

APPENDIX 1

Emergency Action Subplans

Wyong Shire Council

Emergency Action Subplan for the Wyong 'Authorised Locations'

North Entrance Beach

Hargraves Beach

Cabbage Tree Harbour

November 2011

Emergency Action Subplan for the Wyong 'Authorised Locations'

**North Entrance Beach
Hargraves Beach
Cabbage Tree Harbour**

**Prepared by
Umwelt (Australia) Pty. Ltd.
on behalf of
Wyong Shire Council**

Project Director:	Peter Jamieson	
Project Manager:	Pam Dean-Jones	
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2/20 The Boulevard
PO Box 838
Toronto NSW 2283

Ph: 02 4950 5322
Fax: 02 4950 5737
Email: mail@umwelt.com.au
Website: www.umwelt.com.au

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Key Contacts for Coastal Erosion Management During Severe Storm Events

Wyong Shire Council	Phone: 02 4350 5555 (Business hours) Phone: 02 4350 5555 (After hours – Council rangers or to report roads, water or sewer emergencies)
State Emergency Service	Phone: 132500 (all hours)
Office of Environment and Heritage (OEH)	Phone: 131555 (Pollution Line all hours) Phone: 02 4908 6800 (Newcastle Office, Business hours)
Local ABC Radio FM 92.5	Phone: 1300 925 222
State Disaster Recovery Centre	Phone: 1800 018 444

1.0 Introduction

This report presents the draft Emergency Action Subplans for the three 'Authorised Locations' (see **Tables 1.1** and **1.2**) identified by the NSW Office of Environment and Heritage (OEH, 2011a) at Wyong, NSW. These are the North Entrance, Hargraves and Cabbage Tree Harbour Beaches.

SMEC (2011) prepared maps of immediate coastal erosion hazard zones (the zone of wave impact and the zone of reduced foundation capacity) for the three beaches identified, as part of the Coastal Hazard Study. The findings of the hazard study (and the underlying process assessments and assumptions) and the maps provide the basis for the draft Subplans, by identifying the locations at risk.

Private and public assets and infrastructure are situated within the immediate coastal erosion hazard zones. This includes almost 2 km of frontage that is private property, some sections of public road, beach accesses and water and sewerage infrastructure that are present below ground.

The draft Subplans are required under Section 55C(1)(b) of the *Coastal Protection Act 1979* and is prepared in accordance with the Guidelines for Preparing Coastal Zone Management Plans, determined by the NSW Government through the Office of Environment and Heritage (DECCW (OEH), 2010).

The structure and content of the draft Subplans draw on and are consistent with guidance provided in the coastal reform documents development by the NSW government, including:

- Guidelines for Preparing Coastal Zone Management Plans (DECCW (OEH), 2010).
- Guide to the Statutory Requirements for Emergency Coastal Protection Works (OEH, 2011a).
- Code of Practice under the *Coastal Protection Act 1979* (OEH, 2011b).
- Coastal Zone Management Guide Note: Emergency Action Subplans (OEH, 2011c).

1.1 OEH Coastal Erosion 'Hot spots' and 'Authorised Locations'

In NSW locations with very high to extreme immediate coastal hazard risks are identified as coastal 'hot spots' and 'Authorised Locations' and listed in a schedule attached to the Coastal protection Act and OEH Guidelines. **Table 1.1** and **Table 1.2** list places which are identified as hot spots or authorised locations. Wyong locations are noted in both. Because of this, it is essential that thorough Subplans are produced.

Table 1.1 - Coastal Erosion 'Hot Spots'

LGA	Beach
Byron Shire Council	Belongil Beach
Ballina Shire Council	Lennox Head
Clarence Valley Council	Brooms Head
	Wooli
Port Macquarie-Hastings Council	Lake Cathie
Greater Taree City Council	Old Bar Beach
Great Lakes Council	Winda Woppa - Jimmys Beach
Wyong Shire Council	The Entrance North
	Noraville
	Norah Head
Gosford City Council	Wamberal/Terrigal
Pittwater Council	Bilgola
	Mona Vale
Warringah Council	Collaroy/Narrabeen
Eurobodalla Shire Council	Batemans Bay

Table 1.2 - Authorised Locations for Emergency Coastal Protection Works

Authorised Locations for Emergency Coastal Protection Works
Basin Bay/Beach, Mona Vale
Belongil Beach, Byron Bay
Bilgola Beach, Bilgola
Brooms Head, north of the outlet from Cakora Lagoon
Collaroy Beach, Collaroy
Hargraves Beach, Noraville
Narrabeen Beach, Narrabeen
North Entrance Beach, The Entrance (North)
Mollymook Beach, Mollymook
Cabbage Tree Harbour Beach, Norah Head
Old Bar Beach, Old Bar
Pearl Beach, Pearl Beach
Wamberal Beach, Wamberal
Wooli Beach, Wooli

1.2 Purpose of the Subplans

This purpose of these Subplans is to ensure compliance with state legislation, and provide Council with an outline schedule of actions to undertake during an emergency flood and/or erosion event.

