come into effect on the EPA's public register at: http://www.epa.nsw.gov.au/prpoeoapp/.

If you have any questions in relation to this issue or wish to discuss this matter further, please contact Jen Byrne on (02) 4224 4100.

Yours sincerely

GREG NEWMAN 9.9.13
Senior Regional Operations Officer
Environment Protection Authority

Att: Notice 1516628

PO Box 513 Wollongong NSW 2520
Level 3, 84 Crown Street, Wollongong NSW
Tel: (02) 4224 4100 Fax: (02) 4224 4110
ABN 43 692 285 758
www.environment.nsw.gov.au

Section 58(5) Protection of the Environment Operations Act 1997

Licence Variation

Licence - 12426

AUSTRALAND CORPORATION (NSW) PTY LTD

ABN 57 001 022 117

PO BOX A148

SHELLHARBOUR NSW 2529

Attention: Mr Glenn Colquhoun

Notice Number	1516628
File Number	LIC07/478
Date	09-Sep-2013

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 activities at Bass Point Tourist Road, SHELL COVE, NSW, 2529 ("the premises").

B. In July 2013, the licensee requested that water monitoring/discharge points be added to the licence and requested a change to the sampling frequency at selected water monitoring/discharge points.

C. EPA has added water monitoring/discharge points to the licence and changed the sampling frequency and sampling method at selected water monitoring/discharge points.

D. EPA has also varied a number of conditions to ensure that the licence is appropriate for Stage 1 works and is consistent with the Site Environmental Management Plan.

E. A draft notice, prepared under the POEO Act, which incorporated the proposed amendments, was provided to the licensee on 30 August 2013.

F. EPA met with the licensee on 4 September 2013 to discuss the proposed amendments.

G. EPA received confirmation of the licensee's acceptance of the proposed changes on 5 September 2013.

H. The EPA has taken into account the objects of the POEO Act and the relevant factors listed in section 45 of that Act.

VARIATION OF LICENCE NO. 12426

Section 58(5) Protection of the Environment Operations Act 1997

Licence Variation

1. By this notice the EPA varies licence No. 12426. The attached licence document contains all variations that are made to the licence by this notice.
2. The following variations have been made to the licence:
   - The premises description has been amended at Condition A2.1.
   - Water monitoring/discharge points at Point 13, the landscape mound, the trommel pad sediment basin and the acid sulphate soil sediment basin have been added at Condition P1.3.
   - Noise monitoring locations have been added at Condition P1.4.
   - Concentration limits at Point 7 have been removed or modified at Condition L2.1.
   - New concentration limits at the trommel pad sediment basin and the acid sulphate soil sediment basin have been added at Condition L2.1.
   - Standard conditions relating to the use of turbidity in place of total suspended solids have been added at L2.2-5.
   - Conditions relating to effluent application to land have been removed.
   - Standard conditions relating to erosion and sediment controls have been added at O4.2-3, O4.6 and O4.7 and a duplicative condition relating to erosion and sediment controls has been removed.
   - Standard conditions relating to sediment basins have been added at O4.10-14 and duplicative conditions relating to sediment controls have been removed.
   - A condition relating to chemical storage has been amended at Condition O.20.
   - Water monitoring requirements have been amended at Condition M2.3.
   - Noise monitoring requirements have been added at Condition M2.4.
   - Conditions relating to testing methods and noise monitoring have been removed.
   - A condition relating to reporting on background noise levels has been removed.
   - Conditions relating to monthly reporting have been amended at Condition R5.2.

William Dove 9 September 2013

William Dove

Head Regional Operations Unit

Metropolitan - Illawarra

(by Delegation)

INFORMATION ABOUT THIS NOTICE

- This notice is issued under section 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.

Licence Variation

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).

Environment Protection Licence

Licence - 12426

NSW EPA

Licence Details

Number: 12426

Anniversary Date: 13-April

Licensee

AUSTRALAND CORPORATION (NSW) PTY LTD

PO BOX A148

SHELLHARBOUR NSW 2529

Premises

SHELL COVE

BASS POINT TOURIST ROAD

SHELL COVE NSW 2529

Scheduled Activity

Marinas and Boat Repairs

Fee Based Activity	Scale
Boat mooring and storage	Any handling capacity

Region

Metropolitan - Illawarra

Level 3, NSW Govt Offices, 84 Crown Street

WOLLONGONG NSW 2500

Phone: (02) 4224 4100

Fax: (02) 4224 4110

PO Box 513 WOLLONGONG EAST

NSW 2520

Environment Protection Licence

Licence - 12426

Environment Protection Licence

Licence - 12426

Environment Protection Licence

Licence - 12426

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.

