

## The Port Fairy Pilot Wave Energy Project



## Environmental Management Plan

**BPS** BioPower Systems Pty Ltd  
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## Definitions & Abbreviations

BPS	BioPower Systems Pty Ltd
bioWAVE	Wave energy pilot unit
CEO	Chief Executive Officer
CM Act	<i>Coastal Management Act</i>
dB	decibels
DPI	Victorian Department of Primary Industries
DSE	Victorian Department of Sustainability and Environment
DELWP	Victorian Department of Environment, Land, Water & Planning
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
HLV	Heavy Lift Vessel
PEDS	Project Environmental Delivery Standards
PMP	Project Management Plan
TSV	Transport Safety Victoria
WHS	Workplace Health and Safety

## 1. Introduction

### 1.1. Scope of this EMP

This Environmental Management Plan (EMP) details the environmental management requirements for the Port Fairy Pilot Wave Energy project.

This EMP includes:

- The requirements for environmental management during the installation, operation and decommissioning activities;
- The responsibilities for implementing this EMP; and
- Project environmental controls and limits to ensure that project objectives and targets can be achieved with minimum impact on the environment.

The Environmental Risk Register forms the basis for this EMP. It includes information on all activities which may have an impact on the environment, expected risk levels and controls, and limits to manage these risks.

The approval of this EMP by the Director, Major Projects and Environmental Approvals Department of The Victorian Department of Environment, Land, Water & Planning (DELWP), is a condition of CM Act consent for the installation, operation, and decommissioning of the wave energy generator. BioPower Systems Pty Ltd (BPS) has responsibility for the project in accordance with the requirements of this EMP.

### 1.2. Project location

The 250kW bioWAVE<sup>1</sup> is to be positioned in accordance with Figure 2, 850 m offshore sitting on unvegetated sand, and connected to onshore electrical equipment at a privately-owned property located some 4km west of Port Fairy. The private property extends across the Taylors Bay beach to the high water mark. The Southern Ocean Mariculture (SOM) business operates on the site. The bioWAVE location is shown Figure 1 and Figure 2.

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<sup>1</sup> The bioWAVE system comprises the ocean based bioWAVE device, the onshore electrical equipment, and the interconnecting cable.

