Great Lakes COUNCIL

Jimmys Beach

Coastal Zone Management Plan

MARCH, 2016

Jimmys Beach CZMP (Draft) / Great Lakes

For: Great Lakes Council

MARCH, 2016

MARINE

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PREPARATION, REVIEW AND AUTHORISATION

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EXECUTIVE SUMMARY

The Jimmys Beach coastline is a diverse natural landscape boasting unique features bordered by Yacaaba Headland to the east and Barnes Rocks, Winda Woppa and the Myall River entrance to the west. Its unique natural beauty and character makes it one of the Great Lakes regions most valuable assets. However, long term erosion and sea level rise trends mean the coastline is under considerable threat.

Great Lakes Council (GLC) with assistance from the NSW Office of Environment and Heritage (OEH) has been developing this Coastal Zone Management Plan (CZMP) to better manage the coastline and address future challenges. This CZMP has been developed in line with the NSW State Governments coastal legislation, polices and guidelines.

A number of technical studies have been undertaken in recent years to provide Council with a sound technical basis to develop the CZMP. These studies have included:

- *Great Lakes Coastal Hazard Study Appendix E – Jimmys Beach Coastal Hazard Study* (SMEC 2013)
- *Jimmys Beach Sand Nourishment Assessment* (BMT WBM 2012)
- *Sediment and Hydrodynamic Assessment of the Lower Myall River Estuary and Preparation of Management Recommendations* (BMT WBM 2011).
- *Jimmys Beach Emergency Action Sub-Plan EASP* (Great Lakes Council 2011).

The community has been involved in developing the CZMP to incorporate an appreciation of the community's values and perspectives. The CZMP focuses on managing risk associated with coastal hazards, such as erosion, recession and wave overtopping. It aims to set out broad strategies for managing these risks in a timely and cost effective manner while maintaining the values that are important to the community. By implementing a schedule of prioritised actions Council will reduce immediate high risks and reduce the likelihood of risks increasing into the future. Council proposes to implement the plan over the next 10 years, and will be reviewing the suitability and success of management actions over this period.

Assets impacted by coastal erosion were assessed and a summary is provided in *Table ES-1*.

Table ES-1 Assets at risk over various planning periods due to a major storm event

Immediate Risk	Assets at risk by 2050	Assets at risk by 2100
Parts of The Boulevarde roadway between Kururma Crescent and Guyra Street.	Most of The Boulevarde roadway and part of Tuloa Avenue roadway. Services (electricity, water, telephone cables) within The Boulevarde Road reserve would also be at risk. Properties from Kururma Crescent to the near the western end of The Boulevarde (27).	All of The Boulevarde roadway, most of Tuloa Avenue to Coorilla Street and the foreshore carpark. Southern half of Kururma Crescent, Guya Street and Gemalla Street roadways. Fishermans Walk to western end of The Boulevarde affected by Zone of Reduced Foundation Capacity (ZRFC) only (5). Properties from Fishermans Walk to the western end of The Boulevarde (52). Properties along southern part of Kururma Crescent (7).

Immediate Risk	Assets at risk by 2050	Assets at risk by 2100
		Guya Street (4). Gemalla Street (3). The Anchorage (mid section) between Guya Street and Gemalla Street (9). Services within affected road reserves.

After a review of the coastal processes, hazards, risks and values of the shoreline, potential management options were assessed and management strategies recommended. Based on the recommendations the following shoreline management actions are advised:

1. Further Investigation and Monitoring
2. Development Controls
3. Beach Nourishment (Short-term)
4. On-Demand Beach Nourishment System (Longer-term, subject to findings of investigation)
5. Stormwater management/water quality
6. Emergency planning
7. Education
8. Access management
9. Dune/natural area management
10. Compliance issues
11. Foreshore facilities.

A summary of the recommended management actions for Jimmys Beach are set out in *Table ES-2,* including a summary of indicative costs, with *Figure ES-1* diagrammatically showing key management actions.

Based on these recommendations, Council, in agreement with their funding partners, has adopted the hopper based permanent sand transfer system strategy for the medium term (approximately 20 years). At the time of writing, tenders for the permanent sand transfer system had been determined by Council with the contract awarded to Cardno. It is expected that the construction and commissioning of the new plant will be completed by early 2016.Council has also established of a beach monitoring program using Real Time Kinematic (RTK) survey and implemented trialling of a beach profile design to reduce initial storm losses.

The challenge now for GLC is to ensure the CZMP is implemented to guarantee a sustainable future for Jimmys Beach. At this stage, consistent with Stage 2 of the NSW Coastal Reforms, various funding options are being considered for ongoing renourishment costs. Funding models are to be clarified in the review of Jimmys Beach CZMP to be completed in the 12 months following certification of this plan.

It should be recognised that protection of private property is primarily the responsibility of the property owners. As such where shoreline protection works are primarily implemented to provide protection to private property, (some of) these works could be partially funded or financed by benefited property owners and these options are to be investigated as a priority.

It is noted that non-action, would result in greater risks and increased rehabilitation costs in the long run. Great Lakes Council issues this Coastal Zone Management Plan to allow the

community the opportunity to participate in its implementation, helping to contribute to the health of the coastal environment and wellbeing of the community.

Recognising the need to reflect the most up-to-date information Council, in conjunction with OEH are proposing to review this CZMP over the next 12 months. This review will include review of longer term strategies that consider the potential limit to cost-effectiveness of renourishment as sea level and storminess increases. The revised plan may reconsider all options, including planned retreat.

Table ES-2 Summary of Recommendations and Implementation Schedule

No.	Management Strategy	Action	Method of Implementation	Responsibility	Performance Criteria	Commencing	Indicative Costs				Priority	Funding Options
							Yr 1 (2015)	Yr 2-5 (2015-2018)	Yr 6-10 (2019-2024)	Annual Maintenance		
Investigation and Monitoring												
1	Further Investigations and Monitoring											
1.1	Investigation of sand transfer system for On-Demand Beach Nourishment	Feasibility assessment for on-demand beach nourishment system. Exploring options of Hopper or Sand Shifter for beach nourishment. *Note: GLC has undertaken this assessment and the Hopper system has been adopted.*	Through this CZMP.	GLC with support from OEH.	Method of on-demand beach nourishment is defined including an accurate cost estimate for future budget purposes.	Complete	$60,000				High	OEH part funding.
1.2	Beach Profile Monitoring	Pre and post storm beach profiling to enable storm demand volume to be better estimated.	Surveys (Land and Hydrographic) and/or photogrammetric surveys.	GLC with support from OEH.	Record of beach profiles gained over next 5-10years to improve understanding of storm demand and coastal processes.	2016 subject to funding availability.	$40,000 (Surveys every 3mths at $10,000).	$30,000 (Yearly survey at $10,000).	$20,000 (2 surveys at $10,000).	$10,000 – frequency to be reduced overtime subject beach profile.	High	OEH part funding. GLC General funds.
Development Controls												
2	Development Control Plan	New development/redevelopment in areas subject to coastal inundation, flooding and coastal erosion shall be required to meet new coastal development controls.	Through GLC Development Control Plan (DCP).	GLC Planning Staff.	All future development within coastal risk areas to be assessed against coastal development controls.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time	GLC planning / development assessment staff time	GLC planning / development assessment staff time.	High	GLC General funds.
2.1	Floor level	Apply minimum floor level for new development/ redevelopment in areas subject to coastal inundation and associated flooding. GLC to amend development controls to provide minimum floor level for coastal risk areas.	Through GLC Development Control Plan.	GLC Planning Staff.	All new development to have floor levels immune or resilient to inundation.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	High	GLC General funds.
2.2	Greenfield subdivisions and development	New development should not occur seaward of existing development/coastal hazard lines.	Through GLC Development Control Plan.	GLC Planning Staff.	All future development to have floor levels immune or resilient to inundation.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	High	GLC General funds.
2.3	Building Standards	New development/redevelopment within coastal hazard areas. Improved building standards for new development to provide resilience to coastal hazards and ensure compatible with coastal character. Such as; • Resilience to inundation of lower level • Geotechnical design to accommodate reduced foundation capacity (Piled construction) • Lightweight/relocatable construction.	Through GLC Development Control Plan.	GLC Planning Staff.	All future development to have floor levels immune or resilient to inundation.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	High	Grants do not cover Council or admin staff time. GLC General funds.
2.4	Existing Development	When substantial renovation occurs promote house retrofitting or replacement to suit coastal hazards and coastal character. House retrofitting and design standards – raising habitable floor level, improved design and usage of appropriate construction materials for resilience against coastal hazards. Geotechnical design to accommodate reduced foundation capacity (Piled	Through this CZMP and Education see 10.3.	GLC and Community/ Residents.	Community/Residents are aware that retrofitting or replacing houses can make them more resilient to coastal hazards. Some retrofitting of existing houses occurs to make them more suited to coastal hazard area.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	Medium	GLC General funds.

No.	Management Strategy	Action	Method of Implementation	Responsibility	Performance Criteria	Commencing	Indicative Costs				Priority	Funding Options
							Yr 1 (2015)	Yr 2-5 (2015-2018)	Yr 6-10 (2019-2024)	Annual Maintenance		
		construction)										
Beach Nourishment												
3	Beach Nourishment											
3.1	Trial Nourishment –Seek Approvals	Approvals for extraction of sand from Winda Woppa spit (primary source) and Yacaaba sandwave (backup source). It may be possible to provide an amendment to the current approvals for extraction. Undertake Environmental Impact Assessment (EIA) to support approval.	Through this CZMP.	GLC in consultation with OEH, DPI, LMPA, DPI-Fisheries.	Approval granted for extraction of sand from Winda Woppa (primary source) and Yacaaba (backup source).	2015	$50,000 for amending approvals and EIA. Plus GLC staff and administration time				High	OEH part funding approved in March 2015. GLC General funds.
3.2	Trial Nourishment	Trial nourishment program, implement process whereby on a regular basis (4 or more times per year) sand is manually extracted from Winda Woppa spit and trucked to nourish the Jimmy Beach erosion. Program replaces current event based nourishment.	Through this CZMP.	GLC in consultation with OEH.	Proactive nourishment to provide buffer from erosion. Nourishment is no longer in direct response to an erosion threat.	2015	$350,000+ If GLC plant and staff can be used may be possible to reduce cost.	$700,000		To cease once on-demand system is set up (see 4.1).	High	OEH coastal management grants approved in March 2015 for trial only.
On-Demand Beach Nourishment System												
4	On-Demand Beach Nourishment system - Hopper Subject of findings of investigation (see 1.1)	Undertake design, approvals and Environmental Impact Assessment (EIA) for On-Demand beach nourishment system.	Through this CZMP.	GLC with support from OEH.		2017		$200,000 for design approvals and EIA.			Medium	OEH coastal management grants for capital works only.
4.1	On-Demand Beach Nourishment system - Hopper	On-Demand nourishment system funding acquired. Nourishment system construction.	Through this CZMP.	GLC with support from OEH	Nourishment system capable of undertaking on demand beach nourishment to meet Jimmys Beach storm demand.	2017		GLC staff and administration time. To apply for grants to fund works.	$1.7million capital	$100,000 to $200,000 subject to system. Expected system life 20+yrs	Medium	Ongoing annual cost will need to be funded through Council funds with Potential Levy on private landowners under LG Act.
Stormwater Management / Water Quality												
5	Stormwater Management/ Water Quality	Stormwater management to be considered in accordance with Tea Gardens Hawks Nest (SMP).	As part of SMP.	GLC.	Refer SMP.	2018	NA	NA	NA	Refer SMP.	NA	NA
Emergency Planning												
6	Emergency Planning	Review Emergency Action Sub-Plan (EASP) following endorsement of CZMP by GLC.	Council to review.	GLC with SES & OEH support.	EASP to be regularly reviewed against CZMP and work being untaken to ensure it is able to meet emergency needs.	2016	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.		High	GLC General funds.
6.1	Emergency Training	Training and Education of GLC personnel in emergency plan implementation	Council training	GLC with SES & OEH support.	GLC personnel able to implement emergency plan.	2016	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.		High	GLC General funds.
Community Education												
7	Education	Advise residents and visitors of actions to be taken in a coastal storm emergency.	Through distribution/ promotion of EASP, review emergency/ evacuation plan.	GLC Emergency Management Committee and SES.	Ensure community (and visitors) are well educated about emergency procedures.	Dependent on frequency of major storm events.	SES & GLC Staff time and advertising costs.	SES & GLC Staff time and advertising costs.	SES & GLC Staff time and advertising costs.		High	Council resources in conjunction with SES.
7.1	Information/Signage	Distribute information/ install signage to educate community (including visitors) on ecological values, risks to public safety, Marine Park Zoning, dune management, access and parking.	Through funding for environmental improvement, in association with DuneCare activities, Department of Primary Industries	GLC, DuneCare, and DPI.		ongoing	GLC Staff time and signage costs.	GLC Staff time and signage costs.	GLC Staff time and signage costs.		High for matters relating to public risk. Medium	Undertaken with Council resources and/or grant funds in conjunction with DuneCare and DPI.

No.	Management Strategy	Action	Method of Implementation	Responsibility	Performance Criteria	Commencing	Indicative Costs				Priority	Funding Options
							Yr 1 (2015)	Yr 2-5 (2015-2018)	Yr 6-10 (2019-2024)	Annual Maintenance		
			(DPI) – Marine Parks								for other	
7.2	Planning advice	Provide planning advice on Section 149 Planning Certificates to advise of coastal risk policy and the adopted CZMP.	Through issue of Section 149 certificates.	GLC Planning Staff.		ongoing	GLC Staff time.	GLC Staff time.	GLC Staff time.		Medium	GLC General funds.
7.3	Building Standards	Promote use of coastal compatible development and retrofitting.	Through GLC Development Control Plan.	GLC staff.	Ensure community is updated and educated in benefits of coastal appropriate development.	ongoing	GLC Staff time.	GLC Staff time.	GLC Staff time.		Low	GLC General funds.
Access Management												
8	Access Management	Ensure current level of public access is maintained or improved where and when it is safe to do so.	Through this CZMP	GLC.	Current level of public access is maintained or improved where and when it is safe to do so.	2016	GLC Staff time.	May identify future access ways requiring Design & Construct (D&C).			Medium	GLC General funds (GF).
8.1	Pedestrians	Review number and location of beach accessways.	Through this CZMP.	GLC.	Current level of pedestrian public access is maintained or improved where and when it is safe to do so.	2016	GLC Staff time.	May identify future access ways requiring D&C.			Medium	GLC GF &/or Coastal Reserve Trust (CRT) fund.
8.2	4WD & Boats	Review provision for 4WD access. Carry out minor upgrades to Winda Woppa boat ramps as outlined in Waterways Shore Facilities Management Strategy.	As part of GLC and Greater Taree City Council (GTCC) (2010) Vehicles on Beach Policy. As part pf Waterways Shore Facilities Management Strategy.	GLC & GTCC.	If vehicle access policy is revised review and access may be stopped.	2016	GLC & GTCC Staff time .	May identify future access ways requiring D&C.			Medium	GLC General funds &/or CRT fund.
Dune/Natural area Management												
9	Dune/ natural area management											
9.1	Rehabilitate informal beach access tracks	Continue to monitor and rehabilitate informal beach access tracks	As part of Council's Bush Regeneration and LandCare activities. As Part of DuneCare program.	Cooperatively with DuneCare	Maintain and improve health of dune vegetation. Opportunities for sand build up on dunes and beach provided.	ongoing	DuneCare time and resources.	DuneCare time and resources.	DuneCare time and resources.		Medium	DuneCare time and resources. NSW Govt Environment Grant funding. GLC General funds.
9.2	Weed Management	Continue to control weed and pest species.	As part of Council's Bush Regeneration and LandCare activities.	GLC cooperatively with NPWS, Crown Lands, and Dune Care.	Reduce weed and pest species.	ongoing (minimum 5 year frequency)	$5,000 annually (for weed control).	$5,000 annually (for weed control).		$5,000 annually (for weed control).	High	GLC, NPWS, Crown Lands, and Dune Care to contribute.
9.3	Dune Planting	Dune planting and fencing.	As Part of DuneCare program.		Maintain and improve health of dune vegetation	Ongoing	DuneCare time and resources.	DuneCare time and resources.	DuneCare time and resources.		Medium	DuneCare time and resources.

Compliance Issues												
10	Compliance issues	Improve compliance/ enforce penalties for: • Unauthorised vehicle access • 4WDing over dune vegetation, and on beach • Littering • PWC/Power Boats in unauthorised area or dangerous driving • Unauthorised parking	Cooperatively GLC and other enforcement staff. • Council Rangers • Authorised Officers of Council. • Officers of the NSW Police Force & Water Police; • DPI – Marine Parks	GLC & other enforcement staff.	Reduction in unauthorised activity.	ongoing	Enforcement staff time.	Enforcement staff time.	Enforcement staff time.		Medium	GLC & other enforcement staff to provide staff time.
Foreshore Facilities												
11	Foreshore Facilities	Maintain and improve foreshore facilities such as boat ramp, picnic and recreation facilities.	Through GLC asset management program.	GLC	Facilities are maintained and improved where it is safe and appropriate to do so in response to coastal risks	As assets reach the end of their serviceable life or need for additional facilities is identified.	Not costed	Cost expected to occur over this period and beyond.	Cost expected to occur over this period and beyond.		Low	GLC General funds &/or CRT fund.

Figure ES-1 Management Actions for Jimmys Beach

JIMMYS BEACH CZMP PROGRESS

Following initial consultation (Appendix C) Council sought a Gateway Determination from NSW Department of Planning and Environment for a Planning Proposal to, *inter alia* amend Coastal Risk Planning Area Maps in Great Lakes Local Environmental Plan (LEP) 2014, including mapping for Jimmys Beach. This determination became effective from 11 July 2014, and with a subsequent extension of time had a projected completion date of 18 January 2016.

In response to the strict timeline, Council has applied an Integrated Coastal Management approach from the commencement of the Gateway period. This allowed more efficient coordination of effort and resources for statutory exhibition, community engagement, media, and reporting between Planning and Engineering sections of Council.

PROPOSED REVIEW OF CZMP

Whilst information contained in this CZMP document hasn't changed substantially, the purpose of this update is to inform the public on the most recent community engagement, funding developments and unfolding emergency responses to the latest series of storms.

Currently, Jimmys Beach coastal management options are caught between responding to real and present threats from a very active storm season and putting in place cost-effective measures to make improvements in the long term. Recognising the need to reflect the most up-to-date information Council, in conjunction with OEH are proposing to review this CZMP over the next 12 months. It will update dredging and sand transfer commissioning and operating information; develop concepts for design, recovery and revegetation of dune system along The Boulevarde; and, provide clarification on funding models. It is also intended to conduct further community engagement and workshop opportunities during this next stage of the CZMP.

MINISTERIAL CERTIFICATION

Ministerial Certification of this CZMP is currently pending. A condition of funding for proposed dredging and capital works on a Sand Transfer System. Given the moderate likelihood of increased storm activity this winter, re-establishment of an adequate sand buffer in the vulnerable area of Jimmys Beach is considered a very high priority.

RECENT COMMUNITY ENGAGEMENT

In the most recent exhibition period from 2 April to 15 May 2015 Community Information Sessions were held at Hawks Nest Community Hall on two separate occasions: Thursday 9 April and Monday 27 April 2015. Reasonable attendances of 20 - 30 people were recorded at both sessions with 23 formal submissions on the CZMP subsequently received. Other Sessions held at Forster and Pacific Palms also had information available regarding Jimmys Beach CZMP.

An updated Appendix C - Consultation has been included with this document and covers the most recent community engagement activity. The formal submissions covered a wide range of issues including road reinstatement, land use planning, the nourishment program, cost-sharing and general environmental values.

FUNDING DEVELOPMENTS

Since the completion of the draft CZMP (recently exhibited) funding has been secured from the State to assist the design and installation of an On-Demand Beach Nourishment System. This will efficiently deliver sand onto vulnerable areas of Jimmys Beach and progressively regrow a more resilient dune/beach profile. The proposed On-Demand Beach Nourishment System and dune reconstruction will result in reduced cost ($/m^3) of sand placed, as well as decreasing the volume of sand lost during each storm event. The

Transfer System is estimated to cost $1.99M which will be funded on a 50:50 basis by State Government and Council.

Funding for a complementary dredging program for the Eastern Channel has also been confirmed by State and Commonwealth investors. This project will restore navigation in the eastern Myall River mouth, rebuild the Jimmys Beach sand buffer and provide up to 120,000m^3 of sand in reserve to supply the On-Demand Beach Nourishment System, once installed. The project also includes restoration work on Corrie Island (RAMSAR) and is estimated to cost $2.75M in total. It is expected that future nourishment sand will also be sourced form Corrie Channel to the north of the island depending on investigation and monitoring. Similarly, if indicated by sedimentation behaviour it may prove advantageous to shirt sand transfer activates to the Yacaaba source at some future date.

Conceptual details of the On-Demand Beach Nourishment System; are shown in *Figure ES-1*. *It should be now noted*, that current investment plans will eventually include a semi-permanent hopper, slurry box and pumping main located at Winda Woppa, adjacent to the sand stockpile. In the short term it is intended to rebuild the sand buffer by pumping from the dredge through a temporary pipeline.

At this stage, and consistent with Stage 2 of the NSW Coastal Reforms, funding options are being considered for ongoing renourishment costs. Funding models are to be clarified in the review of Jimmys Beach CZMP to be completed in the 12 months following certification of this plan.

STORMS AND EMERGENCY RESPONSE

Difficulty has occurred in securing sufficient sand for beach renourishment over the last 12 months. A number of factors including access to reserves, approvals and protracted negotiations around proposed renourishment resulted in a gradual depletion of remaining reserves. In August 2014 a large storm event resulted in erosion back to the road shoulder and following trucking of sand from Deadmans Stockpile as well as from a private source (Lot 1 The Boulevarde) usual reserves were almost completely gone.

Ocean storms generating large swells occurred in April and May 2015. The storms again produced large waves on Jimmys Beach for an extended time resulting in loss of remaining sand and a large part of the road formation over approximately 110m of The Boulevarde. This severe erosion required immediate replenishment of the beach profile along with reconstruction of the road on a section of the Boulevarde.

The beach nourishment material was dredged from the Eastern Channel, which provided associated navigation and water quality benefits. The project was jointly funded between the Commonwealth, State and Council. Sand was pumped to initially rebuild the Jimmys Beach profile (30,000m^3) and then to build a substantial stockpile on Winda Woppa Spit (80,000m^3), representing a further four to five years supply at average loss rates from Jimmys Beach.

Funds for reinstatement of the road at The Boulevarde were sourced through the NSW Roads and Maritime Disaster relief program. Fortunately, additional funds were secured to allow installation of a cement modified reinforced substructure beneath the road formation.

Figure ES-2 gives typical details of the reinforced substructure adopted for road reinstatement. The objective of the substructure is to provide a modest, but not absolute level of resistance against wave attack which, when coupled with the required sand buffer (including dune reconstruction) will provide a reliable level of protection. In particular, given the current lack of sand it is hoped the substructure will provide reasonable protection for the road in the period prior to the re-establishment of suitable sand buffer volumes.

The reinforced substructure proved very cost-effective, utilising plant already required for the road reinstatement process. Average cost of the treatment was in the order of $1,000/m. It is designed to fail gradually if undercut and can accommodate up to around 750mm slump along the toe line whilst still supporting the road. It is capable of being underpinned or extended on either end if needed in the future and forms a strategic adjunct to the proposed renourishment program.

REVIEW OF JIMMYS BEACH EMERGENCY ACTION SUB PLAN

Jimmys Beach Emergency Action Sub Plan is also scheduled for amendment as part of the planned review process over the next 12 months. This will incorporate the above changes relating to the road substructure, updated renourishment volumes and On-Demand Beach Nourishment System operation. By the time of review, operational data and beach behaviour through several storm events should also be available to refine operating guidelines and trigger points.

CONCLUSION

Management of the proposed On-Demand Beach Nourishment System will need to be based on measured refinement, responding appropriately to changing environmental conditions over time. It is expected that once a high level of confidence is established, perhaps after 10 years, a review of Jimmys Beach Coastal Risk Planning Area may be appropriate.

The proposed CZMP Review to be conducted over the 12 months following certification provides a suitable timeframe in which to resolve many of the actions that are currently in play in response to recent increases in storm erosion along Jimmys Beach. Council and OEH partners have adopted a precautionary approach responding to the real and present risk to public and private assets whilst ensuring the chosen measures are logically and physically compatible with future refinement. Importantly, the chosen measures are complementary to medium and long term options and do not unnecessarily sterilise future adaptation opportunities.

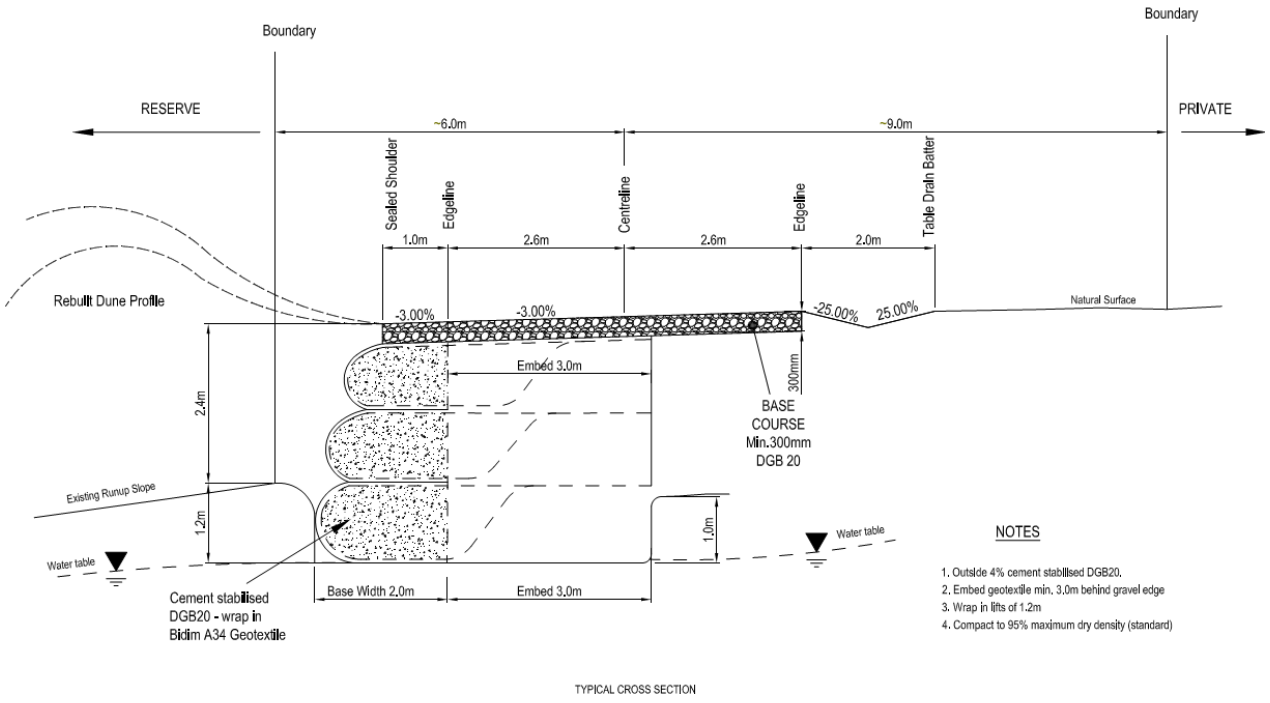

Figure ES-2 Typical section for reinforced substrate adopted for road reinstatement

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LIST OF ABBREVIATIONS

AHD	AUSTRALIAN HEIGHT DATUM
AHIMS	ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM
ALS	AIRBORNE LASER SCANNING
CRT	COASTAL RESERVE TRUST
CZMP	COASTAL ZONE MANAGEMENT PLAN
DCP	DEVELOPMENT CONTROL PLAN
DPI	DEPARTMENT OF PRIMARY INDUSTRIES
EASP	EMERGENCY ACTION SUB-PLAN
EIA	ENVIRONMENTAL IMPACT ASSESSMENT
GF	GENERAL FUNDS
GLC	GREAT LAKES COUNCIL
GSC	GEOTEXTILE SAND CONTAINERS
GTCC	GREATER TAREE CITY COUNCIL
LEP	LOCAL ENVIRONMENTAL PLAN
LGA	LOCAL GOVERNMENT AREA
MHWM	MEAN HEIGHT WATER MARK
MSL	MEAN SEA LEVEL
NPWS	NATIONAL PARKS WILDLIFE SERVICE
NSW	NEW SOUTH WALES
OEH	OFFICE OF ENVIRONMENT AND HERITAGE
REF	REVIEW OF ENVIRONMENTAL FACTORS
SEPPS	STATE ENVIRONMENTAL PLANNING POLICIES
SES	STATE EMERGENCY SERVICE
SMP	STORM MANAGEMENT PLAN
TSC	THREATENED SPECIES CONSERVATION
ZRFC	ZONE OF REDUCED FOUNDATION CAPACITY

1 INTRODUCTION

1.1 Study Area

Jimmys and Winda Woppa Beaches are located within the Great Lakes Local Government Area (LGA) to the north of Newcastle and on the northern shore of the Port Stephens estuary. Jimmys Beach stretches from the boulders on the western side of Yacaaba Head and connects Yacaaba to the mainland. Winda Woppa Beach is the extension of Jimmys Beach between Barnes Rocks and the mouth of the Lower Myall River. See *Figure 1* which provides a locality map and shows the area covered by this Coastal Zone Management Plan (CZMP).

Jimmys Beach has a moderately steep beach face then a usually gently sloping shallow seabed. The beach predominantly faces south becoming southwest as it progresses east towards Yacaaba Head. It is exposed to ocean swells, however the majority of waves affecting Jimmys Beach are generated by westerly winds across a 12 km long fetch. Jimmys Beach is highly crenulate (scalloped) as sandwaves protruding up to 100 m into the bay adjacent to Jimmys Beach move along the beach at a rate of 70 m/yr. These sand pulses slowly move northward and begin to merge with the beach, which is approximately 4 km long (Short 2007).

The 1.4 km long, southwest facing Winda Woppa Beach represents the terminus of a spit for sand moving west along the Jimmys - Winda Woppa shoreline. Winda Woppa Beach receives both low refracted swell and westerly wind waves. The Myall River mouth tidal shoals extend approximately 500 m south of the entrance and across the western end of Winda Woppa (Short 2007).

Average dune heights along Jimmys Beach range from 4.6 m AHD at Jimmys Beach east to 5.4 m AHD in the centre section to 7.6 m AHD at Jimmys Beach West. Australian Height Datum (AHD) is approximately equal to Mean Sea Level (MSL).

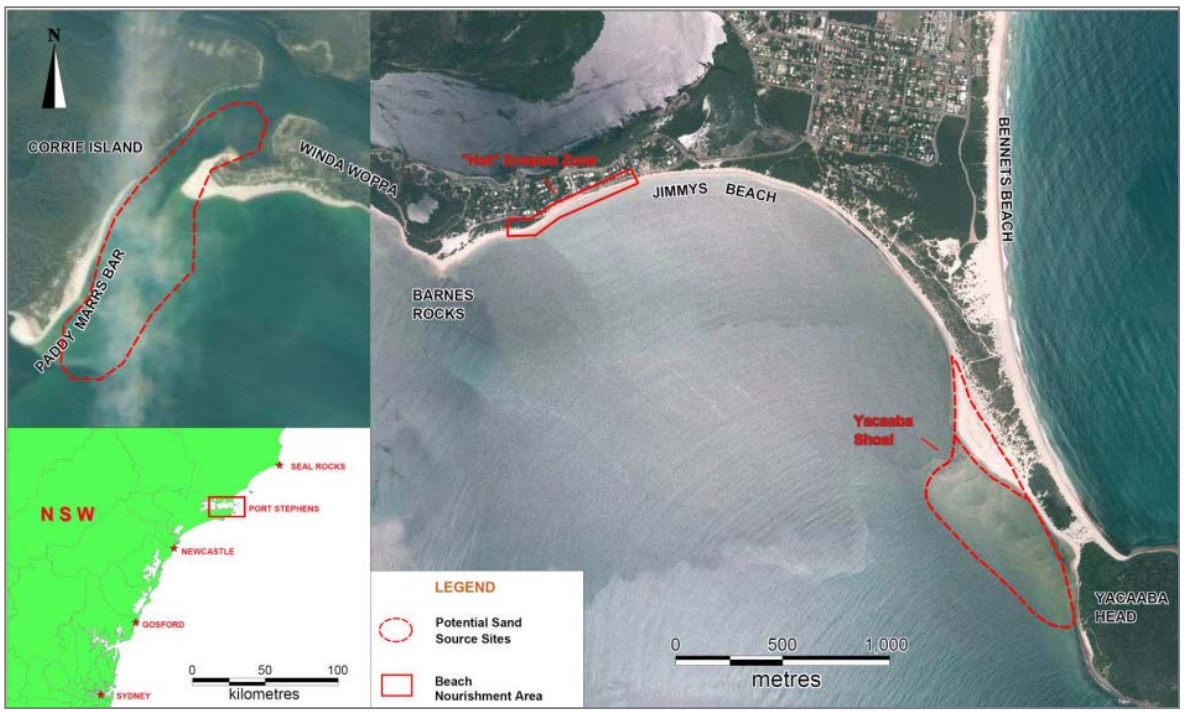

Figure 1 Study Area

Residential development behind Jimmys Beach began in the 1960s (Watson 2000). Parts of Jimmys Beach have experienced recession during at least the past 30 years. The beach was breached at its narrowest point by waves during the 1974 storms. A row of beachfront houses in this location has been threatened by storm erosion ever since (Short 2007). Beach erosion and recession has been managed by ongoing beach nourishment since the 1980s.

1.2 Current Coastline Management Strategy

Beach nourishment has consisted of planned programs and emergency sand placement to protect public infrastructure located between the foreshore and residential development (GLC 2011a). Historically beach nourishment has been undertaken to maintain a minimum setback of 15 m from the dune crest to The Boulevarde fronting residential properties. Emergency works (sand dumping) commences when the top of the erosion scarp is 10 m from the road reserve (GLC 2011a).

Between 1996 and 2008, nourishment was mainly in the form of emergency works with sand sourced from two terrestrial 'stockpiles'. The first, and most used, was the back dune system at the end of Beach Street known as 'Dead Mans'. The second less frequently used site was at the western end of The Boulevarde. Both sites are now depleted of material and present little opportunity as a source for any future renourishment (GLC 2011a).

Sand for planned beach nourishment programs has historically been sourced from the Corrie Island channel/ Paddy Marrs Bar at the Myall River entrance, with dredged sand delivered to Jimmys Beach via temporary pipelines. More recently this source has been augmented with sand from the Yacaaba Shoal at the Port Stephens estuary entrance. In February 2008, permanent pipelines were buried along Jimmys Beach to deliver sand from the shoal.

Past beach nourishment operations have been subject to the normal environmental impact assessment process, i.e. social, economic and environmental factors, and values have been identified and the impacts of the nourishment works assessed.

1.3 Review of Coastline Management Strategy

A number of options have been examined in the past for management of coastal hazards at Jimmys Beach, with beach nourishment being the primary management option recommended in previous coastline management strategy reviews (PWD 1987 and MHL 2001). It is also understood that the community favoured 'soft options' that retain beach amenity in the 2001 management strategy review.

Since the last review, a number of legislative amendments have occurred, accompanied by new policies and guidelines for management of the coastal zone, including:

- *NSW Coastal Planning Guideline: Adapting to Sea Level Rise* (Department of Planning DoP 2010)
- *Guidelines for Preparing Coastal Zone Management Plans* (OEH 2013).

On 14 June 2011, Great Lakes Council (GLC) adopted the *NSW Coastal Planning Guideline* which contains coastal planning principles including assessment and evaluation of coastal

risks taking into account the NSW sea level rise planning benchmarks, contained in the former NSW Government's *NSW Sea Level Rise Policy Statement 2009*.

This review is based on:

- the *Jimmys Beach Coastal Hazard Study* (SMEC in 2013); this report updated previous work and included mapping of coastal hazards zones taking into account sea level rise planning benchmarks of a 0.4 m rise over 1990 mean sea levels by 2050 and 0.9 m rise by 2100; and
- community comment on the hazard study and consultation undertaken as part of the preparation of this Coastal Zone Management Plan (CZMP).

The Hazard Study was exhibited from August 2012 to March 2013, with one submission being received from the Winda Woppa Association Inc. Minor editorial amendments were then made to provide qualifications and clarification of technical information presented in the report to address comments. The Winda Woppa Association Inc. also raised management issues in relation to adoption of hazard lines in the *Great Lakes Local Environmental Plan 2014* for development assessment purposes when the adopted strategy is to nourish Jimmys Beach so that the hazard line is 'held' seaward of The Boulevarde. Discussion on development controls is contained in Appendix B Section 1.3.

Consultation activities undertaken during preparation of the CZMP included:

- Information letter to residents/ property owners/ other identified stakeholders
- Media releases and information on Council's website
- Drop in day (on 26th October 2013)
- Review by Port Stephens Estuary Committee
- Review by the NSW Office of Environment and Heritage
- Review by the NSW coastal panel.

Feedback from exhibition of this Draft CZMP will also be incorporated into the Final CZMP.

2 COASTAL VALUES, USES AND ACCESS

2.1 Land Tenure and Zoning

Jimmys Beach – Winda Woppa adjoins the Port Stephens – Great Lakes Marine Park, which is under the control of the Department of Primary Industries (DPI) – Marine Parks. Yacaaba Headland to the east is part of the Myall Lakes National Park and to the west is the Corrie Island Nature Reserve. These conservation reserves are managed by the National Parks and Wildlife Service. Most of Winda Woppa and the spit separating Bennets Beach and Jimmys Beach is Crown land, with the latter being under Council's control. Most of the Jimmys Beach foreshore fronting private property is Council owned land. Refer to *Figure 2* which shows land tenure for Jimmys Beach – Winda Woppa.