The Subplans are to clearly define the actions and effective working relationships that will minimise the emergency risks associated with coastal hazards. They are also to facilitate a rapid and effective response in the event of coastal hazards that threaten life, property or community amenity along the Wyong coastline.

The Subplans set out the responsibilities of Council, with key partner organisations, and how they will communicate and collaborate together in planning and implementing responses to emergencies associated with coastal hazards. This Subplan does not set out specific actions for private landowners, however, does briefly note the actions landowners are able to take in protecting their property using emergency coastal protection works. This is to aid Council in ensuring that at risk property owners are complying with the coastal protection works legislation and guidelines. It also identifies any site specific issues (if any) that may limit a landowners capacity to place emergency coastal protection works, such as access, substrate and restricted areas (i.e. Aboriginal Heritage areas, or EEC areas).

1.2.1 Scope of the Emergency Action Subplan

Council has a DISPLAN and has prepared risk assessments for various natural hazards that affect the people and assets of the Shire.

This draft Emergency Action Subplan has the following scope:

- Pre-emergency planning minimise the impacts during an extreme event.
- Responsibility of Council (and its partner organisations) during coastal emergencies.
- Clear communication and warning systems for residents.
- Actions Council may choose to undertake during an emergency (i.e. works).
- Brief outline of the process of allowance and implementation of works for landowners (see **Table 1.3**).
- Any local limitations to landowners with respect to coastal protection works.
- Clean up and review protocols, monitoring to inform future planning strategies (i.e. reviewing what works, and what doesn't).

1.3 Statutory and Policy Context

Emergency Action Subplans may include emergency coastal protection works. Legislation relating to coastal protection works carried out as part of emergency response changed significantly during 2010. In 2011, three additional documents were released by the NSW Government relating to coastal protection works, the Statutory Requirements for Emergency Coastal Protection Works (OEH, 2011a) for private landowners, the *Code of Practice under the Coastal Protection Act 1979* (OEH, 2011b) and the *Coastal zone management guide note: Emergency action plans* (OEH, 2011c). This section outlines the current requirements.

1.3.1 Definitions Relating to Coastal Emergencies

Definitions used in the Subplans are those used in the *Coastal Protection Act 1979* and the *Coastal Protection Regulation 2011*. Definitions of some key terms in relation to the legislation are as follows:

Emergency Action Subplan: that part of a coastal zone management plan that deals with the matter referred to in section 55C (1) (b) of the *Coastal Protection Act 1979*. In s55C(1) (b) coastal zone management plans must make provision for emergency actions carried out during periods of beach erosion, including the carrying out of related works, such as works

for the protection of property affected or likely to be affected by beach erosion, where beach erosion occurs through storm activity or an extreme or irregular event.

Coastal protection works: activities or works to reduce the impact of coastal hazards on land adjacent to tidal waters, including sea walls, revetments, groynes and beach nourishment.

Emergency coastal protection works: works comprising the placement of the following material on a beach or a sand dune adjacent to a beach, to mitigate the effects of wave erosion on land (in compliance with the requirements of Section 55P (1) of the Coastal Protection and Other Legislation Amendment Act 2010):

- (a) Sand or fabric bags filled with sand (other than sand taken from a beach or a sand dune adjacent to a beach);
- (b) Other objects or material prescribed by the regulations (other than rocks, concrete, construction waste or other debris).

The Act does not provide a specific definition of a *coastal emergency*. However, it does define ‘*storm conditions*’ as a period during which a severe weather warning for large waves or damaging surf issued by the Bureau of Meteorology applies.

1.3.2 NSW Coastal Panel

The NSW Coastal Panel is a statutory authority under Part 2A of the *Coastal Protection Act 1979*, with membership comprising local government and public authority nominees. The Panel’s role is to provide expert advice to the Minister administering the Act and to local councils. The Minister may also refer draft coastal zone management plans to the Panel for review. The Coastal Panel is also the consent authority in relation to coastal protection works on the open coast where no coastal zone management plan exists, or is yet to be adopted (<http://www.environment.nsw.gov.au/coasts/coastalpanel.htm>).