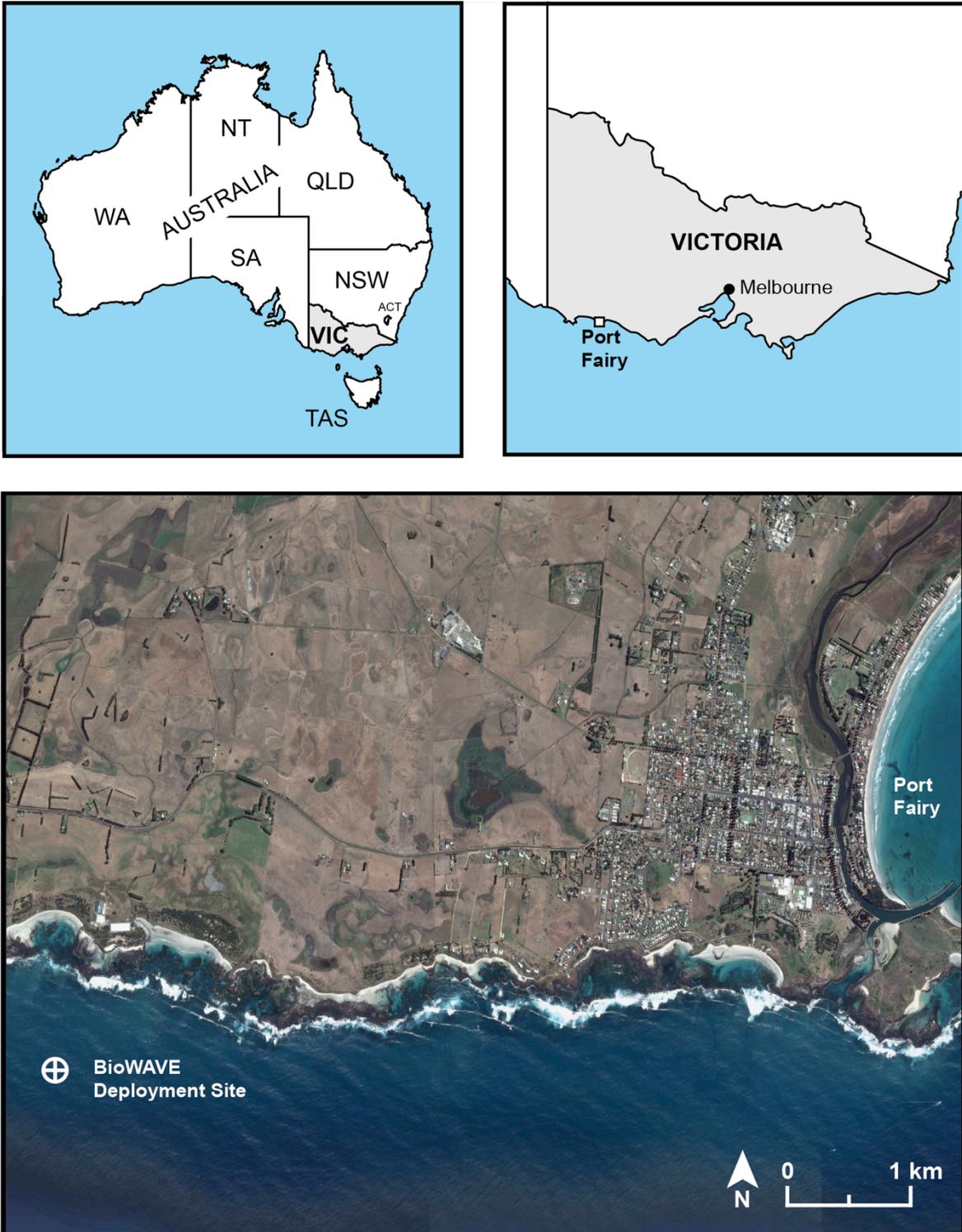


Figure 1: Location of bioWAVE Pilot Project

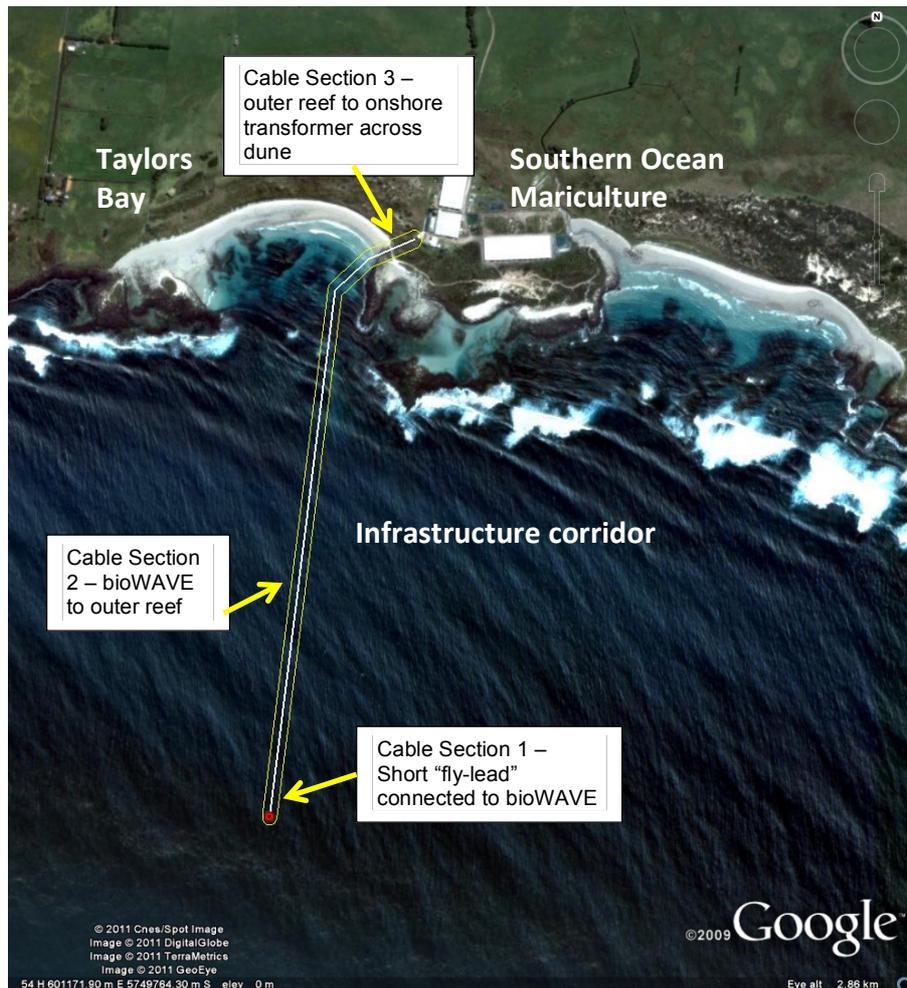


Figure 2: Site Layout at Project Location

### 1.3. Project description

The Port Fairy Pilot Wave Energy Project is a research and development undertaking, which is scheduled to operate for between 12 and 21 months, and is aimed at proving a particular method of producing electricity from wave action. The project is funded by the Commonwealth Government, the Victoria State Government, and by equity capital from BPS. The project is important because it proposes a new method of generating electricity with near zero greenhouse gas emissions, utilising a high proportion of wave energy in comparison to other (surface positioned) wave energy generators.

The project encompasses the design, fabrication, assembly, testing, ocean deployment, commissioning and operation, subsequent decommissioning and removal of the bioWAVE, the on-shore electrical equipment with a connection to the electricity distribution grid, and the cable which conducts electricity and control and monitoring signals between these two components. The bioWAVE will not contain any toxic materials.

The bioWAVE itself sits on the ocean floor, and comprises the Paddle Structure, Foundation, and the O-Drive. The hydraulic power conversion equipment and electrical generator are housed within the O-Drive pressure vessel.

The overall height of the bioWAVE is 25.6m and its footprint covers an area on the seabed of 336 square metres (21m by 16m). The depth of the ocean where the bioWAVE sits is 26m. Its GPS coordinates are 38°23'54.3"S 142°10'21.6"E (subject to final confirmation). A circular exclusion zone of 300 metres diameter is required for the bioWAVE, and will be identified by a north buoy (North Cardinal mark) south buoy (South Cardinal mark)<sup>2</sup>. The exclusion zone will be backed by a legal framework, notices to mariners, and otherwise made known through community engagement, beach, and boat ramp signs.

The bioWAVE main components as illustrated in Figure 3 are:

- *Paddle Structure*

The Paddle Structure sways slowly to and fro as dictated by the waves, through a maximum arc of 46 degrees. If the sea becomes too rough, the Paddle will slowly lower to the horizontal position. Operation of the Paddle is controlled by its buoyancy, that is, by the relative proportions of air and water contained within the cylindrical vessels. If filled with water, the Paddle will descend to the horizontal position and will remain there until air is reinstated. The air is supplied through an air pipe from a compressor situated in the north buoy. The air compressor in the north cardinal mark buoy is powered from the O-Drive through an interconnecting power cable.

- *Foundation*

The Foundation is a shallow-skirted mud mat, which consists of a flat horizontal plate (16m x 21m) with an arrangement of 0.8m high vertical plating on the bottom to form open 'segments' or 'compartments'. When placed on the sandy seabed, the vertical plates ('skirts') will sink into the sand such that the flat plate comes to rest on the surface. There are provisions to apply limited water jetting or suction to the compartments to assist the embedment if required. The weight of the bioWAVE is enough to maintain stability of the unit, but the embedded plates ('skirts') provide additional resistance to sliding and to uplift.

- *O-Drive*

The O-Drive is a self-contained subsea rated module that contains the power conversion equipment. When the Paddle Structure is engaged with the O-Drive and moving with the waves, a pair of hydraulic cylinders are actuated, which deliver fluid to the O-Drive. The internal mechanism then converts the energy from the hydraulic cylinders into grid-ready electricity.

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<sup>2</sup> Transport Safety Victoria specifications, email dated 14 November 2012.