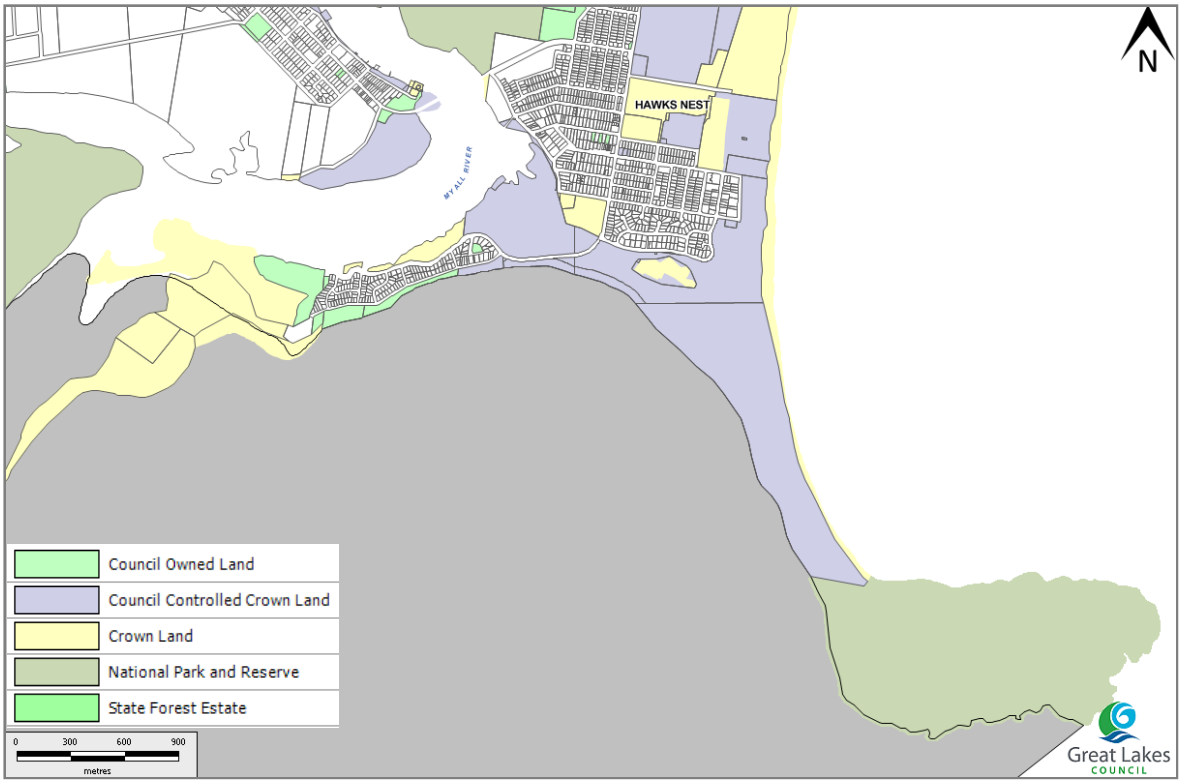

Figure 2 Land Tenure

Under the *Great Lakes Local Environmental Plan (LEP) 2014*, development at Jimmys Beach is zoned R2 Low Density Residential, surrounding land fronting the Myall River is E2 Environmental Conservation and the foreshore along Port Stephens is zoned E3 Environmental Management. Under the *Port Stephens – Great Lakes Marine Park Zoning Plan 2007*, most of the waterway along Jimmys Beach – Winda Woppa is zoned General Use. A Sanctuary Zone is located immediately to the east of Barnes Rocks. Refer to *Figure 3* for LEP 2014 and Marine Park zonings.

Coastal/ estuarine values and uses associated with the Jimmys Beach area are summarised in Section 2.2 . The significance of some values has been recognised through inclusion in environmental zonings; natural and cultural heritage listings under environmental legislation; and/ or mapping under State Environmental Planning Policies (SEPPs).

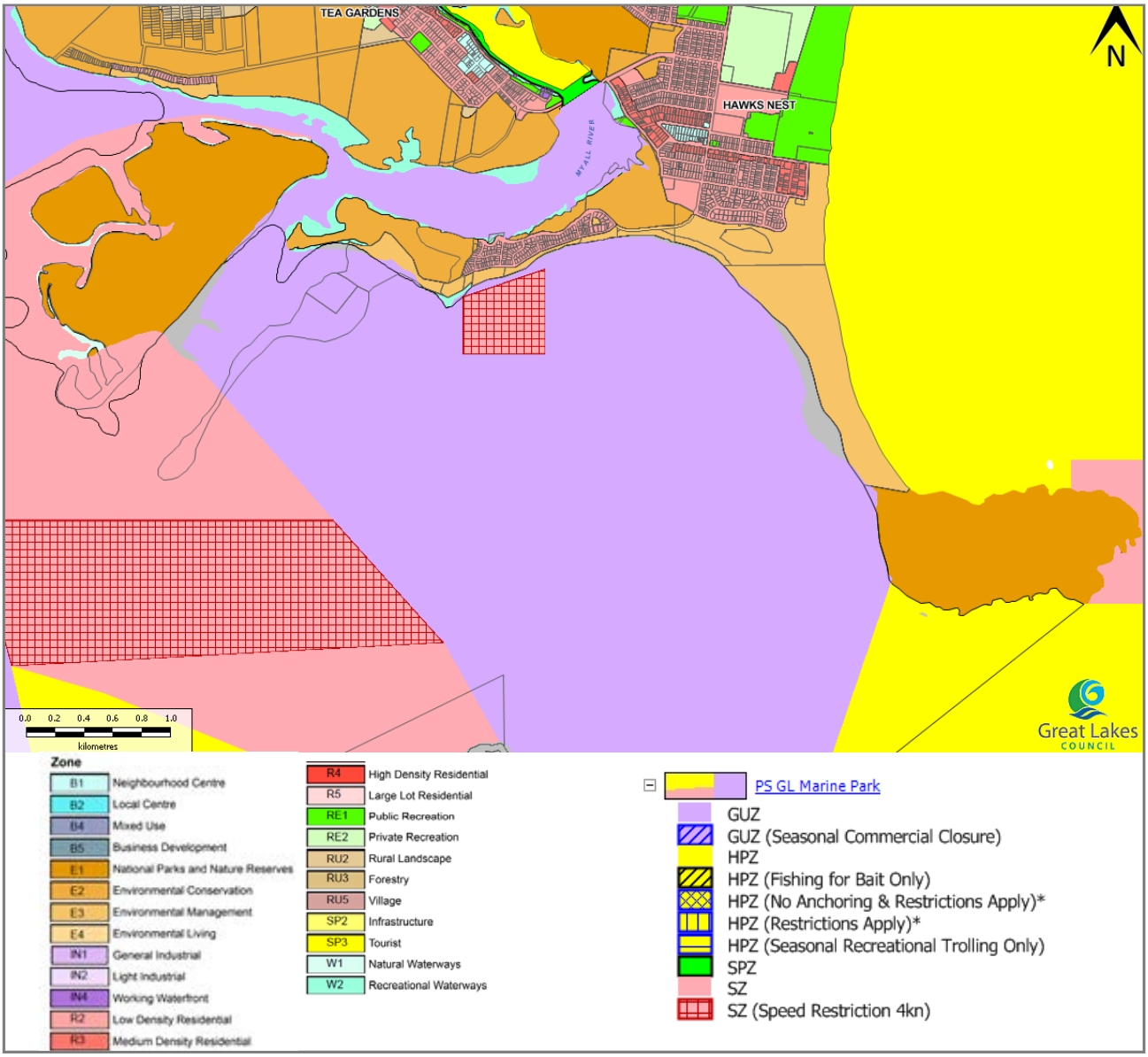

Figure 3 Great Lakes LEP 2014 and Marine Park Zoning (MPA 2007)

2.2 Values

Natural Heritage

The Port Stephens - Great Lakes Marine Park borders Jimmys Beach - Winda Woppa at the Mean High Water Mark (MHWM). A substantial area of the shallow seabed off Jimmys – Winda Woppa Beach is covered by seagrasses, mainly Zostera (eelgrass) with some mixed Zostera/ Halophila (paddleweed) beds and a bed of mixed Zostera/ Posidonia (strapweed) at the western end of Jimmys Beach. Posidonia is more susceptible to disturbances than the other seagrass species and this bed is included in a Marine Park sanctuary zone. This sanctuary zone is also known for dolphin activity, see *Figure 3* for location.

An area of mangroves and saltmarsh is located at the eastern end of The Anchorage, north of the roadway. Mangrove stands are located along the Myall River and at Winda Woppa, including around Winda Woppa lagoon. Mangroves and seagrasses are protected under the *Fisheries Management Act 1994.* Areas of mangrove and saltmarsh in the vicinity of Jimmys – Winda Woppa Beach are also mapped and protected under SEPP No. 14 Coastal

Wetlands. The adjacent Corrie Island Nature Reserve, to the west of Winda Woppa, is also a mapped SEPP No. 14 Coastal Wetland and is part of the internationally recognised Myall Lakes Ramsar Wetland (NSW MPA 2010). The wetland communities, and sand and mudflats of Corrie Island provide habitat for many species of waterbirds including migratory waders protected under international treaties (www.environment.gov.au). See *Figure 4* which shows the location of SEPP No.14 Wetlands and estuarine vegetation around the entrance to Port Stephens.

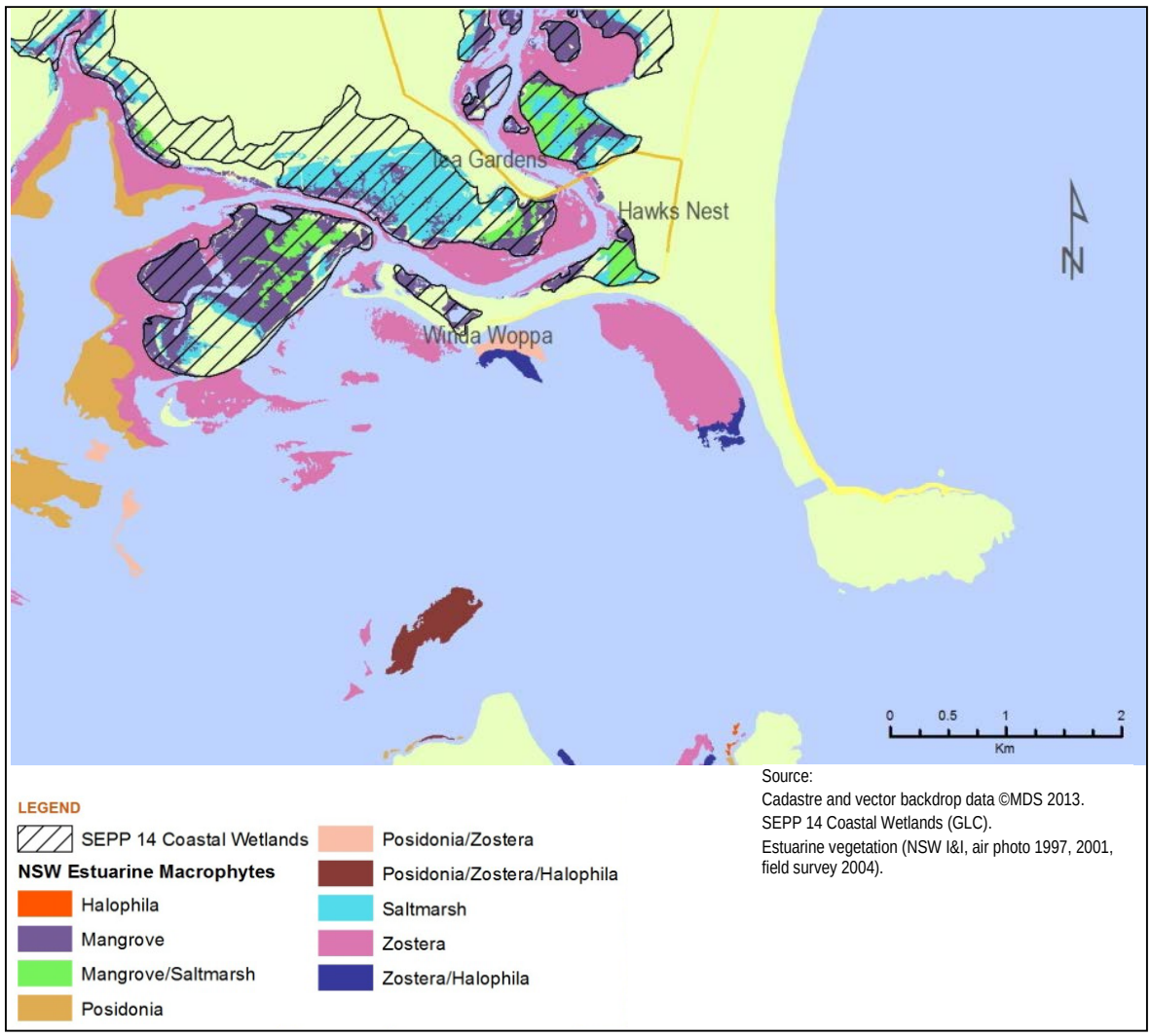

Figure 4 Coastal Wetlands and Marine Vegetation

The *Tea Gardens Hawks Nest Conservation & Development Strategy* (GLC and Acacia Environmental Planning 2003) identified habitat corridors throughout the locality. A corridor links habitat nodes at Koala Reserve/ Telfer Park, Jimmys Beach Reserve and the reserve at Winda Woppa, west of The Anchorage.

The koala population at Hawks Nest/Tea Gardens is listed as an endangered population under the *Threatened Species Conservation (TSC) Act 1995* and a Recovery Plan was prepared by NPWS in 2003. This plan identified Swamp Mahogany *Eucalyptus robusta* and Tallowwood *E. microcorys* in particular as being of primary importance to the Hawks Nest/ Tea Gardens koala population.

Cultural Heritage

The Worimi Aboriginal people are the traditional caretakers of the coastal land from the Wallis Lake area down to Newcastle and west to Gloucester and are made up of the Buraigal, the Gamipingal and the Garawerrigal clans. The middens, campsites and burial sites of the Worimi people line the coast (www.about.nsw.gov.au).

A search of OEH's Aboriginal Heritage Information Management System (AHIMS) database identified nine Aboriginal sites at or in the vicinity of Jimmys Beach. Sites mapped by Manly Hydraulics Laboratory MHL (1999) were mainly middens.

The Norfolk Island Pines at 36-38 The Anchorage, Winda Woppa were listed as being of local heritage significance in Schedule 5 (Heritage Schedule) of the Draft Great Lakes LEP 2012. Smith History and Heritage (2007) noted that *Norfolk Island Pines were early popular plantings in coastal areas and have special significance in such areas*. Features contributing to the significance of the pines along The Anchorage include their landmark qualities and age.

A vessel wreck site located on the southern bank of the Myall River, near the alignment of Guya Street, was also listed as being of local heritage significance in the Draft Great Lakes LEP 2012 Heritage Schedule. The NSW Heritage Office (1999) indicated that this is likely to be the remains of the timber paddle steamer *Patterson*, built in 1887 at Newcastle and decommissioned on a beach at Winda Woppa before 1916. All that remains of the vessel is an iron boiler. The boiler is representative of the Scotch type fitted to steamers from the latter nineteenth century and the remains are a tangible reminder of the fate of purposely abandoned vessels which once operated in the area.

These heritage items are not listed in the gazetted *Great Lakes Local Environmental Plan 2014,* but are under review for inclusion in the near future due their social significance.

Community Values

The main attributes of the Jimmys Beach area were identified as the natural environment and lifestyle. The natural environmental values as seen by the community related to the natural beauty of the area, undeveloped character, scenic views and clean, clear water.

Lifestyle attributes were identified as safe swimming for children and the variety of other recreational opportunities, the relaxed coastal environment, the quietness, the ambience, its peacefulness and living close to the water. Property owners valued the peace and tranquillity of the area more than the other respondents.

2.3 Community Uses

As noted in Section 2.1 , the Port Stephens - Great Lakes Marine Park borders Jimmys Beach - Winda Woppa, with most of this section zoned for general use which permits the following activities:

- Recreational fishing
- Shell and seaweed collecting
- Recreational boating
- SCUBA diving and snorkelling
- Motorised watersports
- Some commercial fishing.

Full details of zone objectives and permitted activates are available at www.legislation.nsw.gov.au

The following activities are undertaken at/ near Jimmys – Winda Woppa Beach:

- Swimming in the shallow, sheltered waters
- Surfing during large ocean swells along the Yacaaba boulders
- Fishing from the shore and from boats
- Canoeing/ kayaking
- Jet skiing
- Occasional professional fishing off Jimmys Beach (beachsafe.org.au).

The Ecology Lab (1998) recorded recreational fishing for bream, flathead, whiting and other species off Jimmys Beach.

Commercial fishing closures in the vicinity of Jimmys Beach are hauling for sea mullet from November to January and mesh netting from April to August (except by method of splashing for no longer than 2 hours in a single operation of the net).

Issues or conflicts between different uses

By far the greatest perceived issue is the interaction between Personal Water Craft (PWC)/ Power Boats and other waterway users. Safety was the main concern for many waterway users with PWC/Boats coming in close proximity to other users. A lesser concern was the noise created by PWC/Boats. Other concerns included fishermen, illegal 4WDs and parking issues. These issues with community uses are outlined further in Section 4.2.1 .

2.4 Public Access

There is good access to the beach from the park and picnic area next to Jimmys Beach Caravan Park. There is a second access from Tuloa Avenue (access road to Jimmys settlement), with a carpark right on the beach, but no shade or amenities (beachsafe.org.au).

A boat launching ramp, providing access to the Myall River, is located near the end of Jacabba Street.

3 SUMMARY OF COASTAL PROCESSES

3.1 Beach Evolution

The evolution of the Winda Woppa spit was investigated by Thom *et al* (1992) see *Figure 5*. From a review of Admiralty charts and other survey data, the spit was thought to have formed around 1820 and continued westward to its maximum extent until a storm in 1927 resulted in breaching of the spit, creating a sandbank that migrated landwards to form a beach on Corrie Island. Winda Woppa spit has continued to extend westwards ever since but dredging/ removal of sand for beach nourishment has prevented extension past its present position (SMEC 2013).

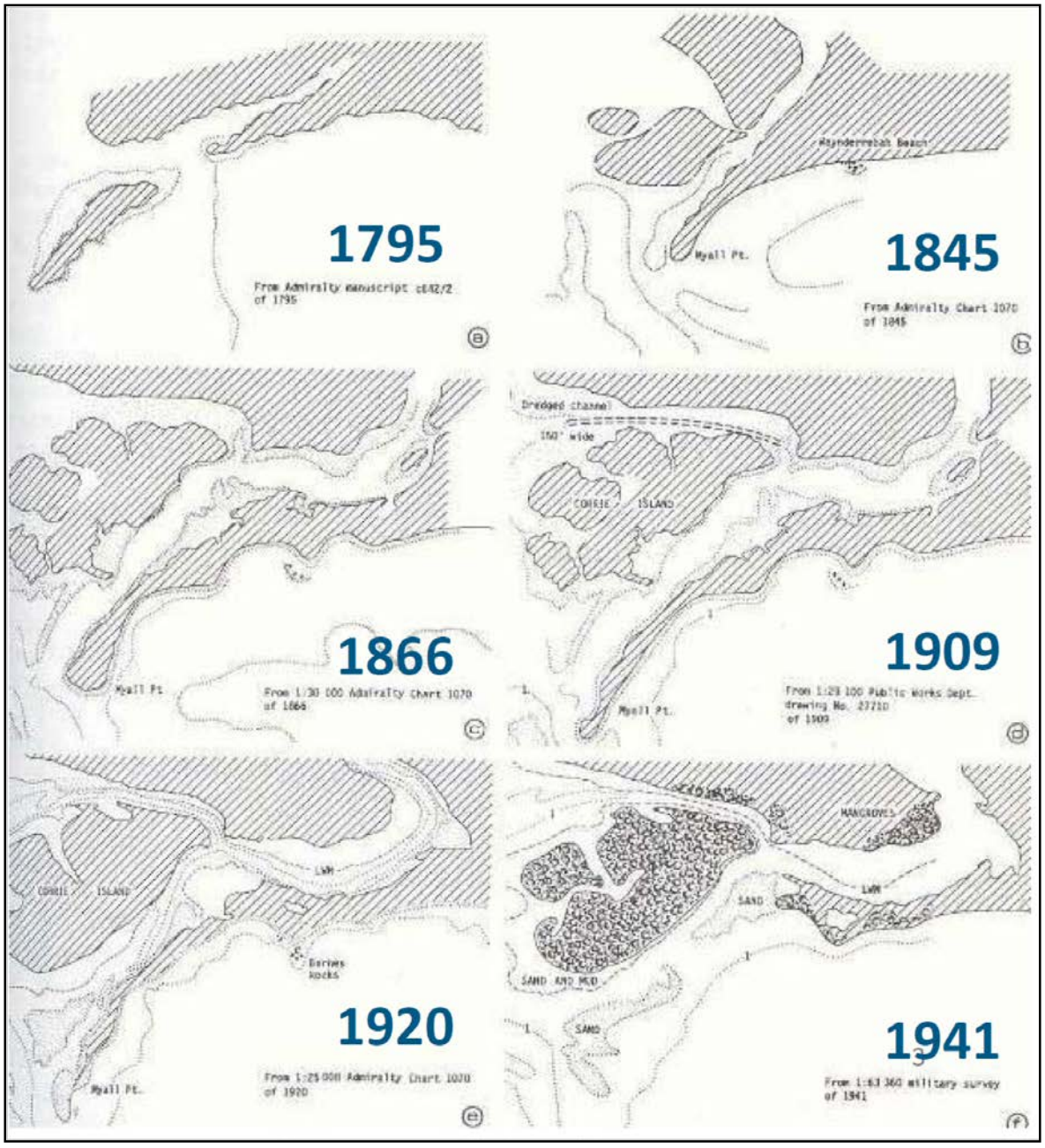

Figure 5 Evolution of Winda Woppa spit between 1795 and 1941 (Thom et al., 1992)

Based on historical photographs from 1968 onwards, Vila-Concejo *et al* (2011) found that the Yacaaba sandwave (shoal) was first apparent in the 1980s and there was a period up until the 1990s where westward sediment transport caused sandwave formation and migration towards the inner part of the estuary. Since this time sandwave migration has slowed, remaining relatively stable with some further migration observed between 2006 and 2008 (SMEC 2013).

3.2 Coastal Processes

Gordon (1982) presented a conceptual coastal sediment transport model for three inter-related systems: the ocean beach (Bennetts Beach), the estuary beach (Jimmys Beach) and the aeolian process of the Yacaaba Isthmus to understand how each discrete process system provides feedback to the other systems. A summary of key conclusions are outlined below:

- The system, especially the areas surrounding Jimmys Beach and the Myall River entrance, is in a state of disequilibrium, due to the fickle behaviour of the Myall entrance, and is in a phase of readjustment. The dominance of any entrance and entrance switching/ modification behaviour is event (storm) related.
- A combination of swell and sea factors point to a dominant westerly sea condition due to the fetch of Port Stephens. The westerly wind-induced, high occurrence seas dominate the lower occurrence but higher energy swell events. South-easterly sea/ swell entering the Port Stephens estuary have potential to significantly impact on the littoral processes affecting Jimmys Beach.
- Tidal currents would not significantly influence beach processes at Jimmys Beach. While flood flows from the Myall River may modify the quasi-normal current patterns, the impact of these events on the Jimmys Beach littoral system is likely to be small, infrequent and of short duration.
- Although short term fluctuations in beach width and storm induced recession of the erosion scarp is the case at Jimmys Beach, the long term shoreline realignment will be dominated by the westerly seas which result in a west to east movement of sand on Jimmys Beach and development of a sand sink immediately west of Yacaaba Head. Southeasterly waves would also reverse the sand movement direction to deposit sand onto Paddy Marrs Bar at depth, without re-entraining by westerly winds. Accordingly, Jimmys Beach can conceivably lose sand in both directions.
- It is estimated that there is about 10,000-15,000 m^3/yr of easterly drift conveying sand from Jimmys Beach towards Yacaaba Headland.

Wave transformation modelling by SMEC (2013) indicated that offshore wave energy tends to focus on the western end of Jimmys Beach around Barnes Rocks and Guyra Street with significant wave heights under typical conditions reaching 0.6 m. The nearshore swell wave approach angle indicates westerly sediment transport under ocean swell conditions, however, complex nearshore processes such as wave focusing, differential wave setup and lateral expansion currents during large swells may counteract westerly sediment transport in some locations.

Locally generated wind waves generate eastward sediment transport. The significant wave height within Port Stephens generated by westerly, south-westerly and southerly winds can reach up to 0.3 m in typical conditions, with wave energy focusing around the Yacaaba sandwave and along Jimmys Beach.

SMEC (2013) concluded that the majority of sand eroded from the area fronting development at Jimmys Beach is transported to the east while a smaller proportion ‘leaks’ past Barnes Rocks and is transported west to Corrie Channel.

4 COASTAL HAZARDS, RISKS AND ISSUES

4.1 Coastal Hazards

A summary of coastal hazards is provided below. For further information on coastal hazards refer to the *Great Lakes Coastal Hazard Study Appendix E – Jimmys Beach Coastal Hazard Study* (SMEC 2013).

An analysis of historical aerial photographs indicated sand loss over the last few decades at various locations within Port Stephens: the flood tide delta, Jimmys Beach, Shoal Bay and Nelson Bay, with only the sandwave attached to Yacaaba Head (Yaccaba shoal) and the sand spit associated with the Myall River entrance identified as gaining sand (SMEC 2013).

SMEC (2013) estimated storm demand at Jimmys Beach from analysis of photogrammetric data between 1968 and 1974 (to encompass the major 1974 storm). The 1963 to 1983 period of photogrammetric data was used to determine natural changes in shoreline position (i.e. shoreline recession prior to commencement of beach nourishment). Following ongoing nourishment, the beach has been relatively stable as indicated by the photogrammetric (survey) profiles between 1983 and 2008. *Figure 6* indicates sections of the shoreline and the location of associated profiles.

Figure 6 Location of photogrammetric profiles

As noted in Section 1.3 sea level rise planning benchmarks of a 0.4 m rise by 2050 and 0.9 m rise by 2100 over 1990 mean sea level were adopted to estimate the position of future hazard lines (see Appendix A for Hazard Maps). Other key parameters are listed in *Table 1*.

Note; 2060 hazard lines have also been produced to align with *Great Lakes Local Environmental Plan (LEP) 2014* planning horizons (see Appendix A for 2060 Hazard Map).

Table 1 Key parameters used in determining immediate, 2050 and 2100 hazard lines

Beach Section	Storm Demand (m^3/m)	Adopted long term recession rate due to sediment loss (m/yr)	Long term recession due to sea level rise (m)	
			2050	2100
Winda Woppa	20	0	5	12.4
Jimmys Beach West	50	0.6	5.9	14.6
Jimmys Beach Centre-East	70	0.4	6	14.9
Jimmys Beach East (Block 2)	70	0.9	5	12.4
Jimmys Beach East (Block 3)	40	0.1	5	12.4
Yaccaba Isthmus East	20	0	5	12.4
Yaccaba Isthmus West	50	0	5	12.4

The parameters discussed above were used to produce the:

- present day (immediate) hazard line, i.e. position of back beach escarpment (after this has slumped to a stable angle of repose) following erosion of the adopted storm demand from the beach; and,
- 2050 and 2100 hazard lines taking into account long term recession (due to sand loss and sea level rise) and storm demand.

The limit of the Zone of Reduced Foundation Capacity (ZRFC) was also estimated, based on the schematic shown in *Figure 7*, which relates to an area of unconsolidated sands where building foundations may become unstable. The ZRFC varies in response to dune height and sand/ soil properties. In addition, the likely recovery of the beach following a major storm, or series of storm events, needs to be considered.

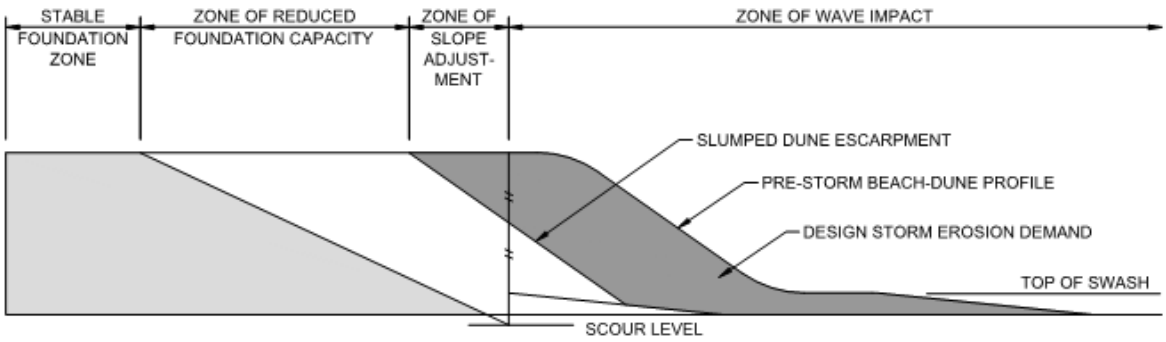

Figure 7 Schematic Representation of Coastline Hazard Zones (Nielsen et al 1992)

See Appendix A for the hazard maps. As indicated by the mapping for 2100, the hazard line would approach the Myall River shoreline at the narrowest section of Jimmys Beach.

Wave runup levels were calculated to provide an indication of areas of the foreshore that currently would be overtopped in a major event. This indicated minor overtopping along The Boulevarde and in the low-lying area adjacent to Winda Woppa Lagoon.

4.2 Coastline Management Issues and Risks

4.2.1 Community Issues

The main issues (in order of importance) identified for Jimmys Beach – Winda Woppa through consultation activities were:

- Beach erosion
- Jetski (PWC) / power boats
- Development
- Vehicles/Parking/4WDs
- Fishing
- Access/walking tracks
- Dogs
- Dunes / vegetation
- Maintenance.

Beach erosion and PWC / power boats were by far perceived to be the greatest issues. Respondents wanted beach erosion managed whether this be through beach nourishment, dune management or alternative options. Many respondents felt alternative options other than beach nourishment needed to be explored. A review of potential management options is provided in Appendix B.

For PWC / Power Boats safety was the main concern for many waterway users with PWC/Boats coming in close proximity to other users. A lesser concern was the noise created by PWC/Boats. See Appendix C for more detail on the results of community consultation.

4.2.2 Risk Assessment – Storm Erosion and Shoreline Recession

Table 2 identifies the built assets as identified from the hazard maps (see Appendix A) at risk for various planning periods. This includes assets at risk due to erosion during a major event and/or assets that are substantially affected by the ZRFC. Properties only affected by the ZRFC are indicated. 'Property' generally refers to an affected dwelling or a lot affected landward of the building setback.

The position of the hazard lines does not take into account the adopted beach nourishment strategy, as it cannot be guaranteed that beach nourishment would continue indefinitely or provide ultimate protection during an extreme event. The position of the hazard lines is based on the assumption that the entire shoreline is erodible (i.e. comprised of sand).

Table 2 Assets at risk over various planning periods due to a major storm event

Immediate Risk	Assets at risk by 2050	Assets at risk by 2100
Parts of The Boulevarde roadway between Kururma Crescent and Guyra Street.	Most of The Boulevarde roadway and part of Tuloa Avenue roadway. Services (electricity *Figure 8*, water *Figure 9*, telephone cables *Figure 10*) within The Boulevarde Road reserve would also be at risk. Properties from Kururma Crescent to the near the western end of The Boulevarde (27).	All of The Boulevarde roadway, most of Tuloa Avenue to Coorilla Street and the foreshore carpark. Southern half of Kururma Crescent, Guya Street and Gemalla Street roadways. Fishermans Walk to western end of The Boulevarde affected by ZRFC only (5). Properties from Fishermans Walk to the western end of The Boulevarde (52). Properties along southern part of Kururma Crescent (7). Guya Street (4). Gemalla Street (3). The Anchorage (mid section) between Guya Street and Gemalla Street (9). Services within affected road reserves.

Figure 8 Electricity Assets at Jimmys Beach (DBYD 2014)

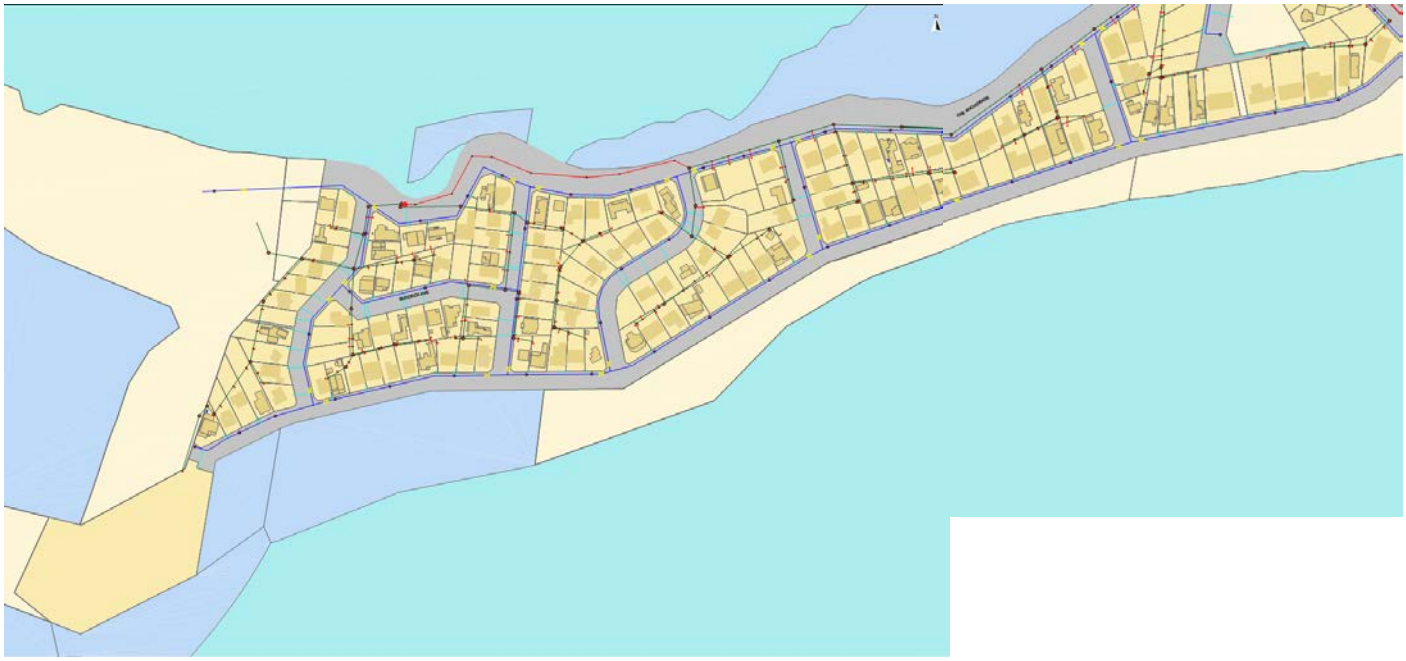

Figure 9 Water Assets at Jimmys Beach (DBYD 2014)

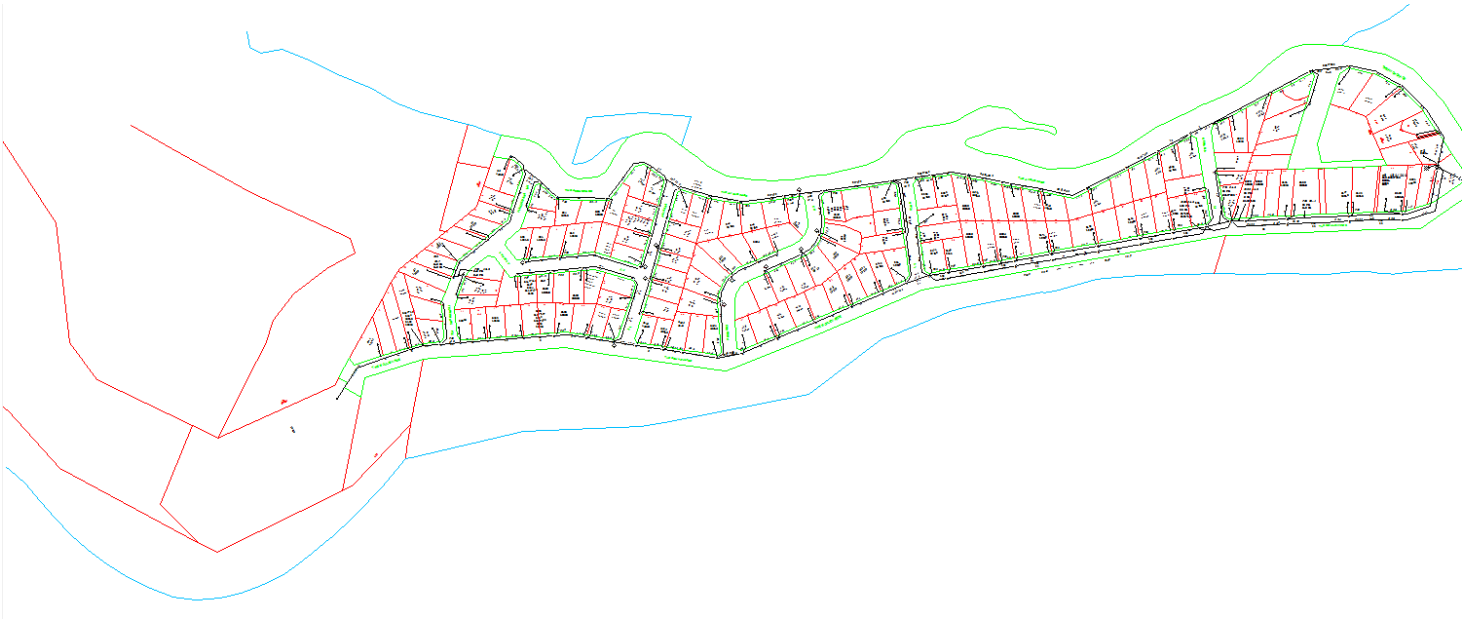

Figure 10 Communications Assets at Jimmys Beach (DBYD 2014)

5 MANAGEMENT OPTIONS

As noted in Section 1.2 , the currently adopted management strategy for Jimmys Beach is beach nourishment to protect The Boulevarde and residential development along Jimmys Beach.

Appendix B provides a review of a number of options to determine if alternate management strategies can increase the efficiency, cost-effectiveness and certainty of protecting property, while maintaining beach amenity into the future.

5.1 Adopted Risk Management Strategy

This report recommended that based on the exhibition of this draft, the assessment of risk management options summarised in Appendix B and community consultation (Appendix C), on-demand sand nourishment in the form of hydraulic pumping equipment (hopper arrangement) be the main preferred management option for Jimmys Beach – Winda Woppa based on an expected operational life for the system of 20 years. With sand sourced from Winda Woppa.

This recommendation has since been further investigated by GLC and is now the adopted strategy.