Environment Protection Licence

Licence - 12426

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.

Scheduled Activity	Fee Based Activity	Scale
Marinas and Boat Repairs	Boat mooring and storage	Any handling capacity

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 or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
SHELL COVE
BASS POINT TOURIST ROAD
SHELL COVE
NSW 2529
PART LOT 206 DP 857030, PART LOT 8032 DP 1072187

A2.2 In relation to Condition A2.1, the premises is defined by the 'Boundary of Stage 1 Boatharbour Development' in site drawing 'Shell Cove Boatharbour (Stage 1) Boundary of Boatharbour Development Plan for EPL,' drawing number 301015-01089-CS-DWG-0021, dated 7 August 2013 and prepared by Worley Parsons.

Note: The 'Shell Cove Boatharbour (Stage 1) Boundary of Boatharbour Development Plan for EPL' is maintained on file EF13/2571 at the EPA's Level 3, 84 Crown Street, Wollongong Office.

A3 Information supplied to the EPA

A3.1 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.

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.

Air

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Dust deposition		Nearest residence at Boollwarroo Pde, Shellharbour Village
2	Dust deposition		Nearest residence on Mary, William or Sophia Streets
3	Dust deposition		Nearest residence on Whitsunday or Apollo Drives

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

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
7	Discharge to waters Water quality monitoring	Discharge to waters Water quality monitoring	Storage Pond Discharge into Shellharbour Swamp E 304827 N 6170591
8	Water quality monitoring		Surf zone 100m south of groyne E 305215 N 6170407

9	Water quality monitoring		Surf zone 100m north of breakwater E 305007 N 6170808
10	Water quality monitoring		Upstream location Runoff into premises from west E 304179 N 6170716
11	Water quality monitoring		Upstream location Runoff into premises from north E 304567 N 6171012
12	Water quality monitoring		Shellharbour Swamp Discharge into near shore zone E 304960 N 6170650
13	Water quality monitoring		Upstream Location Runoff into premises from south-west E 304290 N 6170438
14	Water quality monitoring		Landscape mound Runoff into premises from south E 304893 N 6169904
15	Discharge to waters Water quality monitoring	Discharge to waters Water quality monitoring	Trommel pad Sediment basin E 304687 N 6170081
16	Discharge to waters Water quality monitoring	Discharge to waters Water quality monitoring	Acid sulphate soil Sediment basin E 304469 N 6170507

P1.4 The following points referred to in the table below are identified in this licence for the purposes of monitoring noise from the premises.

EPA Identification No.	Type of Monitoring Point	Type of Discharge	Location Description
17	Noise monitoring		Nearest residence at Boollwarroo Pde, Shellharbour Village
18	Noise monitoring		Nearest residence on Mary, William or Sophia Streets
19	Noise monitoring		Nearest residence on Whitsunday or Apollo Drives

3 Limit Conditions

Environment Protection Licence

Licence - 12426

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 Concentration limits

L2.1 Water and/or Land Concentration Limits

POINT 7

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	Visible				Not Visible
pH	pH				4.0-8.5
Total suspended solids	milligrams per litre				50

POINT 15,16

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	Visible				Not Visible
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

Note: Exceeding the limits specified in Condition L2.1 of this licence for pH, turbidity and total suspended solids (TSS) is only permitted when the discharge occurs solely as a result of rainfall measured at the premises and that rainfall event exceeds the 5 year ARI rainfall event. A 5 year ARI rainfall event is taken to be one that exceeds the 5 year ARI rainfall intensity in the 'Intensity-Frequency-Duration Table,' dated 26 August 2013 and prepared by the Bureau of Meteorology. The 'Intensity-Frequency-Duration Table' is maintained on file EF13/2571 at the EPA's Level 3, 84 Crown Street, Wollongong Office.