1.3.3 Minister’s Guidelines for Preparing Coastal Zone Management Plans

Coastal local government areas that commence the preparation of a coastal zone management plan (CZMP) after 1 January 2011 must prepare CZMPs in accordance with the Guidelines, which were adopted by the Minister for Climate Change and Environment under Section 55D of the Coastal Protection Act 1979 in December 2010. In addressing coastal risks, a CZMP must include an Emergency Action Subplan, which describes:

- Intended emergency actions to be carried out during periods of beach erosion (other than matters dealt with in any plan made under the *State Emergency and Rescue Management Act 1989*). In general, these emergency actions will include property or asset protection.
- Any site specific requirements for landowner emergency coastal protection works. The CZMP must identify suitable locations where landowners could construct coastal protection works (subject to cost sharing arrangements with Council and to the requirements of the *Environmental Planning and Assessment Act 1979*).
- Consultation carried out with owners of land affected by the plan.

1.3.4 Guide to the Statutory Requirements for Emergency Coastal Protection Works & Code of Practice under the *Coastal Protection Act (1979)*

The OEH guidelines for emergency protection works (2011a) primarily relate to works for private landowners. The document provides some helpful information, considerations and implementation information in relation to the design of emergency protection works. It also details the process private landowners must follow to gain permission to undertake emergency works. Under specified circumstances, the legislation allows landowners to:

- install, maintain and remove emergency works in accordance with requirements under the Coastal Protection Act 1979. These allowable emergency works are to be small-scale, must not result in up, or downdrift erosion impacts, and be removable;
- apply to construct other types of coastal protection works of a larger scale than emergency coastal protection works and which include long-term protection works or alternate temporary or short-term protection works. These works will need approvals under various Acts, including the *Environmental Planning and Assessment Act 1979*. The landowners need to demonstrate that they (and any future title holders) commit to maintaining the works and managing any up, or downdrift erosion impacts.

Since the three locations noted are 'Authorised Locations', private landowners are able to undertake emergency works as long as these guidelines are followed, and the Code of Practice (OEH, 2011b) for implementation.

The Code of Practice document was prepared as a guidance document to detail the requirements of the Coastal Protection Act 1979 relating to emergency coastal protection works, specifically the implementation of these works, i.e. placement, maintenance, removal and restoration activities. Council is not obligated to follow the Code of Practice in its approach to emergency works.

Table 1.3 summarises the requirements for emergency coastal protection works under the Coastal Protection Act (1979). These requirements are for private landowners.

Table 1.3 requirements for emergency coastal protection works under the Coastal Protection Act (as noted in OEH, 2011a and b)

What emergency protection works are permitted	Sand nourishment, large geotextile bags, filled with sand. Council will not support the placement of emergency protection works which use small 'sandbag' type bags to protect private property on open ocean beaches. Rock and rubble materials are not permitted.
Approvals required	Landholders who wish to undertake one off emergency protection works must apply to an authorised officer (e.g. OEH) for a certificate permitting the works to take place. The authorised officer may place conditions on the certificate. Landholders must notify the authorised officer and council before approved works commence. Where works are on public land, the owner or manager of the land must be notified. Applications for a certificate must include information about the materials to be used, concept designs for placement and where the works will be placed. If stockpiling of materials is necessary, the application must state where materials will be stockpiled.
Locations	Only those properties where the coastal erosion escarpment is within 20 metres of the maximum seaward extent of residential buildings (not including decks, fences, pergolas). In specific circumstances, a land owner may place emergency protection works in front of an immediately adjoining property, with the consent of the land owner.

When can works be undertaken?	<p>Emergency protection works may only commence when the wave erosion escarpment is within 20 metres of the most seaward wall of the building. Placement of sand or sand filled geotextile bags is not to occur during major storm events, unless specifically approved by a senior police officer (as defined in the State Emergency and Rescue Management Act 1989) or a professional engineer certifies that the eroded escarpment has a low likelihood of failure (note these conditions are subject to change).</p> <p>Emergency protection measures must only be placed on the beach and/or dune when it is safe for machinery to be on the beach. In general, this implies at low tide and outside peak beach usage periods.</p>
What can be done?	<p>Only clean sand in the grain size range 0.15 to 0.5 millimetres may be used for beach nourishment or to fill geotextile bags. Council expects that any sand which is used for filling geotextile bags will eventually become part of the beach or dune sand.</p> <p>Sand for emergency protection works must not be extracted or removed from local coastal dunes, except if it is obtained from an existing, licensed or approved sand quarry.</p>
Where can materials be obtained?	<p>No appropriate quarries exist in Wyong Shire. Quarries which may be able to provide suitable sand are located in the Stockton Coastal Barrier, north of Newcastle.</p> <p>Sand for emergency protection works may be obtained from the material that Council dredges from shoals in the entrance of Tuggerah Lake. Such sand must be placed in accordance with the Entrance Management Strategy and Dredging Management Plan for the entrance channel.</p> <p>Rock, gravel, soil or other extractive materials must not be used for beach nourishment or to fill geotextile bags which will be placed on the beach. Use of rubble or other unspecified waste or fill is prohibited.</p>