Based on historical rates of erosion and accretion, the ideal nourishment strategy would involve placement of smaller quantities of sand onto the Jimmy's Beach 'null point' on a more frequent basis. Based on historical rates of erosion and accretion, the ideal nourishment strategy would involve placement of approximately 10,000m^3 of sand every 6 months, which is a total of 20,000m^3 annually (BMT WBM 2012).

As described in BMT WBM 2012, "The large volume of in-situ sand on the Winda Woppa sand spit, along with the strong tidal dynamics of the entrance shoals at the mouth of the Lower Myall River, would provide for a suitable supply of sand from this location for future nourishment needs (totalling some 400,000m3 over a design 20 year period)."

The Yacaaba or Corrie Channel source may be explored if needed in the future subject to sedimentation patterns and monitoring.

Trucking can commence immediately to undertake these more frequent nourishment campaigns without any significant capital outlay and to confirm the effectiveness and required volumes for regular nourishment. To reduce on-going annual costs and minimise impacts, trucking should then be replaced by hydraulic pumping in the form of an on-demand sand nourishment system. A further feasibility assessment for an on-demand beach nourishment system should take place to provide a detailed technical investigation of the hopper system and its viability has been completed.

A number of general coastal zone/foreshore management improvements were also identified to:

- Address issues raised during consultation
- Improve public access and beach amenity in general
- Facilitate appropriate recreational uses of the coastal zone
- Protect the values identified in Section 2.2 of the CZMP.

These recommendations are discussed in Section 5.2 below.

5.2 General Coastal Zone Management Recommendations

Actions recommended in the Foreshore Management Plan for Port Stephens (Umwelt 2009) included:

- Rationalising and standardising foreshore signage and ensuring it is appropriately located;
- Carrying out minor upgrades to Winda Woppa boatramp as outlined in the Waterways Shore Facilities Management Strategy (Jelliffe Environmental 2003);
- Implementing improvements as recommended in the Tea Gardens Hawks Nest & Bulahdelah Stormwater Management Plan (Jelliffe Environmental 2000);
- Planning for and undertaking dune stabilisation, vegetation management, beach access points and structures; and,
- Formalising carparks.

The following management measure were suggested through community consultation and identified through site inspections:

- Access Management (Pedestrians/4WD/PWC/Boats) - Pedestrian access is maintained or improved and vehicle/boat access reviewed;
- Compliance issues - Improve compliance/ enforce penalties for, unauthorised vehicle access, 4WDing over dune vegetation and on beach, littering, PWC/power boats in unauthorised area or dangerous driving, and unauthorised parking; and,
- Foreshore facilities – Maintain and improve foreshore facilities such as boat ramp, picnic and recreation facilities.

6 COASTAL MANAGEMENT GOALS AND OBJECTIVES

6.1 Consideration of Goals and Objectives in CZMP Preparation

Part 4A, Section 55 C (1) of the *Coastal Protection Act 1979* lists matters to be dealt with in Coastal Zone Management Plans (CZMPs) as reproduced below:

A coastal zone management plan must make provision for:

> *(a) protecting and preserving beach environments and beach amenity, and*
>
> *(b) 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, and*
>
> *(c) ensuring continuing and undiminished public access to beaches, headlands and waterways, particularly where public access is threatened or affected by accretion, and*
>
> *(d) where the plan relates to a part of the coastline, the management of risks arising from coastal hazards, and*
>
> *(e) where the plan relates to an estuary, the management of estuary health and any risks to the estuary arising from coastal hazards, and*
>
> *(f) the impacts from climate change on risks arising from coastal hazards and on estuary health, as appropriate, and*
>
> *(g) where the plan proposes the construction of coastal protection works (other than emergency coastal protection works) that are to be funded by the Council or a private landowner or both, the proposed arrangements for the adequate maintenance of the works and for managing associated impacts of such works (such as changed or increased beach erosion elsewhere or a restriction of public access to beaches or headlands).*

The OEH 2013 *Guidelines for Preparing Coastal Zone Management Plans* set out ten principles for preparing CZMPs. The first principle is to consider the objectives of the *Coastal Protection Act 1979* and the goals, objectives and principles of the *NSW Coastal Policy 1997*.

Section 3 of the *Coastal Protection Act 1979* sets out objectives which are to provide for the protection of the coastal environment of the State for the benefit of both present and future generations. The overriding vision of the 1997 *NSW Coastal Policy* is the ecological sustainability of the NSW Coast. The Policy contains the nine goals.

Table 3 lists the goals, objectives and principles contained in the above legislation, policy and guidelines indicating how these have been considered in the preparation of the Jimmys Beach CZMP. Many of the principles, goals and objectives are similar and have been grouped against the *Guideline* principles.

Table 3 Consideration of Coastal Management Principles, Goals and Objectives in CZMP Preparation

Guidelines for Preparing CZMPs Principles	Coastal Protection Act Objectives	NSW Coastal Policy Goals	How Principles, Goals and Objectives have been considered
1. Consider the objectives of the *Coastal Protection Act 1979* and the goals, objectives and principles of the *NSW Coastal Policy 1997* and the *NSW Sea Level Rise Policy Statement 2009*. *Note: NSW Sea Level Rise Policy is no longer State Government Policy.*	To encourage, promote and secure the orderly and balanced utilisation and conservation of the coastal region and its natural and man-made resources, having regard to the principles of ecologically sustainable development.	Providing for ecologically sustainable development and use of resources.	Sand for nourishment of Jimmys Beach is sourced from the same system, therefore sand resources are recycled and moved to the area where assets are at greatest risk from coastal erosion/ shoreline recession.
	To recognise and foster the significant social and economic benefits to the State that result from a sustainable coastal environment, including: - benefits to the environment, and - benefits to urban communities, fisheries, industry and recreation, and - benefits to culture and heritage, and - benefits to the Aboriginal people in relation to their spiritual, social, customary and economic use of land and water.	Providing for ecologically sustainable human settlement in the coastal zone. Protecting and enhancing the aesthetic qualities of the coastal zone.	Beach nourishment is a 'soft' engineering option which would not detract from the aesthetic values of the coast.
	To provide for the acquisition of land in the coastal region to promote the protection, enhancement, maintenance and restoration of the environment of the coastal region.	-	n/a
	-	Protecting and conserving the cultural heritage of the coastal zone.	Beach nourishment is a 'soft' engineering option which would not adversely affect cultural heritage values.
2. Optimise links between plans relating to the management of the coastal zone.	To ensure co-ordination of the policies and activities of the Government and public authorities relating to the coastal region and to facilitate the proper integration of their management activities.	Providing for integrated planning and management of the coastal zone	Actions to be implemented through other plans are indicated in *Table 4*.
3. Involve the community in decision-making and make coastal information publicly available.	To recognise the role of the community, as a partner with government, in resolving issues relating to the protection of the coastal environment	Providing information to enable effective management of the coastal zone.	Consultation activities to inform the community and seek feedback on management of Jimmys Beach are summarised in Section 1.3

Guidelines for Preparing CZMPs Principles	Coastal Protection Act Objectives	NSW Coastal Policy Goals	How Principles, Goals and Objectives have been considered
4. Base decisions on the best available information and reasonable practice; acknowledge the interrelationship between catchment, estuarine and coastal processes; adopt a continuous improvement management approach.	-	Recognising and accommodating the natural processes of the coastal zone.	The Jimmys Beach Coastal Hazard Study summarises and updates information from previous studies. Beach nourishment allows for natural coastal processes.
5. The priority for public expenditure is public benefit; public expenditure should cost-effectively achieve the best practical long-term outcomes.	-	-	Section 8.1 makes reference to the benefits of beach nourishment to coastal property owners and discusses cost-sharing. Beach nourishment provides a public benefit by maintaining beach amenity.
6. Adopt a risk management approach to managing risks to public safety and assets; adopt a risk management hierarchy involving avoiding risks where feasible and mitigation where risks cannot be reasonably avoided; adopt interim actions to manage high risks while long-term options are implemented.	-	-	The Jimmys Beach Emergency Action Sub Plan (EASP) prepared by Council, see Appendix D, identifies actions to manage risks to public safety in the event of a coastal erosion emergency.
7. Adopt an adaptive risk management approach if risks are expected to increase over time, or to accommodate uncertainty in risk predictions.	To encourage and promote plans and strategies for adaptation in response to coastal climate change impacts, including projected sea level rise.	-	The sea level rise benchmarks were adopted in the *Hazard Study* and are reflected in the hazard maps.
8. Maintain the condition of high value coastal ecosystems; rehabilitate priority degraded coastal ecosystems.	To protect, enhance, maintain and restore the environment of the coastal region, its associated ecosystems, ecological processes and biological diversity, and its water quality.	Protecting, rehabilitating and improving the natural environment of the coastal zone.	Recommendations to improve management of dune/ foreshore vegetation are included in *Table 4*.
9. Maintain and improve safe public access to beaches and headlands consistent with the goals of the NSW Coastal Policy.	To promote public pedestrian access to the coastal region and recognise the public's right to access	Providing for appropriate public access and use.	Recommendations for pedestrian and vehicle access/ parking are included in *Table 4*.
10. Support recreational activities consistent with the goals of the NSW Coastal Policy.	To promote beach amenity	as above	Beach nourishment maintains beach amenity and hence associated recreational uses.

6.2 Jimmys Beach CZMP Goals

Council's *Great Lakes 2030 Community Strategic Plan 2010-2030* (GLC 2011b) objectives include protecting the natural environment while addressing the challenges of population growth. Strategies associated with this objective include the following, which are relevant to the management of coastal hazards at Jimmys Beach:

- Allowing for our increasing population and associated development without impacting on our natural environment
- Ensuring the development that does take place is sensitive to the natural environment
- Planning for and minimising the potential impact of climate change

With regard to the latter, the expected outcome is to identify areas with the potential to be affected by rising sea levels to protect them from future development and plan for community relocation if needed.

The Hazard Study identified areas potentially at risk under the sea level rise planning benchmarks and the preferred risk management options within this CZMP are considered consistent with these broad strategies.

7 CZMP ACTION PLAN

Strategies and actions to address coastal hazards and issues, together with measures to enhance the natural environment and improve public access are listed in the Implementation Schedule for this CZMP in *Table 4* with *Figure 11* diagrammatically showing key management actions. A description of the main options to mitigate coastal hazards is provided in Section 5 with further detail provided in Appendix B. Some of the actions below would be implemented through existing management plans and programs, and cooperatively with other agencies. Other actions relate to the coastal zone of Port Stephens or the Myall River in general and would be implemented through other strategic plans as indicated.

Table 4 Implementation Schedule

No.	Management Strategy	Action	Method of Implementation	Responsibility	Performance Criteria	Commencing	Indicative Costs				Priority	Funding Options
							Yr 1 (2015)	Yr 2-5 (2015-2018)	Yr 6-10 (2019-2024)	Annual Maintenance		
Investigation and Monitoring												
1	Further Investigations and Monitoring											
1.1	Investigation of sand transfer system for On-Demand Beach Nourishment	Feasibility assessment for on-demand beach nourishment system. Exploring options of Hopper or Sand Shifter for beach nourishment. *Note: GLC has undertaken this assessment and the Hopper system has been adopted.*	Through this CZMP.	GLC with support from OEH.	Method of on-demand beach nourishment is defined including an accurate cost estimate for future budget purposes.	Complete	$60,000				High	OEH part funding.
1.2	Beach Profile Monitoring	Pre and post storm beach profiling to enable storm demand volume to be better estimated.	Surveys (Land and Hydrographic) and/or photogrammetric surveys.	GLC with support from OEH.	Record of beach profiles gained over next 5-10years to improve understanding of storm demand and coastal processes.	2016 subject to funding availability.	$40,000 (Surveys every 3mths at $10,000).	$30,000 (Yearly survey at $10,000).	$20,000 (2 surveys at $10,000).	$10,000 – frequency to be reduced overtime subject beach profile.	High	OEH part funding. GLC General funds.
Development Controls												
2	Development Control Plan	New development/redevelopment in areas subject to coastal inundation, flooding and coastal erosion shall be required to meet new coastal development controls.	Through GLC Development Control Plan (DCP).	GLC Planning Staff.	All future development within coastal risk areas to be assessed against coastal development controls.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time	GLC planning / development assessment staff time	GLC planning / development assessment staff time.	High	GLC General funds.
2.1	Floor level	Apply minimum floor level for new development/ redevelopment in areas subject to coastal inundation and associated flooding. GLC to amend development controls to provide minimum floor level for coastal risk areas.	Through GLC Development Control Plan.	GLC Planning Staff.	All new development to have floor levels immune or resilient to inundation.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	High	GLC General funds.
2.2	Greenfield subdivisions and development	New development should not occur seaward of existing development/coastal hazard lines.	Through GLC Development Control Plan.	GLC Planning Staff.	All future development to have floor levels immune or resilient to inundation.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	High	GLC General funds.
2.3	Building Standards	New development/redevelopment within coastal hazard areas. Improved building standards for new development to provide resilience to coastal hazards and ensure compatible with coastal character. Such as; • Resilience to inundation of lower level • Geotechnical design to accommodate reduced foundation capacity (Piled construction) • Lightweight/relocatable construction.	Through GLC Development Control Plan.	GLC Planning Staff.	All future development to have floor levels immune or resilient to inundation.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	High	Grants do not cover Council or admin staff time. GLC General funds.
2.4	Existing Development	When substantial renovation occurs promote house retrofitting or replacement to suit coastal hazards and coastal character. House retrofitting and design standards – raising habitable floor level, improved design and usage of appropriate construction materials for resilience against coastal hazards. Geotechnical design to accommodate reduced foundation capacity (Piled	Through this CZMP and Education see 10.3.	GLC and Community/ Residents.	Community/Residents are aware that retrofitting or replacing houses can make them more resilient to coastal hazards. Some retrofitting of existing houses occurs to make them more suited to coastal hazard area.	2015	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	GLC planning / development assessment staff time.	Medium	GLC General funds.

No.	Management Strategy	Action	Method of Implementation	Responsibility	Performance Criteria	Commencing	Indicative Costs				Priority	Funding Options
							Yr 1 (2015)	Yr 2-5 (2015-2018)	Yr 6-10 (2019-2024)	Annual Maintenance		
		construction)										
Beach Nourishment												
3	Beach Nourishment											
3.1	Trial Nourishment –Seek Approvals	Approvals for extraction of sand from Winda Woppa spit (primary source) and Yacaaba sandwave (backup source). It may be possible to provide an amendment to the current approvals for extraction. Undertake Environmental Impact Assessment (EIA) to support approval.	Through this CZMP.	GLC in consultation with OEH, DPI, LMPA, DPI-Fisheries.	Approval granted for extraction of sand from Winda Woppa (primary source) and Yacaaba (backup source).	2015	$50,000 for amending approvals and EIA. Plus GLC staff and administration time				High	OEH part funding approved in March 2015. GLC General funds.
3.2	Trial Nourishment	Trial nourishment program, implement process whereby on a regular basis (4 or more times per year) sand is manually extracted from Winda Woppa spit and trucked to nourish the Jimmy Beach erosion. Program replaces current event based nourishment.	Through this CZMP.	GLC in consultation with OEH.	Proactive nourishment to provide buffer from erosion. Nourishment is no longer in direct response to an erosion threat.	2015	$350,000+ If GLC plant and staff can be used may be possible to reduce cost.	$700,000		To cease once on-demand system is set up (see 4.1).	High	OEH coastal management grants approved in March 2015 for trial only.
On-Demand Beach Nourishment System												
4	On-Demand Beach Nourishment system - Hopper Subject of findings of investigation (see 1.1)	Undertake design, approvals and Environmental Impact Assessment (EIA) for On-Demand beach nourishment system.	Through this CZMP.	GLC with support from OEH.		2017		$200,000 for design approvals and EIA.			Medium	OEH coastal management grants for capital works only.
4.1	On-Demand Beach Nourishment system - Hopper	On-Demand nourishment system funding acquired. Nourishment system construction.	Through this CZMP.	GLC with support from OEH	Nourishment system capable of undertaking on demand beach nourishment to meet Jimmys Beach storm demand.	2017		GLC staff and administration time. To apply for grants to fund works.	$1.7million capital	$100,000 to $200,000 subject to system. Expected system life 20+yrs	Medium	Ongoing annual cost will need to be funded through Council funds with Potential Levy on private landowners under LG Act.
Stormwater Management / Water Quality												
5	Stormwater Management/ Water Quality	Stormwater management to be considered in accordance with Tea Gardens Hawks Nest (SMP).	As part of SMP.	GLC.	Refer SMP.	2018	NA	NA	NA	Refer SMP.	NA	NA
Emergency Planning												
6	Emergency Planning	Review Emergency Action Sub-Plan (EASP) following endorsement of CZMP by GLC.	Council to review.	GLC with SES & OEH support.	EASP to be regularly reviewed against CZMP and work being untaken to ensure it is able to meet emergency needs.	2016	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.		High	GLC General funds.
6.1	Emergency Training	Training and Education of GLC personnel in emergency plan implementation	Council training	GLC with SES & OEH support.	GLC personnel able to implement emergency plan.	2016	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.	GLC Staff time and advertising costs.		High	GLC General funds.
Community Education												
7	Education	Advise residents and visitors of actions to be taken in a coastal storm emergency.	Through distribution/ promotion of EASP, review emergency/ evacuation plan.	GLC Emergency Management Committee and SES.	Ensure community (and visitors) are well educated about emergency procedures.	Dependent on frequency of major storm events.	SES & GLC Staff time and advertising costs.	SES & GLC Staff time and advertising costs.	SES & GLC Staff time and advertising costs.		High	Council resources in conjunction with SES.
7.1	Information/Signage	Distribute information/ install signage to educate community (including visitors) on ecological values, risks to public safety, Marine Park Zoning, dune management, access and parking.	Through funding for environmental improvement, in association with DuneCare activities, Department of	GLC, DuneCare, and DPI.		ongoing	GLC Staff time and signage costs.	GLC Staff time and signage costs.	GLC Staff time and signage costs.		High for matters relating to public risk. Medium	Undertaken with Council resources and/or grant funds in conjunction with DuneCare and DPI.

No.	Management Strategy	Action	Method of Implementation	Responsibility	Performance Criteria	Commencing	Indicative Costs				Priority	Funding Options
							Yr 1 (2015)	Yr 2-5 (2015-2018)	Yr 6-10 (2019-2024)	Annual Maintenance		
			Primary Industries (DPI) – Marine Parks								for other	
7.2	Planning advice	Provide planning advice on Section 149 Planning Certificates to advise of coastal risk policy and the adopted CZMP.	Through issue of Section 149 certificates.	GLC Planning Staff.		ongoing	GLC Staff time.	GLC Staff time.	GLC Staff time.		Medium	GLC General funds.
7.3	Building Standards	Promote use of coastal compatible development and retrofitting.	Through GLC Development Control Plan.	GLC staff.	Ensure community is updated and educated in benefits of coastal appropriate development.	ongoing	GLC Staff time.	GLC Staff time.	GLC Staff time.		Low	GLC General funds.
Access Management												
8	Access Management	Ensure current level of public access is maintained or improved where and when it is safe to do so.	Through this CZMP	GLC.	Current level of public access is maintained or improved where and when it is safe to do so.	2016	GLC Staff time.	May identify future access ways requiring Design & Construct (D&C).			Medium	GLC General funds (GF).
8.1	Pedestrians	Review number and location of beach accessways.	Through this CZMP.	GLC.	Current level of pedestrian public access is maintained or improved where and when it is safe to do so.	2016	GLC Staff time.	May identify future access ways requiring D&C.			Medium	GLC GF &/or Coastal Reserve Trust (CRT) fund.
8.2	4WD & Boats	Review provision for 4WD access. Carry out minor upgrades to Winda Woppa boat ramps as outlined in Waterways Shore Facilities Management Strategy.	As part of GLC and Greater Taree City Council (GTCC) (2010) Vehicles on Beach Policy. As part pf Waterways Shore Facilities Management Strategy.	GLC & GTCC.	If vehicle access policy is revised review and access may be stopped.	2016	GLC & GTCC Staff time .	May identify future access ways requiring D&C.			Medium	GLC General funds &/or CRT fund.
Dune/Natural area Management												
9	Dune/ natural area management											
9.1	Rehabilitate informal beach access tracks	Continue to monitor and rehabilitate informal beach access tracks	As part of Council's Bush Regeneration and LandCare activities. As Part of DuneCare program.	Cooperatively with DuneCare	Maintain and improve health of dune vegetation. Opportunities for sand build up on dunes and beach provided.	ongoing	DuneCare time and resources.	DuneCare time and resources.	DuneCare time and resources.		Medium	DuneCare time and resources. NSW Govt Environment Grant funding. GLC General funds.
9.2	Weed Management	Continue to control weed and pest species.	As part of Council's Bush Regeneration and LandCare activities.	GLC cooperatively with NPWS, Crown Lands, and Dune Care.	Reduce weed and pest species.	ongoing (minimum 5 year frequency)	$5,000 annually (for weed control).	$5,000 annually (for weed control).		$5,000 annually (for weed control).	High	GLC, NPWS, Crown Lands, and Dune Care to contribute.
9.3	Dune Planting	Dune planting and fencing.	As Part of DuneCare program.		Maintain and improve health of dune vegetation	Ongoing	DuneCare time and resources.	DuneCare time and resources.	DuneCare time and resources.		Medium	DuneCare time and resources.

Compliance Issues												
10	Compliance issues	Improve compliance/ enforce penalties for: • Unauthorised vehicle access • 4WDing over dune vegetation, and on beach • Littering • PWC/Power Boats in unauthorised area or dangerous driving • Unauthorised parking	Cooperatively GLC and other enforcement staff. • Council Rangers • Authorised Officers of Council. • Officers of the NSW Police Force & Water Police; • DPI – Marine Parks	GLC & other enforcement staff.	Reduction in unauthorised activity.	ongoing	Enforcement staff time.	Enforcement staff time.	Enforcement staff time.		Medium	GLC & other enforcement staff to provide staff time.
Foreshore Facilities												
11	Foreshore Facilities	Maintain and improve foreshore facilities such as boat ramp, picnic and recreation facilities.	Through GLC asset management program.	GLC	Facilities are maintained and improved where it is safe and appropriate to do so in response to coastal risks	As assets reach the end of their serviceable life or need for additional facilities is identified.	Not costed	Cost expected to occur over this period and beyond.	Cost expected to occur over this period and beyond.		Low	GLC General funds &/or CRT fund.

Figure 11 Management Actions for Jimmys Beach

8 CZMP FUNDING, MONITORING AND REVIEW

8.1 Funding

Implementation of CZMP actions may be eligible for funding via the Coastal or Estuary Management Program which is conditionally funded on a 50/50 basis between Council and NSW State Government. As noted in the program Guidelines, the priority for public expenditure is public benefit. Funding under these NSW Government Programs typically does not cover Council's administrative costs, staffing costs or maintenance programs.

Under the *Local Government Act 1993*, *Coastal Protection Works* may be constructed by, or on behalf of, landowners or by landowners jointly with a Council or public authority. *Coastal Protection Works* means activities or works to reduce the impact of coastal hazards on land adjacent to tidal waters and includes revetments.

The *Local Government Act 1993* also provides for *Coastal Protection Services* to maintain and repair coastal protection works, and to manage the impacts of such works. Section 496B provides for the making and levying of annual charges for coastal protection services for properties that benefit from coastal protection works. This means that landowners and other stakeholders who would benefit from the works or services can be charged an additional levy by Council.

The principles of the *Coastal Protection Service Charge Guidelines* (DECCW 2010) may be considered in determining levies. The guidelines provide guidance on levies associated with maintenance costs and cost-sharing, and include a number of items to be considered in calculating the charge such as legal costs, insurance, accounting and reporting.

On-demand beach nourishment would reduce the coastal hazard for properties at risk along The Boulevarde and provide certainty to owners. Benefits would include:

- market values maintained due to reduced coastal hazard risk
- minimisation of development constraints associated with coastal hazards

Based on the above, the funding options set out in *Table 4* are indicative only at this time and additional costs such as legal costs, insurance, accounting and reporting are not included.

Resources for implementation of some actions included in the CZMP include various State Government environmental programs and volunteer groups such as the local DuneCare group. These programs and groups are currently available/active and contribute significantly to the management options available to Council.

8.2 CZMP Review

This Plan is to be reviewed periodically;

- Following the completion of various actions
- As more data on coastal processes and climate change becomes available e.g: updates on climate change induced sea level rise

- In response to changes in Government policy.

Based on the above, a review of the hazard lines shown in Appendix A should also take place.

An initial review in 2020 is suggested to consider the progress of key actions identified in the CZMP and subsequent reviews (if not triggered by factors as outlined above) no later than 10 years to ensure the plan remains current.

Any major amendments to the CZMP would be publicly exhibited for community comment. Progress on the implementation of the CZMP would be included in Council's Annual Corporate Report and integrated planning and reporting into the future.

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Jimmys Beach CZMP

Appendix A – Hazard Maps

The limits of the *Zone of Wave Impact and Slope Adjustment* and the *Zone of Reduced Foundation Capacity* have been calculated using the values for design storm erosion demand, for the 2050, 2060 and 2100 planning periods, adding the estimated recession allowed for as a result of upper range sea level rise prognoses as advocated by the NSW Sea Level Rise Policy and measured long term recession.

To obtain the location of the various zones, average values of the different profiles would normally have been used. However, several anthropogenic influences (beach nourishment, dune stabilisation, etc.) would have distorted the average result. The Airborne Laser Scanning (ALS) data, which provides a greater density of data (dated from 2006) was used to define the hazard lines.

The immediate hazard limits due to the design storm erosion volume are shown in Figure A1 for the Jimmys Beach coastline. It can be seen that there is no private property at immediate risk of storm damage. However parts of The Boulevarde in front of the residential development between Kururma Cres and Guyra St lie within *the Zone of Slope Adjustment*.

For the 2050 and 2100 planning periods, long term beach recession and sea level rise limits were added to the design storm recession for several locations along the beach, to determine the seaward limits of the *Zone of Reduced Foundation Capacity* and *Stable Foundation Zone*. Figure A2 illustrates the hazard limits for 2050 and Figure A3 illustrates the hazard limits for 2100. For the 2050 planning period, there will be approximately 16 properties landward of The Boulevarde within *the Zone of Slope Adjustment*. For the 2100 planning period, there will be about 25 more properties along The Boulevarde extending into *the Zone of Slope Adjustment* with a breakthrough in the back beach area into the Myall River channel.

For the 2060 planning period, there will be approximately 18 properties within *the Zone of Slope Adjustment* and 11 additional properties extending into *the Zone of Reduced Foundation Capacity* (refer to Figure A4).

It should be noted that the hazard mapping assumes that the dune is composed of erodible material and that the nearshore beach profile is in equilibrium with the wave climate. It also assumes that present day management practices such as beach nourishment are discontinued. Continuation of the present day management practice of beach nourishment would improve the long term coastal hazard prognosis along Jimmy's Beach.


LEGEND
Present Landward Limit of the Zone of Wave Impact and Slope Adjustment
Present Landward Limit of the Zone of Reduced Foundation Capacity
N
DATE 06/12/2011
0 200 400
metres
COORDINATE SYSTEM
MGA 94 Zone 56
FIG NO. A1
FIGURE TITLE Present Hazard zones at Jimmys Beach
PROJECT NO. 3001829
PROJECT TITLE Great Lakes Coastal Hazard Study
CREATED BY A.XIAO
LOCATION I:\projects\3001829 - Great Lakes Coastal Hazard Study\009DATA\GIS
SMEC
Great Lakes COUNCIL
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LEGEND
2050Landward Limit of the Zone of Wave Impact and Slope Adjustment
2050 Landward Limit of the Zone of Reduced Foundation Capacity
N
DATE 06/12/2011
0
200
400
metres
COORDINATE SYSTEM
MGA 94 Zone 56
FIG NO. A2
FIGURE TITLE Year 2050 Hazard Zones at Jimmys Beach
PROJECT NO. 3001829
PROJECT TITLE Great Lakes Coastal Hazard Study
CREATED BY A.XIAO
LOCATION I:\projects\3001829 - Great Lakes Coastal Hazard Study\009DATA\GIS
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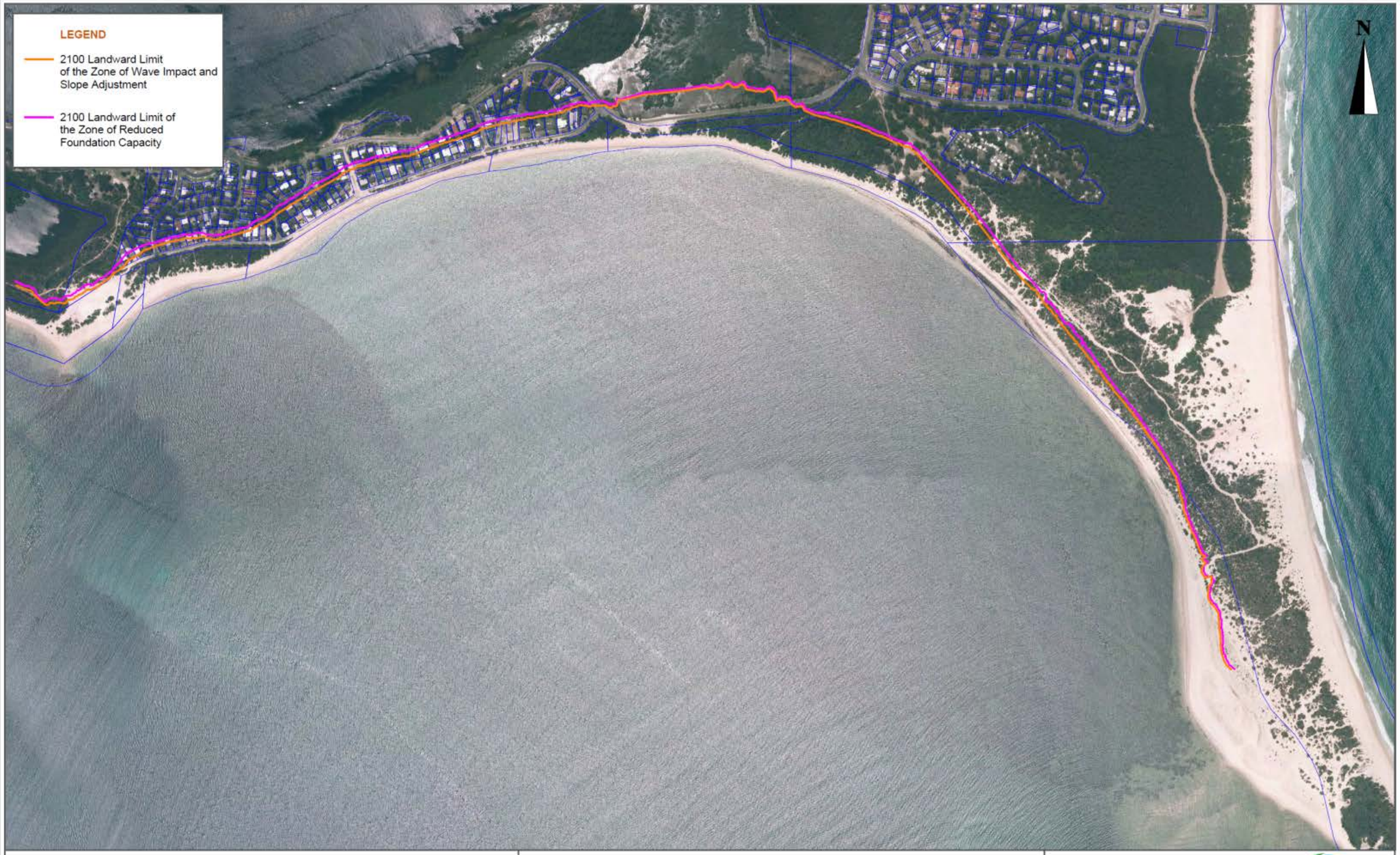

DATE 06/12/2011 | 0 200 400 metres | COORDINATE SYSTEM MGA 94 Zone 56 | FIG NO. A3 | FIGURE TITLE Year 2100 Hazard Zones at Jimmys Beach

PROJECT NO. 3001829 | PROJECT TITLE Great Lakes Coastal Hazard Study | CREATED BY A.XIAO | LOCATION I:\projects\3001829 - Great Lakes Coastal Hazard Study\009DATA\GIS

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LEGEND
2060 Landward Limit of the Zone of Wave Impact and Slope Adjustment
2060 Landward Limit of the Zone of Reduced Foundation Capacity
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DATE 06/12/2011
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MGA 94 Zone 56
FIG NO. A4
FIGURE TITLE Year 2060 Hazard Zones at Jimmys Beach
PROJECT NO. 3001829
PROJECT TITLE Great Lakes Coastal Hazard Study
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Jimmys Beach CZMP

Appendix B - Review of Management Options

APPENDIX B REVIEW OF MANAGEMENT OPTIONS

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1 REVIEW OF MANAGEMENT OPTIONS

The currently adopted management strategy for Jimmys Beach is beach nourishment to protect The Boulevarde and residential development along Jimmys Beach. A number of options were examined during preparation of the CZMP to determine if alternate management strategies can increase the efficiency, cost-effectiveness and certainty of protecting property, while maintaining beach amenity into the future. The following management strategies have been reviewed in Sections 1.1 to 1.3 ;

- Current Beach Nourishment Strategy,
- On-Demand Sand Pumping – installation of a pumping system to deliver nourishment from a pipeline and reduce ongoing costs,
- Alternate options - a number of general coastal zone management options are discussed in relation to strategies raised by stakeholders during community consultation, and
- Development controls.

These management strategies are then summarised in *Table 3* with estimated costs (capital & maintenance) and advantages/disadvantages of each option provided.

1.1 Beach Nourishment Options

A recent study assessing practical options for future ongoing nourishment at Jimmys Beach determined that the best option for ongoing nourishment should involve smaller and more frequent campaigns to avoid out-of-equilibrium beach alignments that promote rapid erosion to return to a more natural alignment. Larger scale over nourishment creating these beach profiles are rapidly re-profiled by waves and any additional effective erosion buffer is lost. Based on historical rates of erosion and accretion, the ideal nourishment strategy would involve placement of approximately 10,000m^3 of sand onto the Jimmys Beach 'null point' every 6 months (BMT WBM 2012).

The outcome of the *Sand Nourishment Assessment* (BMT WBM 2012) favoured hydraulic pumping of sand using a hopper arrangement. Both the Winda Woppa/Lower Myall River entrance sand spit and Yacaaba sandwave would be suitable sites for a hopper, although the greater in-situ supply of sand at Winda Woppa would favour this site over Yacaaba. The Sand Shifter may also be a preferred option subject to further detailed investigations and based on the assumption that it does not encounter regular blockages. Both options will be discussed further in Section 1.1.2 .

The two potential sand sources for beach nourishment at Winda Woppa and Yacaaba were assessed for suitability based on their grain size characteristics. It was found that the sand source at Yacaaba is more suitable as the grain size characteristics of this source are more compatible with those of the native beach sand than the source at Winda Woppa. Due to the greater percentage of fines at Winda Woppa increased volumes of nourishment would be required (SMEC 2013). However, although historically there has been considerable accretion on the Yacaaba sandwave, the rate of recovery of the sand shoal following recent dredging works has been slow. Morphology modelling also flags future recovery of extraction areas as an issue, which questions the viability of this location as a long-term sustainable source for nourishment sands (BMT WBM 2012). Before committing to any permanent infrastructure it would be recommended to undertaken monitoring and field trials.

1.1.1 Current Beach Nourishment Strategy

Historically beach nourishment has taken place in two forms, 1) Small scale emergency works (<10,000m^3), and 2) Larger scale operations (>10,000m^3 to 100,000m^3). The smaller scale emergency works are typically undertaken and funded by Great Lakes Council (GLC) using land based plant. As larger scale operations involving dredging exceed the financial capacity of council there has been a reliance upon external funding (typically from NSW Government). *Figure 1* shows a larger scale beach nourishment campaign in progress with a dredge pipeline delivering nourishment sand to Jimmys Beach.

Figure 1 Beach Nourishment works at Jimmys Beach

*Table 1 p*rovides a summary of known beach nourishment works (and locations where specified) sourced from available literature and other information. The estimated nourishment volumes presented in *Table 1* are based on a range of sources of variable reliability, with actual volumes difficult to determine particularly in the case of emergency beach nourishment.

Table 1 Summary of available data on nourishment volumes

Year	Volume (m^3)	General Nourishment Location	Sand Source	Source of Information
1984	43,000	-	Paddy Mars Bar	PBP 2005
1987	20,000	Vicinity of Guya Street	Paddy Mars Bar	PBP 2005
1988	80,000	Fishermans Walk to Gemalla Street	Western Corrie Island Channel	Watson 1997
1992	48,000	Kururma Crescent to Gemalla Street	Northern Corrie Island Channel	PBP 2005
1995	69,000	Kururma Crescent to Gemalla Street	Paddy Mars Bar	PBP 2005
1998	100,000	-	Western Corrie Island Channel	PBP 2005
1998 -2008	100,000[1]	Emergency nourishment (Jacabba Street to Gemalia Street)	Terrestrial stockpiles mainly 'Dead Mans' area	GLC 2011a
2007	6,000	Emergency nourishment area (Jacabba Street to Gemalia Street)	-	Vila-Concejo et al (2008)
2008	50,000	-	Sandwave adjacent to Yacaaba Head. Permanent pipeline used	Vila-Concejo et al (2010)
2009	10,000	-	Unknown	Vila-Concejo et al (2010)
2010	5,000[2]	Beach nourishment area (Jacabba Street to Gemalia Street)	Corrie Channel	Tattersalls Lander
2010	23,000[3]	Beach nourishment area (Jacabba Street to Gemalia Street)	Yacaaba sandwave	Tattersalls Lander
2011	5,000	Emergency nourishment area (Jacabba Street to Gemalia Street)	'Dead Mans' sand dune (emergency works)	BMT WBM (2012)
2012	9,000	Emergency nourishment area (Jacabba Street to Gemalia Street)	'Dead Mans' sand dune (emergency works)	BMT WBM (2012)

1. This estimate appears to be based on the number of emergency nourishment interventions and the estimated volume of a typical emergency intervention and is subject to considerable uncertainty.
2. This estimate is based on the volume of the dump truck hoppers used in the works and the number of trips made.
3. This estimate (rounded up from 22,982m^3) was provided by Rob King (Principal) from the dredging contractor (National Dredging Services) who undertook the 2010 works (pers. comm. Bob Lander)

Based on the information presented in *Table 1*, it is estimated that a total of approximately 550,000 m^3 (568,000 m^3 with some uncertainty) of sand has been placed on Jimmys Beach, at a total estimated cost of approximately $3.2 million. This gives an annual average beach nourishment volume of approximately 21,000 m^3, delivered and placed at an average cost of $5.80/ m^3. This makes no allowance for cost escalation, based on

more recent works a cost of approximately $15/m^3 would be considered more realistic. Recent small scale emergency works have been undertaken by GLC at cost of about $70,000-$80,000 per annum for 5,000-9,000m^3 (giving a cost rate of $10-$15/m^3). Recent larger scale works involving dredging have been in the order of $600,000 - $700,000 per campaign and have removed some 30-50,000m^3 (giving a cost rate of $15-20/m^3) (BMT/WBM2012).