L2.2 If the licensee uses turbidity (NTU) in place of TSS to determine compliance with Condition L2.1, the licensee must develop a statistical correlation which identifies the relationship between NTU and TSS for water quality in the sediment basin/s in order to determine the NTU equivalent of 50 TSS before its use.

L2.3 The licensee must provide the EPA with a copy of the statistical correlation assessment methodology and results before using NTU in place of TSS.

L2.4 The licensee must develop and implement a method to enable the ongoing verification of the relationship between NTU and TSS.

L2.5 The licensee must provide the EPA with any amendments the licensee makes to the statistical correlation as a result of the ongoing verification required by Condition L2.4 before using the revised statistical correlation.

L3 Waste

L3.1 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.

L4 Noise limits

L4.1 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.

L4.2 5dB(A) must be added to the measured noise levels if the noise is substantially tonal or impulsive in character.

L4.3 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.

L5 Blasting

L5.1 The use of explosives is prohibited.

L6 Hours of operation

L6.1 All work at the premises must be conducted between the following hours: 7am to 6pm Mondays to Fridays, 7am to 5pm Saturdays, no construction on Sundays and Public Holidays.

L6.2 Exemptions to standard construction hours
The four categories of works that may be undertaken outside the standard hours of operation permitted

by this license are:
a) the delivery of oversized plant or structures that police or other authorised authorities determine require special arrangements to transport along public roads;
b) emergency work to avoid the loss of lives or property, or to prevent environmental harm;
c) works that are not more than 5 dB(A) over the rating background level at the nearest noise sensitive receiver as assessed by acoustic investigation.
The licensee must notify the EPA within 24 hours of undertaking any works referred to in this Condition as well as providing the EPA with a copy of the results of any acoustic investigation made in relation to this Condition within 24 hours.
d)works conducted on Shellharbour South Beach to take advantage of access at low tide conditions and/or low wave conditions.

L7 Potentially offensive odour

L7.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

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

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

O3.2 Areas of the premises not currently engaged in site operations or activities must be stabilised and maintained in a condition that does not emit dust.

O3.3 Measures must be installed to prevent the carry over of mud or dirt onto public roads beyond the premises boundary.

O4 Processes and management

Erosion and Sediment Control

O4.1 Any crossings of 'clean water channels' must be constructed in a manner that prevents erosion and prevents sediment from washing into the channels.

O4.2 The licensee must maximise the diversion of run-on waters from lands upslope and around the site whilst land disturbance activities are being undertaken.

O4.3 The licensee must maximise the diversion of stormwater runoff from disturbed areas within the premises to sediment basins or infiltration sumps installed on the premises.

O4.4 Existing water courses used to bypass stormwater around the boat harbour must be lined with a non-erodible liner if their channels or banks are disturbed by the licensee.

O4.5 Temporary and permanent constructed drainage around the site must be stabilised immediately.

O4.6 The drainage from all areas that will mobilise suspended solids when stormwater runs over these areas must be controlled and diverted through appropriate erosion and sediment control measures.

O4.7 The licensee must minimise the area of the site that is able to generate suspended material when water runs over it.

O4.8 Temporary vegetative restabilisation techniques must be applied to any disturbed soil to prevent areas remaining bare for more than 28 days.

O4.9 Stockpiles must not be placed within 30 metres of any watercourse.

Sediment Basins

O4.10 Where sediment basins are necessary, all sediment basins and associated drainage must be installed and commissioned prior to the commencement of any clearing or grubbing works within the catchment area of the sediment basin that may cause sediment to leave the site.

Note: This condition does not apply to those works associated with the actual installation of sediment basins or associated drainage.

O4.11 Erosion and sediment control measures, including sediment basins, must be designed (stability, location, type and size), constructed, operated and maintained in accordance with the guideline "Managing urban stormwater: soils and construction" Landcom 2004.

O4.12 The licensee must ensure the design storage capacity of the sediment basins installed on the premises is reinstated within 5 days of the cessation of a rainfall event that causes runoff to occur on or from the premises.

O4.13 The licensee must ensure that sampling point(s) for water discharged from the sediment basin(s) are provided and maintained in an appropriate condition to permit:

a) the clear identification of each sediment basin and discharge point;
b) the collection of representative samples of the water discharged from the sediment basin(s); and
c) access to the sampling point(s) at all times by an authorised officer of the EPA at all reasonable times where safe to do so.