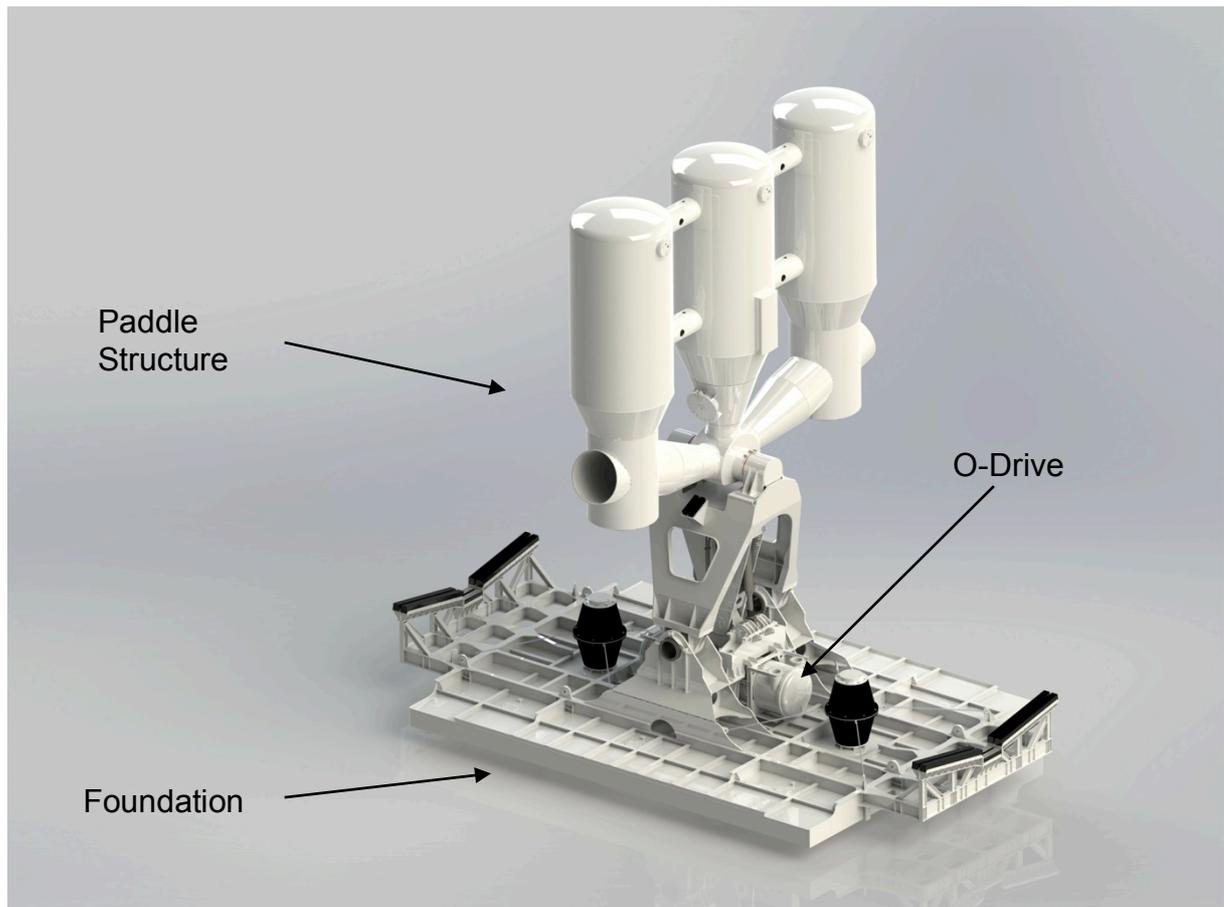


Figure 3: Main components of the bioWAVE

The above components have been fabricated by BPS and sub-contractors in Australia, and by Strategic Marine Co. shipyard in Vietnam. The final assembly of all components for the bioWAVE unit has occurred in Vietnam. Onshore testing of all systems has been carried out by BPS engineers, and verified by DNV GL, a leading certification body for the offshore industry.

## 1.4. Installation

### a. Subsea cable installation

A 3.3kV subsea cable has been procured for the project. The cable has three sections: the first section is connected to the O-Drive, and has a length of 60m; the second extends from this point to the side of the Taylors Bay reef; and the third spans the reef and extends over the land to the onshore transformer. The cable, where it rests on the seabed, will naturally self-bury over time<sup>3</sup>, but none the less will be held in place by lengths of chain. The third section of the cable crosses the Taylors Bay reef, where it will be subjected to significant breaking waves and associated large forces. The cable will be secured across this zone by anchor bolts and will be protected by articulated iron pipe. Divers and support vessels will be employed to install the cable across between the bioWAVE and the shoreline.

<sup>3</sup> ENTURA 39334 20 April 2012 "Port Fairy 250kW ocean wave energy converter Application Report and Environmental Impact Assessment" p9.

The third cable section emerges from the sea onto land via an excavated trench that crosses the beach and a sand dune to reach the electrical and switching equipment located near existing structures on the property. The cable route for the third section is located 4 metres to the east of the existing seawater pipes. Being alongside the existing pipes reduces the impact on the nearshore and onshore environment.

#### b. Buoy installation

The two navigation buoys, which identify the exclusion zone, will be installed prior to the deployment of the bioWAVE. The north buoy utilises concrete block anchors and mooring chains, designed specifically for the expected sea conditions. The south buoy utilises tram wheels and mooring chains as its anchors. The buoys and mooring equipment will be deployed by divers, utilising support vessels equipped with winches.

#### c. Onshore electrical equipment installation

The onshore electrical equipment consists of a transformer, switchgear, and protection equipment, and a power use meter. Connection to the grid is via the SOM electrical circuit behind the SOM meter. The equipment stands on a small concrete slab at the SOM business, on private land.

#### d. bioWAVE installation

The bioWAVE will be loaded onto a Heavy Lift Vessel (HLV) at the shipyard in Vietnam, and will be transported to the deployment location near Port Fairy. Upon arrival, the HLV will lower its bow anchor and a tug at the stern will be used to align the vessel according to the installation specifications. The tug will then adjust to maintain this heading. Pending acceptable weather conditions (wave and wind), the bioWAVE will be lifted and lowered into place on the seabed by the HLV cranes. The HLV will then detach the lifting gear by actuating hydraulic shackles, and will mobilise for departure from the site. The bioWAVE will then be connected to the pre-installed subsea cable and the pre-installed north buoy, and will then be commissioned.

#### e. Subsea cable re-installation

The previous subsea cable installation, as outlined above in 1.4a, was successfully completed in November 2015. However, prior to being energised, the cable incurred damage in the field due to impact from equipment and abrasion. As a result, the cable has been removed from the site and must be replaced with a new cable. A new cable has been procured and will be installed along the same route as the previous cable. The new cable comprises a single continuous section, with a length of 1040m. A 100m long section of the original cable, which was buried in a trench from the onshore transformer to the shoreline, will be re-used. By re-using this section of cable in place, we are able to avoid re-disturbing the native vegetation on the site. The new cable will be jointed to the existing buried cable at a location 2m above the intertidal zone at the shoreline (which consists of sand and rocks). The cable junction will be buried and the new cable will then extend from this point offshore to the bioWAVE location. The installation procedure will be similar to the previous installation. However, the new cable will be protected by articulated pipe from near the onshore junction to a location 200m from the bioWAVE. This

protection will lower the risk of damage due to wave impact and abrasion. The cable will be secured to the existing anchor points, from the previous cable, with allowance for up to four additional anchor bolts to be added. An engineering stability design has been prepared and independently reviewed. It is expected that the cable will remain secure over the reef section, and will self-bury in the sand in the offshore region. We expect the offshore installation operation to be completed in 3 days during September or October 2016.

### 1.5. Environmental policy

BPS will deliver this project in accordance with:

- The BPS Environmental Policy (refer to Annexure 1)
- Statutory approvals
- This EMP

### 1.6. Environmental Management Plan overview

The implementation of this EMP is underpinned by the Environmental Risk Register, and is in accordance with BPS's Environmental Policy.

This EMP has been prepared to fulfil the following objectives:

- To establish the processes and controls that will be implemented to ensure that this project is delivered with no greater risk or effects than those identified in the risk assessment
- To evaluate performance
- To communicate environmental management requirements to contractors, who will be bound contractually to meet the requirements of this EMP

The following key Environmental objective and target have been set.

**Objective:** No breaches of legislation relating to environmental obligations

**Target:** Zero environmental and safety incidents

**Strategy:** Employ established and approved regimes for managing specific environmental aspects and ensure their implementation.

## 2. Planning

### 2.1. Legal requirements

Project approvals, legislative requirements, and other relevant requirements such as guidelines and codes of practice relevant to the environmental aspects of this project have been identified and include<sup>4</sup>:

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<sup>4</sup> ENTURA 39334 20 April 2012 "Port Fairy 250kW ocean wave energy converter Application Report and Environmental Impact Assessment" identified the CM Act, EP Act, and the P&E Act.