Based on annual beach nourishment of 20,000m^3/yr (10,000m^{3}every 6 months) the cost to continue nourishment has been estimated at between $364,500 (Yacaaba) to $387,900 (Winda Woppa) subject to sand source (BMT/WBM 2012). This exceeds the likely amount available under council budgets (approximately $100,000 based on emergency works) and would require supplementary annual funding external sources. Noting that cost estimates were based on the assumption that council would outsource all elements of the work except project management, should council choose to supply plant and labour some reductions in cost could be achieved.

1.1.2 On-Demand Sand Pumping

Given the current method for beach nourishment requires uncertain externally funded work to supplement small scale emergency works undertaken and funded by Great Lakes Council (GLC), alternative options were explored to reduce ongoing costs. A recent study assessing options for future ongoing nourishment at Jimmys Beach stated that the best long-term option for low ongoing operational costs was on-demand hydraulic pumping of sand (WBM BMT 2012). Hydraulic transfer of sand from one area of the beach compartment to another is a suitable solution at Jimmys Beach as it provides a flexible system that largely works in with the natural system. The most cost effective options were;

- Onshore pumping unit consisting of an integrated slurry pump and hopper unit (**Hopper**), and
- Sand Shifter offshore sand bypass system (**Sand Shifter**)

Winda Woppa (Lower Myall River) provides a closer pumping distance than the Yacaaba sandwave (approximately 2.1 km compared with 2.7 km). There is however an existing pipeline from Yacaaba to Jimmys Beach that may be able to be utilised to offset some of the cost differential between the two options. Yacaaba is also a more compatible sand source so less additional overfilling will be required. For the purpose of this investigation it is deemed that both options will cost similar amounts, the reduced distance of pumping from Winda Woppa will be offset by use of an existing pipeline and more compatible sand at Yacaaba. These options should however be investigated further before committing to either site.

Pumping has added benefits over traditional trucking used for current small scale works. It minimises disruptions to public amenity and beach access (see *Figure 2*) while minimising the impacts to public infrastructure including roads. Delivery by pipe also allows material to be discharged directly to the location requiring minimal profiling works.

Figure 2 Sand being pumped onto beach Burleigh, Queensland Australia

Hopper

Beach nourishment using a hopper system involves conventional earthmoving equipment to excavate nourishment material from the source. The nourishment material is deposited into the hopper which has an integrated slurry pump that mixes the sand with water from a separate water supply pump to form the slurry. The slurry is then pumped through a pipeline to the nourishment site. Subject to pumping distances a booster pump can be required along the pipeline.

A tracked mobile hopper such as the *Slurrytrack* (CGC Dredging) would enable the hopper to be located at the material source so earthmoving equipment can directly fill the hopper. *Figure 3* shows a Slurrytrack unit in operation using an excavator to fill the hopper directly. Nourishment volumes of approximately 20,000m^3/yr would be within this type of hoppers operating range with other systems at Mandurah and Dawesville transporting volumes in the order of 100,000m^3/yr. Examples of the hopper system used in nourishment projects include;

- Mandurah, Western Australia (100,000m^3/yr),
- Dawesville, Western Australia (100,000m^3/yr), and
- Port Geographe, Western Australia.

Figure 3 Tracked mobile hopper pumping unit operating in Dawesville, Western Australia

The Hopper system would be suitable for either source at Winda Woppa or Yacaaba sandwave. If the Yacaaba sandwave was used as the source it is likely that an existing pipeline between Jimmys Beach and the Yacaaba sandwave could be utilised. A 300mm pipeline is consistent with the pipe sizes generally used for this type of pumping and nourishment operation.

Sand Shifter

The Sand Shifter is a proprietary system developed by Slurry Systems Marine Pty Ltd. The Sand Shifter unit is a single structure that acts as a sand recovery and transport system (see *Figure 4*). The unit is based on a fluidising principle that allows sand to be recovered from below the seabed. The fluidising system on the Sand Shifter comprises a fluidising pipe below an inverted channel and barrier that both traps and creates a sand-water slurry. The principle is that the slurry is less dense than the surrounding material and so is displaced by this surrounding material and is forced up into the inverted channel. Once contained in the inverted channel the slurry is then pumped along a pipeline to the nourishment site (with additional booster pumps onshore as required).

Figure 4 Typical Sand Shifter Unit Configuration (source: Slurry Systems Marine)

Generally Sand Shifter units are installed in a configuration parallel to the shore because the onshore-offshore sediment transport through wave and storm action is generally considered greater than longshore sediment transport. It is believed that sand transport volumes in the order of approximately 20,000 m^3/annum would be within this unit's typical operating range, which is similar to the operations at the Noosa River, Queensland.

As the Sand Shifter removes sand from the recovery location, it becomes self burying and can be buried up to 8 m deep. As this burying occurs, a basin or 'crater' forms around the buried unit, thereby attracting sand deposition under the influence of waves and tidal currents, which increases the efficiency of the unit.

Specific examples of projects utilising permanent Sand Shifter installations include:

- Noosa, Queensland (30,000 to 40,000 m^3/yr); and
- Port of Portland, Victoria.

Slurry System Marine Pty Ltd offers the option of trial installations with Noosa originally being a trial system. Photographs showing a working example of a Sand Shifter unit in operation at Noosa are shown in *Figure 5*. Trials have also taken place at Lakes Entrance, Victoria and Point Cartwright/ Mooloolah River, Queensland. These trial systems can be set up with diesel pumps with land side equipment consisting of a water tank and two shipping containers for pumps and control equipment. This type of trial system could be suitable for either Winda Woppa or Yacaaba.

Figure 5 The Noosa trial Sand Shifter unit sourcing sand from the shore (left) and onshore booster pumps and pipework (right)

One consideration that needs to be taken into account with the Sand Shifter is that the fluidising jets and other components of the unit are prone to marine growth and potentially blockages. There are extensive seagrass beds in the region which could lead to blockages. Thus the unit may need to be recovered on a periodical basis for maintenance, which may require access by a crane or similar leading to much higher overall maintenance costs.

Comparison of Hopper and Sand Shifter

The *Sand Nourishment Assessment* (BMT WBM 2012) concluded that "*taking into consideration the social, environmental and financial factors, the preferred nourishment option is a fixed hopper on Winda Woppa spit, with sand loaded manually into the hopper by GLC staff for hydraulic transport to Jimmys Beach"*.

BMT WBM (2012) provided a cost estimate for various methods of hydraulic beach nourishment at Jimmy Beach with the Hopper and Sand Shifter options summarised in *Table 2* below. It was found the Sand Shifter option has the lowest annual recurrent cost if there is no requirement for equipment recovery. However given the unknown frequency that the Sand Shifter equipment may need to be recovered for maintenance and blockages there is a high chance of significant cost escalation. Also, if the loading and spreading of material was carried out by GLC staff and plant for the Hopper arrangement the annual cost would be reduced to approximately $100,000 based on an expected operational life for the system of 20 years.

Table 2 Comparison of cost estimates for selected methods of beach nourishment

Description	Hopper	Sand Shifter
Capital costs	$1.69 M	$1.76 M
Annual costs	$182,500#	$104,000*
Total after 5 years	$2.6 M	$2.28
Total after 10 years	$3.52 M	$2.8
Total after 20 years	$5.34 M	$3.84 M

If GLC plant and staff can be used to load hopper may be possible to reduce cost.

* Cost is subject to typical maintenance. Cost escalation could be considered for higher levels of maintenance due to equipment recovery and blockages.

The *Sand Nourishment Assessment* (BMT WBM 2012) considered a number of options so did not explore the preferred options in sufficient detail to make a final decision to proceed with the preferred option of a fixed hopper on Winda Woppa spit. A further detailed feasibility assessment for an on-demand beach nourishment system should be undertaken to provide a detailed technical investigation of the hopper system and its viability.

Given the potential cost benefits of a Sand Shifter system, if the issues associated with blockages and recovering equipment from such a remote location can be overcome, further consideration of this option should also be given in the detailed feasibility assessment.

Piling and Lightweight Removable Construction.

Whilst beach nourishment will provide a buffer it will not provide ultimate guaranteed protection to houses from extreme events. To complement the beach nourishment management option, houses in the coastal risk area should have piled footings or be lightweight removable construction.

1.1.3 Review of Nourishment

Beach profile monitoring should take place over the next 5 to 10 years measuring pre and post storm beach profiles. The beach profile monitoring should be used assess the performance of the nourishment program and adjust annual beach nourishment volumes accordingly.

If in the longer term the beach nourishment program is not providing suitable enough buffer then complementary options such as a groynes or a seawall as discussed below in Section 1.1.4 may be considered.

1.1.4 Alternative Options

Through community consultation there were a number of suggestions for alternative coastal zone management options to either be considered as stand-alone options or in conjunction with beach nourishment. These included;

- Artificial Reef / Offshore wave buffer / Removable geobag structure,
- Groynes
- ShoreGro/ Dewatering,
- Seawall (vertical piled, rock wall, retaining wall, sheetpiles, rocks) to protect road and beach nourishment,
- Breakwater included as part of a marina development,

Whilst these options may have been successfully applied to other coastlines, the dynamic and individual nature of the coastal environment requires that options be carefully considered to determine if they will achieve the desired outcomes. Each of these options will be discussed in more detail and assessed for practicality at Jimmys Beach.

Artificial Reef / Offshore Wave Buffer

Recent reviews of artificial reefs have shown that the majority of these structures had no significant accretionary impact on the shoreline alignment compared to the predicted morphological responses. In some cases negative impacts and loss of sediment can even be caused by the structure blocking the seaward directed bed return flow and diverting it longshore creating erosion shoreward of the structure (DHI/SMEC 2014).

Artificial reefs are very sensitive to conditions and even when extensive modelling and testing has taken place they have not performed as expected. They are only suitable for small tidal ranges, are sensitive to sea level rise and offer limited protection during storm events. Due to the requirement for offshore construction they are relatively expensive for the protection they can provide. Considering all of the above factors, unless significant complementary benefits can be provided from multipurpose uses (diving / fish habitat / surfing), an artificial reef would not be deemed suitable for application at Jimmys Beach due to the high potential for variable performance.

The structure could be constructed of Geotextile Sand Containers (GSC) to provide removability should the structure not perform as expected. However although there is the perception that GSC structures can be easily removed, this is not generally true in practice and a significant budget would need to be allocated for the activity. Pratte's Reef in California (a trial reef that was constructed from GSC's for $550,000) failed to produce the desired outcomes and was removed. The cost to remove Pratte' reef was $551,000, essentially the same cost as the construction (DHI/SMEC 2014). It should also be noted that in all cases where GSC's have been used in construction of artificial reefs, failures of containers have occurred, which would lead to further variability in performance.

Artificial reefs can provide potential for beneficial use in beach protection in certain instances. However, given the potential variability in performance, should only be implemented if significant budget can be allocated to monitoring and providing alternate protection should they not perform as expected. Hence they have not been considered further for application at Jimmys Beach.

Groynes

Groynes are structures that extend from the shore into the active zone of littoral drift transport. They do not directly counter erosion, only transferring the processes to other locations. Groynes block longshore transport, so can be used to trap sand on the up-drift side of the groyne. This can be beneficial in some cases but negative in others as it does negatively impact on the down-drift side.

Groynes do not directly prevent offshore sand transport by waves and currents. In some cases they even exacerbate the development of rip currents during storm events causing more sand to be transported offshore. Consequently at this stage groynes have not been explored further as a coastal zone management option for Jimmys Beach.

Groynes may be considered as a complementary option to beach nourishment if nourishment alone is proving to be too expensive and benefit can be seen from reducing longshore drift. Amenity and swimmer safety issues would have to be addressed and beach nourishment would still need to be used to manage offshore storm losses.

Dewatering/ShoreGro

Beach dewatering consists of artificially lowering the groundwater table of the beach, with its proponents suggesting that this results in enhanced infiltration losses during uprush/backwash cycles while promoting sediment deposition at the beach face.

A prototype system was implemented in Dee Why Beach, NSW (Davis *et al.,* 1991) with monitoring of the site concluding that there was no discernible reduction of beach erosion

due to the system. A recent review of 19 beach dewatering systems around the world determined that approximately half had either negligible effects on shoreline stabilisation or monitoring results were inconclusive. Beach dewatering systems are susceptible to storm damage and do not provide adequate protection from storm erosion (Mariani et al 2013). As such, dewatering systems are not considered appropriate at Jimmys Beach as a coastal zone management option.

Seawall

The highly reflective nature of a seawall can exacerbate erosion in front of a wall resulting in loss of beach amenity. To address potential loss of beach amenity as it is an important community value it is recommended that a seawall option only be considered in combination with beach nourishment and dune construction as per options discussed in Section 1.1.3

A seawall would extend from Kururma Crescent to near the eastern end of The Boulevarde with return walls at either end. It would protect The Boulevarde and properties behind it in the event that the primary defence of beach nourishment and constructed dune system had not been adequately maintained at the time of a severe erosion event. The seawall would be located as far landward as possible to limit the influence on coastal and dune processes. To minimise the interaction between the seawall and coastal processes (and hence frequency of exposure), a vertically piled structure is recommended on an alignment as far landward as possible, i.e. on the southern side of The Boulevarde roadway. A sheet pile wall can be considered as a similar alternative to the vertical piled wall proposed.

A rock structure as an alternative wall construction type would extend further seaward thus reducing valuable beach width and become exposed more often. Therefore a wall with minimum width is considered the most appropriate potential option for Jimmys Beach.

For a length of approximately 700m along the foreshore a seawall would cost in the order of $3.5 million to construct. As beach amenity is considered a valuable asset for the community and hence a seawall would need to be in conjunction with beach nourishment it is not at this stage considered as an alternative option. More regular on demand beach nourishment should first be implemented and a seawall only considered as a complementary option should beach nourishment not provide suitable management of the coastal risk and assets are deemed necessary to be maintained.

Breakwater as part of marina development

Many stakeholders found that the quiet nature of Jimmys Beach was one of its biggest assets and felt development should be limited. A marina development would not be in keeping with this so this option has not been considered further.

1.2 Environmental Considerations for 'Built' Options

1.2.1 Potential Environmental Impacts

Beach Nourishment Options

The beach nourishment options involve relocating sand from within the same compartment so should not interfere with overall sediment transport processes. There would be minor, localised, temporary impacts where sand was removed for beach nourishment.

An Environmental Impact Assessment (EIA) should be undertaken to support approval applications for extraction of sand at Winda Woopa and/or Yacaaba sandwave. Approvals should incorporate transport of sand by both trucking and hydraulic pumping, with hydraulic pumping expected to reduce potential impacts.

Seawall

A seawall would arrest the continued recession of the foreshore and storm erosion, however it is likely to exacerbate erosion of the beach seaward of the structure and result in scour at each end of the structure during erosion events. This would result in adverse visual, recreational use and public access impacts. An example of a partially exposed vertically piled seawall following severe erosion at Kingscliff Beach is shown in *Figure 6*. Note the dumped rock at the end of the wall to prevent scour of the adjacent unprotected dune.

When considering construction of any seawall the impacts should be assessed in accordance with the DECCW (2010a), *Draft guidelines for assessing the impacts of seawalls*.

Under Section 55M of the *Coastal Protection Act 1979*,a consent authority for a seawall development must be satisfied that adequate arrangements have been made to restore a beach, or land adjacent to the beach, if any increased erosion of the beach or adjacent land is caused by the presence of the seawall. This is in addition to consideration of matters under Section 79C of the *Environmental Planning and Assessment Act 1979*.

Under amendments to the Infrastructure SEPP, consent authorities will also be required to consider matters listed in clause 8 of *State Environmental Planning Policy No 71 Coastal Protection*. These requirements include the need to consider the likely impacts of coastal processes and coastal hazards on a seawall and any likely impacts of the seawall on coastal processes and coastal hazards.

As such, to support the construction of a seawall at Jimmys Beach, evidence would be required to demonstrate the need for a seawall and measures provided to mitigate the potential impacts of a seawall. Therefore any proposed seawall structure would require, complementary ongoing beach nourishment campaign to mitigate potential erosion exacerbation due to reflection and scour. An Environmental Impact Assessment (EIA) would need to be undertaken to support an application for approval to construct a seawall.

Figure 6 Cudgen Headland SLSC Seawall, Kingscliff Beach, northern NSW

1.2.2 Environmental Approvals

State Environmental Planning Policy Infrastructure 2007

Under *State Environmental Planning Policy (SEPP) Infrastructure 2007*, Clause 129, development for the purpose of foreshore management activities (which includes coastal protection works such as revetments and beach nourishment) may be carried out by, or on behalf of, a public authority without consent on any land. This includes construction works, routine maintenance works, emergency works, and environmental management works. In the case of work that does not require consent, Clause 228 of the *Environmental Planning and Assessment (EP&A) Regulation 2000* lists factors that must be taken into account. This includes any impact on coastal processes and coastal hazards, including those under projected climate change conditions.

1.3 Development Controls

1.3.1 NSW Coastal Planning Guideline

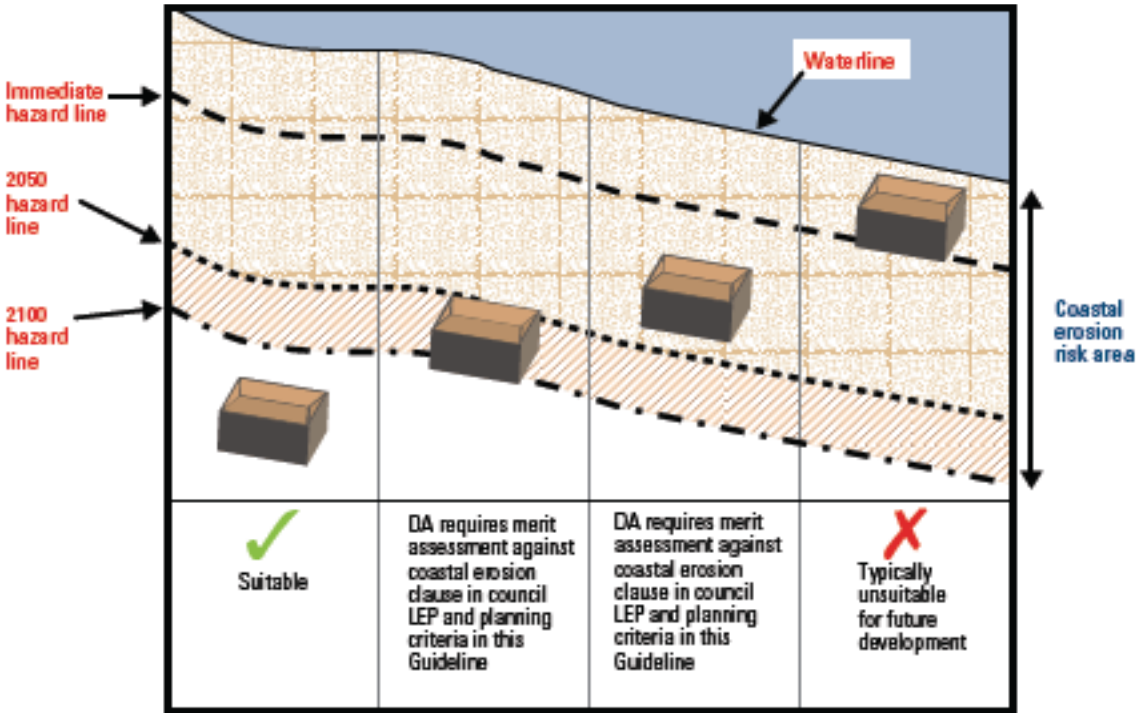
The *NSW Coastal Planning Guideline: Adapting to Sea Level Rise* (DoP 2010), as adopted by Council, sets out strategies that could be employed to address coastal hazards including:

- configuring the development site layout to minimise exposure to coastal risks e.g. ensuring that buildings and infrastructure are placed in low risk areas on the site and provide open space and landscaping between buildings and areas of higher hazard risk

- constructing buildings or structures that are easily decommissioned, disassembled or relocatable either onsite or offsite as required
- providing for safe exit routes during storm events.

It should be noted that in some instances a site may be deemed unsuitable for further development, as illustrated in the guideline and reproduced in *Figure 7*. Time and/ or 'trigger' limited development consent conditions could be applied to allow ongoing sustainable use of coastal areas until such time as coastal risks threaten life and property.

Figure 7 Coastal Hazard Planning Areas and DA Assessment



1.3.2 Great Lakes Local Environmental Plan (LEP) 2014

The *Standard Instrument—Principal Local Environmental Plan* commenced in 2007 and is the current template for all NSW LEPs. The *Great Lakes LEP 2014* adopts the following standard LEP clauses and additional specific controls relating to Jimmys Beach – Winda Woppa.

- Clause 3.3 which excludes development in environmentally sensitive areas, such as coastal waters, from being exempt or complying development. The LEP 2014 also includes lands within 100 m of coastal waters and coastal lakes as environmentally sensitive areas.

- Clause 5.5 which relates to implementation of the principles of the *NSW Coastal Policy*, matters to be considered in the assessment of proposed development in the coastal zone including visual, beach amenity, public access and ecological impacts. In addition consent should not granted unless the consent authority is satisfied that the development would not be significantly affected by coastal hazards, or have a significant impact on coastal hazards, or increase the risk of coastal hazards in relation to any other land.

- Clause 5.7 which requires consent for development below mean high water mark.

- Clause 7.18 of the LEP 2014 is specific to residential development at Winda Woppa and states that development consent must not be granted on land

identified as “Development Restricted Area” (see *Figure 8*) on the Winda Woppa Coastal Development Map unless;

a) a development will be situated on a lot with an area not less than 450 square metres, and

b) the development will not involve the erection of more than 2 dwellings on that lot, and

c) the development will comprise a single building, and

d) the gross floor area of at least one dwelling will not exceed 60 square meres.

Figure 8 Development Restriction Area – Great Lakes LEP 2014

Clause 7.4 which applies to land identified as “Coastal Risk” on the Coastal Risk Planning Map (see *Figure 9*) and requires the consent authority to consider a number of matters including whether the development is likely to be adversely affected by coastal hazards, alter coastal processes to the detriment of the environment and increase the risk to other development. It also requires measures to mitigate risks to life, as well as structures by making provision for relocation, modification or removal.

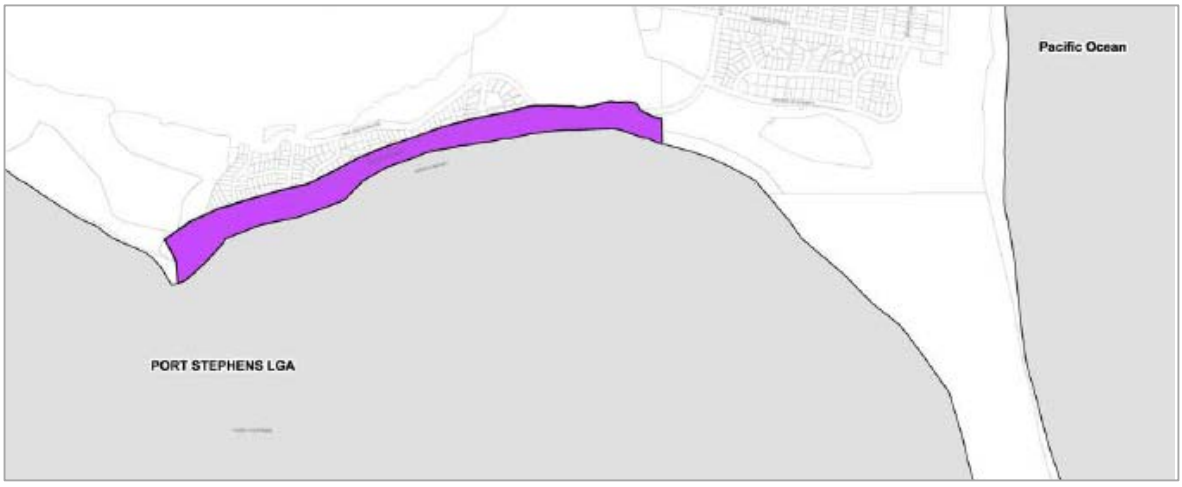


Figure 9 Coastal Risk Planning Area – Great Lakes LEP 2014

1.3.3 Great Lakes Development Control Plan

Under the DCP 2014, Winda Woppa (which is within the Hawks Nest locality) is to be *recognised as a particularly sensitive area with new development being sensitively designed to take into account potential coastal erosion hazards, sea level rise and flooding.* In addition, *development is to be limited to low scale and low density housing designed to fit within this scenic area and to be protected from natural hazards.*

The Development Control Plan (DCP) 2014 also contains the following provisions in relation to coastal development.

Chapter 3 Character Statements (3.3.1.2 Hawks Nest Additional Low Density Residential Character Statement)

"Development at Winda Woppa is to be limited to low scale and low density housing developments designed to fit within this scenic area and to be protected from natural hazards."

Chapter 4 Environmental Considerations (4.3 Sea Level Rise and Coastal Erosion)

"Objectives - To ensure people and assets are safeguarded from risks associated with sea level rise and coastal erosion."

"Controls

1. For development proposals on land identified in the coastal hazards map under Great Lakes Local Environmental Plan 2014, a report from a suitably qualified geotechnical engineer and an engineer specialising in coastal marine processes will be required, to determine the geotechnical and physical stability of the land is not compromised and to determine suitable measures for protection of the building against coastal erosion and recession, changes in storm frequency and intensity and sea level rise.
2. Where native vegetation that currently protects a dune system from erosion processes will be affected by proposed development, a Vegetation and Environmental Impact Assessment by a qualified arborist or ecologist may be required.
3. A linear sea level rise of 0.9m to the year 2100 is to be taken into account.
4. A Geotechnical Report shall also be required on sites affected by coastal hazards such as coastal erosion or erosion or reduced foundation capacity. "

Chapter 5 (5.5 Setbacks)

"To maintain visual amenity along the coastal frontage within the Pacific Palms area, a minimum setback of 15m from the seaward property boundary applies to the coastal hazard areas identified within Great Lakes LEP coastal hazard maps. No habitable buildings or structures are permitted within the setback area."

Chapter 9 (9.2.1 Design Principles)

"Good subdivision design goes beyond minimum lots size requirements. Careful appraisal and systematic analysis of the site with consideration of all the natural and man-made constraints is required to ensure that its best qualities are used most effectively to suit the proposed development. The matters that may be taken into account when determining the suitability or otherwise of a site for subdivision include, but are not necessarily limited to,

the following: Hazards and Constraints: Potential impact of sea level rise and coastal erosion and the need for foreshore protection”

Table 3 Assessment of Risk Management Options

Option	Capital Cost	Ave Annual Cost/Yr	Advantages	Disadvantages
1. Beach Nourishment	n/a	$350,000+ (as per current strategy)	'soft engineering' option which maintains beach amenity	Requires establishment of plant for each nourishment campaign. Relies on sufficient nourishment volume being available to protect assets during a severe erosion event which is not predictable. Funding for beach nourishment may not be allocated/ made available when 15 m trigger is met or in an emergency. Beach nourishment may not be eligible for State Government funding assistance as it is considered 'maintenance'. May require separate environmental impact assessment and approvals for each nourishment campaign.
2. On-demand sand nourishment (Hopper)	$1.7 million	$182,500 If council staff/plant/equipment could be utilised for ongoing works maybe able to reduce this cost to approximately $100K	Minimises establishment time and costs for beach nourishment. More efficient system for beach nourishment. System capital cost would be eligible for funding assistance. An ongoing approval may be able to be obtained, eliminating the need for environmental impact assessment and gaining approvals for each nourishment campaign.	Would require an additional sand source to maintain beach width in the future under predicted sea level rise.
3. Development Controls	n/a	n/a	Allows for coastal processes. New development/ assets are removed from areas at risk from coastal hazards. Maintains beach amenity (provided restoration works are undertaken as assets are removed).	Does not address risks to existing assets/ development. Public access along the back of the beach may be restricted. Limit to time over which current land uses can be maintained.

** options include beach nourishment to maintain beach amenity*

1.4 Adopted Risk Management Strategy

This report recommended that based on the exhibition of this draft, the assessment of risk management options summarised in *Table 3* , and community consultation, on-demand sand nourishment in the form of hydraulic pumping equipment (hopper arrangement) be the main preferred management option for Jimmys Beach – Winda Woppa.

This recommendation has since been further investigated by GLC and is now the adopted strategy.

Based on historical rates of erosion and accretion, the ideal nourishment strategy would involve placement of smaller quantities of sand onto the Jimmy's Beach 'null point' on a more frequent basis.

Trucking can commence immediately to undertake these more frequent nourishment campaigns without any significant capital outlay and to confirm the effectiveness and required volumes for regular nourishment. To reduce on-going annual costs and minimise impacts, trucking should then be replaced by hydraulic pumping in the form of an on-demand sand nourishment system. A further feasibility assessment for an on-demand beach nourishment system should take place to provide a detailed technical investigation of the hopper system and its viability has been completed.

As part of this review, a number of general coastal zone/foreshore management improvements were also identified to:

- address issues raised during consultation
- improve public access and beach amenity in general
- facilitate appropriate recreational uses of the coastal zone
- protect the values (Natural Heritage, Cultural Heritage and Community see Section 2.2 of the CZMP).

These recommendations are discussed in Section 1.5 below.

1.5 General Coastal Zone Management Recommendations

Actions recommended in the Foreshore Management Plan for Port Stephens (Umwelt 2009) included:

- Rationalising and standardising foreshore signage and ensuring it is appropriately located.
- Carrying out minor upgrades to Winda Woppa boatramp as outlined in the Waterways Shore Facilities Management Strategy (Jelliffe Environmental 2003).
- Implementing improvements as recommended in the Tea Gardens Hawks Nest & Bulahdelah Stormwater Management Plan (Jelliffe Environmental 2000).
- Planning for and undertaking dune stabilisation, vegetation management, beach access points and structures.
- Formalising carparks.

The following management measure were suggested through community consultation and identified through site inspections:

- Access Management (Pedestrians/4WD/PWC/Boats) - Pedestrian access is maintained or improved and vehicle/boat access reviewed.
- Compliance issues - Improve compliance/ enforce penalties for, unauthorised vehicle access, 4WDing over dune vegetation and on beach, littering, PWC/power boats in unauthorised area or dangerous driving, and unauthorised parking.
- Foreshore facilities – Maintain and improve foreshore facilities such as boat ramp, picnic and recreation facilities.

Jimmys Beach CZMP

Appendix C Consultation

TABLE OF CONTENTS

1 INTRODUCTION

Activities undertaken as part of the review of the Jimmys Beach management strategy and preparation of the Coastal Zone Management Plan included:

Table 1 Consultation Activities

Date	Activity
4-7 October 2013 (long weekend)	Distribution of questionnaire at Jimmys Beach Holiday Park Inclusion of questionnaire in First National Hawks Nest and Tea Gardens Real Estate 'welcome packs' for holiday rentals Distribution of questionnaire to Tea Gardens Real Estate holiday rental mailing list
18 October to 20 December 2013	Information and online survey questionnaire on Council's website (also contact for hard copy)
October 2013	Press releases in the *NOTA* (Wed 2 October) and *The Advocate*
26 October 2013	Information stall at the Myall River Festival (11 am to 3 pm) at Tea Gardens
9 December 2013	Letter to owners of properties at Jimmys Beach

1.1 Myall River Festival

Approximately 55 people (30 couples/ groups) visited the stall at the Myall River Festival and spoke with SMEC or Council's representative.

Comments/ suggestions included the following:

- Changes to the Myall River entrance area as a result of anthropogenic activities: dredging of the western channel (former creek) in the early 1900s and resultant silting of eastern channel, logging destabilising shorelines resulting in severe erosion in 1929 storm, removal of sand dunes at Dead Mans for beach nourishment, size of lagoon has increased.
- Fate of beach nourishment sand, i.e. where it ends up after being eroded from Jimmys Beach – concerns this is:
    - adding to siltation of the eastern channel
    - smothering seagrasses (offshore) and mangroves (to west at Pindimar)
    - makes impacts of swell waves worse when sad works offshore
- Coordination of maintenance dredging (for water quality and navigation) of Myall River entrance and beach nourishment, i.e. using dredged sand for nourishment.
- Houses should never have been built along Jimmys Beach due to sand movement
- Suggested management options:
    - Breakwaters
    - Marina
    - Offshore reefs
    - Remove houses
    - Do nothing

- ‘Test’ groyne
- Interlocking foreshore blocks

1.2 Questionnaire Survey

Table 2 provides a breakdown of respondents to the questionnaire. Approximately half were property owners at Jimmys Beach/ Winda Woppa. Refer to **Section 3** for a breakdown of where questionnaire respondents live.

Table 2 Completed Questionnaires

Questionnaire Distribution	No. Completed
Hard copies completed by visitors to the Jimmys Beach Caravan Park	5
Hard copies completed by visitors staying (or previously staying) in holiday rentals	13
Hard copies completed at Myall River Festival (42 distributed)	20
Hard copies mailed in (includes some taken at Myall River Festival and later mailed in)	4
Competed online	1
Property Owners (166 mailed out)	44
Total	87

2 SUMMARY OF QUESTIONNAIRE RESULTS

The numbers in brackets in the sections below relate to the number of times the same or similar comment was made.

1. What activities do you undertake at or near Jimmys Beach?

Respondents undertake a number of activities in and around Jimmys Beach. The most popular activities in order are walking, swimming, sunbathing, nature observation, childrens' play, sightseeing and fishing from the shore. This was the case for both visitors to the Winda Woppa area and property owners.

Table 3 Most Popular Activities

Activity	No. times mentioned	Activity	No. times mentioned
Walking	82	Fishing from a boat	36
Swimming	78	Picnics/ barbeques	39
Sunbathing	56	Running	22
Nature observation	52	Cruising (power boat)	21
Children's play	50	Kayaking/ canoeing	20
Diving/ snorkeling	25	Riding a personal water craft (PWC)	12
Sightseeing	49	Sailboarding/ kit surfing	11
Fishing from the shore	45	Water skiing/ wakeboarding	8
Surfing	17	Sailing a yacht	8

Other activities mentioned were: cycling (3), camping (beach and park) (2), fishing from kayaks, exercising the dog, bird watching and paddle boarding.

2. Have you experienced any issues or conflicts between different activities? If so, please provide details, e.g. which activities, location where these conflicts occur.

Only about half the respondents identified issues or conflicts between different recreational activities, with jetskis and power boats coming too close to swimmers mentioned most frequently (24 respondents). The number of times this was mentioned was almost double the combined comments for other conflicts which were mainly between anglers (commercial and recreational fishing including spearfishing) and swimmers; and between illegal 4WDing on the beach and other beach users.

3. Are there other issues or problems affecting Jimmys Beach?

Most property owners identified other issues or problems affecting Jimmys Beach, with beach erosion by far the main issue or problem mentioned. Other issues identified mainly related to visitor parking during peak times, occasionally unleashed dogs on the beach and the scale of the proposed development at the western end of The Boulevarde.

About half the other respondents identified issues or problems. Beach erosion was identified as the main issue, followed by lack of foreshore access to launch paddlecraft and small sailcraft,

4. What do you like or value most about Jimmys Beach-Winda Woppa?

Most respondents answered this question. Most responses related to the natural beauty of the area, undeveloped character, scenic views and clean, clear water. This was followed by opportunities for safe swimming for children and the variety of other recreational opportunities; then the peaceful and tranquil environment. Property owners valued the peace and tranquillity of the area more than the other respondents.

5. What would you like to see stay the same about Jimmys Beach-Winda Woppa?

Most respondents wanted to see the undeveloped nature of the area and natural environment maintained. About half the comments related to these values, or to see everything stay the same.

6. What changes or improvements would you like to see at Jimmys Beach-Winda Woppa?

General changes or improvements requested were mainly:

- Improved pedestrian beach access: specific comments were for access to the water for disabled/ less mobile people and more regular maintenance of beach accessways
- More vehicle and parking controls and additional parking: specific comments included no parking on The Boulevard; paid parking along The Boulevarde by installing a boom gate; carpark/ more parking for boat trailers; and banning of 4WDs on the beach or section of the beach subject to beach erosion.
- Additional facilities including picnic areas, beach showers, toilets and rubbish bins
- Off leash dog area, with the area west of Barnes Rock identified as suitable
- Dredging the Myall River 'short cut'.

7. Would you like to see changes/ improvements to management of erosion/ shoreline recession?

For the questionnaires completed by property owners, there were over 70 comments relating to foreshore management. Of these 34 related to alternatives to beach nourishment, 12 to beach nourishment practise/improvements, three to other options combined with nourishment, and 19to due management.

In addition, eight property owners commented on the interrelationship of coastal processes/erosion for Jimmys Beach, Port Stephen as a whole and the Myall River entrance (e.g. sand movement between the Myall River entrance and Jimmys Beach influencing both accretion at the entrance and erosion at Jimmys Beach).

Four comments related to the complexity of the issues including: adverse impacts or "hard protection options": short-term vs long term options, "invasive vs passive options" and effects of sea level rise: and uncertainty on the range of options that could be considered,

Five property owners commented on the money spent on beach nourishemt (negatively) or suggested how this should be funded e.g. that the beach is a resource for all including for Hawks Nest/Tea Gardens and visitors for the area, that tourism depends on maintenance of the beach and that this should be paid for by all.

For the 44 questionnaires completed, fewer comments were made on foreshore management (about 30). Of these 14 related to alternatives to beach nourishment (including tow suggestions for property purchase), six to beach nourishment, two for options combined with nourishment and five to dune management.

In addition there were three comments on the interrelationship between coastal processed/erosion for Jimmys Beach, Port Stephens as a whole and the Myall River entrance and seven requests for dredging the Myall River "short cut".

Six comments were made on the amount of rate payer and tax payer funds being spent on nourishment or how this should be funded.