O4.14 The licensee must endeavour to maximise the reuse of captured stormwater on the premises.

Dredging

O4.15 Dredge spoil for beach nourishment must be placed in a manner that minimises the pollution of waters. Where practical the dredge spoil outlet pipe should be positioned at the maximum distance practicable from the high water mark and treated with a dewatering structure to minimise turbidity in the surf zone.

Breakwall and Groyne

O4.16 For purposes of turbidity control, only clean rock may be used for break wall and groyne construction.

Acid Sulphate Soil

O4.17 Any acid sulphate soils disturbed during the project must be managed in accordance with the document titled " ACID SULPHATE SOIL MANUAL, ASSMAC 1998".

O4.18 From the time when the acid sulphate soil is exposed to the atmosphere:
a) 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 condition/s of this licence and to assess the risks of odours impacting residential areas under worst-case wind conditions.
b) the licensee has 30 days to submit the log of odour observations to the EPA together with an assessment of actual and potential odour impacts on the nearest residential areas.

O4.19 If the assessment identifies a likely risk of odours impacting residential areas, the licensee must:
a) minimise the handling of odorous materials near to residential areas, and
b) locate odorous stockpiles away from residential areas, and
c) cover stockpiles to reduce the escape of odours to the atmosphere, and
d) apply odour suppressants such as lime.

Chemical Storage

O4.20 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 1940-2004: The Storage and Handling of Flammable and Combustible Liquids
b) Australian Standard AS 4452-1997: The Storage and Handling of Toxic Substances

Sewage

O4.21 Sewage effluent must not be disposed of on-site.

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:

M2.2 Air Monitoring Requirements

POINT 1,2,3

Pollutant	Units of measure	Frequency	Sampling Method
Total Solid Particles	grams per square metre per month	Monthly	Composite sample

M2.3 Water and/ or Land Monitoring Requirements

POINT 7

Pollutant	Units of measure	Frequency	Sampling Method
Biochemical oxygen demand	milligrams per litre	Daily during any discharge	Grab sample
Nitrate	milligrams per litre	Daily during any discharge	Grab sample
Nitrogen (ammonia)	milligrams per litre	Daily during any discharge	Grab sample

Environment Protection Licence

Oil and Grease	Visible	Daily during any discharge	Visual Inspection
pH	pH	Daily during any discharge	Probe
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample
Turbidity	nephelometric turbidity units	Daily during any discharge	Probe

POINT 8,9,12

Pollutant	Units of measure	Frequency	Sampling Method
Colour (apparent)	Visible	Special Frequency 1	Visual Inspection
Turbidity	nephelometric turbidity units	Special Frequency 1	Probe

POINT 10,11,13,14

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	Visible	Special Frequency 2	Visual Inspection
pH	pH	Special Frequency 2	Probe
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample
Turbidity	nephelometric turbidity units	Special Frequency 2	Probe

POINT 12

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	Visible	Special Frequency 2	Visual Inspection
pH	pH	Special Frequency 2	Probe
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample

POINT 15,16

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	Visible	Daily during any discharge	Visual Inspection
pH	pH	Daily during any discharge	Probe
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample

Note: Special Frequency 1 means:
1. weekly, or
2. daily during coffer dam construction, wet weather,* or break out.**

* 'wet weather' is defined as 20mm or more of rainfall in a 24 hour period, as measured at the premises.
** 'Break out' means there is water flowing from the premises into the surf zone.

Note: Special Frequency 2 means:
1. daily if turbidity at point 8, 9 or 12 is equal to or greater than 5 nephelometric turbidity units, or
2. weekly if turbidity at point 8, 9 or 12 is less than 5 nephelometric turbidity units.

M2.4 Noise Monitoring Requirements

POINT 17, 18, 19

Pollutant	Units of Measure	Frequency	Sampling Method
Noise	dB(A)	Weekly	Australian Standard 2436—2010 Guide to noise control on construction, maintenance and demolition sites

M3 Testing methods - concentration limits

M3.1 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.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* 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".

M4 Weather monitoring

M4.1 Rainfall must be measured and recorded in millimetres per 24 hour period, at 9am each day. For the purpose of this licence the Shell Cove project office is considered an acceptable rainfall monitoring location.