Coastal Management Act 1995 (Vic)  
 Environment Protection Act 1970 (Vic)  
 Planning and Environment Act 1987 (Vic)  
 Wildlife Act 1974 (Vic), and the regulations this act authorises, the  
 Wildlife (Marine Mammals) Regulations 2009<sup>5</sup>

Where legislation requires a specific management action or response with respect to the environment, these requirements have been identified within the Project Environmental Delivery Standards (PEDS) as environmental controls, environmental limits, environmental monitoring programs, or within contingency plans. The content of the PEDS is further described in Section 2.2.

<b>Legislation</b>	<b>Delivery Standard (PEDS)</b>
Coastal Management Act 1995 (Vic)	All
Environment Protection Act 1970 (Vic)	All
Wildlife (Marine Mammals) Act 2009 (Vic)	Marine based works, decommissioning
Wildlife Act 1974 (Vic)	Marine based works, decommissioning
Planning and Environment Act 1987 (Vic)	Onshore Activities

Compliance with legal and other requirements will be evaluated in accordance with Section 3 of this EMP.

## **2.2. Project Environmental Delivery Standards (PEDS)**

Project Environmental Delivery Standards (PEDS) have been identified for the project to address key environmental risks, effects and legal requirements. The PEDS are a collation of the management and mitigation measures, environmental performance monitoring and contingency plans for the project. The PEDS relate to:

- Fabrication
- Project Management, all areas
- Marine Based Works – bioWAVE and cable
- Onshore activities
- Operation and Maintenance of the bioWAVE unit
- Decommissioning

PEDS for these items are contained in Annexure 2 – Project Environmental Delivery Standards.

The PEDS include:

- An Objective – the performance goal
- A Target – the performance level at which the objective is to be achieved
- An Application – the project activities and areas to which the PEDS applies

- Environmental controls – management and measures required to support achievement of the objective during the project. These include process controls and associated monitoring
- Environmental Limits – the environmental limits that apply to the PEDS
- Environmental Monitoring Programs – the environmental monitoring programs required to demonstrate compliance with environmental limits

### **2.3. External notification and reporting requirements**

Any deviations from this EMP will be reported to government agencies as described in Table 1. Any proposed changes to this EMP must be approved by the Director, Major Projects and Environmental Approvals DELWP, in accordance with CM Act conditions of approval.

Following approval, key stakeholders will be advised in accordance with the Community Consultation Plan.

Reporting Requirements			
Subject	Reporting or Notification		
	Requirement of	Agency	Time frame
Environmental Risk Register	Condition 5 of CM Act consent for works	DELWP	Prior to works commencing on site. As approved by Director, Major Projects and Environmental Approvals DELWP
Stakeholder Engagement	Condition 6 of CM Act consent for works	DELWP	In accordance with the Community Consultation Plan, as approved by the DELWP.
Pollution event or imminent environmental hazard	This EMP	EPA, DELWP	Immediate notification of a suspected environmental hazard or pollution event. Incident report required in the format provided at Annexure 3.
Reporting of non conformance	This EMP	DELWP	Non-conformances to be reported within 24 hours of the non-conformance.

Table 1 Reporting Requirements

## 2.4. Risk management

Environmental risks associated with the project have been identified and documented in the Port Fairy Pilot Wave Energy Project – Environmental Risk Register, consistent with the AS/NZS 4360:2004 Risk Management – Principles and Guidelines.

## 2.5. Organisational structure and responsibility

BPS has overall responsibility for this project in accordance with this EMP. The project organisation is shown in Figure 4.

The Project Manager is responsible for:

- Implementing this EMP
- Co-ordinating all activities relating to this EMP
- Communicating responsibilities to contractors
- Making sure that contractual arrangements allow for adequate resources to undertake works in accordance with this EMP

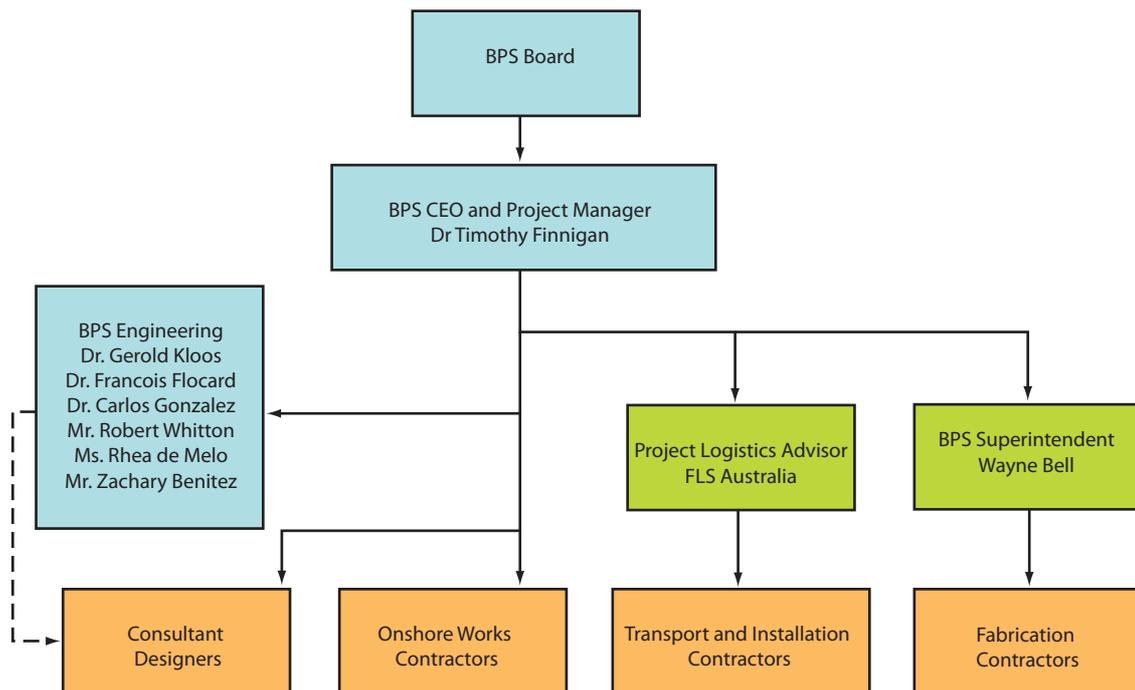


Figure 4: Project organisational chart

BPS Project Manager and staff under his direction will implement this EMP by:

- Setting and maintaining standards for all project participants particularly contractors;
- Making sure that the project activities comply with environmental regulations, requirements and this EMP;
- Ensuring that all project participants understand the environmental regulations, requirements and this EMP;
- Proposing measures to prevent harm to the environment through this EMP and the Port Fairy Pilot Wave Energy Project – Environmental Risk Register.

## 2.6. Document and record control

Environment documents and records will be filed and stored electronically on the BPS secure server. A Document Control master list contains references to the documents.

## 2.7. BPS change management arrangements

Proposed changes to the project will be assessed by the CEO and contractors to identify and manage environmental consequences of any change. Any changes to this EMP must be approved by the Director, Major Projects and Environmental Approvals DELWP.

## 2.8. Training and awareness

All project participants shall be qualified and experienced to undertake their work in an environmentally responsible manner and will be made aware of the requirements of this EMP.

All personnel involved in the execution phases of the project will be required to complete an induction which will incorporate environmental aspects of the project. Contractors will be required to demonstrate an understanding of key issues, requirements and responsibilities.