Erosion Management

Of the 44 property owners who responded to the mailout, 16 were in favour of continuing beach nourishment. Some respondent's support for this was in the absence of alternative options and seven people felt they could not comment as they were not sure what other options were available or that they did not feel qualified to comment.

Of the other 44 respondents (note that six live at Hawks Nest/ Winda Woppa and three have holiday homes there), 17 were in favour of continuing beach nourishment.

Several respondents wanted to see a permanent solution to beach erosion. Specific suggestions for management of beach erosion were:

- Removable sand socks/ geotextile bags (2)
- Rock wall/ retaining wall (4)
- Buried pylons/ rocks to protect road and beach nourishment (1)
- Offshore reef/ offshore wave buffer (7)
- Groynes (3)
- Groynes and beach nourishment (2)
- Breakwater including as part of a marina development (2)

Use of sand dredged from the Myall River/ short cut for beach nourishment was suggested by a few respondents.

As noted above two suggestions related to purchase of property.

Dune management

Comments on dune management included:

- Low dune planting/ maintenance of dune vegetation to provide views (6)
- Better control/ fencing of dunes to prevent access to the dunes (5)
- More dune planting and regeneration (4)
- Weed control (3)

8. How often do you visit Jimmys Beach-Winda Woppa?

Of the 166 property owners at Jimmys Beach/ Winda Woppa, 122 are non-resident owners. Of the 44 property owners who responded to the questionnaire, 12 indicated that they live at Hawks Nest/ Winda Woppa permanently. Of the other 44 questionnaire respondents, six live in the Hawks Nest/ Winda Woppa area and another seven nearby

(six at Tea Gardens and one at Pindimar). This is reflected in the number of respondents indicating they visit Jimmys Beach daily.

The frequency of visition to Jimmys Beach-Winda Woppa is shown in **Table 4**, indicating that most non-resident owners and holiday makers visit Jimmys Beach – Winda Woppa about once a month or every few months. One respondent indicated that it was their first visit to the area.

Table 4 Frequency of Visitation to Jimmys Beach – Winda Woppa

Frequency	No. of Respondents	Frequency	No. of Respondents
About once a month	21	About once a week	14
Every few months	19	More than once a week	11
Daily	15	About one a year	9

9. What town/suburb do you live in?

Most non-resident property owners live in the Sydney Region (19) followed by the Hunter Region (5) and Central Coast (3). Two respondents indicated they spent half their time in Sydney and the other half at Jimmys Beach-Winda Woppa.

Similarly for the other 44 respondents, most lived in the Sydney Region (17) followed by the Hunter Region (5) and Central Coast (2).

10. Other Comments

Other comments have generally been included under the questionnaire responses above. Additional comments/ matters raised by property owners included the following.

- That the beach is a resource for all including for Hawks Nest/ Tea Gardens and visitors for the area, that tourism depends on maintenance of the beach and that this should be paid for by all.
- That coastal/ estuarine processes within Port Stephens should be considered as a whole with one body responsible for management

A number of policing, regulation and maintenance issues were also raise by property owners relating to illegal lopping of vegetation for views, dogs on the beach, illegal parking, personal water craft, litter and anti-social behaviour.

3 COMPILATION OF RESPONSES

Following is a compilation of responses to the open ended questions. Similar responses are grouped and the number times these comments were made are indicated in brackets.

3.1 Property Owner Responses

1. Issues or conflicts between different activities

No or No response (18)

Jet skis/ power boats and other waterway users

- Jetskis disturbing the peace
- Sometimes people on jetskis annoy
- PWC come into shore too close to swimmers
- PWC near swimmers, too may power boats at peak times
- Jetskis and power boats entering swimming areas and disturbing peaceful surroundings
- Sometimes water skiing boats/ jetskis come too close to swimmers at any place along the beach
- Jetskis too close to others and not considering wake/ noise etc
- PWCs are often too close to people
- Occasional inconsiderate jetski riders and powerboats pulling tyres too close to the shore conflicts with the kids playing on the shore
- Powered craft sometimes get too close to bathers
- Sometimes at Christmas watercraft come too close to swimmers
- Sometimes people snorkelling are in a bit of danger when boats come in
- Worried that power boats will hit a person who is swimming
- Power boats in close to beach not safe or appropriate
- Motorised boats etc coming too close to swimmers

Commercial fishing/ recreational fishing and swimming/ snorkelling

- The professional fishermen treat the beach badly and have no consideration for general leisure activities
- Conflict between swimmers and spear fishermen particularly at Barnes Rocks
- Spear fishers without buoy/marker near swimmers
- Occasionally fishermen and swimmers like the same patch but no real problems

Vehicles/Parking/4WD

- Illegal 4WDs and family beach users – the beach is too narrow – no policing by Council
- Commercial fishing vehicles and unpermitted vehicles in dune areas

- 4WDing on beach by fishermen
- Too much illegal parking during the summer months
- Holiday makers paying no regard to sensitivity of sand dunes following nourishment – parking along the beach front has contributed to erosion over the past 40 years

Ecology and recreational use

- The beach is shared by many, the only potential area where conflict could exist is between boats and the dolphin breeding area
- Fishermen removing animal life from the rocks and people who are attempting to enjoy flora and fauna

Beach Nourishment

- Sand dumping conflicts with recreational use

2. Other issues or problems affecting Jimmys Beach

No or No response (6)

Beach erosion/ coastal processes

- Beach erosion/ beach erosion is the main issue (12)
- Need to keep sand on beaches to enable access and use of the beach
- Need to replenish sand
- After beach nourishment storms undercut sand making a very steep descent to the water-difficult for people with limited mobility and carrying gear
- Beach nourishment sand blowing into properties and down the street and also covering the road

Vehicles/ Parking/ 4WDs

- Occasional visitor vehicles heading wrong-way down one-way The Boulevarde
- Unauthorised 4WD vehicles driving along the beach (2)
- Cars parked all over the place to get to beach accesses at Christmas
- People parking wherever and hopping over dune fencing and ‘parking in’ residents
- Parking during holiday peak – residents have access to driveways seriously impaired

Dunes/ vegetation

- Illegal removal of bush and trees obstructing views – I don't know of a single prosecution, response of installing huge signs in front of suspected offender's homes is an eyesore for everyone and does not prevent vegetation removal.
- Poisoning of bitou bush near the carpark without any replacement planting to prevent erosion, time taken to replace hay bales when they have broken down
- Weed invasion, bitou bush, mother of millions

Dogs

- Dog owners allowing dogs to run freely along the beach
- The dog issue, it works fine with early morning dog walkers, no dogs later does not always happen but no problem if controlled which they are
- Occasional issues with unleashed dogs on the beach
- Occasionally dogs are in prohibited areas

Development

- No more development/ block development such as that taking place at the western end of The Boulevarde (4)
- The development at lot 1 The Boulevard: out of character and scale with the environment (3).
- Proposed development at western end, destruction of vegetation including wetland. This has destroyed all surrounding bushes, trees and hillocks that children use to love (2)

Walking Tracks/ Access

- Steep climb from the water to the beach entry point
- Lack of disabled access - difficult to get into the water

Commercial fishing

- Professional net fishing not well controlled

Ecology

- Illegal removal of sea life from Barnes Rock etc

Pollution

- Discharge of effluent from moored yachts

Maintenance

- The degradation, the constant ongoing management Council has given The Boulevarde - a very run down and unloved look
- Road damage from continual truck movements
- Local roads damaged by trucking sand

3. Values of Jimmys Beach-Winda Woppa

No response (1)

Natural Beauty/ Nature/ Views/ Undeveloped Nature

- Its beauty/ natural beauty (10)
- Beautiful views/views across Port Stephens/splendid outlook (8)
- Its natural environment/ unspoilt environment/ natural beach setting (8)
- Sand/ clean, white sand (6)
- Water/ clean, clear water/ pristine water (4)
- Lack of development (overlooking houses, commercial premises, paths and boardwalks) (4)
- Nature/ wildlife (birds, dolphins and the occasional koala, the fish) (3)

Tranquillity

- Tranquillity/ peace and quiet/ serenity (13)
- The isolation/ solitude/ relatively secluded/ generally not crowded (7)

Safety/ amenity/ recreational opportunities

- A family friendly beach/ safe for children (11)
- Its multi-use, diverse activities (swimming, boating, fishing, walking, sightseeing, snorkelling, spear fishing, nature observation, exercise) (8)
- Swimming/ calm water/ safe swimming (7)
- Walks (beautiful, peaceful, pleasant, to see sunset) (5)
- Cleanliness (2)
- It is a glorious place to be shared/ open to all (equality) (2)
- Easy access (undamaged areas)
- Safe boating
- The breeze and the smell of ozone
- Variety of orientations for shelter from winds
- Most people are pretty relaxed
- It is a very nice place to live
- Proximity to home

Other Comments relating to the values of Jimmys Beach

- I love Jimmys Beach
- I love the place and want to see it continue to be maintained
- It has been my holiday place/ heaven for nearly 50 years. Dad was signature to get water and power and children love the place like I do.
- Jimmys Beach is a jewel and whatever you can do to preserve it in its pristine state (including sand nourishment) will be greatly appreciated
- The attraction of Jimmys Beach/Winda Woppa is the reason we sold in Sydney and embraced a sea change.
- When we travel to other coasts in Australia we often say to ourselves, this is ok but Jimmys Beach is better – it is a superb waterway and beach, a real treasure

4. Things respondents would like to see stay the same

No response (6)

Natural Beauty/ Nature/ Views/ Undeveloped Nature

- Natural environment/ natural beach/ beauty/ unspoilt nature (13)
- Everything/ everything apart from erosion (8)
- Clean sand and clear water (4)
- The beach (2)
- The views (2)
- Green open areas, trees
- Protection of dolphins
- No unit type development/ no more development/ low key development/ no intruding development/ low level dwellings (no huge developments)/ current residential estate, no coastal walkways (7)
- The un-guttered roads
- No commercial activities/ commercial water sport operators (2)
- Recreational opportunities
- Safe family environment for residents and visitors

Tranquillity

- Retain its tranquillity
- Uncrowded nature (3)
- Quiet amenity

Recreational use

- The many users of the beach from kayakers to bathers to catamarans
- Safe environment for variety of recreational activities (3)

- Family orientated nature of its use (2)
- No dogs on beach
- Current/ controlled access points to beach (2)

5. General changes or improvements

(comments on dune management and beach erosion/ coastal processes have been included under **Q7**)

None/ No response (11)

Pedestrian Access (improved)

- Being elderly with limited mobility, I would like at least one access point to be preserved as level through the sand to the water as well as the present one at the northern end of The Boulevarde
- Access for disabled/ less mobile so they can swim at the beach
- More regular maintenance of beach accessways
- Perhaps improved access to the beach
- Clearly defined tracks to beach

Roads/ vehicles/ parking/ 4WDs

- Better maintenance of The Boulevarde
- 40 km/hr speed limit
- No parking along The Boulevarde, adequate/ visible signage to prevent cars going the wrong way, speed humps
- There should be more precise parking instructions at the end of The Boulevarde (opposite Barns Rocks) indicating that this a turning area, not parking area
- Improved car parking control along The Boulevarde
- Stop people parking on the side of the road/ on the beach, maybe by providing parking, though not sure where it could go
- Formal car park at beginning of Winda Woppa (if built in nature area at the start of The Anchorage it would not be seen from the road or the beach) with paid parking and money used to fund beach nourishment
- A boom gate at the end of The Boulevard to bring in revenue and it would also slow the traffic down and prevent cars going the wrong way
- Lock gate at end of The Boulevarde
- Ban 4WD access to local beaches
- Professional fishermen should be banned from the beach where erosion occurs – there are 4WD access points to the east and west of the erosion area

Dogs

- Many elderly locals have companion dogs and walk them illegally near the river mouth because the closest dog area is on the ocean beach – in other areas (e.g. Central Coast) there are many beaches with areas reserved for dog walking. A section of the beach, perhaps beyond Barnes Rocks could be allocated for dog walking with dog poo bags provided. A boardwalk along The Boulevarde for walking dogs
- A dog leash free area west of Barnes Rocks is needed
- Dog friendly beach zones
- Clear marking as to where dog friendly areas are

Facilities/ recreation

- Improvement of Winda Woppa boat ramp
- Continuation of low key development of park along river front
- Improved parking, toilet shower facilities at carpark
- Picnic area, extra showers at beach access, garbage bins
- Outdoor gym facilities in park/s to encourage adult fitness
- Rubbish bins at access points
- Bins at regular intervals to prevent people leaving their rubbish behind

Ecology

- Dolphin zone, no boats in the western end of the beach
- Not too many jetskis ruining the ecosystem

Development etc

- Sustainable economic activity is critical for human beings
- Certainty of ongoing viability for current occupation

6. Changes/ improvements to management erosion/ shoreline recession

Dune Management

- Fencing on the water side of dune vegetation to prevent access
- Improved dune protection to prevent people hopping over the fence from the road
- Continue beach nourishment but construct fences that keep people out of the top area. Picnics and cricket are inappropriate on the top sand area along the road
- Better fencing of new sand dumps and signage
- Signs to advise of unstable re-nourishment sand before a child running and down the dune face gets buried alive
- Provide walkways down to the water after sand is pumped onto beach

- Stable beach sand
- Sand builds up at Kururma Cres entrance from waterside, maybe straw bales to hold sand back each side
- The dunes must be managed. The practice of piling on the top so it shifts and collapses onto the road behind is deplorable and hardly sensible management by Council. The dunes immediately in front of our property have been artificially change through this practice during the 25 years of ownership. They don't have to be the mess they are. Dunes at more or less road level with suitable foliage would present the pleasant vista of the bay for visitors driving along The Boulevarde and arrest erosion
- Don't remove too much undergrowth around trees and bushes, small birds like to scrub around and nest nearby especially at reserve at Winda Woppa
- Regeneration of plants along beachfront roadside along east end
- More coastal fringing flora planting
- Encourage ground cover vegetation
- Low scrub planting on the dunes which can be cared for by local residents
- Council/ resident partnership (including $ contribution or with assistance from residents) to clear some dune vegetation to allow water glimpses, clear dead brush and wood (fire hazard and prevents new growth) and Bitou bush and other weed clearing
- Use lower ground cover instead of shrubs for land/ beach erosion. We pay a lot of money for a view which is being destroyed by shrubs. Low ground cover is just as effective (as seen at Long Reef & Collaroy, Sydney)
- Limited resident paid Council sponsored trimming of green space along The Boulevard to reduce illegal cutting and destruction
- Bitou bush eradication to continue and continue establishment of low dune vegetation along the side of the road
- Get rid of lantana and bitou weed

Beach nourishment

- More sand on the beach
- Keep the sand regenerated
- It is a shame that the original natural shape and slope of the beach has been altered so dramatically because of the beach renourishment programme
- Continue beach nourishment unless better techniques become available
- It seems we are destined to review this every 10-15 years and then come up with the same solution, i.e. nourishment – which is the best and most economic. Memories are short!
- Unsure, the beach nourishment is noisy and disruptive (trucks all day every day), not sure of options
- Trucking 20,000 m^3 of and from the Yacaaba sand wave is tantamount to official environmental vandalism – supporters of this should visit the remnants of the Cronulla sand dunes and re-think their stance
- Whilst a permanent solution would be welcomed the so called "hard options" (breakwaters/groynes etc) would have a major impact on beach profile both above

and below the waterline. Beach nourishment is the most environmentally compatible option

- Beach nourishment should continue but in a way that conserves the works and not just endless nourishment without retention
- Would like to understand if there are any options to assist the beach nourishment
- Remove sand that has built up along the road and place on beach
- Over the years there has been a buildup of sand along the side of The Boulevard. It is close to 3 m high in places. It could be used as re-nourishment for the beach. It was not originally like this.

Combined options

- Continue beach nourishment as and when necessary and concrete pylons and boulders under the sand to protect the roadway from collapse in the worst storm
- The beach needs to be stabilised with a long-term preventative solution to sand erosion as per approach adopted at Lord Howe Island for example. Offshore factors bearing on the problem have been studied but there has not so far been integration of the studies with a plan for a permanent solution (SMEC could be integral in a cohesive plan for such a solution) hard-form reinforcement (sheet-pile based) might need only be used where wave induced erosion occurs with extension either side later, if required.
- Nourishment combined with groynes to prevent longshore and drift

Alternatives to nourishment

- Would like a solution to erosion problem not involving re-nourishment but continue re-nourishment if it's the most beneficial (and cost effective) solution
- Prevent erosion/ better protection/ a permanent solution to the erosion (7)
- A permanent solution to the ongoing erosion issues not just a reaction to storm damage and erosion when it occurs. We feel that Council has been avoiding a permanent solution because they don't want to pay for it.
- Enough money has been spent to reach no real solution – please just get on with a permanent solution
- Permanent solution as per what has been done elsewhere in Australia – renourishments I have seen to date have not been successful and have usually been negated within a year or two by storms and have required more cost to repair
- Have spent many summers at Jimmys Beach since 1975/76 and have observed erosion and Council's efforts in replenishing the beach but this does not last and has the effect of damaging the road with heavy vehicles. Hoping there will be a new approach and more permanent solution
- An alternative to sand nourishment – it is so ugly. I also hate the environmental vandalism going on to extract sand from the dune at Dead Man's and from the beach near Yacaaba
- You can't change the shoreline unless you pay exorbitant amounts of money. Sand is not the answer to the problem. Aesthetically it looks good but financially it is a problem.

- No fixed type walls will work. Any protection methods should be able to be adjusted e.g. sand socks can be adjusted and taken out. Using sand socks from a bathing section across the worst affected area
- As sea level is rising, alternative methods to address erosion should be trialled. A solution should be sought that dissipates the wave energy coming through the heads before large breakers with destructive force hit the face of the sand dune. Suggest a reversible option as per southern end of the Gold Coast – sand filled synthetic “sausages” across the face of the expected incoming swells, shallowing the water and thus causing the waves to peak and break long before reaching the beach, thus dissipating the energy. There would perhaps need to be 300 m of sausages. The sausages could be filled using sand dredged from the short-cut and carried around in barges. If the strategy doesn’t work and unintended consequences do occur, it would be a relatively simple matter to split the sausages and the sand would gradually redistribute itself around the Port. It may be a little bit more expensive than trucking or piping sand but a lot less than an engineered solution. If it works, any additional costs would be more than covered by the savings from the annual renourishment program
- I am in favour of some kind of buffer in the water say 100 m out from the shore, all the way along Jimmys Beach parallel to The Boulevarde
- A buffer of some kind parallel to The Boulevarde approximately 100 m offshore. I am sure this has been proposed many times previously and for some reason has been ignored
- An offshore reef to break up the waves on the beach which cause erosion
- If some large rocks were dumped in the bay off the area of erosion, would that not improve the issue? Surely if would stop the waves.
- Consider modification of wave erosion by banks in the bay
- Build an artificial reef if it would prevent sand erosion – it would also provide a fish shelter
- Some type of “breakwall”, submerged along vulnerable stretch of beach
- Is there not a way of buttressing the eroded part or is it too expensive?
- Retaining wall, offshore management (artificial reef) and/or grids, as has been done at Waikiki Beach Hawaii which look natural and blend into the environment
- Solid rock or similar barrier/s established at erosion ‘hotspot’ instead of sand nourishment
- Permanently fix the erosion to reduce or clear ongoing costs. In a number of spots on the south shore of Port Stephens there are permanent fixtures to sort erosion
- Build something more permanent such as a breakwater or other structure
- A permanent solution like “shore-gro” or rock groynes are needed
- A more permanent solution i.e. groynes, artificial reefs, re-contour sea bed to stop or reduce beach erosion
- Maybe groynes placed along out into the water to break the strong surge we get especially in band windy weather
- A hard fix for the erosion such as strategically placed groynes

Other Comments on Options

- The issue is too complicated to pass a casual opinion
- Too big a question – long term vs short term; invasive vs passive; effects of sea level rises etc. Suggest a strategy is devised and followed by experts
- Beach nourishment is worthy – but what else do the experts say?
- Not really sure what the options are

7. Suburb

Sydney/Winda Woppa (2 respondents indicated they spent half their time in each location)

Great Lakes LGA

Winda Woppa/ Hawks Nest (12)

Hunter Region

Newcastle (2)

Maitland (2)

Bolwarra

Central Coast Region

Holgate (2)

Empire Bay

Queensland

Mt Mellum

Not specified (1)

Sydney Region

Sydney (4)

Cammeray

Belimba Park (near Camden)

Roseville

Lane Cove

Woolwich

Mosman

Killara

Pymble

Forestville

Collaroy

Lindfield

Glenhaven

Lane Cove

Randwick

Darlinghurst

8. Other comments

(where relevant comments have been included under issues/ improvements)

Coastal Processes/ Erosion

- Been a regular visitor for over 45 years and am concerned by acceleration of erosion of last 10-15 years, both at Winda Woppa and towards the river entrance and the bar and changes due to low flows over the bar which prevent sand moving by like it used to

- I walk on Jimmys Beach every day and have been doing so for 24 years and the erosion over that period has been dramatic
- I have been living here for 14 years and question the soft fix approach
- The mouth of the river needs dredging. The western end of the sand has extended greatly, in my almost 50 years of Winda Woppa holidays. They tell me the sand migrates to the beach but the sand at the point has extended 100 m in my time
- We believe the continual renourishment of the problem, in turn, causes sand movement to the 'short cut' and fills it
- Not enough water flows over the bar to carry sand into the bay, so instead of depositing sand, wave action erodes it. This is since the main channel of the river was dredged for big boats
- I would like to point out some relevant issues that I don't think are given adequate consideration:
  - Jimmys Beach is unique because it is the only beach in NSW within an estuary that is threatened by erosion
  - It is only under very specific, relatively uncommon conditions where erosion of the beach occurs during a major east coast low with a south east swell. Large swell waves come through Port Stephens Heads aiming directly at Jimmys Beach
  - Jimmys Beach is a locality where a public asset (Council's road – The Boulevarde) is between private property and the erosion threat
  - The erosion is restricted to a relatively narrow (about 300 m) width of beach
- Port Stephens sand movements should be considered as a whole, and be the responsibility of a single State Government authority, not a multiple buck-pass to ineffective minor government departments, local government and non-government
- SMEC is highly regarded as a consulting engineering group with proven record in solving complex civil engineering problems. We would like to see SMEC employed to integrate the rather fragmented studies, comprehensive solution and plan such as that produced in Lord Howe Island. We see SMEC as far better employed to look at a solution in current time rather than in more astrological predications of what might or might not occur 50 years hence

Recreation and Tourism

- Consideration of prevention of dwellings being undermined by erosion from storms should be rated ahead of recreational activities
- The beach is shared by many, none of us own it, we share it
- The continuation of Jimmys Beach-Winda Woppa as a tourist destination relies on the area's natural beauty and regeneration of the beach
- The erosion problem has caused a drop in tourism numbers, blocked access and constant ongoing cost for management, and caused/added to a drop in land values. Decline in general area – does not have a good look.
- People drive down the street constantly to stop to look at the view (in spots where this has not been made impossible because of the foliage choice) – does this not suggest that the view is a big draw card to visitors and locals alike. Please don't ruin the view for everyone

Money spent on erosion control

- I am not in favour of sand nourishment, it has not worked, and has wasted a lot of money.
- The problem has gone on for far too long and not sorted
- Everyone uses the beach. Everyone needs to pay for the beach nourishment.
- Continual funding of sand nourishment is throwing money into a black hole

Zoning/ Development Controls/ Levies/ Rates

- I have commented some time ago on our concerns re proposed zoning changes – leave things as they are. Levies are most unfair on ratepayers on what is a town amenity and most popular swimming for visitors
- Council appear to wish to protect against any potential liability by restrictive building rules
- High cost of having beach house

Policing/ Regulation/ Maintenance

- Heavy punative action against anyone destroying existing verge flora
- A residents working group to help maintain/ control any improvements implemented by Council
- Rubbish washing onto beach – local volunteers usually help clean as needed by not organised
- More clean-ups to pick up cans/ bottles e.g. clean up Australia
- There is no monitoring of illegal traffic, ranger not located there nor visits
- Repair of local roads
- Night time hooliganism, fireworks, bonfires, loud drunken behaviour, rubbish, broken glass left behind for residents to clean up
- Restrictions around dogs and ineffective responses to illegal bush lopping need to be considered more thoughtfully, punitive strategies never work, avoid more rules
- Stricter policing of PWC would be good

Questionnaire/ Consultation

- Thank you for the opportunity to comment/ contribute (2)
- Council has its own agenda and resident's comments have not been considered previously as being valid or worthy. We have been ignored by Council. It is disappointing that we have only had a little over a week to respond to this survey
- The residents and owners at Jimmys Beach – Winda Woppa have always been prepared to work with Council to prevent any further erosion of the beach and or destruction of green areas. Involve these people in your strategies and give some formal responsibility to the locals
- We would appreciate a close relationship between SMEC and the Winda Woppa Association

3.2 Other Respondents

1. Issues or conflicts between different activities

No or No response (24)

Jet skis/ power boats and other waterway users (9)

- Jet skis
- Personal water craft are too noisy close to shore where families are gathered
- Whilst swimming I occasionally find that jet-ski riders have no concern for swimmers (or cannot see
- Jet skis coming too close to shore
- Jet skis through short cut
- Jetskis harassing kayakers
- Only occasionally jet skis
- PWC, waterskiers, powerboats are inconsiderate and come too close to bathers/ shore
- Some power boat drivers area oblivious to swimmers and snorkelers

Commercial fishing/ recreational fishing and swimming/ snorkelling

- Commercial net fishing preventing swimming at Jimmys Beach
- Snorkellers swimming where shore-based fishermen are already fishing, they should go somewhere else. If I see people snorkelling then I don't through my bait and sink at them

4WDs and pedestrians

- The 4WDs kept us from really relaxing as kids were running around and cars were coming along tracks

2. Other issues or problems affecting Jimmys Beach

No or No response (24)

Beach erosion/ coastal processes

- Beach erosion (5)
- Natural evolution of beachfront presents a problem as a result of planning allowing residential development of Winda Woppa
- Management of renourishment
- No permanent solution to erosion
- Sand nourishment not doing the job

Lack of access to the water's edge or to launch small watercraft

- Difficulty getting down to water's edge
- I had intended to sail on bay with a small hobbie cat but could not gain access from Jimmys
- Unable to launch a catamaran from Jimmys beach with only 2 people. There is nowhere else to sail as river is too narrow and has oyster leases
- Was impossible to drag kayaks through sand to the bay, we gave up, probably won't revisit and go back to Shoal Bay
- Lack of access for kayaks/ small sail craft

Walking/ Cycling Tracks

- There used to be a nature walk back of scout hall to main road , it seems to be overgrown
- People not using formal walkways, sand in channel
- Very poor condition of The Boulevarde for cycling/ walking
- I also find not enough designated cycleways

Vehicles/ Parking/ 4WDs

- 4WD on beach
- I think only the car access should be restricted. It gets too busy

Commercial fishing

- Commercial fishing from the shore
- professional fishers creating noise

Myall entrance navigation channels

- Silting of channel at Corrie limits boating to bay
- The short cut needs dredging

Damage to dunes

- Degradation of dunes

Dogs

- Winda Woppa has no off-lead dog areas and prohibits dogs on the beach, this is draconian and easily could accommodate dog owners by allowing restricted times on the beach

Development

- Potential developments close to beach
- The Myall Lakes, river, port, beach and national parks. All treasures! Buildings around Tea Gardens seen incongruent with the character of the original area
- Hawks Nest shopping village could do with some improvement, perhaps support for local businesses

Maintenance

- Puddles after rain around beach showers
- The roads in and out around the area are terrible considering the revenue the council makes from the caravan parks etc

Other

- I don't swim there, it's too sharky for me, dark weed beds
- Sometimes there is lots of seaweed

3. Values of Jimmys Beach-Winda Woppa

No comments (5)

Nature; natural/ pristine area; scenic amenity; clear, clean water

- The views and encounters with a beautiful coastal environment as well as wildlife
- Natural beauty of the area and facilities available
- It is a lovely natural setting that has been kept beautifully by preserving most forestry around the setting
- The beautiful beach
- Beautiful beach, clear, clean water, just a perfect place
- Natural environment, unspoilt area
- Nature
- Location, outlook, wildlife, marine life
- Natural area
- Its pristine condition
- The space, the bay
- Natural beauty
- View to Nelson Bay and heads, clean water
- The size and colour of the beach, the protected bay, the view, the space – I love that the whole place is not yet too developed
- The water
- Bushwalks and little shops
- The views and the stillness of the water
- Easy access
- Natural – absence of development or at least minimal development. Clean beach, calm waterway, clean water

- Pristine environment, clean, good for kids to play – no waves, beautiful view
- Lovely clear water
- The views
- Scenery (2)
- Beautiful view, spacious

Tranquillity

- Seclusion
- The peace and quiet
- Nice and quiet for walking
- Peace and quiet

Safety/ safe recreational opportunities

- A good swimming alternative to Bennets Beach
- Safe area for children
- Fishing, safe for children
- Safe, good camping facilities
- Clean water, dolphins, safe swimming
- It is still a campers paradise
- Lots of other people like it, good community value
- recreational activities
- It's a great family recreation area – safe and protected. A good alternative to the main beach
- The clear, clean water and low swell with progressive depth for visiting little kids
- Clean water, protected from certain winds
- Picnic area
- Safe swimming for children
- Clean, safe beaches
- Great place for a holiday, very friendly people

4. Things respondents would like to see stay the same

No response (2)

Undeveloped nature/ natural environment

- All the natural environments maintained and hopefully extended. Less buildings in view from the beach
- No large commercial enterprises
- Its pristine condition
- Natural environment
- Great environment and surrounds
- The view, the space
- The nice view

- Retain bush, clean sand and water – beautiful area, quiet and clean, it would be wonderful if it could remain so
- Pristine environment, beautiful views
- Absence of development (2)

Everything

- Please no improvements, I like it fairly natural
- Just stay as is
- Everything (2)
- All in all I think it should remain the same

Ecological values

- Maintenance of marine environment and biodiversity
- Bird life and left natural

The beach

- The beach
- The sand on the beach
- Sufficient beach to use, not too reduced
- Retain beach and dune

Good water quality

- Water quality (2)

Other

- Riverside dining

Controlled access points

- You are doing well to restrict the number of access points

5. General changes or improvements

(comments on dune management/ erosion control have been included in **Q7**)

None/ No response (17)

Pedestrian and vehicle access and parking (improved)

- The road into Jimmys could be much improved (pot holes)
- No parking on The Boulevarde
- Better beach access
- More access paths
- Better road access
- More parking for boat trailers,
- Boardwalk linking Bennets Beach from surf club to No.1 The Boulevarde

Access (less)

- Less access, limit access other than walkways

- Ban 4WD access
- No vehicle access (e.g. for commercial fishermen)

Facilities/ recreation

- More picnic facilities and kids playground
- More fish and land based fishing, maybe better access to surf fishing
- Boat access to the bay for small sailing craft on beach roller access
- toilet
- freshwater shower
- fix bubblers along Marine Drive, they have been damaged for years
- marine park fishing restrictions removed
- Cleaner sand

Myall Lakes entrance dredging

- Open and maintain the short cut channel (3)
- Dredge the short cut

Dogs

- larger dog friendly zone on Jimmys Beach

6. Changes/ improvements to management erosion/ shoreline recession

Dune Management

- More planting of vegetation as part of beach nourishment and follow-up
- Continued preservation of the dunes and elimination of the weeds
- existing haybales (*where dune has eroded)* good idea by needs to be managed. Bales kept in order, some have been disturbed
- Policed dune protection
- Ensure the local property owners don't destroy the vegetation on the dune to improve their views

Alternatives to current beach nourishment practices

- It is always important to improve on the management of erosion and shoreline recession
- Come to some decision that doesn't involve having to re-nourish every year
- Beach nourishment via dredging, no trucks, some groynes
- Beach nourishment is ok if sand is sourced well and doesn't just keep ending up in the channel
- The sand continues to be eroded and ending up affecting the depth offshore from Winda Woppa
- If we could work a solution between Jimmys Beach and the Corrie shortcut/ channel it would be good to see the beach stay

Alternatives to beach nourishment

- Only if nourishment no longer can address the erosion adequately
- Needs more permanent solution to dredging and beach nourishment

- Please stop wasting our tax dollars on never ending band-aid measures in sand replenishment
- Fix the constant erosion as ratepayers funds are being wasted
- Erosion stopped
- Council has had enough time and consultants to build the Suez canal – yet we are still pumping sand there at Jimmys Beach at a cost of $100,000s and no close to a solution. Is this going to continue forever?
- Just get it done (fix erosion)
- Choice of suitable means of erosion control that does not depend on short term sand nourishment. Come up with an answer that does not affect biodynamics of waterway
- A conclusive remedy for erosion. I'm certainly not an expert but current approach doesn't seem to work
- Build something to prevent erosion that is permanent
- A rock wall to retain sand
- Cost efficiency using a rock retaining wall
- Reef put in place
- Beach nourishment and groynes
- Build a marina enclosure opposite junction of The Boulevarde and The Anchorage. This will assist in erosion management and local economy

Myall River entrance dredging and use of sand for nourishment

- Opening of the short cut channel
- Dredge the short cut to replenish beach erosion instead of using Dead Man's
- I have heard a lot of complaints from locals regarding closing of the "short cut" because of beach nourishment. Has any marine modelling been undertaken to identify a permanent solution?

Property purchase

- Cease nourishment because it is a never ending pain. Buy two properties, cut a channel to the river and put a bridge across
- I consider that a technical solution is well beyond solution by lay people, otherwise MHL would have solved it. It seems that the solution is to obtain funds, buy and demolish the houses and forget it

Other Comments

- It's not only on the northern side of the port, on the southern side a reef has been covered by sand. There seems to have been a central cause, maybe dredging many years ago
- Like to see use of past and recent port sand movements as evidence for proposed projects to protect houses
- Acknowledge that the protection of property relates to very few residents, but Jimmys Beach is a community asset
- A permanent commitment from State Government and Council to continue the nourishment
- Time to stop constant cost (of beach nourishment) to the rate payers

7 Suburb

Great Lakes LGA

Hawks Nest (5)

Tea Gardens (6)

Tea Gardens (1 holiday property)

Winda Woppa (1)

Pindimar

Hunter Region

Newcastle

Raworth, Maitland

East Maitland

Singleton

Central Coast Region

Kincumber, Gosford

Blue Mountains Region

Hazelbrook

Victoria

Kerang

Not specified (3)

Sydney Region

Sydney (3) – (1) with holiday home at Winda Woppa and (1) with holiday home at Pindimar

Berowra

Epping

Paddington

Erskinville

Penrith

Crows Nest

Arncliffe

Rose Bay

Coogee

North Curl Curl

Oatley

Carlingford

Sydney

Sydney (holiday house in Hawks Nest)

Victoria

Kerang

8. Other Comments

(Comments have been included under issues/improvements above)

4 PLANNING PROPOSAL CONSULTATION

4.1 Gateway Determination

Following initial consultation (**Sections 1, 2 & 3 above**) Council sought a Gateway Determination from NSW Department of Planning and Environment for a Planning Proposal to, *inter alia* amend Coastal Risk Planning Area Maps in Great Lakes Local Environmental Plan (LEP) 2014, including mapping for Jimmys Beach. This determination became effective from 11 July 2014, and with a subsequent extension of time had a projected completion date of 18 January 2016.

In undertaking the planning proposal Council has encouraged the broader beach-going community to get involved in the preparation of the Coastal Zone Management Plan. This social catchment concept includes beachside residents and residents of the broader LGA, as well as visitors from outside the LGA who enjoy Jimmys Beach. Community engagement approaches used include public information sessions (advertised in the local newspaper, radio and Council's website), media interviews, surveys, and direct meetings with community groups.

Council, in response to the strict timeline, applied an Integrated Coastal Management approach from the commencement of the Gateway period. This allowed more efficient coordination of effort and resources for statutory exhibition, community engagement, media, and reporting between Planning and Engineering sections of Council.

4.2 NSW Coastal Panel

Working closely with OEH partners, Council staff convened a meeting of NSW Coastal Panel, specifically tasked to clarify options and funding arrangements for future investment in risk management along Jimmys Beach. This meeting, held at Tea Gardens on 28 January 2015 also integrated details of related projects underway in the vicinity, including the proposed dredging of the Eastern Channel as well as State and Federal investment in a permanent sand transfer system to improve the efficiency of Jimmys Beach renourishment operation. Importantly, this meeting established the need to move forward to decisively address erosion risk in the short term whilst looking to fine tuning and revision of the CZMP, following certification, over the subsequent 12 to 24 months.

4.3 Councillor Coastal Workshop

A Coastal Workshop was held on 9 March 2015 to allow Great Lakes Councillors access to recognised legal, science and engineering experts in the coastal management domain. It included coastal consultants, legal practitioners, senior OEH staff as well as Coastal Panel Chair, Angus Gordon. This workshop provided opportunity for Councillors to specifically seek advice on the immediate and medium term actions needed for Jimmys Beach as well as the legal implications of these strategies.

4.4 Recent Community Engagement

In the most recent exhibition period from 2 April to 15 May 2015 Community Information Sessions were held at Hawks Nest Community Hall on two separate occasions: Thursday 9 April and Monday 27 April 2015. Reasonable attendances of 20 - 30 people were recorded at both sessions with 23 formal submissions for Jimmys beach subsequently received. Other Sessions held at Forster and Pacific Palms also had information available regarding Jimmys Beach.

4.5 Review of Coastal Zone Management Plan

It is noted that a planned revision of Jimmys Beach CZMP scheduled over the next 12 to 24 months offers an opportunity to update dredging and sand transfer commissioning and operating information. The early review will also develop concepts for design, recovery and revegetation of dune system along The Boulevarde. It is intended to conduct further community engagement and workshop opportunities during this next stage of the CZMP. As such the planned review provides a good means of increasing community awareness and participation in development of pragmatic adaptation actions.

A summary and discussion of most recent formal submissions is provided in **Section 5**, below.

5 FORMAL SUBMISSIONS

A total of 23 formal submissions were received during the most recent exhibition period from 2 April to 15 May 2015. Submissions were also received from NSW Department of Primary Industries and NSW Crown Lands. The Crown submission was received late but has been included due to issues which relate directly to the proposed ongoing and semi-permanent renourishment program. State submissions are considered in **Section 5.2**.

5.1 Summary of Public Submissions

Table 5 provides a summary of public responses on three particular management issues. It gives a condensed view of concerns and suggestions across the three main management areas above that were important to a particular respondent. Respondent numbers however, provide no real measure of significance of each issue at a community level, as the written submissions are not responses to standard survey questions.