1.3.5 Coastal Zone Management Guide Note: Emergency Action Subplans (OEH, 2011c)

This document gives guidance on the preparation of Emergency Action Subplans, as well as some of the responsibilities and abilities Council has related to emergency protection works. The document notes the three main requirements that are to be included in any Emergency Action Subplan as a minimum, these are to:

- describe intended emergency actions to be carried out during periods of beach erosion, such as coastal protection works for property or asset protection, other than matters dealt with in any plan made under the State Emergency and Rescue Management Act 1989 relating to emergency response (sections 55C(1)(b) and (g) of the Coastal Protection Act 1979);
- describe any site-specific requirements for landowner emergency coastal protection works;
- describe the consultation carried out with the owners of land affected by a Subplan.

1.4 Roles and responsibilities

Wyong Shire Council has responsibility for planning and works during an extreme event, and is responsible (though not obligated) to undertake emergency works where necessary to protect its coastal assets. Under NSW legislation, Council is not required to obtain prior consent for works (as is required for private landowners), as long as an adequate environmental assessment has been carried out and the NSW Coastal Panel has been

notified. Adequate environmental assessment could be in the form of a REF or EIS. In this case, the CZMP is considered to be an adequate assessment.

If a CZMP and Emergency Action Subplan are not currently in place, Council is still able to undertake works as long as the NSW Coastal Panel is informed. The Coastal Panel then have 21 days to respond. For minor works with sand bags, or minor repair and maintenance works to structures, Council is able to undertake this at their discretion with no requirement for Coastal Panel notification.

As stated in the *Coastal zone management guide note: Emergency action plans* (OEH, 2011c), there is no requirement for Council to follow the *Code of Practice under the Coastal Protection Act* (1979) in contrast to the emergency works allowances of private landowners. Therefore, if necessary Council may choose undertake emergency protection measures that would be disallowed in the *Guide to Statutory Requirements for Emergency Coastal Protection Works* (OEH, 2011a), for private landowners.

Under the current legislation relating to emergency works and local and government organisation responsibilities, some specific points are noted:

- Council is not responsible for the protection of private property. Although they may choose to undertake works to protect a location or property in their management, they are not legally required to; this is also the case for public property.
- The responsibility of State Emergency Service (SES) is to protect people, and minimise risk to life (i.e. co-ordinate evacuations etc.). They are not permitted to undertake any kind of works in the coastal zone to mitigate the effects of coastal erosion or inundation to property.
- The role of BoM is to provide accurate and up to date forecasts and severe weather warnings to assist other organisations to plan, communicate and act effectively. The principle division of roles between the SES and WSC is in relation to protection of human life and property (SES) and emergency beach protection works (Council) during an emergency event. The SES has protection of human life as its first priority, followed by evacuation and/or rescue of animals, household and business possessions. It is not responsible for emergency beach protection works. Council is responsible for emergency beach protection works, in consultation with OEH and Land and Property Management Authority.
- Private landowners will be responsible for applying for certification to undertake emergency works on their property, as well as the implementation of any works.

1.5 Councils emergency responsibilities and actions

1.5.1 Pre Emergency Preparation

Council should begin educating staff and the community on the protocols and measures to be taken during emergency events, prior to them occurring. This will ensure preparedness during emergencies, which will reduce the risk to people and property. The following points should be noted:

- Council officers should be properly trained in relation to other emergency response measures in the Emergency Management Plans/Subplans.

- Council will ensure residents and landowners in 'Authorised Locations' are aware of the erosion hazards affecting their properties and of the options available to them for emergency protection.
- Council will ensure that any landowner within the immediate coastal hazard zone carries out emergency protection works, within prescribed conditions.

1.5.2 Storm Prediction

It is suggested that triggers relating to forecast storm events be established. This will enable Council to effectively warn and prepare when a large event is forecast. For example, when extreme wave conditions are forecast to occur at the same time as a very high tide.

Although it is the Bureau of Meteorology's (BoM) responsibility to forecast extreme weather events, it will also be in Council's interest to keep track of high tide predictions and wave conditions forecast by the BoM, and plan and act accordingly.