Environmental topics to be included in inductions will depend on the nature of the contractor's work and the site, and will include:

- BPS Environmental Policy
- Key environmental issues and controls
- Emergency response procedures
- Incident reporting
- Waste management
- Cetacean requirements
- Individual and organisational responsibilities
- Communication requirements
- Consequence of departure from the requirements of this EMP

## 2.9. Communication

The CEO or his delegate is responsible for and undertakes all requirements with respect to community liaison. Community liaison includes the Moyne Shire Council and will be carried out in accordance with the project's approved Community Consultation Plan.

## 2.10. Internal project communication

Internal communication methods include memoranda, documents, reports, meetings, emails, telephone and direct discussions, and newsletters.

Meetings between project personnel and the site contractors will occur prior to the start of works and at the completion of the works. For site works that span more than 2 months, meetings will occur at intervals consistent with criticality of the activities. Environmental matters will be included as a standard agenda item at all contractor site meetings.

## 2.11. External communication

A variety of methods have and will continue to be used to enable information to be distributed to, and received from, members of the community and key stakeholders. These include the following:

- BPS website [www.biopowersystems.com](http://www.biopowersystems.com)
- Email

- Media releases
- Newspaper advertisements and public notices
- Direct verbal or written advice ( e.g. telephone, letter, email )
- Specific notices placed at boat ramps and on the beach at Taylors Bay

Key communication activities and content include the following:

- Project outline description and schedule to be available on the BPS website. Schedule to be updated when necessary
- All complaints will be considered and will receive a response within 1 business day
- Engagement of various stakeholder groups before, during and after commencement of the project as described in BPS's Stakeholder Engagement Plan
- Notices in relation to the exclusion zone of the bioWAVE

Key stakeholders include;

- Local, Victorian and Commonwealth government agencies
- Business and commercial parties
- The local community and community groups
- Funds contributors

## **2.12. Emergency preparedness, response and recovery**

Each contractor executing the works will be required to have emergency response procedures relevant to their activities.

Project inductions will provide an overview of this EMP and the emergency response requirements it contains.

Following an emergency incident, an investigation will be conducted and corrective actions identified and addressed in accordance with this EMP.

## **3. Environmental management, measurement and evaluation**

### **3.1. Incident reporting and investigation**

All environmental incidents, including pollution incidents will be reported to the DELWP and recorded. This requirement will be included in inductions and reinforced at contractor site meetings. Annexure 3 – BPS Incident Report will be used to record incidents. This report details incident reporting, recording and investigation requirements including the identification of appropriate management actions and recommendations.

External reporting requirements in relation to hazards and incidents are identified in section 2.3 of this EMP.

### **3.2. Confirmation of compliance with this EMP**

Checks will be undertaken to monitor compliance with this EMP, and will be scheduled to assess if activities are in accordance with this EMP. Taking into consideration the short duration of some activities, and their location, the checks will be:

- Deployment of the bioWAVE unit – prior to loading at Vietnam
- Deployment of the cable – after installation (on land and in the sea)
- Operation of the unit – at the first scheduled inspection and maintenance activity after 3 months of operation
- Decommissioning of the unit – after removal of the unit and cable

Compliance with this EMP will be assessed through observation of project activities, interviews and review of records. Results will be recorded on check lists specific to the activity.

For each of the major project activities above, implementation of this EMP will be monitored and compliance checked by the CEO, who will report compliance findings to the DELWP.

### **3.3. Evaluation of environmental performance**

Environmental performance will be evaluated through environmental monitoring, inspections and surveys identified in the PEDS alongside environmental controls. Any monitoring of the project site will cease once the bioWAVE has been decommissioned and the project close out report completed.

### **3.4. Timing contingency for monitoring activities**

Marine operational monitoring and inspections (including surveys) will be undertaken only when it is safe to do so. The decision on when it is safe will be taken by the marine operator and divers' supervisor.

## **4. Project environmental close out**

A review of this EMP and environmental performance will be undertaken by BPS in conjunction with contractors at the conclusion of the project.

A project environment close out report will be prepared following the review. It will cover the following topics:

- The effectiveness of contract conditions in making sure that contractors work to the requirements of this EMP
- Compliance with legislation
- Compliance with the PEDS

The close out report will contain a summary of any impact the project may have had on the environment, and make recommendations if any, of additional environmental controls that might be applicable to future projects of the same type. The project environmental close out report will be submitted to the DELWP within 3 months of decommissioning the bioWAVE.

## **5. References**

1. Entura – 39334 20 April 2012 Application Report and Environmental Impact Assessment (Contains flora and fauna survey)
2. Andrew Long & Associates 12 December 2011 Heritage Due Diligence Study and Implications for Development
3. Australian Marine Ecology - Taylors Bay Benthic Survey December 2011
4. Delft University of Technology April 2011 Alternative and Modifications of Monopile Foundation or its Installation Technique for Noise Mitigation

## 6. Annexure 1 - BPS Environmental Policy

BPS's mission is to develop environmentally friendly sources of energy from ocean wave and tidal action. In so doing, the Board of Directors and management of BPS recognises that implementing its projects must also minimise any harm to the environment in the short term, and zero harm in the long term. To achieve this, BPS will:

- Comply with all relevant environmental legislation
- Establish project specific Environmental Management Plans
- Ensure environmental awareness in its personnel
- Conduct its activities in accordance with Environmental Management Systems based on the requirements of AS/NZS ISO 14001:2004
- Ensure that contractors comply with the company's applicable Environmental Management Plan

Timothy Finnigan  
CEO

## 7. Annexure 2 - Project Environmental Delivery Standards

<b>PROJECT MANAGEMENT (all activities)</b>	
<b>Objective</b>	To plan and implement all aspects and activities of the project To ensure that contractors comply with this EMP
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS
<b>Application</b>	The duration of the project - all activities and areas
<b>Environmental controls</b>	
<b>1. Contract Conditions</b> ➤ All execution contracts are to include the requirement for the contractor to demonstrate awareness of the environmental risks as identified in the Environmental Risk Register, and to conduct works in conformance with this EMP ➤ Contractor to return responses to checklists to the Project Manager for acceptance	<b>Phase</b>  All site works
<b>2. Emergency response preparedness</b> ➤ All execution contractors will have emergency response procedures appropriate for the nature of their activities ➤ Plans to be submitted to the Project Manager for acceptance	All site works
<b>Environmental limit</b> Contractors' works not to commence until they demonstrate awareness of contract conditions, and emergency response procedures are in place.	<b>Environmental monitoring program</b> Not applicable to this PEDS

<b>bioWAVE Fabrication</b>	
<b>Objective</b>	To recycle materials to the fullest extent possible
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS
<b>Application</b>	The duration of the major fabrication works
<b>Environmental controls</b>	
<b>1. Materials Recycling</b> ➤ Cutting patterns to minimise waste, separation of waste materials to allow recycling of steel offcuts <b>2. Toxic Materials</b> ➤ No toxic materials to be used in fabrication or on the components	<b>Phase</b>  Major fabrication works
<b>Environmental limit</b> 90% steel recycling of offcuts No toxic materials used	<b>Environmental monitoring program</b> Contractor's records