Table 5 Summary of Formal Submissions

Respondents	Erosion/Recession Management
6	Sand renourishment should continue
5	Sand renourishment is not sustainable and/or cost-effective
5	Permanent or hard engineering solution is needed
4	Truck/plant access and transfer pipelines will damage walking track and sensitive areas
3	Comprehensive investigation and modelling of sediment transport needed
3	Already many studies that don't focus on main threats or solutions
3	Swell modifying, subsurface reef structures needed
3	Any Coastal Protection Service Charge should be equitable
2	A more durable road foundation should be used in road reinstatement
2	Monitoring and evidence-based action will be required in the future
1	Better economic assessment of options and timeframes
Respondents	**Environmental Management**
3	Fragile nature of peninsula needs protection and rehabilitation
3	Most questionnaire survey respondents valued natural beauty and peaceful nature of area
2	Concerned about management of Sea Grass and apparent siltation
1	Dunes, vegetation & access at Eastern Car Park should be stabilized, protected and improved

Respondents	Land Use Planning
4	Early review of CZMP needed
3	Coastal Risk Planning Area will prevent improvement/renovation of houses
2	Hazard lines are not appropriate for planning purposes
2	Property values have decreased due to Coastal Risk Planning Area
1	Prohibit development on all active dune systems

5.2 State Agency Submissions

NSW Department of Primary Industries provided advice in relation to the correct title of 'DPI - Marine Parks', its objectives and the relationship of various marine zonings to conservation and permitted activities. Several other definitional matters were also clarified and have been noted for correction. SES (within DPI) were contacted independently for comment but did not respond by close-off time.

NSW Crown Lands consulted with Council staff on 20 May 2015 and have undertaken to provide a written submission. Due to the importance of operations in Crown reserves, particularly to the proposed renourishment program, the submission will be appended to this CZMP for consideration during the review process.

5.3 Discussion of Public Submissions

5.3.1 Erosion and Recession Management

The cost-effectiveness of continued renourishment was a common theme in the formal submissions as well as in discussion at both Information Sessions. And consequently, the interest in hard, more permanent solutions shows the same level of mention. It is also noted that of the 23 formal submissions six respondents explicitly supported the continuation of sand renourishment of Jimmys Beach.

The currently preferred option of renourishment was selected on the basis of cost-effectiveness in which the indicative cost of each option was resolved into an annual cash flow or cost. This method does not capture the benefits that may derive from a particular option, such as the economic and social value of also maintaining a viable public beach, that renourishment also delivers.

The proposed CZMP review not only provides a good opportunity to capture and clarify all relevant costs and benefits, it also offers the chance to use this information to more reliably prioritise potential actions. Such an evaluation can then be use to better design an adaptation pathway for investment in coastal risk management by establishing appropriate timeframes and action trigger points.

It may well be that the use of renourishment over the next 15 – 20 years can readily adapt by the addition of a sea wall structure (still requiring renourishment) or perhaps some other emerging technology.

The idea of a Coastal Protection Service Charge was reasonably prominent in submissions. This discussion has only just commenced and again, the proposed CZMP review provides an appropriate opportunity to properly explore all cost implications with the community and to put forward a charging model that does satisfy the test of equity. It is worth noting that the issue of 'public good' was raised in view of the large number of

non-residents that also enjoy having a viable beach. This is a very valid point and logically the role of Council and State. The NSW Coastal Protection Service Charge Guidelines provides a means of proportioning charges to all stakeholders including local and state government as well as owners of public utilities.

Rebuilding the road structure along The Boulevarde with a more durable base was an option already under consideration and which was only confirmed when the necessary disaster relief funds became available through NSW Roads and Maritime Services. This has been now taken up with the installation of a cement-modified reinforced substructure that can stand moderate levels of swell damage without failure. This is designed to give a modest level of protection pending the establishment of the full sand buffer in the near future.

Three issues relating to: previous investigations, permanent solutions and reef structures speak to the need to take a more comprehensive approach to understanding the swell, current and sediment dynamics comprising the eastern basin of Port Stephens. This could be commenced by compiling and reviewing the learnings from previous studies by government agencies. A summary of the current status of knowledge should then be used to plan and design further results-orientated investigations that recognise current contingencies and longer coastal adaptation timeframes.

5.3.2 Environmental Management

Although not a seemingly prominent issue over the 22 public submissions it was clear that environmental values and serenity and amenity of the Jimmys Beach area were considerations that underpinned peoples' strong attachment to this shoreline. Three respondents emphasized the fragile nature of ecosystems on Wind Woppa peninsula, hinting at the need for an active inter-agency approach to its sustainable management.

Similarly, the management of Sea Grass beds just offshore at Jimmys Beach are a matter of concern. This reflects points, originally raised at the Myall River Festival Information Session, and in responses to the questionnaire survey. An important contention has been that dumping of sand to meet emergency conditions invariably leads to large immediate losses during each particular storm event. This is believed to be due to the unstable condition of the sand when tipped from a truck.

Additional sand appears to be transported offshore beyond the immediate surf zone, in a south easterly direction dropping out over Sea Grass beds. This suggestion does appear to be borne out in examination of air photos across the decades, with a noticeable increase over the past 10 years. Other anecdotal evidence (Myall River Festival) speaks of decreased Flathead catches in this area, perhaps tied to reduced Sea Grass habitat.

Importance was also placed on the Eastern Carpark due to the ease of access for mobility impaired people. It is agreed that this particular area has suffered from wave overtopping from time to time (most recently in the storms of March 2015) and could become a site for general improvement of infrastructure, parking and access, including dune rebuilding and revegetation.

5.3.3 Land Use Planning

Several people recognised the desirability of an early review process for Jimmys Beach CZMP in order to clarify issues and priorities once the current contingencies have past, and a reasonable sand buffer re-established. This is also consistent with Council and OEH wishes in that it will also allow fuller exploration of other options, and the funding of the necessary integrating research and development.

Other land use planning responses questioned the use of the Coastal Risk Planning Area as the basis for development assessment and strategic planning. A recurring question,

also reflected at the Community Information Sessions, was the apparent need for revision of the risk area now that the commitment to nourishment had been confirmed on the part of Council. This is in part a valid question and OEH advise that as long as there is no definitive sea wall supporting the dune system, renourishment itself does not remove erosion/recession risk entirely. This aspect of residual risk needs to be captured in the Risk Planning Area however, it is believed that once consistent levels of protection are demonstrated through future storm events, with the operation of nourishment there, will be some scope for a statistical review of the extents of the Planning Area.

Other minor misconceptions regarding both property values and development options can be clarified reasonably easily. Part of the concern over property values appears to stem from unfortunate misinformation regarding the levels of development or even renovation that would be possible with existing residences. Along The Boulevarde, most extension and addition work can still be undertaken providing appropriate foundation design is incorporated where necessary. This is a reasonable precaution. Opportunities to extend residences to the rear and away from the hazard source also offer other redevelopment options.

The prospect of complete redevelopment (knock down & rebuild) is also considered in the context of the proposed nourishment program. In this case it makes good sense to require such developments to be piled below or beyond the area of potential instability, the zone of reduced foundation capacity (ZRFC). If the foundations were to be exposed say, in the case of a Super Storm, the residence would not be lost, allowing recovery time to re-establish sand and dunes through the nourishment process. Such precautions are seen to be prudent given the value of the structures the foundations would support.

Management of the proposed Sand Nourishment System will need to respond appropriately to changing environmental conditions over time. It is expected that once a high level of operational confidence is established, perhaps after 10 years, a review of Jimmys Beach Coastal Risk Planning Area may be appropriate.

Jimmys Beach CZMP

Appendix D – Emergency Action Plan

Subject to finalisation of this CZMP the Jimmy's Beach Emergency Action Sub Plan (EASP) should be reviewed. Amendments will be required to update with new sources of beach nourishment.

As management options of CZMP take place the Jimmy Beach ESAP should continue to be reviewed.

Great Lakes COUNCIL

DRAFT Jimmys Beach Emergency Action Sub Plan

Table of Contents

1. Introduction

1.1 Background

Jimmys Beach is located on the northern shoreline of Port Stephens, Winda Woppa. In 1985 approximately 110 dwellings occupied the peninsula with redevelopment and new sites bringing that number to 130 in 2005. Of these, 48 are located along The Boulevard which faces Jimmys Beach. A public road and utilities are located between these private properties and the foreshore.

Erosion problems have been occurring along Jimmys Beach for many years, the erosion has increased over the last 30 years possibly due to the loss of foreshore vegetation. Historically, sand renourishment of the beach has been used as a means to protect the public infrastructure during severe storm events. Shown below in Figure 1 is the High Erosion Area of the site.

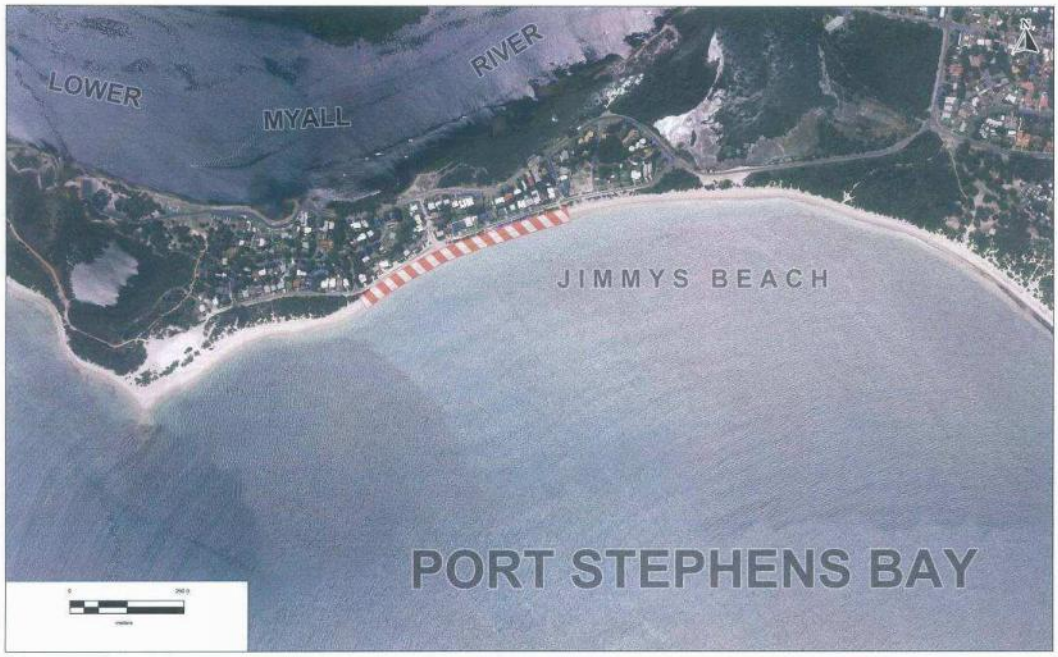


Figure 1

Jimmys Beach Emergency Management Plan - Heavy Erosion Site

Recognising the effectiveness of using sand as a sacrificial barrier to erosion, a proactive renourishment scheme was developed where sand was sourced from the Yacaaba Isthmus, approximately 2.5 km to the east of the erosion point, pumped along the beach face, and used to create a deeper beach front. This relocated sand created a store or buffer along the foreshore to mitigate one annual storm cycle. The buffer was then to be replenished throughout the year as needed to maintain a constant sand barrier

The management of Jimmys Beach will always be reliant on maintaining this adequate sand buffer. The maintenance of that buffer will be dependent upon storm activity and the timely renourishment of the beach to restore the depleted sand resources. The scale of the renourishment exercises, inevitably, means that from time to time, emergency sand replenishment might be required to buffer storm

erosion threats to the public infrastructure. This will require strategically managed supplies of sand, sound deployment techniques and post emergency actions

This Emergency Action Sub Plan has been prepared to provide guidance on when and how, to respond to storm induced coastal erosion events and the necessary actions to be undertaken during and after the event has occurred. The plan also identifies the approvals necessary to undertake these works.

1.2 Property Description

The details of the foreshore directly affected by significant storm erosion are:

Owner :	Land and Property Management Authority
Land Manager :	Great Lakes Council
Lot :	73
DP :	524621
Zoning:	6(a)

Directly adjacent to this foreshore is a 15m road allotment containing public infrastructure. Private allotments under threat if these items of public infrastructure lost are, but not limited to:

Lots: 16 through to 25	DP: 233547	Zoning: 2(a)
Lots: 39 through to 53	DP: 233549	Zoning: 2(a)

2. Objectives of the Emergency Action Sub Plan (EAsP)

The purpose of this plan is to provide information and direction on the future emergency management of the Jimmys Beach foreshore. Principally, the plan is to provide guidance on what is to be done when storm erosion threatens the public infrastructure along Jimmys Beach. Recognising there are a number of issues surrounding emergency management, the plan is divided into three key areas:

- Emergency Strategy.
- Post Emergency Actions.
- Necessary Approvals.

3. Emergency Strategy

3.1 General

It has been determined that the emergency management of Jimmys Beach foreshore is to be undertaken using sand as a buffer against high erosion caused by significant storm events. Historically, sand has been sourced for emergency works from two primary locations. The first, and most used, is the back dune system at the end of Beach Road known as “Dead Mans”. The second, and not so heavily used site, is at the western end of The Boulevard. Both sites have been used successfully in the past and could present the primary source of sand for

future emergency works. However, the future use of the western end of The Boulevard is no longer considered a viable option due to recent infrastructure improvements in that area.

There is also a future option to stockpile sand on the western shoreline of the Winda Woppa peninsula, sourced from the Eastern Channel of the Lower Myall River. This additional sand source may provide a valuable supply of sand to use in an emergency situation and could be considered for future renourishment campaigns. However, prior to any use of this material a thorough investigation into the environmental impact of such actions needs to be undertaken.

3.2 Emergency Intervention - When to Act

Due to the nature of the work, and equipment required, a pre-emergency reaction period needs to be considered to ensure there is enough time to mobilise staff and resources. A "trigger point" is a marker or points in time that indicate a need to commence emergency action procedures to renourish the beach. In this case, these will be displayed physically on the ground.

3.2.1 Trigger Point 1 - Monitoring and Standby Procedures

When the erosion of the foreshore has depleted the sand buffer to within **10m** of the road edge, monitoring of tide / swell and ground conditions is to be undertaken to provide indications if the threat will increase. During this time, all plant and human resources are to be placed on standby.

3.2.2 Trigger Point 2 - Commence Emergency Works

When the erosion of the foreshore has depleted the sand buffer to within **5m** of the road edge, mobilisation of plant and human resources is to commence. During this time all traffic control measures are to be put in place and the immediate renourishment zone secured and sand extraction and transportation routes managed.

3.3 Sand Source

Sand is to be sources from 'Dead Mans' until such time that the use of sand from the eastern channel of the Lower Myall has been approved. In the past when the existing sand buffer has been breached, approximately 8,000m3 has been used over a period of two weeks to protect the public infrastructure and maintain minimum buffer between and the road and the foreshore. Consequently a stock pile of 10,000m3 of sand is to be maintained at "Dead Mans" and used in the event of an emergency.

Annexure A shows clearly the area of sand to be used for emergency renourishment of the beach. Sand is not to be removed from any other part of the dune system without approval. An access road currently exists in this location.

3.4 Traffic Management Plan

Traffic management is critical when dealing with coastal erosion along Jimmys Beach. Past actions have required all roads leading into the erosion zone to be

occupied by trucks, other plant, and on ground staff. The exclusion of the community from the site is imperative for the management of public safety.

A comprehensive traffic managed plan as been prepared utilising all potential sand stockpile sites at once. Exclusion of non use areas and the required scaling down of the traffic control plan will be at the discretion of the lead agency. The Traffic Management Plan is attached as annexure B.

3.5 Renourishment Process

Once emergency works have been initiated, all traffic management systems need to be in place. Sand is to be sourced and transported along the identified route. Only necessary erosion and protection fencing is to be removed to provide access to the erosion area.

Sand deposition is to commence at the deepest erosion point and moved along the foreshore by appropriate machinery. Emergency works are to continue until the storm abates or the tidal progression allows a period of down time. Works are to recommence as soon as practical and should continue until the threat of further erosion is mitigated. Where possible, a buffer of 5m is to be achieved before the site is declared clear.

3.6 Communication Strategy

A communication strategy needs to be in place that covers pre, during and post storm events. As the erosion of Jimmys Beach is a regular occurrence, steps can be taken to maintain a level of local community awareness and preparedness.

3.6.1 Pre Emergency Preparedness

As the foreshore erosion in this area is very localised, the immediate effected properties are to be kept informed of general practices via information sent directly to their property. Due to the high-holiday rental rate in this location, information also needs to be readily available in each of the holiday rental properties potentially under threat. This can be achieved by liaising with the local Real Estates to ensure appropriate information is displayed in each of the locations. This is to be undertaken in April each year, as this period is closure to the known storm period which effects this location form May through to September.

3.6.2 During Emergency Actions

Initial awareness of the potential for a storm event causing erosion is broadcast through the Bureau of Meteorology. Once an announcement has been initiated, the relevant State Emergency Service and Council's Local Emergency Officer are to undertake actions as described in the State Storm Plan.

All on ground works are supervised by Councils Operations Manager through the Area Coordinator.

3.6.3 Post Emergency Community Communication

Due to the high potential that foreshore erosion will render the foreshore and beach face unusable, appropriate signage is to be in place at all entries, warning of potential beach zones hazards created by the loss of sand. Where

the beach is rendered unsafe, the beach is to be closed and reshaped until usable. This is to be communicated by on ground signage and appropriate exclusion fencing.

4. Post Emergency Actions

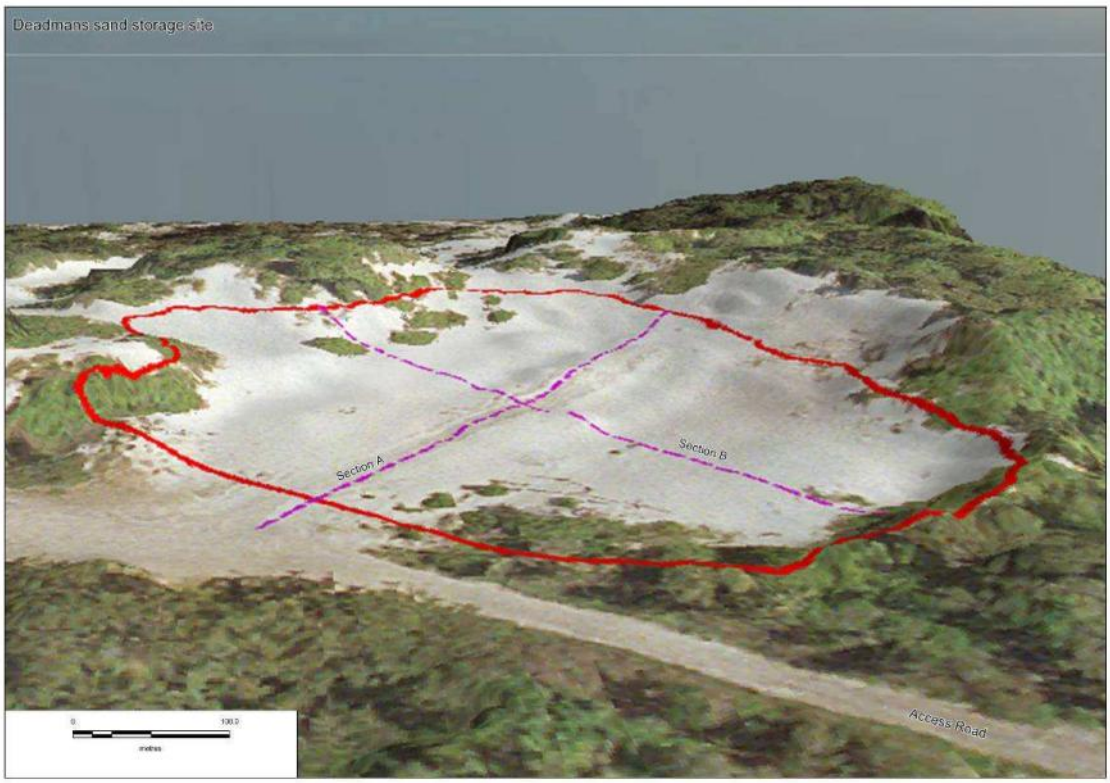
Once the need for emergency works has ceased further actions are required to gauge effectiveness of emergency works and prepare for future renourishment when required. These works include:

- Survey the area used to source the sand to identify quantities extracted.
- Commence replenishment of the sand source area to ensure material is available for future campaigns.
- Survey eroded foreshore area to determine the extent renourishment need to maintain the sand buffer as required for one annual storm period.
- Commence renourishment of Jimmys Beach as soon as possible.
- Reinstate all dune and pedestrian fencing.
- Commence revegetation of the foreshore to assist in retaining sand along the dune system.
- Amend Emergency action Sub Plan as required.
- Report actions as per requirements of approvals.
- Establish cost and resources used to undertake works.

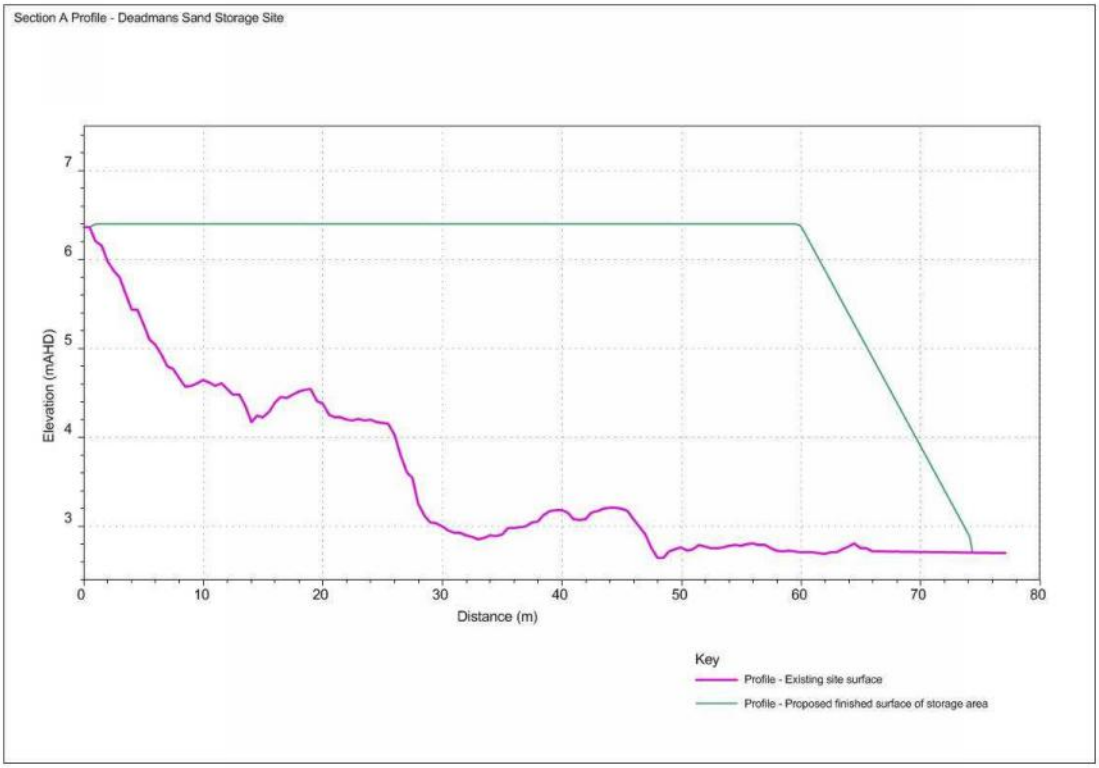
5. Approvals

The land managed under this emergency action sub plan is Crown Land. To ensure all relevant approvals are in place concurrence from the Department of Primary Industries, Crown Lands Division needs to be obtained. This approval covers access to the land for stockpiling sand, removing stockpiled sand and the use of that sand for emergency works. To underpin these activities a Review of Environmental Factors (REF) has been produced which stipulates all proposed works. This REF and approval to operate is attached as Annexure C.

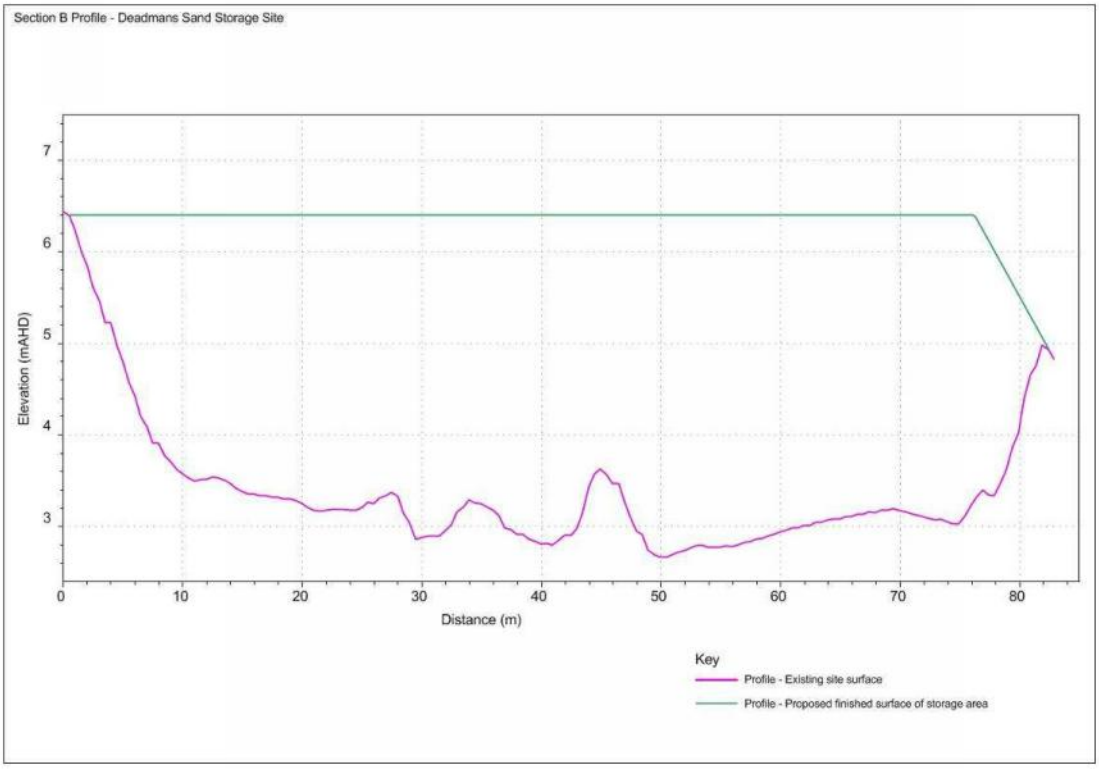
Annexure A: Deadmans Sand Storage Site



DEADMANS SAND STORAGE SITE



SECTION A PROFILE - DEADMANS AND STORAGE SITE



SECTION B PROFILE - DEADMANS AND STORAGE SITE

Annexure B: Traffic Control Plan

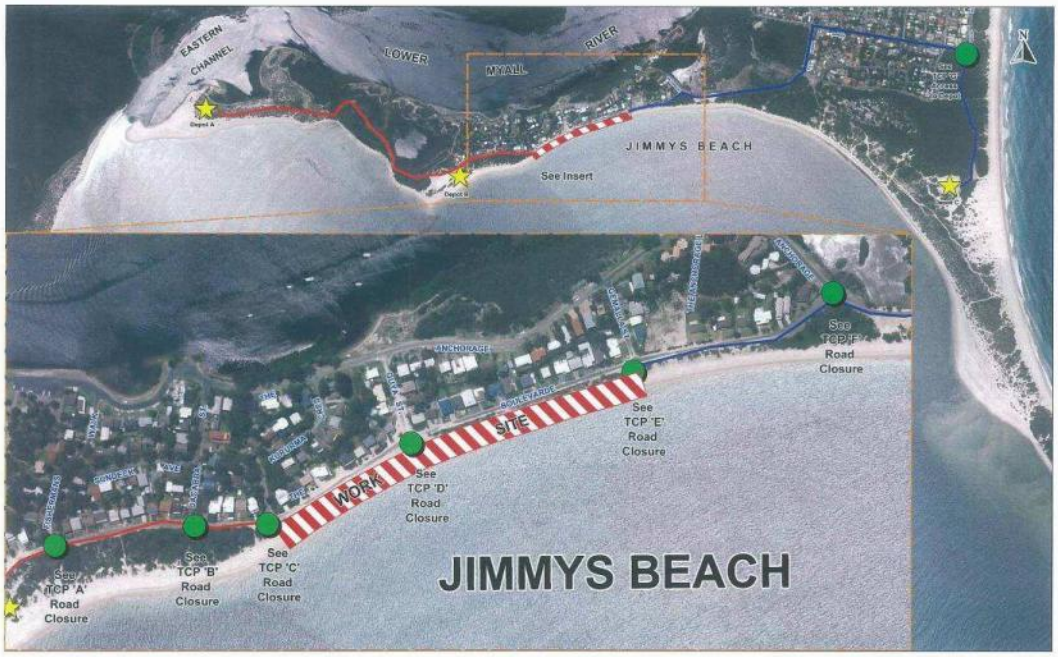
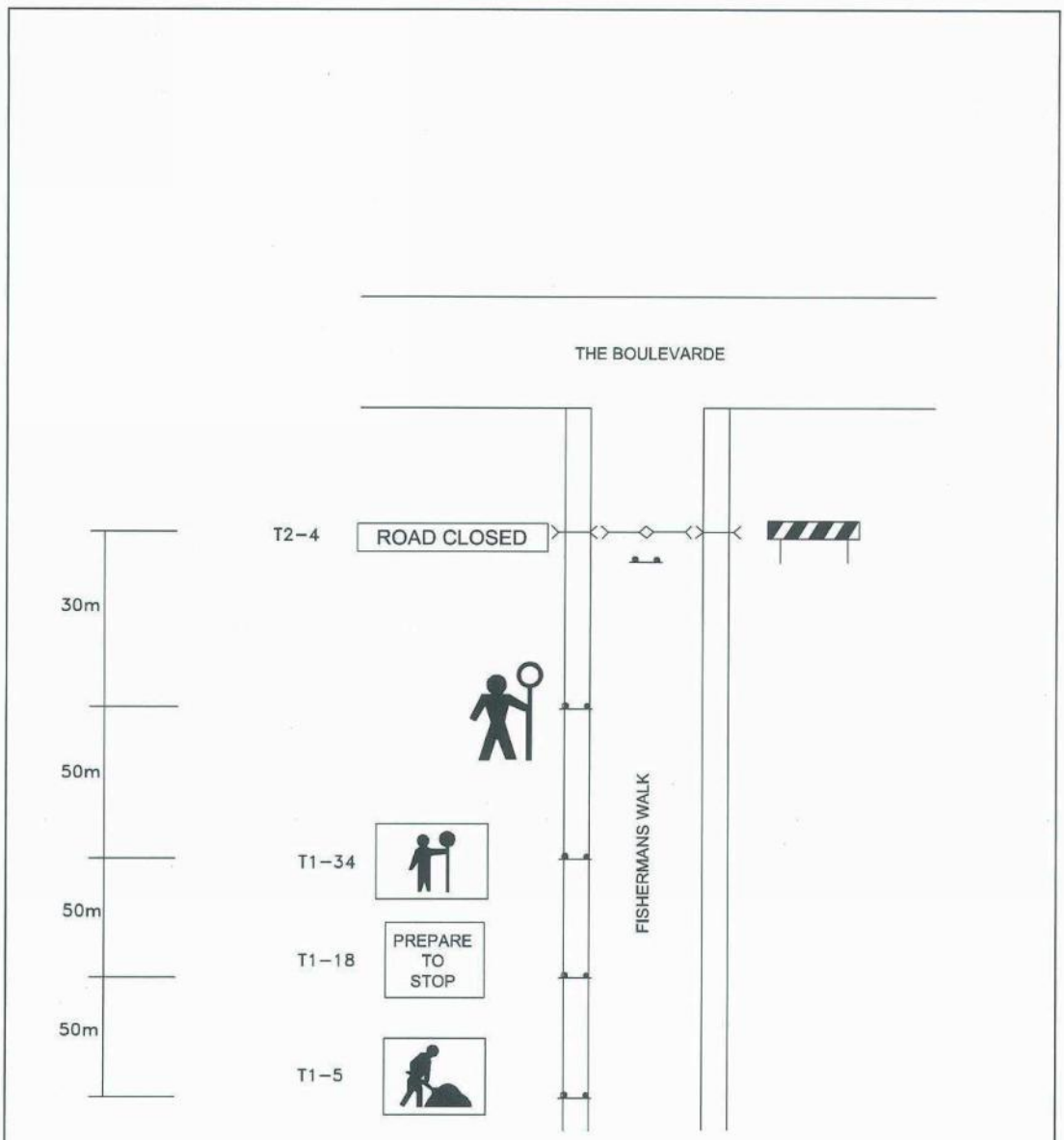


Figure 5

Jimmys Beach Emergency Management Plan - Traffic Control Plan



PREPARED BY WADE HOLMES
7222034632
BASED ON TCP 47

Great Lakes COUNCIL	Great Lakes Council Design & Investigation Breese Parade Forster NSW 2428	Project: Jimmys Beach Emergency Management Plan File: emergency management plan.dwg Date: Apr 28, 2011 - 1:59pm Plotted by: wadeh	Title: Traffic control plan Plan A Fishermans Walk Original Scale: NTS Designed/Drawn: WH Date: April 2011 Checked: - Date: - Authorised: - Date: - Drawing Number: TC/2011/002 Rev: -

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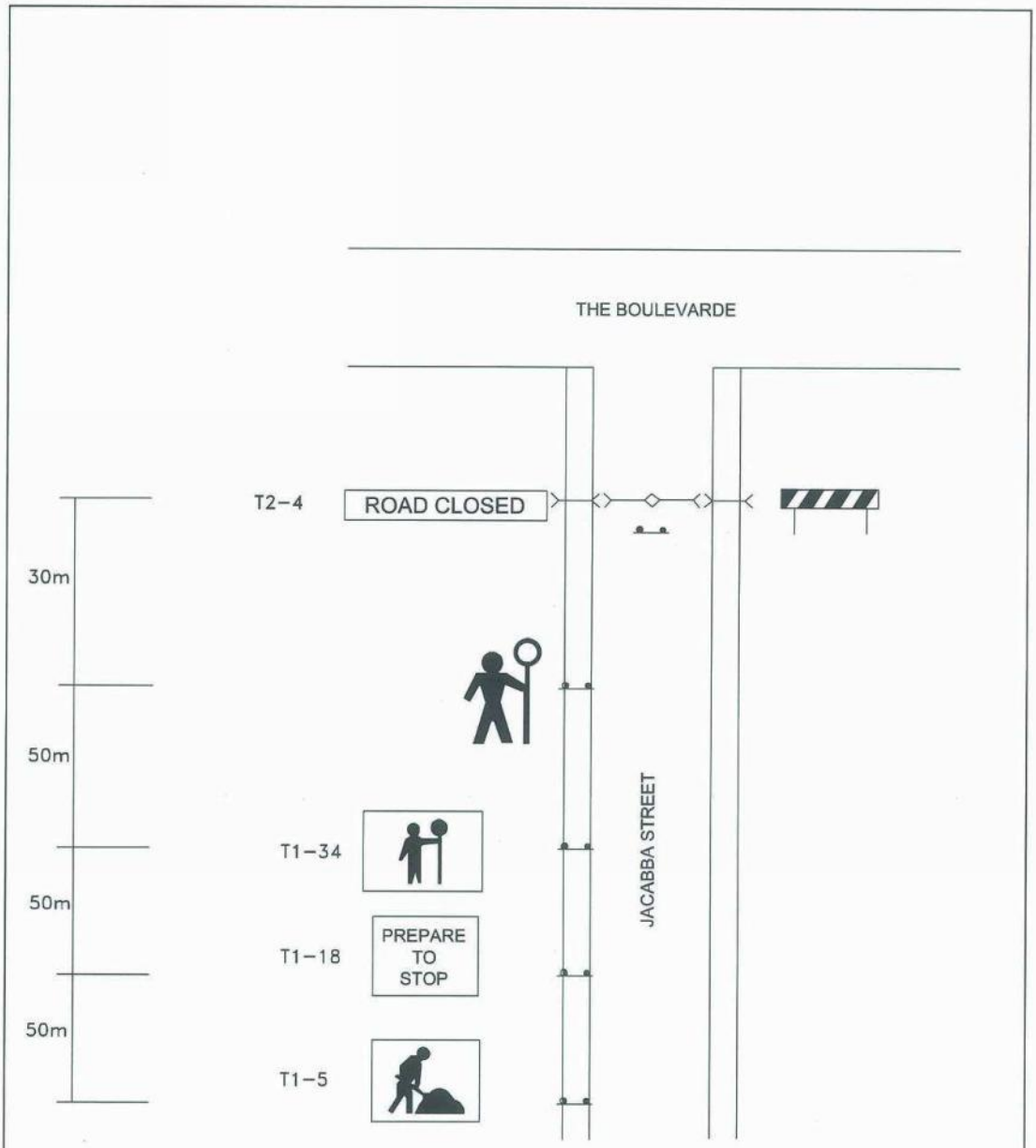

Great Lakes Council
Design & Investigation

Breese Parade
Forster
NSW 2428

Project: Jimmys Beach Emergency Management Plan

Title: Traffic control plan Plan B Jacabba Street

File: emergency management plan.dwg
Date: Apr 28, 2011 - 2:00pm Plotted by: wadeh

Original Scale	Designed/Drawn	Checked	Authorised
NTS	WH	-	-
	Date April 2011	Date -	Date -