1.5.3 Pre Storm Warnings

Council will provide information to nearby residents about approaching coastal emergencies using the following mechanisms:

- Council will provide routine emergency management briefings to local precinct committees. These briefings will explain coastal emergencies and outline strategies for emergency preparedness.
- Council will provide emergency management information at local community centres.
- Local radio in the area (in association with the Bureau of Meteorology, BOM) will provide regular updates on approaching storm systems, tides and predicted erosion events.
- Council, in consultation with SES and BoM, will provide information about approaching coastal emergencies on its website. After a coastal emergency event, Council will provide information on its website about road and access closures and reopening (if any).
- Council will coordinate with SES to ensure that residents are aware of urgent hazards during emergency events. For instance, Council will work with SES to provide door to door communication and assistance as necessary, and will aid in evacuation procedures if necessary.

2.0 Emergency Response for North Entrance

2.1 Immediate Hazard Zones

Figures 2.1a and 2.1b show the immediate coastal erosion hazard zones for North Entrance. These hazard zones were determined in the Coastal Hazard Study (SMEC, 2011).

The assets that are in the immediate erosion hazard zones include:

- beach access ways across the frontal dune;
- a section of public road;
- areas of dune vegetation; and
- private properties (plus the water & sewerage infrastructure).

2.2 Proposed Emergency Response Actions - Council

Council will have responsibility for emergency response actions, as set out in the subsequent sections; however, assistance may be required from SES and local groups to coordinate efforts during an emergency. If there is risk to life, Council will assist SES to evacuate the area.

Due to the OH&S risks apparent during an extreme event, any Council actions near the shoreline should be kept to a minimum unless **absolutely necessary**. Post storm clean-up and remediation measures are favoured to ensure staff and public safety.

Council should be prepared with signage and/or safety barriers to close the roads to traffic and pedestrians to hazard areas during an emergency.

In some cases, more substantial works over and above sand bag placement may be necessary to protect property or infrastructure (if Council chooses to, and is able to); however, these actions should be seen as a last resort, and only when there is imminent danger to property or infrastructure (as determined by Council or consultant engineers). The following sections give information and actions related to works that Council may choose to undertake during an emergency.

2.2.1 Access for Emergency Activities

During and after major coastal storms that may cause erosion of the beach, dunes and hinterland, emergency access to the northern end of North Entrance Beach is via Curtis Parade (see Figure 2.1b) off the Central Coast Highway. For the southern end of North Entrance Beach, the emergency access is via Hutton Road, off Robert St, which is again off the Central Coast Highway.

2.2.2 Actions prior to an emergency

To facilitate emergency works along the shoreline, the following should be noted:

- a stock pile of sand and geotextile bags should be available near to the location



Legend

- Immediate Limit of Zone of Wave Impact and Slope Adjustment
- Immediate Limit of Zone of Reduced Foundation Capacity

FIGURE 2.1a

**Emergency Protection Works
at North Entrance
(Private Property)**



Source: SMEC (2010)
Note: Contour Interval 0.5m

0 25 50 100m
1:2000

Legend

- Immediate Limit of Zone of Wave Impact and Slope Adjustment
- Immediate Limit of Zone of Reduced Foundation Capacity

FIGURE 2.1b

**Emergency Protection Works
at North Entrance
(Private Property)**

- access is needed to suitable plant (i.e. dumpers, bobcats, filling frames, sewing machine etc.) nearby, or the ability to mobilise it at short notice.

Council should determine whether the use more substantial coastal protection methods may be required during an emergency. However, these actions should only be considered if they are absolutely necessary, implementable and provide essential benefits when considering the potential costs. Therefore, it is suggested that for use only in extreme cases and where Council or consultant engineers determine it to be a necessity to construct more substantial works, there should be an attainable supply of the appropriate material to stabilise the coastline.

Council should also aid and monitor its coastal residents to ensure and private landowner works are being undertaken legally and in accordance with NSW Government legislation, as shown in Table 1.3.

2.2.3 Actions during an emergency

If any action during a storm can be avoided, it should be. The risks of injury during a storm event are extreme. However, if damage to property and infrastructure is imminent, and Council has decided to intervene, the following measures should be taken:

- the use of sand and geotextile sand bags where appropriate to minimise erosion and/or flooding should be the first option; and
- the implementation of more substantial coastal protection methods to stabilise the shoreline only if considered absolutely necessary.

2.2.4 Actions after an emergency

Any emergency works undertaken during a storm to stabilise the shoreline should be removed from the beach following the storm event, when it is safe and practical to do so.