<b>MARINE BASED WORKS (bioWAVE activities)</b>	
<b>Objective</b>	To manage marine based works for the project to ensure that impacts on the marine environment are eliminated or insignificant.
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS
<b>Application</b>	The duration of all marine based works
<b>Environmental controls</b>	
	<b>Phase</b>
<b>1. Minimise Translocation of the Abalone Gangioneuritus Virus</b> ➤ Treat equipment and objects that are deployed in or near the inshore and near shore reef habitats prior to departure from the area.	Marine works
<b>2. Minimise Introduced Marine Pests to Taylors Bay and Reef</b> ➤ Use local (Port Fairy) vessels where appropriate ➤ Other vessels needed for the deployment/ decommissioning of the bioWAVE will be inspected, cleaned, vessel surfaces maintained, and have no bilge water and other liquid discharges.	Marine works
<b>3. Minimise Interference with Cetaceans</b> ➤ The following measures will be implemented to avoid encounters with travelling or resting cetaceans <sup>6</sup> : <ul style="list-style-type: none"> <li>• Vessels and divers must observe the caution zones and prescribed minimum distances to be maintained in relation to marine mammals: caution/exclusion zones/distances are: for vessels - whales 300m/200m, dolphins 150m/100m; minimum distances for divers are – whales 50m, dolphins 30m</li> <li>• A speed limitation of 5 knots on all marine vessels within the caution zone of a marine mammal</li> <li>• Marine vessels will come to a halt if large cetaceans (especially mother and calf pairs) approach and come within the exclusion zones of the vessel, or the heading of the vessel is within a 60 degree arc of their direction of travel (forward and rear)</li> <li>• Deployment and decommissioning of the unit is planned to occur outside of the seasonal timings of the Southern Right Whale (usually late June to early October).</li> </ul>	Marine works
<b>4. Deployment/Removal/Towing</b> ➤ Undertake these activities only when sea swells are less than 2 metres as determined by the Marine Operator in charge of this work. ➤ Use slinging equipment with correct ratings. The correct ratings will be determined by the Marine Operator in conjunction with the Design Consultant (who has an oversight supervisory role), taking into account the mass being slung and lifted, the number of lifting and slinging points, allowance for drag, and a contingency allowance. ➤ Contractors will have an emergency response plan agreed before commencement of activities	Deployment or Removal of bioWAVE or O-Drive
<b>5. Emergency Response</b> ➤ The following will trigger an emergency response: <ul style="list-style-type: none"> <li>• If weather conditions change and the Deployment Supervisor considers that it is unsafe to continue deployment</li> <li>• If the rigging or tow lines fail</li> <li>• If a vessel towing the bioWAVE cannot continue</li> </ul>	Marine works
<b>Environmental limit</b> Cease operation if a marine mammal is within the exclusion zone; recommence when zone is clear Do not commence towing unless emergency response is available	<b>Environmental monitoring program</b> Nominated marine mammal observers during marine based works

<sup>6</sup> The first three controls are extracted from the Wildlife (Marine Mammals) Regulations 2009.

<b>MARINE BASED WORKS (cable installation activities)</b>	
<b>Objective</b>	To appropriately manage marine based works for the project
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS
<b>Application</b>	The duration of sea deployed – that is low tide mark and below - cable sections - installation/removal works
<b>Environmental controls</b>	
<b>1. Bull Kelp</b>	<b>Phase</b>
➤ Avoid stands of bull kelp by prior selection of the cable route (diver survey)	Cable – sea sections
<b>2. Interference with Cetaceans</b>	
➤ The following measures will be implemented to avoid encounters with travelling or resting cetaceans <sup>7</sup> : <ul style="list-style-type: none"> <li>• Vessels and divers must observe the caution zones and prescribed minimum distances to be maintained in relation to marine mammals: caution/exclusion zones/distances are: for vessels - whales 300m/200m, dolphins 150m/100m; minimum distances for divers are – whales 50m, dolphins 30m</li> <li>• A speed limitation of 5 knots on all marine vessels within the caution zone of a marine mammal</li> <li>• Marine vessels will come to a halt if large cetaceans (especially mother and calf pairs) approach and come within the exclusion zones of the vessel, or the heading of the vessel is within a 60 degree arc of their direction of travel (forward and rear)</li> <li>• Deployment and decommissioning of the unit is planned to occur outside of the seasonal timings of the Southern Right Whale.</li> </ul>	Cable – sea sections
<b>Environmental limit</b> Cease operation if a marine mammal is within the exclusion zone; recommence when zone is clear	<b>Environmental monitoring program</b> Nominated marine mammal observers during marine based works

<sup>7</sup> The controls are generally extracted from the Wildlife (Marine Mammals) Regulations 2009.

<b>Shore Based Activities</b>		
<b>Objective</b>	To undertake shore based activities with minimal environmental impact	
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS	
<b>Application</b>	Installation of electrical cable from shore – the low tide mark and above - to the land based termination	
<b>Environmental controls</b>		<b>Phase</b>
<b>1. Vegetation</b> ➤ Bare areas caused by the works will be planted with native vegetation on completion of backfilling.		Shore work
<b>2. Fauna</b> ➤ The hooded plover and fairy tern breeding sites will be avoided. ➤ Inspect site with identified community members who know where the breeding sites are, and agree cable route before work commences.		Shore work
<b>3. Weeds</b> ➤ Weed sources on machinery, vehicles, and personnel will be cleaned before entering site		Shore work
<b>4. Wildfire</b> ➤ No fires to be lit on site ➤ CFA requirements must be observed such as those that apply on total fire ban days.		Shore work
<b>5. Erosion and Sedimentation</b> ➤ Work will not commence if the weather forecast suggests more than 10mm of rain will fall in the next 3 days		Shore work
<b>6. Heritage</b> ➤ Work will cease if Aboriginal heritage or human remains are found during trenching operations, and advice sought from BPS (the measures outlined in Annexure 4, will need to be followed)		Shore work
<b>Environmental limit</b> Operators to be made aware of contract conditions before start of work	<b>Environmental monitoring program</b>	