Drawing Number: TC/2011/003 Rev -

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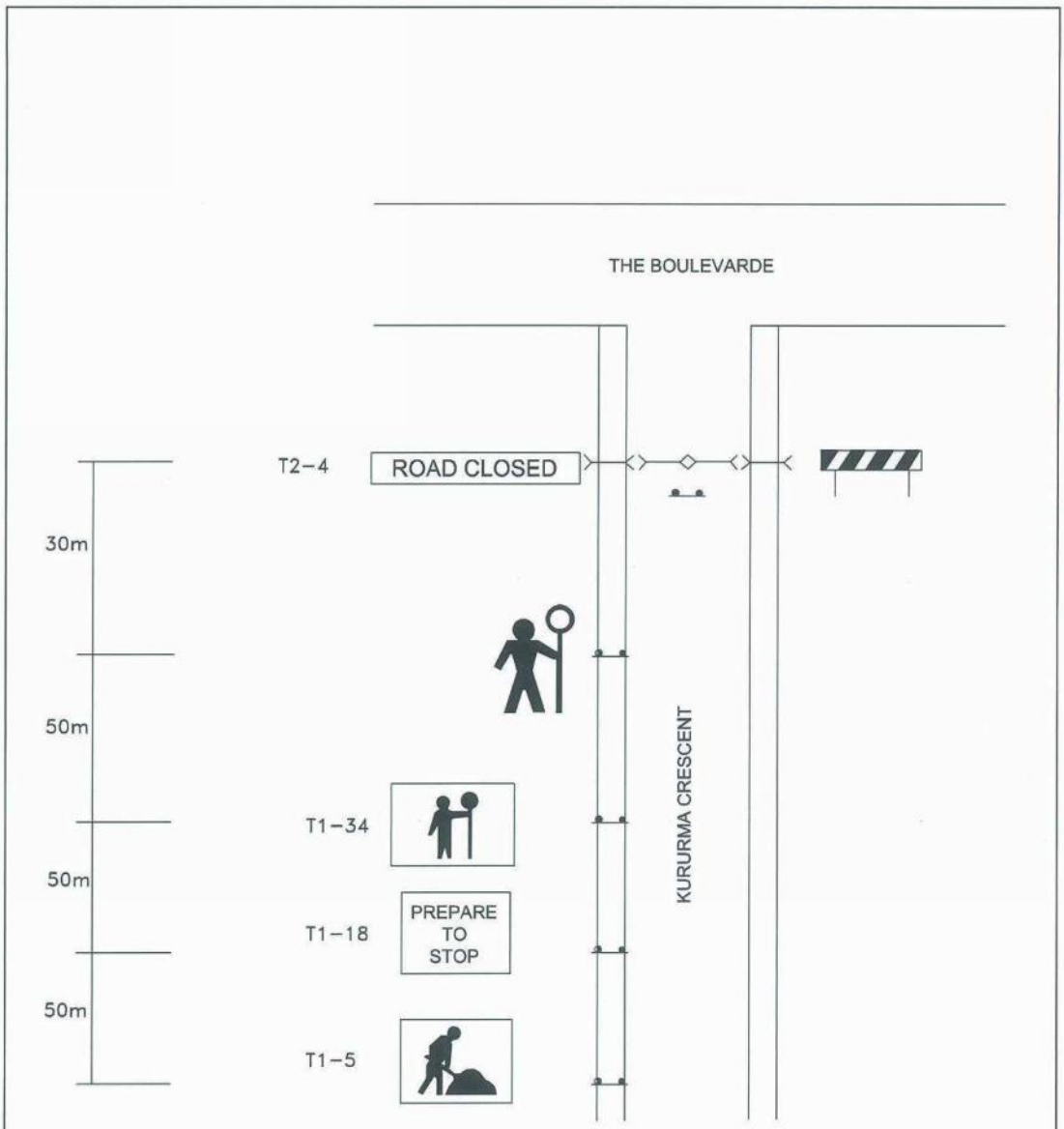

Great Lakes Council
Design & Investigation

Breese Parade
Forster
NSW 2428

Project: Jimmys Beach Emergency Management Plan

Title: Traffic control plan Plan C Kururma Crescent

File: emergency management plan.dwg
Date: Apr 28, 2011 - 2:01pm Plotted by: wadeh

Original Scale: NTS
Designed/Drawn: WH Date: April 2011
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Authorised: - Date: -
Drawing Number: TC/2011/004
Rev: -

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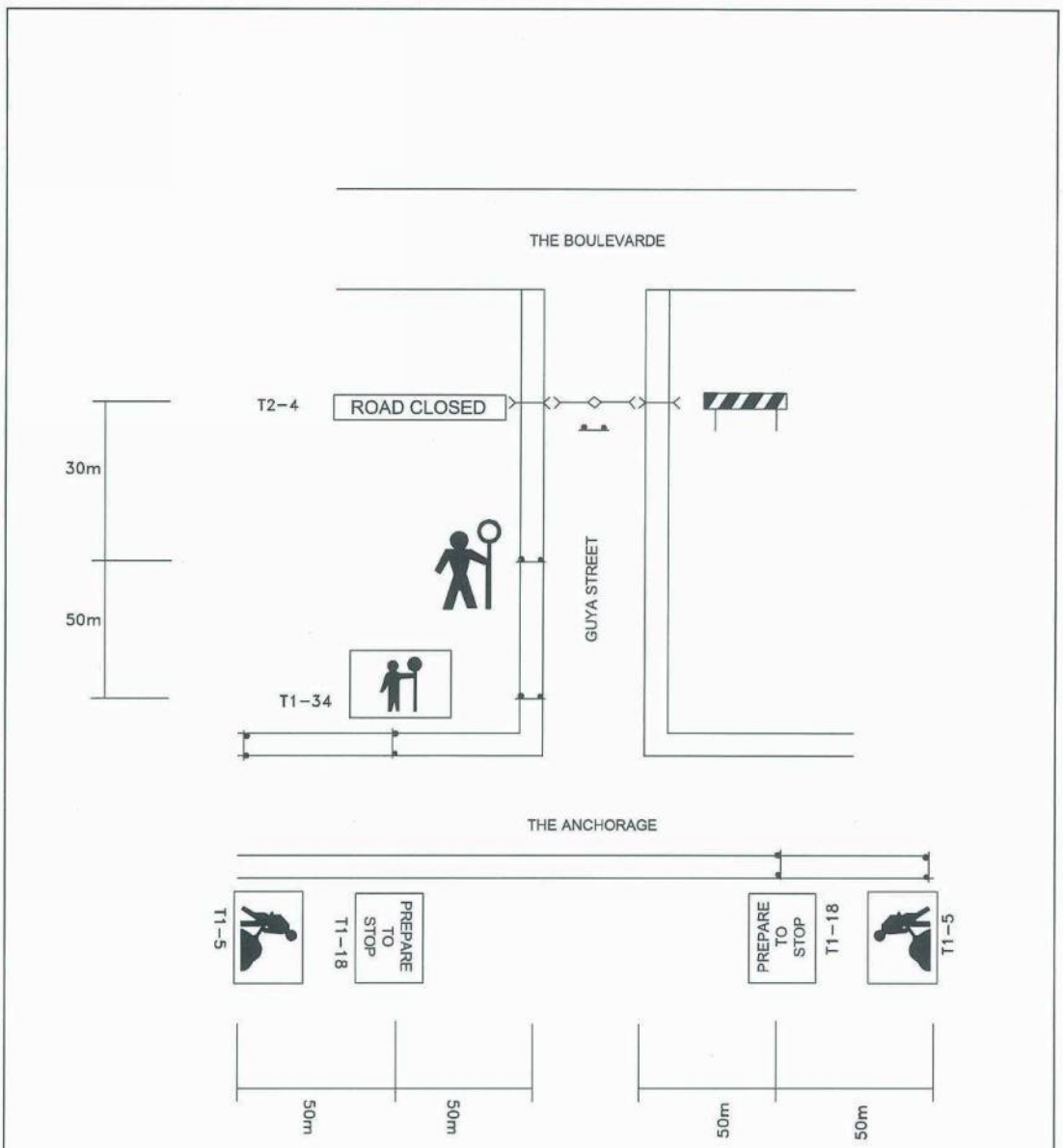

PREPARED BY WADE HOLMES
7222034632
BASED ON TCP 47

Great Lakes COUNCIL

Great Lakes Council
Design & Investigation

Breese Parade
Forster
NSW 2428

Project: Jimmys Beach Emergency Management Plan

Title: Traffic control plan Plan D Guya Street

File: emergency management plan.dwg
Date: Apr 28, 2011 - 2:01pm Plotted by: wadeh

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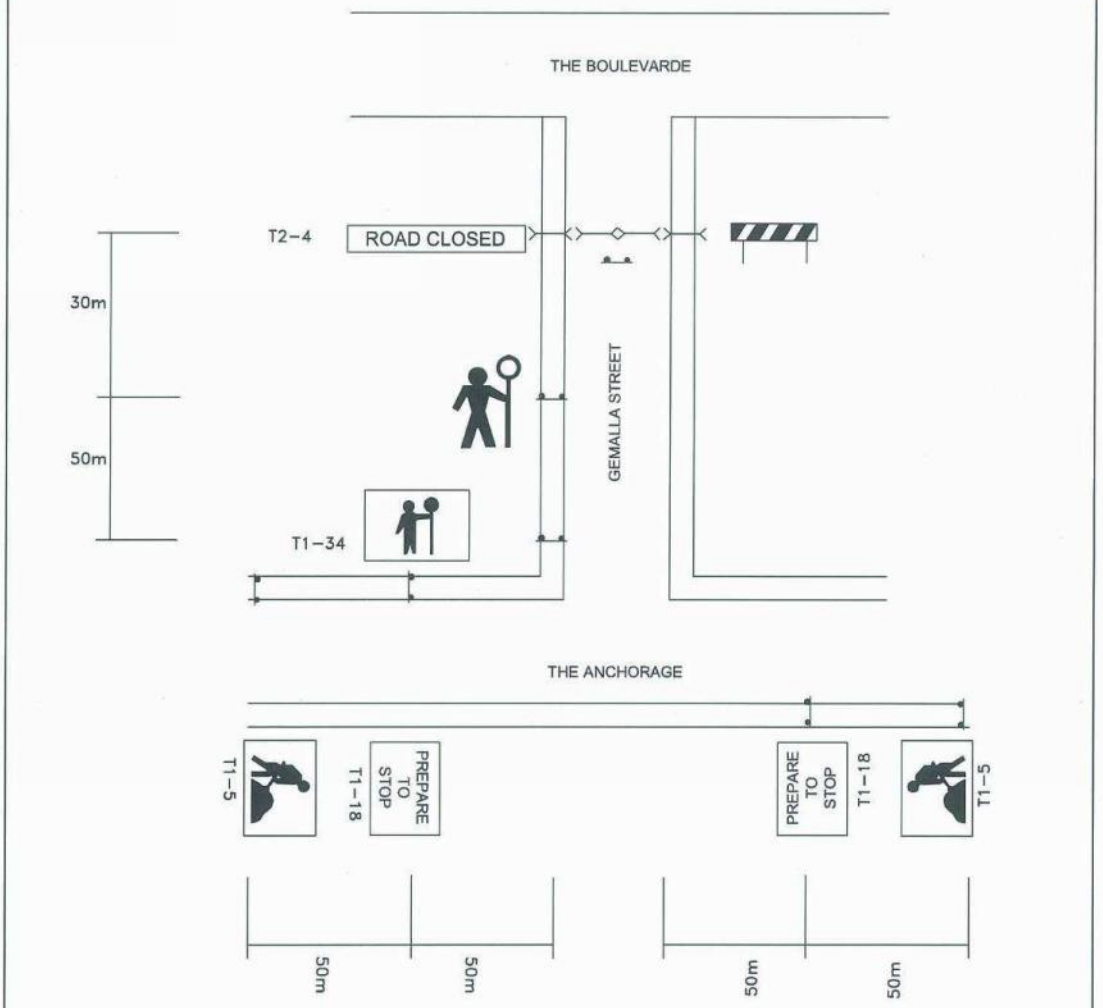

PREPARED BY WADE HOLMES
7222034632
BASED ON TCP 47

Great Lakes COUNCIL	Great Lakes Council Design & Investigation Breese Parade Forster NSW 2428	Project: Jimmys Beach Emergency Management Plan File: emergency management plan.dwg Date: Apr 28, 2011 - 2:02pm Plotted by: wadeh	Title: Traffic control plan Plan E Gemalla Street Original Scale: NTS Designed/Drawn: WH Date: April 2011 Checked: - Date: - Authorised: - Date: - Drawing Number: TC/2011/006 Rev: -

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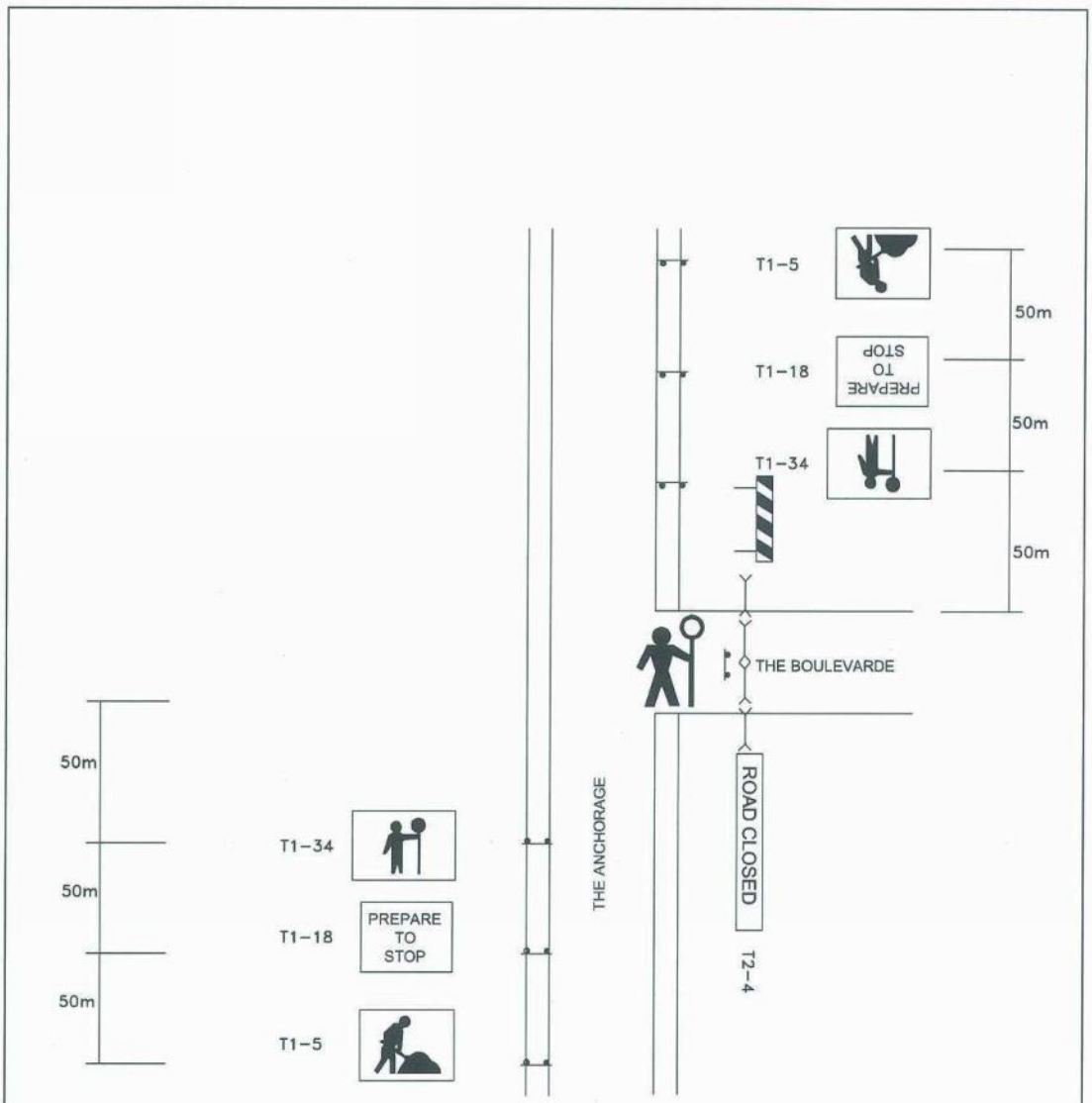

PREPARED BY WADE HOLMES
7222034632
BASED ON TCP 47

Great Lakes COUNCIL	Great Lakes Council Design & Investigation Breese Parade Forster NSW 2428	Project: Jimmys Beach Emergency Management Plan File: emergency management plan.dwg Date: Apr 28, 2011 - 2:02pm Plotted by: wadeh	Title: Traffic control plan Plan F The Boulevarde Original Scale: NTS Designed/Drawn: WH Date: April 2011 Checked: - Date: - Authorised: - Date: - Drawing Number: TC/2011/007 Rev: -

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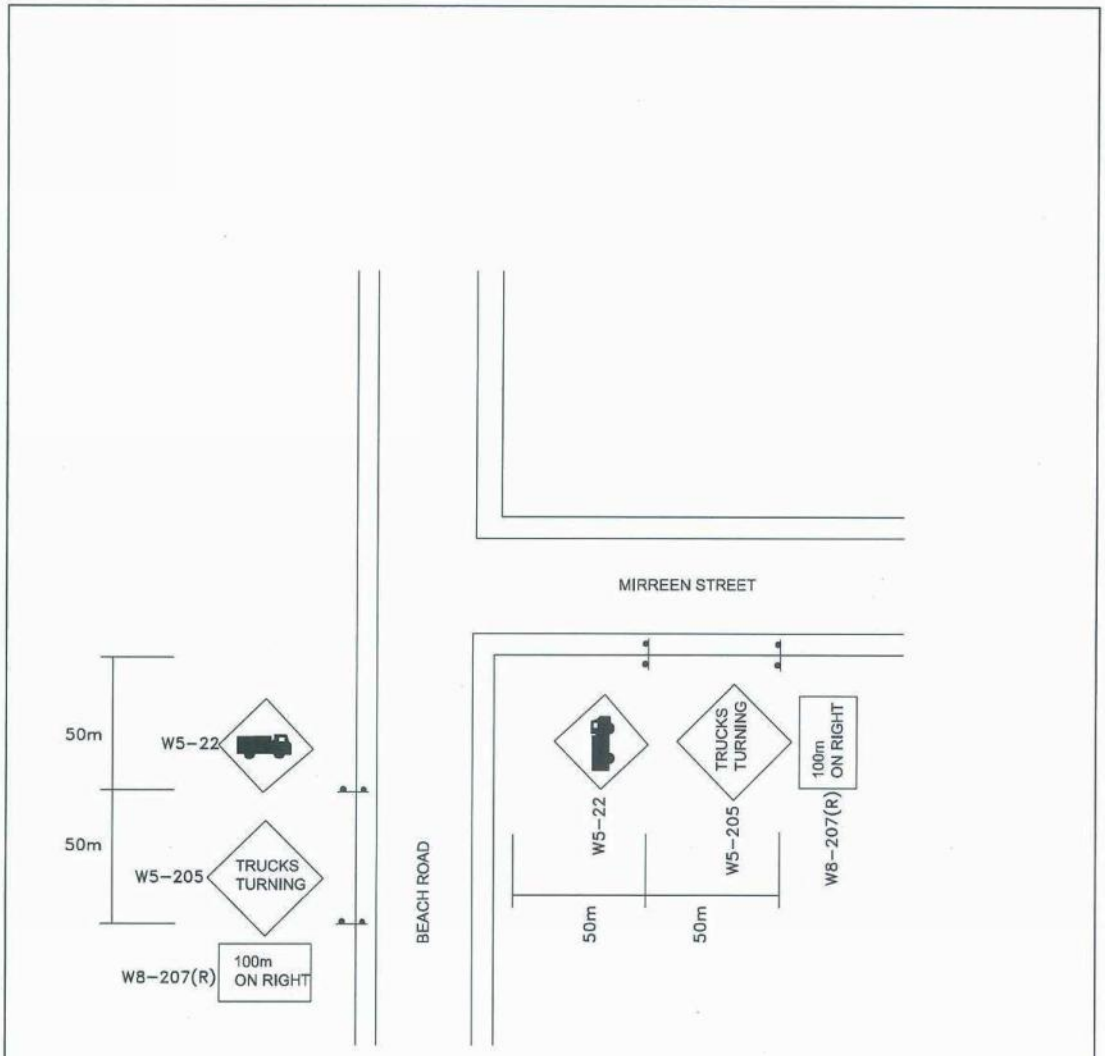

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BASED ON TCP 195

Great Lakes COUNCIL

Great Lakes Council
Design & Investigation

Breese Parade
Forster
NSW 2428

Project: Jimmys Beach Emergency Management Plan

Title: Traffic control plan Plan G Beach Road

File: emergency management plan.dwg
Date: Apr 28, 2011 - 2:03pm Plotted by: waddh

Original Scale	Designed/Drawn	Checked	Authorised
NTS	WH	-	-
	Date April 2011	Date -	Date -

Drawing Number: TC/2011/008 Rev -

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Annexure C: REF & Approval to Operate

NSW GOVERNMENT
CROWN LANDS

T. Hemmingway
NSW Department Primary Industries
Crown Lands
T 02 65913513 F 02 65522816
E terrence.hemmingway@lands.nsw.gov.au

Mr Andrew Staniland
Natural Assets Officer
Great Lakes Council
PO Box 450
FORSTER NSW 2428

Dear Sir

RE REF 2011-2 Sand Extraction at Hawks Nest

I refer to your message of 7th October 2011 and to the Review of Environmental Factors forwarded in relation to the above.

The REF has been considered and I can advise that Crown Lands Division, Department of Primary Industries agrees with the content and considers the documentation fulfils the requirements in terms of Part 5 of the Environmental Planning and Assessment Act 1979.

If further information is required please call on phone number 65913513.

Yours faithfully

T Hemmingway
Mid North Coast
Crown Lands Division

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98 Victoria Street
TAREE NSW 2430

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REVIEW OF ENVIRONMENTAL FACTORS:
REF STANDARD TEMPLATE

Note: This Standard REF Template has been prepared as part of the implementation of the Great Lakes Improvement Program – The REF Process (2010). This Standard REF Template shall be completed for all Council activities and projects. Where the proposed activity has a minor or benign environmental risk or impact, then no further environmental impact assessment is required and the activity can be approved. Where the proposed activity has a moderate or major environmental risk or impact then further environmental impact assessment would be required (eg. REF1 or REF2 standard template).

Project/ Activity Name	Sand Extraction from Yacaaba Peninsula for stockpiling at Deadman's prior to use as re-nourishment sands for erosion protection at Jimmys Beach	**DataWorks Project Reference**	**02/2011**
		Assessment Date	15 September 2011

THE PROJECT/ ACTIVITY AND ANY ASSOCIATED CONSTRUCTION WORKS MUST NOT COMMENCE UNLESS:

- The officer completing the REF has signed the completed document, verifying that each of the steps has been satisfied and no further assessment or investigation is required, AND
- The adopted approval process of Great Lakes Council has been completed and formal written approval has been documented, AND
- It is concluded that the likely environmental impact of the project/ activity is reasonable and the project can proceed subject to relevant protective safeguards/ measures (which are clearly stated herein) and the conditions of any approvals, licences or permits, AND
- The required approvals, licences and permits have been obtained as outlined in TABLE 2 and TABLE 3, AND
- All relevant construction personnel are aware of:
  - Their responsibilities, as detailed in this REF
  - The Project Details and Environmental Impacts as detailed in TABLE 1 and TABLE 4
  - The Protective Safeguards as detailed in TABLE 4
  - The Environmentally Sensitive Areas as detailed in TABLE 3
  - The conditions in any approvals, licences or permits as detailed in TABLE 2

NOTE: If any protective safeguards are required (TABLE 4), the following is to occur:
- The protective safeguards MUST be prepared as an Action Table/ Field Checklist (Schedule 1) that is prepared as and forms part of the Work Specifications and Construction or Environmental Management Plans, and
- Where a construction drawing is prepared, the protective safeguard measures should be listed in the schedule on that drawing.

NOTE: If any approvals, licences or permits are required as outlined in TABLE 2 or TABLE 3, then copies of these MUST be included in the Work Specifications and Construction or Environmental Management Plans and be submitted to the Construction Manager for the project/ activity.

NOTE: Projects/ activities may require a more detailed assessment. Projects/ activities MUST not commence until such time as the required environmental impact assessment and/ or specialist environmental studies has been satisfactorily completed.

NOTE: Some minor projects/ activities are exempt development. Where the project/ activity demonstrably satisfies the exempt criteria, an REF is not required. Reference should be made to SEPP (Infrastructure) for guidance.

NOTE: Projects requiring a Part 3A or Part 4 planning approval must be referred to the relevant consent authority.

NOTE: This REF has been prepared under Part 5 of the EP&A Act 1979 to examine and take into account to the fullest extent possible all matters which are likely to affect the environment if the activity goes ahead. Such matters are described in s111 and s112 of the EP&A Act 1979, s228 of the EP&A Regulation 2000 as well as s5A of the EP&A Act 1979, along with other relevant statutes and legislation.

TABLE 1 – PROJECT DETAILS

STEPS 1-2

NOTE Prior to completing this Standard REF Template, a site inspection is to be undertaken by the officer completing the assessment.

Site Inspection. A site inspection was undertaken by the person completing the REF	☑ Yes
Date of site inspection	15/09/2011

Item	Project Description and Justification	
1.1	Description of the nature of the project/ activity: *(include all associated activities)*	To meet the objective of the Jimmy's Beach Emergency Sub Management Plan 2011 - s7.2.2 "*source material [sand for emergency works] replenishment and stockpiling is required.*" Therefore a continuous stockpile of 20,000m³ of sand is to be retained at the existing Deadman's quarry. Water based machinery will be employed to extract sand slurry from the waters of Port Stephens at Yacaaba peninsula and transfer it through a temporary over-land pipe network to the existing sand quarry area at the end of the unnamed road known as Deadman's (Beach Street), Hawks Nest. Sand is to be stockpiled at this location for emergency use at Jimmy's Beach, Winda Woppa. The Jimmy's Beach Emergency Sub Management Plan 2011 dictated that the sand stockpiled at Deadman's Quarry will be transported by truck to Jimmys Beach during emergency events. Previous campaigns have proven that borrowing sand from Yacaaba for Jimmys Beach nourishment is effective and efficient, with negligible impacts to the natural environment and community. The Jimmys Beach Coastline Management Review (March 2001) shows that the grain size of the sand borrowed from Yacaaba Peninsula is most suitable for nourishment activities.
1.2	Description of main and ancillary activities associated with the project and their proposed timing:	The following actions will occur intermittently (as required) to ensure a stockpile of 20,000m³ of dredged sand is retained at the Deadman's Quarry. The stockpiled dredge sand shall be retained in the identified borrow area at Deadman's Quarry. Works are not permitted to remove sand from beyond the determined boundary of the extraction zone. The actions proposed include (in summary): 1. Sand will be borrowed from the Port Stephens side of Yacaaba Peninsula using water based machinery with a submersible pump. 2. Sand slurry will be pumped along a temporary overland pipeline across Yacaaba Peninsula to the existing Deadman's sand quarry. The overland pipe is to conform to the existing contours without excavation or the removal of existing native vegetation; 3. A series of settlement ponds with adequate bunds are to be established to separate sand and water within the quarry site. Settlement ponds shall be temporary, and shall be created and removed during the course of each separate campaign; 4. Discharge water shall be returned to the borrow area on Yacaaba Peninsula via a return overland pipe laid adjacent to the above mentioned overland pipe; as above, the overland pipe is to conform to the existing contours without excavation or the removal of existing native vegetation 5. The deposited dredged sand shall be stockpiled within the existing quarry area. Sand mounds are to be tapered to the North East to reduce sand-blow during storage periods; and 6. During emergencies, as dictated by the Jimmys Beach Emergency Sub Management Plan, sand shall be extracted from Deadman's Quarry through use of excavator and transported by tip-trucks to Jimmys Beach for emergency placement.

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1.3	Location of the area of the project/ activity and any proximal areas that may be directly or indirectly harmed or affected:	The proposed works are located in the following areas: ▪ Sand extraction: Yacaaba Peninsula, accessed off the end of Beach St and Coorilla St, Hawks Nest on land known as Lot 7004, DP1056911; ▪ Sand and return water pipelines: Crown Land, part Reserve 83292, for Public Recreation and the Preservation of Native Flora; and ▪ Sand quarry renourishment: Deadman's Sand Quarry, accessed off the unnamed road at the end of Beach Street, Hawks Nest on land known as Lot 7004, DP1056911. A plan of the proposed works areas is attached to this REF (Schedule 2)
1.4	Land zoning of the area of the project/ activity:	6(a)
1.5	Ownership of the land to be modified or affected by the project/ activity:	Crown Reserve, under care and control of Great Lakes Council
1.6	Reference of the construction/ activity plans (Schedule 2) referenced in the preparation of and attached to this REF:	There are no formal construction/ activity plans prepared for this proposed activity. A plan of the proposed works areas is attached as Schedule 2.
1.7	Description of the environment of the land to be modified or affected by the project/ activity: *(climate, geology and soils, native vegetation and habitat, waterbodies and cultural, built and social environment)*	The sand borrow site is an area of Port Stephens off Yacaaba Peninsula, which is demonstrated to comprise of sands accrued by the erosion of Jimmys Beach, to the west. The area is estuarine in nature, but contains bare sands with no seagrass or special estuarine values (as a consequence of the dynamic and recent depositions of mobile sands). The pipeline location is on Yacaaba Peninsula, which is a Holocene-age mobile sand-sheet peninsula. It contains bare sands with patches of native coastal vegetation and infestations of weeds (Bitou Bush). This area is highly used for passive recreational activities year round as well as for commercial fishing uses during certain times of the year. Deadman's Sand Quarry renourishment area is heavily modified, with a constructed access road and a 30-year history of sand extraction. Recent storm activity in the period of June and July 2011 and the subsequent emergency re-nourishment works of Jimmys Beach have depleted the quarry of sand stock.
1.8	Description of the environmental impacts of the project/ activity: *(landform modification, biological impacts, water quality impacts, hydrological impacts, pollution and contamination, generation of waste, changed bushfire regimes, etc)*	The activity will result in minor landform changes through sand extraction at the borrow site and renourishment at the deposition site. However, the works will represent a continuation of existing activities at these locations. Temporary dredge sand and return water pipelines will be laid on the surface of the land from the borrow site to Deadman's Quarry. These temporary overland pipelines will follow existing contours and avoid the removal of native vegetation. The sand extraction and renourishment activities will generate noise and exhaust through pumping equipment and truck movements. There will be minor impacts on the selected roads between the quarry and Jimmys Beach during emergency works, however traffic management will ensure alternative routes for general traffic are available and that disruption of the local community is minimised.

1.9	Project benefits, alternative proposals considered and justification of preferred option:	The Statement of Environmental Effects (2005) and the Jimmys Beach Coastline Management Review (March 2001) approve the use of Yacaaba Peninsula as a preferred borrow area due to matching grain size and scientific evidence that sand lost at Jimmys Beach is moved to and accrued at the borrow area on Yacaaba. Subsequent studies, including the Jimmys Beach Renourishment Program Environmental Management Strategy 2007, further confirm that the suggested activity is the preferred option to address re-nourishment and the protection of assets along Jimmys Beach. The Jimmy's Beach Emergency Action Sub Plan 2011 recommends the continuation of stock piling of sand at the existing Deadman's sand quarry. A licence to undertake this activity has been previously received by Council from the NSW Department of Planning and the NSW Department of Lands. Sand extraction and beach nourishment has occurred between 2008 and 2010, as approved in Development Application 312-7-2003 under the (former) Department of Infrastructure, Planning and Natural Resources.
1.10	Description of community consultation undertaken or proposed:	Due to the history and nature of the issues, extensive community consultations have occurred. Consultation has demonstrated general approval/ support from community members to undertake extraction and nourishment activities of the manner described in this REF. In addition, the sand extraction and nourishment activity has previously been approved and undertaken through licences received from state bodies, see 1.9 above. Finally, there has been extensive Government agency consultation on this issue and comments have been incorporated into this REF.
1.11	Project Manager's details:	Name: David Bortfeld Position title: Manager Parks and Recreation Section/division: Parks and Recreation Organisation: Great Lakes Council Postal address: PO Box 450 Telephone number: (02) 6591 7360 Mobile phone number: 0407 546 323 Facsimile number: (02) 6591 7248 E-mail address: david.bortfeld@greatlakes.nsw.gov.au

Has the project/ activity been determined to be a Part 4 or a Part 3A matter?	☐ Yes ☑ No
Has the project/ activity been determined not to be exempt development?	☑ Yes ☐ No
If the project/ activity is a form of development that is exempt, is it being assessed under Part 5 to ensure that environmental impacts are within acceptable standards?	☐ Yes ☐ No ☑ N/A
Is the project/ activity lawful and permissible and can the project/ activity be considered under Part 5?	☑ Yes ☐ No

NOTE: Determination of whether Council projects/ activities are exempt development, Part 3A, Part 4 or Part 5 matters MUST be confirmed by Council's Manager – Development Assessment. Where the project/ activity cannot be considered under Part 5, this form should not be used.

TABLE 2 – APPROVALS, LICENCES and PERMITS

STEP 3

Item	Assessment of Approvals, Licences and Permits	Tick one
2.1	Is there a risk that the project/ activity may have a significant impact on State-listed Endangered, Threatened, Vulnerable or Protected Species, Populations, Ecological Communities or Critical Habitat (Flora and Fauna)? If yes, a Species Impact Statement and/ or a s132C licence may be required under the NP&W Act 1974. The project/ activity must be referred to Council's Ecologist. *s5A EP&A Act 1979, NP&W Act 1974, FM Act 1994, TSC Act 1995* *Relevant authorities: OEH, DPI (Fisheries)*	☐ Yes ☑ No
2.2	Is there a risk that the project/ activity may harm or affect core Koala habitat as defined by SEPP44 Koala Habitat Protection? Part 5 approvals are currently exempt from provisions of SEPP44, but Koala habitat should be considered in the design and protective safeguards *Relevant authorities: DoP*	☐ Yes ☑ No
2.3	Is the project/ activity located within or likely to affect areas protected by State Environmental Planning Policies for conservation purposes: • SEPP 14 Coastal Wetlands? If yes, and the activity involves clearing, construction of a levee, draining or filling, then an EIS and approval from the Director of the DoP is required • SEPP 26 Littoral Rainforests or 100-metre buffer? If yes, then an EIS and approval from the Director of the DoP is required • SEPP 71 Coastal Protection? If the project/ activity is located within the coastal zone, then the application of SEPP71 needs to be considered in the assessment of the activity, particularly Part2, s8 matters *Relevant authorities: DoP*	☐ Yes ☑ No ☐ Yes ☑ No ☑ Yes ☐ No
2.4	Does the project/ activity clear, harm or remove areas of remnant native vegetation, native vegetation on State Protected Land or protected regrowth? Clearing under Part 5 is not an activity controlled by the NV Act (Part 3, Div 1, s16). However, the aims and objectives of the NV Act 2003 should be considered in the design and protective safeguards *NV Act 2003* *Relevant authorities: HCRCMA, OEH*	☐ Yes ☑ No
2.5	Does the project/ activity occur within or seek to clear vegetation from an area covered by a Property Vegetation Plan, s88B conservation instrument or other relevant covenant or instrument? If yes, then the permissibility of the project/ activity needs to be validated and any relevant approvals/ consultations sought *NV Act 2003, Nature Conservation Trust Act 2001, Conveyancing Act 1919* *Relevant authorities: HCRCMA, OEH*	☐ Yes ☑ No
2.6	Is the project likely to have a significant impact on any matters of National Environmental Significance (significant impact means an impact which is important, notable or of consequence, having regard to its context or intensity and depends upon the sensitivity, value or quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts): • Ramsar Wetlands? If yes, then the activity must be referred to DSEWPC and separate approval is required • Commonwealth listed threatened species and ecological communities? If yes, then the activity must be referred to DSEWPC and an approval is required from this agency • Commonwealth migratory species protected under International Agreements? If yes, then the activity must be referred to DSEWPC and an approval is required from this agency • World Heritage Properties? If yes, then the activity must be referred to DSEWPC and separate approval is required from this agency • National Heritage Places? If yes, then the activity must be referred to DSEWPC and an approval is required from this agency • Commonwealth land or marine areas? If yes, then the activity must be referred to DSEWPC and an approval is required from this agency • Nuclear actions? If yes, then the activity must be referred to DSEWPC and separate approval is required *EPBC Act 1999* *Relevant authorities: DSEWPC*	☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑No ☐ Yes ☑ No
2.7	Is the project activity located within or likely to affect: • Areas reserved or dedicated under the NP&W Act 1974 (eg. National Park, Nature Reserve or State Conservation Area)? If yes, then separate approval is required from OEH • Land reserved or dedicated for environmental protection purposes under the *Crown Lands Act 1989*? If yes, then separate approval is required from LPMA • Land identified as community land under the *Local Government Act 1993*? If yes, the permissibility of the project/ activity needs to be confirmed • Land identified as wilderness under the *Wilderness Act 1987* or declared as wilderness under the NP&W Act 1974 or as a Wild River? If yes, then separate approval is required from OEH • Land gazetted as an Aboriginal Place under the NP&W Act? If yes, then separate approval is required from OEH • Land subject to a Conservation Agreement, Plan of Management or Joint Management Agreement under the NP&W Act? If yes, then separate approval is required from OEH *NP&W Act 1974, Wilderness Act 1987, Crown Lands Act 1989, LG Act 1993* *Relevant authorities: OEH*	☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No
2.8	Is the project/ activity located within or likely to affect a: • Marine Park? If yes, then separate approval from the MPA is required • Aquatic Reserve? If yes, then separate approval is required from DPI (Fisheries) *MP Act 1997, FM Act 1994* *Relevant authorities: MPA, OEH, DPI (Fisheries)*	☑ Yes ☐ No ☐ Yes ☑ No