2.3 Information for Landowners

Any emergency works undertaken by landowners must be prearranged and consented to by an authorised officer. The undertaking of works must be consistent with the NSW Government legislation and guidance noted in **Section 1.0**, and the actions in **Table 1.3**. **Figures 2.1a** and **2.1b** give some indication of potential actions landowners are able to take in the coastal zone and the locations. In addition to the generic guidance provided, some site specific considerations are noted:

- **Figures 2.1a** and **2.1b** indicate potential access routes through the dunes. The accesses shown in both figures of The Entrance are through a CMA area of bush generation and revegetation. Landowners should consult with Council prior to implementation of works to ensure the impacts on these areas.
- Council should discuss these access ways with CMA to ensure no approvals or offset areas are required due to potential works.

3.0 Emergency Response for Hargraves Beach

Figure 3.1 shows the immediate coastal erosion hazard zones for Hargraves Beach. This hazard zone was determined in the Coastal Hazard Study (SMEC, 2011).

The assets that are in the immediate erosion hazard zones include:

- beach access ways across the frontal dune;
- areas of dune vegetation; and
- private properties (plus the water & sewerage infrastructure).

3.1 Proposed Emergency Response Actions

Council will have responsibility for emergency response actions, as set out in the subsequent sections; however, assistance may be required from SES and local groups to coordinate efforts during an emergency.

Due to the OH&S risks apparent during an extreme event, any Council actions near the shoreline should be kept to a minimum unless **absolutely necessary**. Post storm clean-up and remediation measures are favoured to ensure staff and public safety. If there is risk to life, Council should coordinate with SES to evacuate the area.

Council should be prepared with signage and/or safety barriers to close the roads to traffic and pedestrians to hazard areas during an emergency. Should Council choose to undertake works along this frontage to mitigate against erosion, the following measures should be considered.

3.1.1 Access for Emergency Activities

Emergency access to the beach is via a track at the northern end of Elizabeth Drive, off the Central Coast Highway (Budgewoi Rd.).

3.1.2 Actions prior to an emergency

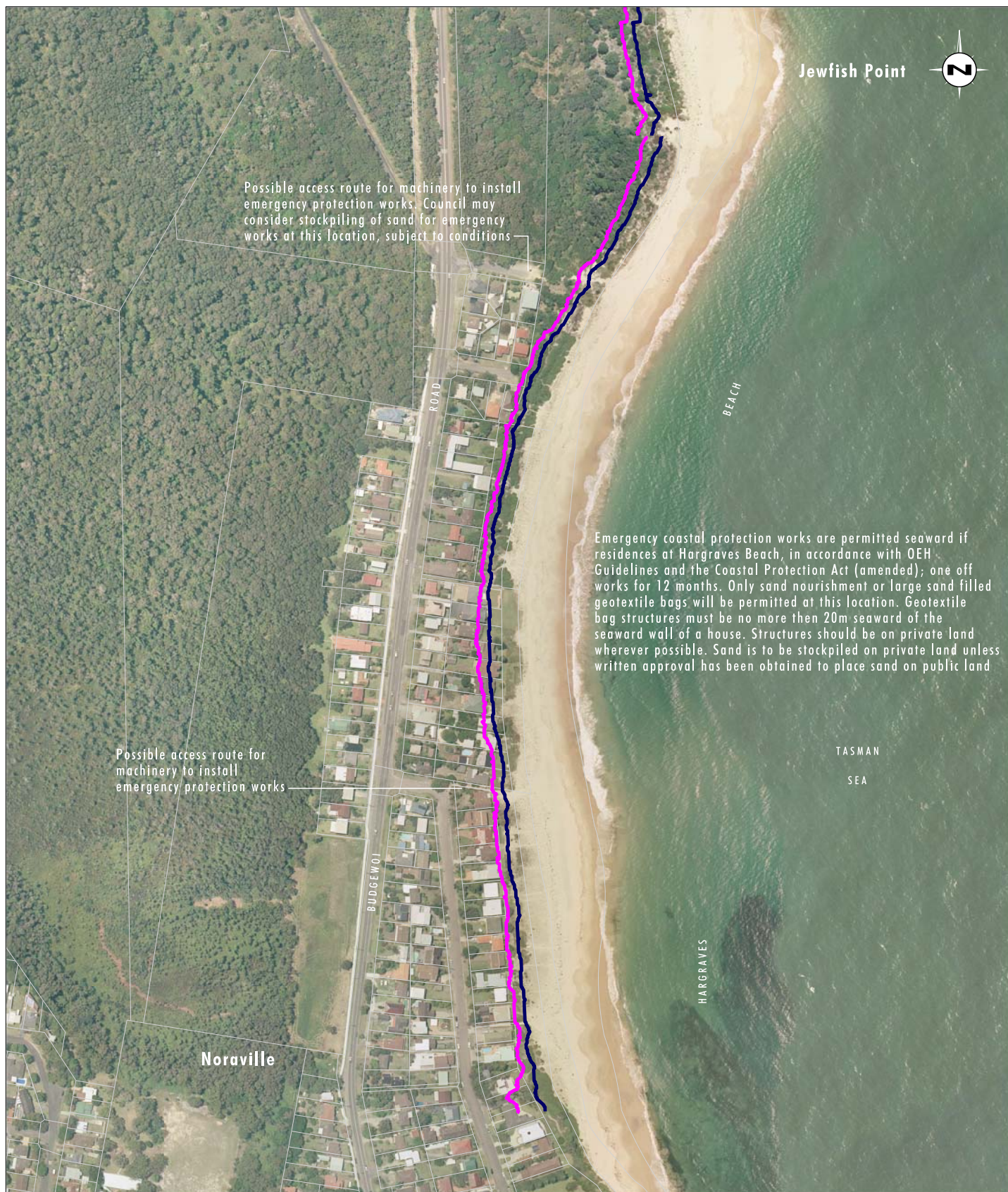
To facilitate emergency works along the shoreline, the following should be noted:

- a stock pile of sand and geotextile bags should be available near to the location. There is a small area at the far north end of the beach near Werepi Street that may be suitable for Council to stockpile materials to use in emergency works.
- access is needed to suitable plant (i.e. dumpers, bobcats, filling frames, sewing machine etc.) nearby, or the ability to mobilise it at short notice.

Council should also aid and monitor its coastal residents to ensure and private landowner works are being undertaken legally and in accordance with NSW Government legislation.

3.1.3 Actions during an emergency

If any action during a storm can be avoided, it should be. The risks of injury during a storm event are extreme. However, if damage to property and infrastructure is imminent, and Council has decided to intervene, the following measures should be taken:



Source: SMEC (2010)

0 100 200 250 m
1:5000

Legend

- Immediate Limit of Zone of Wave Impact and Slope Adjustment
- Immediate Limit of Zone of Reduced Foundation Capacity

FIGURE 3.1

Emergency Protection Works for Private Property at Hargraves Beach

- the use of sand and geotextile sand bags where appropriate to minimise erosion and/or flooding should be the first option; and

3.1.4 Actions after an emergency

Any emergency works undertaken during a storm to stabilise the shoreline should be removed from the beach following the storm event, when it is safe and practical to do so.

3.2 Information for Landowners

Any emergency works undertaken by landowners must be prearranged and consented to by an authorised officer. The undertaking of works must be consistent with the NSW Government legislation and guidance noted in **Section 1.0**, and the actions in **Table 1.3**. **Figure 3.1** gives an indication of potential actions landowners are able to take in the coastal zone and the locations. In addition to the generic guidance provided, some site specific considerations are noted:

- **Figure 3.1** indicates potential access routes through the dunes. The accesses shown in both figures of The Entrance are through a CMA area of bush generation and revegetation. Landowners should consult with Council prior to implementation of works to ensure the impacts on these areas.
- Council should discuss these access ways with CMA to ensure no approvals or offset areas are required due to potential works.

4.0 Emergency Response for Cabbage Tree Harbour

Figure 4.1 shows the geotechnical hazard zones for Cabbage Tree Harbour. These hazard zones were determined through a geotechnical assessment (Shirley Consulting Engineers, 2010).

The assets that are in the hazard zones include:

- beach accesses
- small section of public road
- newly built toe drainage structure providing protection to the slope;
- areas of slope vegetation; and
- private properties (plus the water & sewerage infrastructure).

4.1 Proposed Emergency Response Actions

Council will have responsibility for emergency response actions, as set out in the subsequent sections; however, assistance may be required from SES and local groups to coordinate efforts during an emergency.

Due to the OH&S risks apparent during an extreme event, any Council actions near the shoreline should be kept to a minimum unless **absolutely necessary**. Post storm clean-up and remediation measures are favoured to ensure staff and public safety. If there is risk to life, Council should coordinate with SES to evacuate the area.

Council should be prepared with signage and/or safety barriers to close the roads to traffic and pedestrians to hazard areas during an emergency.

4.1.1 Access for Emergency Activities

Access to the coastal frontage here is via Bald Street at the in the south eastern corner of the bay.