M5 Recording of pollution complaints

M5.1 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.

M5.2 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.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

M6.1 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.

M6.2 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.

M6.3 The preceding two conditions 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.

M7 Requirement to record overflow or bypass incidents

M7.1 When stormwater bypasses and/or overtops any pollution control or erosion and sediment control measure, the licensee must, within 5 days of the incident, provide a brief report to the EPA:
a) outlining the circumstances that led to the failure, and
b) explaining why the measure was not effective, and
c) advising the remediation works carried out to prevent a recurrence of the bypass or overtopping.

M8 Other monitoring and recording conditions

Vibration Monitoring

M8.1 Vibration monitoring must be carried out in accordance with the guidance provided in the Environmental Noise Management Assessing Vibration: A Technical Guideline, published by the Department of Environment and Conservation, February 2006.

Beach Monitoring

M8.2 Daily during any discharge to the beach, the licensee must carry out visual inspections of the near shore

waters including at points 8, 9 and 12. If any visual signs of water pollution appear to extend from the licensed premises to these monitoring locations, all discharges from the premises must be immediately stopped.

Discharges from the premises may only resume when waters at points 8 and 9 are unaffected by the activities of the premises.

Note: This condition does not apply to the natural run-off entering the premises through upstream boundaries and flowing through the premises in "clean water" bypass channels.

Monitoring of Pollution Control Measures

M8.3 All erosion and sediment control measures installed on the premises must be inspected and works undertaken to repair and/or maintain these controls:
a) weekly during normal construction hours outlined in Condition L6.1;
b) daily during periods of rainfall; and
c) within 24 hours of the cessation of a rainfall event causing runoff to occur on or from the premises.

The licensee must record all such inspections including observations and works undertaken to repair and/or maintain erosion and sediment controls.

6 Reporting Conditions

R1 Annual return documents

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.
At 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.

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.

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').

R1.6 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.

R1.7 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.

R1.8 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

R2.1 Notifications must be made by telephoning the Environment 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.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

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 Notification of bypass or overflow incidents

R4.1 The licensee must immediately notify the EPA Environment Line (Telephone 131555) of any failure and/or over-topping of any erosion or sediment control measure or stormwater management measure.

R5 Other reporting conditions

Planned Flooding of the Boat Harbour

R5.1 Thirty days prior to opening the boat harbour to the sea, the licensee must submit a report outlining the opening procedure aimed at minimising the turbidity plume at the beach during the initial tidal exchanges.

Monthly Report

R5.2 Monthly report

The licensee must provide the EPA with a monthly report containing the following information:

a) details of all non-compliances with the conditions of this licence and measures taken, or proposed, to prevent a recurrence of such a non-compliance; and
b) details of all discharges from the sediment basins where the water quality results exceed the limits prescribed by Condition L2.1 including the rainfall measurements to demonstrate compliance; and
c) details of all noise monitoring results as prescribed by Condition M2.4; and
d) details of all air monitoring results as prescribed by Condition M2.2; and
The report referred to in this condition must be received by the EPA within 10 working days of the end of each month.

7 General Conditions

G1 Copy of licence kept at the premises or plant

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 the premises.

G2 Other general conditions

G2.1 **Completed Pollution Studies and Reduction Programs (PRPs)**

PRP	Description	Completed Date
PRP 1 - Assessment & Control of Odours from the exposure of Old Landfill	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.	30-October-2007

Environment Protection Licence

Licence - 12426

Dictionary

General Dictionary

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
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	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.*
AMG	Australian Map Grid
anniversary date	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.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	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.*
COD	Means chemical oxygen demand
composite sample	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.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.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.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	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 mo nths. 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.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	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*.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Paul Wearne

Environment Protection Authority

(By Delegation)
Date of this edition: 13-April-2006

End Notes

1 Licence varied by notice 1067984, issued on 17-Jan-2007, which came into effect on 17-Jan-2007.

2 Licence varied by notice 1074555, issued on 21-Aug-2007, which came into effect on 21-Aug-2007.

3 Licence varied by notice 1110458, issued on 31-Mar-2010, which came into effect on 31-Mar-2010.

4 Licence varied by notice 1504261 issued on 20-Feb-2012

5 Licence varied by notice 1510205 issued on 21-Dec-2012