<b>Operations and Maintenance</b>		
<b>Objective</b>	To operate and maintain the bioWAVE™ for 12-21 months, with minimal harm to the environment in the short term, and no harm in the long term.	
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS	
<b>Application</b>	Operation of the bioWAVE™	
<b>Environmental controls</b>		<b>Operational Phase</b>
<b>1. Noise Emissions Effect on Sea Mammals</b> ➤ Noise emissions will not exceed the temporary threshold shift for cetaceans and pinnipeds. The O-Drive and its surround is designed so that the emitted noise level in air is less than 137dB, as measured at 1 metre distance using a standard sound pressure level meter.		Operation activities
<b>2. Oil Leaks</b> ➤ Conduct over-pressure tests on all hydraulic lines prior to deployment. Implement valve controls to limit or avoid release of hydraulic fluid to environment in event of system failure. Contain O-drive hydraulic oil leaks and use sensors to detect any leaks – to result in shutdown and servicing.		Operation activities
<b>3. Cetaceans Generally</b> ➤ Maritime Encounters - a significant physical encounter will trigger the bioWAVE to shut down for a period of 2 hours. The event will be recorded. ➤ Maritime Encounters – collisions and other disturbances. The bioWAVE is designed without sharp edges, it is slow moving, noise levels are low, electromagnetic radiation levels are very low, and there is no history of whales congregating in the vicinity of its location. ➤ Maritime Encounters – entanglement. The air hose and power cable to the large north cardinal buoy from the bioWAVE are firmly fixed at each end using strain relief as well as the connectors, and are relatively inflexible unlike rope, to avoid entanglement. ➤ Maritime Encounters – dislodgement of or damage to the air hose or power cable between the bioWAVE and the north cardinal buoy resulting in the failure of the service will result in a shutdown.		Operation activities
<b>Environmental limit</b> Noise level in air from the operation of the bioWAVE™ to be less than 137dB. Shutdown if leaked oil level reaches 50 litres	<b>Environmental monitoring program</b> Cetaceans and other mammals monitoring plan. Loss of air from or power to the compressor in the north cardinal buoy will raise an alarm and trigger an investigation into the cause. Recording of time that the bioWAVE shuts down. Leaked oil level alarm triggers an investigation into the cause.	

<b>DECOMMISSIONING WORKS (Marine and shore)</b>		
<b>Objective</b>	To remove the pilot project with no long term impacts on the environment.	
<b>Target</b>	Conformance with environmental limits and controls specified in this PEDS	
<b>Application</b>	Removal of the bioWAVE, cable, and shore installations	
<b>Environmental controls</b>		<b>Phase</b>
<b>1. Return and Disposal of the bioWAVE to the Port of Portland</b> ➤ Remove bioWAVE from the sea by dismantling and cutting up for scrap by metal recycling contractor		De-commissioning
<b>2. Removal of Cable From Seabed</b> ➤ Remove the cable and recycle metallic conductors by metal recycling contractor ➤ Use flotation techniques to lift the cable while divers gently remove the cable from the reef.		De-commissioning
<b>3. Removal of all Shore Based Electrical Equipment</b> ➤ For cable extraction work, efforts will be made to avoid disturbance to vegetation ➤ Bare areas caused by the works will be planted with native vegetation on completion of work. ➤ Transformers, cables, and other electrical equipment will be recycled as scrap or re-use by removal contractor.		De-commissioning
<b>Environmental limit</b> There shall be no project material left in the sea nor on the land, unless approved by relevant authorities. Vegetation shall be replanted with local native species.	<b>Environmental monitoring program</b> Inspection of all sites after completion of the decommissioning activity.	

## 8. Annexure 3 – Incident Report

### BPS INCIDENT REPORT

Incident # \_\_\_\_\_

#### SECTION 1 – EMPLOYEE / CONTRACTOR TO COMPLETE

<b>Incident Date:</b>	_____			<b>Site:</b>	_____		
<b>Incident Type:</b>	_____			<b>Department:</b>	_____		
<b>Date Reported:</b>	_____			<b>Reported By:</b>	_____		
<b>Person Involved:</b>	_____			<b>Shift:</b>	_____		
<b>Occupation: (Person Involved)</b>	Job Title: _____			<b>Days into Roster:</b>	_____		<b>Hours into Shift:</b>
<b>Employment Status</b>	<input type="checkbox"/> BPS Employee	<input type="checkbox"/> Visitor	<input type="checkbox"/> Contractor / Other (Specify) _____				
<b>Reported To:</b>	Responsible Supervisor: _____			<b>Date Reported:</b>	Time Reported (24hr): _____		

#### INCIDENT DETAILS

<b>Incident Type:</b>	<input type="checkbox"/> First Aid Injury	<input type="checkbox"/> Near Miss	<input type="checkbox"/> Environment
	<input type="checkbox"/> Medical Treatment Injury	<input type="checkbox"/> Damage	<input type="checkbox"/> Quality
	<input type="checkbox"/> Restricted Duties	<input type="checkbox"/> Production Loss	<input type="checkbox"/> Administrative
	<input type="checkbox"/> Lost Time Injury	<input type="checkbox"/> Community	<input type="checkbox"/> Other (Specify)

**Brief Description:**

**Detailed Description of Incident:**

**Location:**

**Task:**

**Unplanned**

**Event:**

**INJURY DETAILS**

**Body Location:**  Head/Face  Internal  Arm/Wrist  
 Neck/Shoulder  Leg/Knee  Hand/Finger  
 Tick more than  Back/Trunk  Foot/Toe  
 one if required  Other (Specify)

**Type of Injury:**  Fracture  Amputation  Laceration  
 Dislocation  Concussion  Abrasion  
 Tick more than  Strain/Sprain  Foreign Body  Burn  
 one if required  Other (Specify)

**Mechanism of Injury:**  Falling/Flying object  Lift/Push/Pull  Power Tool  
 Struck by object  Conveyor  Hand Tool  
 Caught on/by  Slip/Trip/Pull  Electricity  
 Fire/Explosion  Animal/Insect  Inhalation/Ingestion  
 Fire Exposure  Dust  
 Other (Specify)

**Treatment:**  None  First Aid  To Doctor/  
 GP  To Hospital  
**Injury Classification:**  Minor Injury  Medically Treated  Lost Time Injury  
 Alternative Duty Injury

**WITNESS DETAILS / STATEMENT**

**Witness (s)**    **Name:** \_\_\_\_\_    **Position:** \_\_\_\_\_    **Contact Number:** \_\_\_\_\_

**Location**    **Department:** \_\_\_\_\_    **Site:** \_\_\_\_\_

**Detailed Description of Incident / Hazard:** \_\_\_\_\_  
(When, Who, Where, What, How, Why?) Attach additional statements if required.

\_\_\_\_\_  
**Signatures:**    Employees Signature    Date



**SECTION 2 – SUPERVISOR/MANAGER TO COMPLETE**

**ACTIONS AND RISK ASSESSMENT**

**Immediate Action Taken:** Preventative action and or control measures  
(Attach additional statement if required)

- Consider:
- 1) Elimination
  - 2) Substitution
  - 3) Segregation
  - 4) Engineering Controls
  - 5) Work practices
  - 6) Personal protective equipment

**How was the Injury / Damage Sustained?**

---

- Contributing Factors:**
- |  |   |
|--|---|
| <input type="checkbox"/> Lack of Communication/Language barriers                   | <input type="checkbox"/> Procedures not followed                            |
| <input type="checkbox"/> Repetition of a task/fatigue                              | <input type="checkbox"/> Insufficient work space                            |
| <input type="checkbox"/> Slippery, worn or uneven floor surface                    | <input type="checkbox"/> Insufficient lighting/ventilation/work space       |
| <input type="checkbox"/> Vapors/fumes/radiation/noise                              | <input type="checkbox"/> Person(s) physical or psychological condition      |
| <input type="checkbox"/> Defective equipment or tools                              | <input type="checkbox"/> PPE not used, unavailable or not appropriate       |
| <input type="checkbox"/> Insufficient training/Supervision for the task            | <input type="checkbox"/> Housekeeping                                       |
| <input type="checkbox"/> Additional contributory or underlying factors not listed: | <input type="checkbox"/> Design of or incorrect equipment, tools, materials |