4.1.2 Actions prior to an emergency

To facilitate emergency works along the shoreline, the following should be noted:

- a stock pile of sand and geotextile bags should be available near to the location;
- a stockpile of appropriate rock material if maintenance on the toe drainage structure is required;
- access is needed to suitable plant (i.e. dumpers, bobcats, filling frames, sewing machine etc.) nearby, or the ability to mobilise it at short notice.



Source: Shirley Consulting Engineers Pty Ltd

Legend

- Immediate Low Hazard Line
- Immediate High Hazard Line

FIGURE 4.1

Emergency Protection Works at Cabbage Tree Harbour

4.1.3 Actions during an emergency

If any action during a storm can be avoided, it should be. The risks of injury during a storm event are extreme. However, if damage to property and infrastructure is imminent, and Council has decided to intervene, the following measures should be taken:

- the use of sand and geotextile sand bags where appropriate to minimise erosion, especially in the transitional areas between armoured and unarmoured sections of the shoreline.

4.1.4 Actions after an emergency

Any emergency works undertaken during a storm to stabilise the shoreline should be removed from the beach following the storm event, when it is safe and practical to do so. Inspection of the toe protection structure should be undertaken following any larger events to determine whether additional maintenance is required.

5.0 Post storm clean-up and rehabilitation works

Although the immediate frontage is mostly in private tenure, there is a small areas of public land where access may be temporarily inhibited. Council should erect signage warning of the hazard, or if the public safety risks are considered to be extreme, temporarily close access to this beach area, until said risks are mitigated.

Council will inspect the beaches and coastal structures after damaging storm events and carry out works to ensure the area is safe before taking down signage, or reopening the area.

When inspecting damaged beach access ways and carrying out repairs prior to reopening, Council should also note the presence of:

- broken or protruding timber, slats, platforms or posts;
- broken or protruding metal posts and chains;
- broken or protruding wire; and
- erosion scarps of no more than 0.5 m are suggested for the seaward end of a safe beach access way.

These features should be repaired and/or replaced before public access to the beach is reinstated.

Council should consider whether works undertaken to protect infrastructure require removal after the storm.

Council should inspect areas where landowners have undertaken works to ensure compliance with individual restrictions.

Council should work with local Landcare and Dunecare groups to plan and implement replanting of dune stabilising species following an event, where necessary, to aid in stabilising the foreshore area.

5.1 Records of Storm Impacts and Emergency Response Activities

The monitoring of emergency response activities and outcomes will inform more strategic decisions about coastal zone management approaches.

To track these activities Council should add information to a data base after each damaging storm. This will include:

- locations of assets and infrastructure that were damaged by the storm and details of the extent of damage;
- photographs of the impact of the storm on assets and infrastructure at key locations;
- undertaking a survey of the beach levels and other features to provide a greater understanding of the hazard;

- what rectification works have been carried out;
- the date of rectification works; and
- cost of rectification works.

The records of storm events, extent of damage and rectification works will assist Council to understand how climate change and/or extreme events are affecting its coastline and to better plan for retreat of some assets over time, to adapt to the effects of sea level rise and other factors such as storm frequency and intensity.

6.0 Summary Action Table

The following implementation table details the actions Council, its partner organisations and private landowners should follow prior to, during, and after an emergency storm event.

Table 1.4 Summarises actions Council (and its partner organisations) during an emergency storm event.

Pre-storm preparation	Actions	Responsibility
	Make the public aware of the hazards & risks	SES & Council
	Storm prediction & monitoring	BoM & Council
	Stock pile materials for emergency works	Council & Dept. of Lands
	Pre-arrange access to plant	Council
Storm phase	Ensure applications to undertake works are approved.	Private landowners
	Actions	Responsibility
	Erect temporary signage of dangers or closure of the road etc.	Council
	Alert residents if risk level is high	SES & Council
	Evacuate residents if necessary	SES & Council
	Use sand and/or sand bags where appropriate	Council
	Undertake emergency works if necessary	Council & Dept. of Lands
Post storm	Undertake sand bag works to protect property prior to an event (to ensure safety).	Private landowners
	Actions	Responsibility
	General clean-up	Council
	Inspect the area for dangers and remove	Council
	Erect permanent warning signs if necessary	Council
	Maintenance on the toe drainage structure	Council & Dept. of Lands
	Remove emergency works if necessary	Council & Dept. of Lands
	Replant dune if necessary	Council and Landcare/Dunecare
	Record and document all actions taken, and monitor area after the event.	Council

7.0 References

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Umwelt (Australia) Pty Limited
2/20 The Boulevard
PO Box 838
Toronto NSW 2283

Ph. 02 4950 5322
Fax 02 4950 5737

www.umwelt.com.au