**Root Cause:** 

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The fundamental system deficiencies underpinning the immediate causes:

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**Current Risk**

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	<input type="checkbox"/> Moderate 11	<input type="checkbox"/> High 16	<input type="checkbox"/> Extreme 20	<input type="checkbox"/> Extreme 23	<input type="checkbox"/> Extreme 25
Likely	<input type="checkbox"/> Moderate 7	<input type="checkbox"/> High 12	<input type="checkbox"/> High 17	<input type="checkbox"/> Extreme 21	<input type="checkbox"/> Extreme 24
Possible	<input type="checkbox"/> Low 4	<input type="checkbox"/> Moderate 8	<input type="checkbox"/> High 13	<input type="checkbox"/> High 18	<input type="checkbox"/> Extreme 22
Unlikely	<input type="checkbox"/> Low 2	<input type="checkbox"/> Low 5	<input type="checkbox"/> Moderate 9	<input type="checkbox"/> High 14	<input type="checkbox"/> High 19
Rare	<input type="checkbox"/> Low 1	<input type="checkbox"/> Low 3	<input type="checkbox"/> Low 8	<input type="checkbox"/> Moderate 10	<input type="checkbox"/> High 15

**Incident Alert required:**

Yes     No    To be completed for incidents with a risk ranking of HIGH or EXTREME and emailed to all managers for distribution to employees and contractors of Forge within 24 hours of the incident occurring.

**Statutory Reporting:**

Date Reported:    Reported By:    Statutory Body:    Ref No.

**Attachments:**

- Training Records
- Plans
- Additional Employee Statements
- Sketches
- Maintenance Records
- Other (Specify)
- Survey Drawings
- Photos
- Work Instructions
- Witness Statements

**Formal Investigation Required:**

Yes     No    If yes, please complete Investigation Report

**Signatures:**

**Supervisor/Manager Signature**                      **Print Name**                      **Date**

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**HSE Manager**                      **Print Name**                      **Date**

## 9. Annexure 4 – Steps to be Followed Upon Discovery of Aboriginal Heritage Site

Appendix 2 is extracted from the Andrew Long and Associates Heritage Assessment for the project.

APPENDIX 2

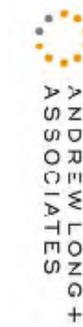
**SUGGESTED PROCEDURE**

**IN THE EVENT**

**AN ABORIGINAL HERITAGE SITE**

**IS IDENTIFIED**

**DURING CONSTRUCTION**



**A. Management of Aboriginal Cultural Heritage Found During Works**

If Aboriginal places or objects found during works the following steps must be applied:

- The person who identified the find will immediately notify the person in charge of the activity.
- The person in charge of the activity must then suspend any relevant works at the location of the discovery and within 5 m of the relevant site extent and isolate the find via the installation of safety webbing, or other suitable barrier and the material to remain *in situ*.
- Works may continue outside of the 5 m barrier.
- The person in charge of works must notify the Cultural Heritage Advisor (CHA) and the Secretary (AAV) of the find within 24 hours of the discovery.
- The CHA must notify the RAP(s) or other agreed Aboriginal stakeholder(s) within 24 hours of the discovery and invite RAP(s) or other agreed Aboriginal stakeholder(s) to inspect the find.
- Within 24 hours of notification, a CHA is to attend the site and evaluate the find to determine if it is part of an already known site or should be registered as a new site and to update and/or complete site records as appropriate and advise on possible management strategies.
- Enable RAP(s) or other agreed Aboriginal stakeholder(s) to inspect site within 24 hours of notification and remove/rebury any cultural heritage material found.
- Within a period not exceeding three (3) working days the Sponsor, in consultation with the CHA, RAP or other agreed Aboriginal stakeholder, shall, if necessary, apply for a Cultural Heritage Permit (CHP) in accordance with Section 36 of the *Aboriginal Heritage Act 2006*.
- If a CHP application is lodged, works may only recommence within the area of exclusion following the issue of a CHP and compliance with any conditions.
  - When the appropriate protective measures have been taken;
  - Where the relevant Aboriginal cultural heritage records have been updated and/or completed;

In the case of the discovery of human remains, separate procedures relating to the discovery of human skeletal remains must be adhered to (see below).

**B. Custody and Management of Aboriginal Cultural Heritage Recovered**

- Any Aboriginal cultural heritage recovered or salvaged from the activity area remains the property of the RAP(s) or other agreed Aboriginal stakeholder(s). Any such recovery or salvage will be agreed to and overseen by a RAP(s) or other agreed Aboriginal stakeholder representative(s). In any such instance it will be the responsibility of the Cultural Heritage Advisor to:
  - Catalogue the Aboriginal cultural heritage;
  - Label and package the Aboriginal cultural heritage with reference to provenance; and

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  - Label and package the Aboriginal cultural heritage with reference to provenance; and

- With the RAP(s) or other agreed Aboriginal stakeholder(s), arrange storage of the Aboriginal cultural heritage in a secure location together with copies of the catalogue and assessment documentation.

### **C. The Management of the Discovery of Human Remains**

Although this evaluation has determined that there is only a low risk of impacting an Aboriginal burial during the implementation of the activity, given the nature of the landforms and archaeological deposits within the activity area, it is nevertheless an extremely important consideration of any development.

The following steps must be taken if any suspected human remains are found in the activity area:

#### **1. Discovery:**

- If suspected human remains are discovered, all activity in the vicinity must *cease immediately* to ensure minimal damage is caused to the remains; and,
- The remains must be left in place, and *protected* from harm or damage.

#### **2. Notification:**

- Once suspected human skeletal remains have been found, the Coroners Office and the Victoria Police must be notified immediately;
- If there is reasonable grounds to believe that the remains could be Aboriginal, the DSE Emergency Co-ordination Centre must be immediately notified on 1300 888 544; and
- All details of the location and nature of the human remains must be provided to the relevant authorities.
- If it is confirmed by these authorities that the discovered remains are Aboriginal skeletal remains, the person responsible for the activity must report the existence of the human remains to the Secretary, Department of Victorian Communities in accordance with s.17 of the *Aboriginal Heritage Act 2006*.

#### **3. Impact Mitigation or Salvage:**

- The Secretary, after taking reasonable steps to consult with any Aboriginal person or body with an interest in the Aboriginal human remains, will determine the appropriate course of action as required by s.18(2)(b) of the Act.
- An appropriate impact mitigation or salvage strategy as determined by the Secretary must be implemented (this will depend on the circumstances in which the remains were found, the number of burials found and the type of burials and the outcome of consultation with any Aboriginal person or body).
- While opportunities to avoid impacting on a burial that may be discovered during the activity may be limited, it is important to explore opportunities to minimise disturbance to the remains through unnecessary exposure or disinterment.

#### **4. Curation and further analysis:**

- The treatment of salvaged Aboriginal human remains must be in accordance with the direction of the Secretary.

**5. Reburial:**

- Any reburial site(s) must be fully documented by an experienced and qualified archaeologist, clearly marked and all details provided to AAV;
- Appropriate management measures must be implemented to ensure that the remains are not disturbed in the future.