STEP 3

Item	Assessment of Approvals, Licences and Permits	Tick one
2.9	Will the project/ activity involve the dredging or reclamation of land or waters? If yes, a Part 7 permit is required from DPI (Fisheries) *FM Act 1994* *Relevant authorities: DPI (Fisheries)*	☑ Yes ☐ No
2.10	Will the project/ activity harm, clear or modify an area of 'marine vegetation' such as seagrass or mangroves? If yes, then a Part 7 permit from DPI (Fisheries) is required *FM Act 1994* *Relevant authorities: DPI (Fisheries)*	☐ Yes ☑ No
2.11	Will the project/ activity cause interruption, disruption or blocking of fish passage? If yes, a Part 7 permit is required from I&I Fisheries *FM Act 1994* *Relevant authorities: DPI (Fisheries)*	☐ Yes ☑ No
2.12	Is the project/ activity a "*controlled activity*" on waterfront land (within 40-metres from the edge of the bank of watercourses). A controlled activity includes constructing a building or carrying out works, removing material or vegetation by excavation or any other means, depositing material on land or the carrying out of any other activity that affects the quantity or flow of water in a water source? s39A(1) of the Water Management (General) Regulation 2004 provides for all public authorities (including Council) to be exempt from the need to hold a controlled activity approval. However, some consultation with NSW Office of Water should be conducted for significant landform-disturbing works of waterfront land and crossings of watercourses *WM Act 2000* *Relevant authorities: NSW Office of Water*	☑ Yes ☐ No
2.13	Will the project/ activity involve works comprising a fixed or floating structure in or over navigable waters? If yes, then referral and approval is required from Maritime NSW and consultation should be made with DPI (Fisheries) *Marine Services Act 1935* *Relevant authorities: Maritime NSW, DPI (Fisheries)*	☑ Yes ☐ No
2.14	Is the project/ activity located within or likely to affect the 'place' of a 'Heritage Item' identified on the Register of the National Estate, under the NSW Heritage Act, an environmental planning instrument or any other relevant register? If Yes, the Heritage Council of NSW or GLC Heritage staff must be contacted for clarification of the necessary investigations/ actions *Heritage Act 1977, Great Lakes LEP* *Relevant authorities: Heritage Council, GLC*	☐ Yes ☑ No
2.15	Is the project/ activity located within or likely to affect a place where a 'Relic' is likely to be discovered (eg Archaeological Zoning Plans)? If Yes, the Heritage Council of NSW or OEH must be contacted for clarification of the necessary investigations/ actions *Relevant authorities: Heritage Council, OEH, GLC*	☐ Yes ☑ No
2.16	Is the project/ activity likely to affect or impact an Aboriginal Relic, Place or Site of Cultural Significance, access to wild resources important to Aboriginal people or affect an area subject to a pending or finalised Native Title claim? If yes, the LALC and Aboriginal Heritage Unit of OEH must be consulted to determine the need for appropriate investigation/ consultation actions and/ or licensing *NP&W Act 1974* *Relevant authorities: LALC, OEH*	☑ Yes ☐ No
2.17	Is the project located on land that this contaminated? If yes, then OEH must be consulted and a Phase 1 Environmental Site Assessment must be completed *Contaminated Land Management Act 1997* *Relevant authorities: OEH*	☐ Yes ☑ No
2.18	Is the project/ activity located at a site at which asbestos or asbestos containing materials exist? If yes, then liaison with GLC Environmental Health staff, OEH and WorkCover NSW is required to determine the appropriate course of action *Relevant authorities: WorkCover NSW*	☐ Yes ☑ No
2.19	Does the project/ activity generate, handle, store, transport or dispose of: • Hazardous, industrial or Group A or "controlled" waste? If yes, then OEH must be consulted to determine an appropriate course of investigation, action and approval • Dangerous goods or "Controlled Chemicals"? If yes, then OEH must be consulted to determine an appropriate course of investigation, action and approval • Or otherwise cause land or water contamination? If yes, then OEH must be consulted and a Phase 1 Environmental Site Assessment must be completed *Relevant authorities: OEH, WorkCover NSW*	☐ Yes ☑ No ☐ Yes ☑ No ☐ Yes ☑ No
2.20	Will the project/ activity discharge any material to a waterway or stormwater drain or affect any water management structures? If yes, then compliance with OEH and GLC pollution reduction/ management targets must be demonstrated *Relevant authorities: OEH, GLC*	☑ Yes ☐ No
2.21	Will the project/ activity discharge "Trade Waste" to the sewer? If yes, then MCW must be consulted to determine the appropriate action, approval or licensing *Relevant authorities: MCW*	☐ Yes ☑ No
2.22	Is the project/ activity located within or likely to affect a State Forest or area subject to a Forest Agreement? If yes, then approval from I&I (Forests) is required *Forestry Act 1916* *Relevant authorities: I&I (Forests)*	☐ Yes ☑ No
2.23	Is the project/ activity located within or likely to affect Crown Land? If yes, approval and/ or an access licence is required from the LPMA *Crown Lands Act 1989* *Relevant authorities: LPMA*	☑ Yes ☐ No
2.24	Is the project/ activity located on a State classified road? If yes, then approval or access arrangements from the RTA is required *Relevant authorities: RTA*	☐ Yes ☑ No
2.25	Is the project/ activity located on privately-owned land? If yes, then approval from the landholder is required	☐ Yes ☑ No

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STEP 3

Item	Assessment of Approvals, Licences and Permits	Tick one
2.26	Will the project/ activity affect or harm sub-surface or above ground utilities? If yes, consultation with the utility/ service provider is required *Relevant authorities: Country Energy, MCW, Telstra*	☐ Yes ☑ No
2.27	Will the project/ activity affect bushfire prone lands, conflict with or hinder the operation of a Bush Fire Management Plan or use flames during a Total Fire Ban? If yes, consultation with the RFS or local Bushfire Management Committee is required *Rural Fires Act 1997* *Relevant authorities: RFS, NSW Fire Brigade*	☐ Yes ☑ No
2.28	Does the project fall within development listed within s100B of the RFS Act? If yes, then referral of the activity to the RFS is required	☐ Yes ☑ No
2.28	Is the project/ activity located within an area of Noxious Weeds or will the project/ activity lead to increased spread or population of noxious weeds or declared pest animals? *Rural Lands Protection Act 1989, Noxious Weeds Act 1993* *Relevant authorities: LHPA, OEH, GLC*	☐ Yes ☑ No
2.29	Is the project/ activity not permitted by the zoning and the objectives of the zoning under the LEP? If yes, the project/ activity cannot proceed as it is not legally permissible *Great Lakes LEP 1996, Manning LEP* *Relevant authorities: GLC*	☐ Yes ☑ No
2.30	Is the project/ activity not permissible under the Local Government Act 1993? If yes, the project/ activity cannot proceed as it is not legally permissible *Local Government Act 1993* *Relevant authorities: DoP, DLG, GLC*	☐ Yes ☑ No
2.31	Are there any other known Approvals, Licences or Permits that are required for the project/ activity? If yes, such Approvals, Licences or Permits need to be sought	☐ Yes ☑ No

NOTE: If you have ticked any ☐ Yes above then you must describe the nature of the issues in the table below AND either:

1 Attach a copy of any correspondence, approval, licence or permit, OR
2 Provide written evidence that the project is exempt.

STEP 3

Item No. (from table above)	Discussion of the Impact and the Nature of the Permit, Approval or Licence that is Required
2.3	This REF has considered the range of issues in clause 8 of SEPP 71 and it has been determined that the sand extraction and renourishment activities will have a no impact on: ▪ Existing public access ▪ The amenity and scenic qualities of the area ▪ Threatened species or their habitats ▪ Fish or their habitats ▪ Existing wildlife corridors ▪ Cultural places, values, customs, beliefs and traditional knowledge of Aboriginals ▪ Coastal water bodies ▪ Items of heritage, archaeological or historic significance As such, the matters of SEPP71 have been adequately considered in this REF and the design of the proposed activity. These works are necessary to preserve coastal infrastructure from the negative effects of storm recession and erosion.
2.8	The project is located in the Port Stephens/ Great Lakes Marine Park. Extensive consultations with the Marine Parks Authority have been undertaken and permission has been granted for the dredging works as described in this REF to occur within the Marine Park environment. The works have been deemed not likely to significantly, negatively impact the condition and integrity of the Marine Park.
2.9	The project involves the dredging of land for the purpose of generating emergency sand for stockpiling and use in the re-nourishment of Jimmys Beach during storm events that cause the erosion of the Jimmys Beach shoreline. The dredging works are a continuation of an existing approval for dredging of a nominated area of Port Stephens off Yacaaba Peninsula.
2.12	The works involve activities within 40-metres of a watercourse, but the activity does not require a Controlled Activity approval under s39(A)(1) of the Water Management Act 2000. Every effort shall be made by the proponent of the activity to preserve the condition and integrity of the Port Stephens Estuary during the undertaking of the works.
2.13	The project will utilise a floating dredge in Port Stephens to access sand for stockpiling at Deadman's Quarry. This is a continuation of existing operation, which has the approval of NSW Maritime with regards to navigation and waterway usage.

2.16	The Yacaaba Peninsula is a landscape of significance to the local Aboriginal people. Consultations have been undertaken to ensure that the works are not likely to cause significant disruption of Aboriginal sites or values. These consultations are reproduced below: **From:** Brereton Steve [mailto:Steve.Brereton@environment.nsw.gov.au] **Sent:** Friday, 29 July 2011 2:13 PM **To:** Andrew Staniland **Subject:** RE: Jimmy Beach Sand Renourishment Approval Hi Andrew, Yes, Everything looks good and I agree and give my approval for the planned sand extraction from the mobile sand dune in Beach Street (Deadmans) Hawks Nest. *Steve Brereton* *Aboriginal Heritage Conservation Officer, Office Of Environment and Heritage* --- **From:** Andrew Staniland [mailto:Andrew.Staniland@greatlakes.nsw.gov.au] **Sent:** Thursday, 14 July 2011 4:35 PM **To:** Brereton Steve **Subject:** FW: Jimmy Beach Sand Renourishment Approval Steve, Further to the email below, an alternative site has been suggested to borrow sand for the purpose of nourishment at Jimmys Beach. Sand is to be taken from mobile sand dune at the end of Beach St (Deadman's) Hawks Nest and stored for use in the existing quarry adjacent (see attached map). At present the mobile sand dune is encroaching on a stand of coastal vegetation. The aim of works is to remove sand from this area. Sand will be taken from above the existing ground level, therefore will not excavate. As per previous email, it has been determined that during works if any material is unearthed that is thought to be of Aboriginal Cultural significance, all works will cease. Steve Brereton will be contacted to investigate and confirm / deny material significance. If significant material is found, Steve Brereton is to advise course of action to best protect the material and site. Can you please approve the above works from an Aboriginal Cultural Heritage point of view. If you need further information please don't hesitate to ask, ***Andrew Staniland*** *Natural Assets Officer, Great Lakes Council* --- **From:** Brereton Steve [mailto:Steve.Brereton@environment.nsw.gov.au] **Sent:** Wednesday, 13 July 2011 7:34 PM **To:** Andrew Staniland **Cc:** Paddington Sarah; Naden Hilton **Subject:** RE: Jimmy Beach Sand Renourishment Approval Hi Andrew, Everything looks good and I agree and give my approval for the planned renourishment works at Jimmy's Beach, Winda Woppa and Hawks Nest. ***Steve Brereton*** ***Aboriginal Heritage Conservation Officer, Office of Environment and Heritage*** --- **From:** Andrew Staniland [mailto:Andrew.Staniland@greatlakes.nsw.gov.au] **Sent:** Wednesday, 13 July 2011 5:44 PM **To:** Brereton Steve **Subject:** Jimmy Beach Sand Renourishment Approval Steve, Great Lakes Council would like to continue to undertake beach renourishment works at Jimmy's Beach Winda Woppa, Hawks Nest. Works will operate the same as previous campaigns, with sand material borrowed from Yacaaba peninsula (in the form of wet slurry) and used to nourish Jimmy's Beach adjacent to The Boulevard, Winda Woppa. Council will contract a specialist to undertake these works, utilising existing underground pipe network (placed for use during previous campaigns). Due to the fact that the sand taken from the borrow area is proven to be an accretion from the nourishment area, and the nourishment area is complied of previous nourishment campaign material, it is unlikely that Aboriginal Cultural Heritage items will be disturbed. Furthermore all machinery and vehicle movements for these works will be restricted to existing tracks along Yacaaba peninsula. It has been determined that during works if any material is unearthed that is thought to be of Aboriginal Cultural significance, all works will cease. Steve Brereton will be contacted to investigate and confirm / deny material significance. If significant material is found, Steve Brereton is to advise course of action to best protect the material and site. Can you please approve the above works from an Aboriginal Cultural Heritage point of view. If you need further information please don't hesitate to ask, ***Andrew Staniland*** *Natural Assets Officer, Great Lakes Council*
2.20	As per 2.12 above, project will discharge sea-water back into Port Stephens by return pipeline. Discharge water will be filtered and free of sand (and other gross contaminants) after passing through purpose built settlement ponds within the quarry deposit site. The discharge water is to be returned to the borrow area to reduce the possible impact of works on seagrass within the bay. The discharge water area will be monitored to ensure that visible plumes do not exceed a distance of 50-metres from the discharge point and that turbidity in the receiving waters does not exceed 50mg/l NTU.
2.23	The works are located on Crown Land. Permission has been received for this activity from the LPMA.

Can the project still proceed under Part 5	☑ Yes ☐ No

TABLE 3 – SENSITIVE AREAS/ ISSUES

STEP 4

Item	IS THE PROJECT/ ACTIVITY LOCATED WITHIN AND LIKELY TO AFFECT THE FOLLOWING SENSITIVE AREAS/ ISSUES (in addition to issues identified in Table 2 above):	Tick one
	SENSITIVE BIOLOGICAL FACTORS	
3.1	Corals or seagrass beds or wetland communities	☑ Yes ☐ No
3.2	Habitat of threatened plant or animal species and endangered populations	☑ Yes ☐ No
3.3	Habitat of species listed under International Migratory Bird Agreements	☑ Yes ☐ No
3.4	Habitat/ wildlife corridors	☑ Yes ☐ No
3.5	Areas of endangered ecological communities, regionally significant native vegetation and inadequately reserved vegetation communities	☐ Yes ☑ No
3.6	Bushfire prone areas	☐ Yes ☑ No
3.7	Fishing grounds, oyster leases and fish breeding/ nursery areas	☑ Yes ☐ No
3.8	Old-growth trees, hollow-bearing trees or standing dead trees	☐ Yes ☑ No
3.9	Rock outcrops	☐ Yes ☑ No
3.10	Environmental Protection Zones as defined by environmental planning instruments	☐ Yes ☑ No
3.11	Urban bushland, roadside vegetation*, foreshores or riparian zones ** s88 of the Roads Act 1993 empowers a road authority to, despite any other Act, remove or lop an tree or other vegetation that is overhanging a public road if, in its opinion, it is necessary to do so for the purpose of carrying out road work or removing a traffic hazard*	☑ Yes ☐ No
3.12	Bush regeneration areas, dune regeneration areas	☑ Yes ☐ No
3.13	Areas of infestations of noxious or invasive environmental weeds or pest animals	☑ Yes ☐ No
3.14	Any other sensitive biological factors	☐ Yes ☑ No
	SENSITIVE PHYSICAL FACTORS	
3.15	Coastlines and dune fields, caves or other unique landforms	☑ Yes ☐ No
3.16	Land with prime agricultural capacity	☐ Yes ☑ No
3.17	Natural waterbodies, riparian zones, wetlands, drinking water catchments or flood prone areas	☑ Yes ☐ No
3.18	Groundwater recharge areas or areas of high water tables	☐ Yes ☑ No
3.19	Erosion prone areas or areas with slopes of greater than 18°	☐ Yes ☑ No
3.20	Subsidence or slip areas	☐ Yes ☑ No
3.21	Areas of acid sulphate, sodic or highly permeable soils	☐ Yes ☑ No
3.22	Areas with salinity or potential salinity problems	☐ Yes ☑ No
3.23	Areas with degraded air quality	☐ Yes ☑ No
3.24	Areas with degraded or contaminated soil area or degraded or contaminated water (ground or surface)	☐ Yes ☑ No
3.25	Any other physically sensitive areas	☐ Yes ☑ No
	SENSITIVE COMMUNITY FACTORS	
3.26	Aboriginal communities, areas subject to approved or pending Native Title claims or areas used by Aboriginal people to access wild resources	☐ Yes ☑ No
3.27	Communities with a strong sense of identity	☐ Yes ☑ No
3.28	Disadvantaged communities (reduced economic, social or cultural indicators)	☐ Yes ☑ No
3.29	Areas sensitive to noise, traffic or odour	☐ Yes ☑ No
3.30	Areas or items of high anthropological, archaeological, cultural, heritage, historical, recreational or scientific value	☑ Yes ☐ No
3.31	Areas or items of high aesthetic or scenic value	☑ Yes ☐ No
3.32	Any other sensitive community factors	☐ Yes ☑ No

NOTE: If you have ticked any ☐ Yes above, then careful attention should be paid to the completion of Table 4 and to relevant community and stakeholder consultation.

STEP 4

Item No. (from table above)	Discussion of the Impact on the Sensitive Area/ Issue
3.1	Seagrass beds are known to be present in the vicinity of the dredging area, however no seagrass beds would be directly affected by the proposed activity. Protective safeguards shall be adopted to ensure the dredging and re-nourishment activities do not have any risk of indirect negative effects on the seagrass beds of this part of Port Stephens. The works shall comply with the recommendations in Umwelt 2006 (*Ecological Management and Monitoring Requirements for the Sand Renourishment Program Jimmys Beach NSW*).
3.2	The proposed works are located within a landscape in which threatened species have been recorded. This includes habitats of the endangered Koala population of Hawks Nest and Tea Gardens and roosting/ foraging areas of birds such as the Little Tern and Pied Oystercatcher. However, the works will not remove or harm any Koala habitats or areas important for lifecycle activities by this species. Further, a previous assessment of the works (Umwelt 2006) has conclusively demonstrated that the activity would not harm the habitat or lifecycle of estuarine wader-birds in any significant or unreasonable manner. The ecology of these species will not be affected by the works. This is further tested in Table 4B of this REF.
3.3	The habitats of the works area may be used by species listed as international migratory species (eg. Little Tern, White-bellied Sea-Eagle). However, the lifecycle, behaviour and habitat of these species is not expected to be significantly or unreasonably harmed or disrupted by the proposed activity.

3.4	A wildlife movement corridor is present in the study area, namely over Yacaaba Peninsula, connecting Yacaaba Headland to the habitats of Hawks Nest and beyond (including Myall Lakes National Park). The proposal does not clear or modify habitat or disrupt the function of this movement corridor. At certain times, a dredge sand and return water pipeline shall be laid on the ground surface from the borrow site to the stock-pile site, but this is temporary only and unlikely to affect local movement of native wildlife in any unreasonable way. The extraction of sand from the waters of Port Stephens would not harm fish movement patterns in any way.
3.7	The extraction of sand from the area off Yacaaba Peninsula is located in an area of fishing grounds. However, it is a continuation of an existing approved activity, which has co-existed with the local commercial and recreational fishing industries. The works are confined to a small area of Port Stephens and are not related to any significant harm to fishing activities or fish breeding areas.
3.11	The works are located in a foreshore area, but represent a continuation of an existing activity. As such, foreshore access or integrity would not be compromised or affected by these works in any unreasonable manner.
3.12/ 3.13	The landscape of Yacaaba Peninsula has been subject to weed control activities and bush regeneration for a number of years and which have principally aimed at reducing the biomass of Bitou Bush from the land. This activity does not encourage or cause any proliferation of Bitou Bush populations on the land. Further, it does not harm or diminish the areas of coastal native vegetation in any way.
3.15	The works are located on the coastline and a Holocene aged dune-field. However, the works will not detrimentally affect the coastline, nor impact on dune fields in any unreasonable or significant manner.
3.17	The sand borrowing aspect of the works are located in the Port Stephens Estuary, but within a location where there is an existing approval for sand dredging and is conducted in a manner that preserves and protects the integrity and function of the waterway.
3.30	Yacaaba Peninsula is an area of cultural significance for the local Aboriginal people. Approval for the activity has been granted from the relevant Aboriginal Liaison Officer with the NSW OEH and the works have been designed and will be operated in a manner that protects and preserves the existing cultural sensitivities and significance of the land.
3.31	The landscape of the proposed works does possess special aesthetic values. The temporary nature of the works and the design of the works would ensure that a significant, detrimental impact would not occur on the aesthetic values of the landscape.

Can the project still proceed under Part 5	☑ Yes ☐ No

TABLE 4A – ENVIRONMENTAL IMPACT ASSESSMENT

Impacts, Causes and Mitigation Factors NOTE: Either tick 'no impact' OR provide details.			STEP 6 Project Specific Environmental Safeguards Required	STEP 7 Significant Issue - Further Assessment Required
PHYSICAL FACTORS	No Impact	Describe impacts, causes and summarise protective safeguards		
Disturbs the topography or above or below ground features including filling, excavation, dredging and tunnelling or involves the deposition of large quantities of spoil/ fill	No Impact ☐	At the Yacaaba borrow site, dredging activities shall be undertaken to obtain sand for stockpiling for emergency nourishment works on Jimmys Beach. These works are a continuation of an existing activity and would obtain mobile sands that are drawn from Jimmys Beach. As such, there is always a continual new supply of sand for dredging and significant landform modification is not envisaged. The works would comply with the recommendations published in Umwelt 2006 (*Ecological Management and Monitoring Requirements for the Sand Renourishment Program Jimmys Beach NSW*). The Deadman's Quarry sand deposition site has a 30-year history of sand extraction and temporary storage. It is thus a highly modified landscape, where landform modification that is proposed would not constitute a significant or unreasonable risk. Jimmys Beach Emergency Works during June and July 2011 has depleted sand stocks from this area. The project proposes to re-stock the quarry for future emergency works. As mentioned, due to the previous use of site, impacts will be minimal. The quarry shall receive 20,000m³ of sand dredged from the borrow area. The site to be surveyed pre- and post-works to record total sand stored and used during each emergency event. The quarry location is protected by the surrounding landscape, therefore potential sand lost to wind erosion is considered to be minimal. Further, the sand stock piles are to be tapered to the north east to further reduce risk of sand blow during storage. During emergency works, as dictated by the jimmy Beach Emergency Sub Management Plan, stockpiled sand shall be excavated by machine and transported by truck to the Jimmys Beach deposition location. Therefore, landform modification is a necessary requirement of the proposed emergency works, but would not cause any significant or unreasonable impacts on the local environment.	☑ Yes ☐ No	☐ Yes ☑ No

Impacts, Causes and Mitigation Factors NOTE: Either tick 'no impact' OR provide details.			Project Specific Environmental Safeguards Required	Significant Issue - Further Assessment Required
Affects a natural waterbody, wetland or groundwater aquifer or the natural drainage pattern; affects the quality or quantity of water in the systems	**No Impact** ☐	Dredging activities shall be undertaken in Port Stephens to source sand for the emergency sand stockpile at Deadman's Quarry. These works constitute a continuation of an existing activity and obtains sand from a mobile sand accretion area, with no seagrass or polluting material present. At the quarry deposition site, bunded deposition areas will be provided for the infiltration of water from the dredge slurry. The Holocene sands are permeable and the groundwater would not be disturbed by this infiltration. As the quarry area is predominately lower than most of the surrounding landscape, the small percentage of infiltration water is not likely to have a dieback affect on adjacent vegetation. Discharge water is also proposed to be pumped from the deposition site by return temporary overland pipe to the borrow area. This return water shall be monitored to ensure that it does not cause any pollution of the estuarine environment.	☑ Yes ☐ No	☐ Yes ☑ No
Disturbs acid sulfate soil or contaminated land in a manner that may cause the liberation of pollutants and contaminants that may harm the environment	**No Impact** ☑	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Uses groundwater or surface water from a natural waterbody; stores water in a dam or artificial waterbody	**No Impact** ☐	The project will extract water and sand in the form of sand slurry from Port Stephens (these works to comply with Umwelt 2006 (*Ecological Management and Monitoring Requirements for the Sand Renourishment Program Jimmys Beach NSW*)) and represent a continuation of an existing approved activity. The sand slurry is to be separated in purpose built settlement ponds within the quarry deposition site. The discharge water shall be returned (pumped through return temporary overland pipeline) to the borrow area to reduce the possible impact of works on seagrass within Port Stephens. The discharge water area will be monitored to ensure that visible plumes do not exceed a distance of 50-metres from the discharge point and that turbidity in the receiving waters does not exceed 50mg/l NTU.	☑ Yes ☐ No	☐ Yes ☑ No
Changes the flood or tidal regimes or is potentially affected by flooding or tides	**No Impact** ☑	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Directly or indirectly pollutes or contaminates watercourses, wetlands, drains or groundwater	**No Impact** ☑	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Uses, stores, disposes or transports hazardous substances or chemicals that may accumulate in the environment (flammable, explosive, toxic, radioactive, carcinogenic or mutagenic substances)	**No Impact** ☑	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Generates or disposes of gaseous, liquid or solid waste (industrial, medical or domestic waste, sewage, sludge or effluent, spoil or overburden); generates or disposes hazardous waste	**No Impact** ☐	There shall be some generation of exhaust gases from machinery for dredging of mobile sands off Yacaaba Peninsula, the transport of the sand slurry to Deadman's Quarry, the stockpiling and movement of sand to and from Deadman's Quarry and the transport and deposition of sand to Jimmys Beach during emergency events. These emissions will be minimised and would not cause any significant impact on the quality of the local air environment.	☑ Yes ☐ No	☐ Yes ☑ No

	Impacts, Causes and Mitigation Factors NOTE: Either tick 'no impact' OR provide details.		Project Specific Environmental Safeguards Required	Significant Issue - Further Assessment Required
Generates greenhouse gas emissions or leads to the release of chemicals which may affect the ozone layer or are precursors to photochemical smog	**No Impact ☐**	There shall be some generation of exhaust gases from machinery for dredging of mobile sands off Yacaaba Peninsula, the transport of the sand slurry to Deadman's Quarry, the stockpiling and movement of sand to and from Deadman's Quarry and the transport and deposition of sand to Jimmys Beach during emergency events. These emissions will be minimised and would not cause any significant impact on the quality of the local air environment.	☑ Yes ☐ No	☐ Yes ☑ No
Generates or emits dust, fumes or odours, particularly in the proximity of residential areas or other land-uses likely to be susceptible to impact	**No Impact ☐**	Emissions from truck and machinery movement are not expected to impact on residential areas due to the location of the works areas. The location of the Deadman's Sand stockpile site is well-separated from existing residential areas and is surrounded by vegetation and elevated landforms, such that wind-blown sand risks are likely to be avoided.	☐ Yes ☑ No	☐ Yes ☑ No
Generates noise, particularly in the proximity of residential areas or other land-uses likely to be susceptible to impact	**No Impact ☐**	Machinery associated with the activity would generate noise, but these would be well-within acceptable levels and would not harm residential areas in any unreasonable or significant manner.	☐ Yes ☑ No	☐ Yes ☑ No
Generates noise outside standard working hours that may affect surrounding landholders and uses.	**No Impact ☐**	The emergency transport of stockpiled sands through Hawks Nest to Jimmys Beach may occur outside standard working hours, but is necessary to protect homes and infrastructure. Such transport is typically associated with significant storm events, where transport noise may not be as noticeable to local residents.	☐ Yes ☑ No	☐ Yes ☑ No
Generates vibration, blasts, electromagnetic fields or radiation, particularly in the proximity of residential areas or other land-uses likely to be susceptible to impact	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Any other physical matters	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
BIOLOGICAL FACTORS	No Impact	Describe impacts, causes and summarise protective safeguards		
Clears or modifies native vegetation (including trees, shrubs, grasses, herbs and aquatic vegetation)	**No Impact ☐**	The project will involve the establishment of two temporary overland pipes, but these are temporary and required only during the extraction of material to replenish the sand stockpiles at the quarry site. The temporary pipes will conform to existing land contours and will follow closed 4WD trails. To create these pipeline corridors native vegetation will be pruned, however such vegetation clumps shall not be removed. No chemical or herbicide shall be utilised and pruned/ cut native vegetation shall be expected to coppice and return to their original density after the removal of the pipes. The pipes shall be established and removed in a manner that is sensitive to native vegetation and will meander along an alignment of least impact. The pipes shall be monitored for ruptures and breaks and the activity of pumping sand slurry will cease in the event that a break occurs in order to protect the natural environment. Pumping activities will commence only after the leak has been repaired.	☑ Yes ☐ No	☐ Yes ☑ No

Impacts, Causes and Mitigation Factors NOTE: Either tick 'no impact' OR provide details.			Project Specific Environmental Safeguards Required	Significant Issue - Further Assessment Required
Displaces or disturbs fauna (terrestrial or aquatic) or their habitats	**No Impact ☐**	The Pied Oystercatcher has been recorded to breed in this locality and the works, whenever possible, shall be scheduled to avoid the breeding season of this species. Any works occurring within the breeding season of this species shall require an Ecologist to undertake a site survey to determine if breeding animals are present. If birds are found to be nesting, no plant or machinery will be permitted within 50-metres of any nest, until the Ecologist has determined that the birds have departed the nest by their own volition. Works shall comply with the recommendations by Umwelt 2006 (*Ecological Management and Monitoring Requirements for the Sand Renourishment Program Jimmys Beach NSW*). The temporary nature of the works and the degree of modification of the local environment would suggest that impacts on local native fauna are minimised and within acceptable levels. The preservation of native vegetation shall protect the habitats of most native fauna species in this area.	☐ Yes ☑ No	☐ Yes ☑ No
Fragments or blocks wildlife movement corridors	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Introduces noxious weeds, vermin, feral species or diseases or releases genetically modified organisms	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Undertakes activity which affects revegetation or replenishment of native species following disturbance	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Introduces high bushfire risk factors or changes the fire regime	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Any other biological issues	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
RESOURCES	**No Impact**	**Describe impacts, causes and summarise protective safeguards**		
Uses or results in the use of community services or infrastructure including roads, power, water, drainage, waste management, education, medical, social services	**No Impact ☐**	A Traffic Management Plan shall be created and adhered to, such that the proposal does not negatively impact on local road infrastructure and traffic movements.	☐ Yes ☑ No	☐ Yes ☑ No
Uses or results in the use of natural resources including water (ground or surface), fuels, timber, extractive material, minerals, prime agricultural land, especially those that are likely to become in short supply in the future	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Affects future potential of commercial deposits of minerals or extractive material or areas important for fishing, agriculture or forestry	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Changes the demographics of an area	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Changes the transport requirements of an area	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Creates a new route alignment for the provision of infrastructure (eg. rail, roads, power)	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Any other resource issues	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
COMMUNITY FACTORS	**No Impact**	**Describe impacts, causes and summarise protective safeguards**		
Generates significant population movements including influx or departure of workforce	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Changes the workforce or industry structure of the area/ region; affects employment opportunities	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Affects areas of high population densities or established development patterns	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No
Affects or restricts local transport patterns	**No Impact ☑**	**OR:**	☐ Yes ☐ No	☐ Yes ☐ No

	Impacts, Causes and Mitigation Factors NOTE: Either tick 'no impact' OR provide details.		Project Specific Environmental Safeguards Required	Significant Issue - Further Assessment Required
Affects an area, building or item of aesthetic, anthropological, archaeological, architectural, historic, Aboriginal, cultural, scientific, recreational, or social significance or other special value for present or future generations; or access to any such areas	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Affects the visual or scenic landscape	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Affects sunlight or views of another property	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Affects the amenity of publicly owned land	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Changes land use from the surrounding uses as a result of the activity; forms a barrier to movement within the community or access to existing properties; leads to a loss of housing	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Generates a significant volume of traffic	No Impact ☐	A Traffic Management Plan shall be created and adhered to, such that the proposal does not negatively impact on local road infrastructure and traffic movements.	☐ Yes ☑ No	☐ Yes ☑ No
Generates nuisance or health or safety risks	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Creates a potential financial loss to members of the community	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Any other environmental impacts on a community	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
OTHER FACTORS	No Impact	Describe impacts, causes and summarise protective safeguards		
Causes a cumulative environmental effect with other existing or likely future activities	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No
Reduces the range of beneficial uses of the environment or the ability of the environment to provide ecosystem service values	No Impact ☑	OR:	☐ Yes ☐ No	☐ Yes ☐ No

NOTE: Projects with significant issues require further assessment (as identified in the table above) or the revising of that project/ activity to reduce the scale of environmental risks or threats. Where the project is modified, a revised REF must be prepared.

TABLE 4B – ASSESSMENT OF SIGNIFICANCE – THE "7-PART TEST"

STEP 6

Factors	Comments	SIS Required
a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	This project is not expected to have an adverse effect on the lifecycle of any local population of a threatened species such that the population is placed at risk of extinction.	☐ Yes ☑ No
b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the lifecycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction	This project is not expected to have an adverse effect on the lifecycle of any species that constitutes a listed endangered population such that the population is placed at risk of local extinction.	☐ Yes ☑ No
c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: *i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction* *ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*	No endangered ecological communities relate to this proposed works areas.	☐ Yes ☑ No

Factors	Comments	SIS Required
d) In relation to the habitat of a threatened species, population or ecological community: *i) the extent to which the habitat is likely to be removed or modified as a result of the action proposed* *ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action* *iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality*	The activities associated with this project would not have a significant impact on the habitat of threatened biodiversity nor cause any fragmentation or isolation of areas of threatened biodiversity habitat.	☐ Yes ☑ No
e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	No gazetted critical habitat relates to the area of the proposed activity.	☐ Yes ☑ No
f) Whether the action proposed is consistent with the objectives of actions of a recovery plan or threat abatement plan	The project does not conflict with any recovery plan or threat abatement plan.	☐ Yes ☑ No
g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process	The project does not constitute a listed key threatening process.	☐ Yes ☑ No

Every project/ activity must be considered with respect to its impact on threatened biodiversity. Assistance in the completion of the above table should be sought from Great Lakes Council's Ecologist.

TABLE 4C – OTHER RELEVANT COUNCIL POLICIES/GUIDELINES

Item	RELEVANT POLICY/ GUIDELINE:	Is the policy relevant?	Has the policy been considered?
4A.1	Water Quality Improvement Plan	☐ Yes ☑ No	☐ Yes ☐ No
4A.2	Sediment and Erosion Control Policy	☑ Yes ☐ No	☑ Yes ☐ No
4A.3	Wallis Lake Wetland Strategy	☐ Yes ☑ No	☐ Yes ☐ No
4A.4	Tree Preservation Order	☐ Yes ☑ No	☐ Yes ☐ No
4A.5	Any other Policy or Guideline	☐ Yes ☐ No	☐ Yes ☐ No
4A.6	Jimmys Beach Emergency Sub Management Plan	☑ Yes ☐ No	☑ Yes ☐ No
4A.7	Umwelt 2006 (*Ecological Management and Monitoring Requirements for the Sand Renourishment Program Jimmys Beach NSW*)	☑ Yes ☐ No	☑ Yes ☐ No
4A.8	DA 312-7-2003 Great Lakes Council	☑ Yes ☐ No	☑ Yes ☐ No

NOTE: The person completing this Checklist must consider the policies identified in Table 4A that are relevant to the project. These policies may contain additional Control Measures to mitigate the environmental impacts of the project or additional requirements relating to how specific activities that are part of the project must be conducted. If there is a particular issue for which Council does not have a policy, the REF author should consult an appropriate supervisor.

NOTE: Refer to sections 5A, 111 and 112 of the EPA Act, clause 228 of the EPA Regulation, DoP's guidelines "Is an EIS required?" and DECC's "Interim Community Guidelines for Community Consultation" for a full list of the matters that must be taken into account to determine the likely impact of an activity on the environment. The relevant documents can be found online at the following locations:

1 EP&A Act and EP&A Regulation: www.legislation.nsw.gov.au/maintop/scanact/inforce/NONE/0

2 DoP's guidelines "Is an EIS required?": www.planning.nsw.gov.au/assessingdev/pdf/gu_isaneisrequired.pdf

3 DECC's "Interim Community Guidelines for Community Consultation": www.nationalparks.nsw.gov.au/PDFs/interim_consulation_guidelines.pdf

TABLE 5A – DECISION

STEPS 9 - 11

Person who prepares the EIA

By ticking the boxes below, I certify to the best of my knowledge that:

☑ I am suitably qualified and competent to complete this REF, and:

☐ ~~I have completed Council's REF training package~~

☑ I have satisfactorily and truthfully completed this Checklist, and

☑ The assessment meets the requirements of sections 5A, 111 and 112 of the EP&A Act, clause 228 of the EP&A Regulation and other relevant legislation and guidelines, and

☑ The information contained in this REF is not false or materially misleading, and

☑ My assessment has been adequately completed, and

☑ My conclusion as to the likely environmental impact of the project is reasonable, and

☑ The community impacts are likely to be ☑ LOW ☐ MODERATE ☐ HIGH (tick one), and

☑ Further environment impact assessment (REF1 or REF2) is not deemed required, and

☑ I have adequately consulted relevant Council Officers on pertinent aspects of the project/ activity (such Officers have comprised the following: Senior Ecologist), and

☑ I am satisfied that, subject to the inclusion of the protective safeguards included in Schedule 1 , the project will not have a significant impact on the environment during both the construction and operation phases.

Signature		**Date**	7 October 2011
Name	Andrew Staniland		

TABLE 5B – PROJECT/ ACTIVITY APPROVAL

Recommendation – Great Lakes REF Assessment Panel

~~The Great Lakes REFAP is of the opinion that:~~

~~☐ The person who completed this REF is suitably qualified and competent, and~~

~~**EITHER**~~

~~☐ Based on the completed REF and our knowledge of the project, the assessment is true and valid and has been adequately completed, the project has minor and predictable impacts, the conclusion as to the likely environmental impact of the project is reasonable **and the Director can approve the project/ activity** subject to the relevant protective safeguards (Schedule 1), the specific additional protective safeguards required by this REFAP and the conditions in any approvals, licences or permits.~~

~~**OR**~~

~~☐ The project requires additional environmental assessment and approval cannot be given at this time. We believe the project/ activity needs to be assessed via:~~

- ~~☐ REF1~~
- ~~☐ REF2~~
- ~~☐ EIS~~
- ~~☐ Other specialist studies or sub-studies (specify): .....~~
- ~~☐ Other (specify): .....~~

~~**Signature (on behalf of the REFAP**~~		~~**Date**~~	
~~**Name**~~			

Determining Officer – Council Officer Who Verifies the EIA

I certify on behalf of Great Lakes Council that:

- I am the Director of the Council Branch proposing the activity and acting on the advice of the Great Lakes REF Assessment Panel, that

EITHER

☑ Based on the completed REF, my knowledge of the project and the recommendations of the REFAP, the assessment has been adequately completed, the project has minor and predictable impacts, the conclusion as to the likely environmental impact of the project is reasonable **and the project can proceed** subject to the relevant control measures and conditions in any approvals, licences or permits and Schedule 1 of this REF.

OR

☐ The project requires additional environmental assessment and approval cannot be given at this time.

Signature		**Date**	10/10/11
Name	Ron Hartley		

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SCHEDULE 1 – ENVIRONMENTAL SAFEGUARDS ACTION PLAN

This form has been reviewed and signed prior to the commencement of any works by the following. These Officers endorse the adoption of the following protective safeguards and will seek to actively implement these safeguards and measures in the field during the project/ activity:

Signed by:
Project Manager **Name..... (please print)**

Signature.....

Date.....

Site Works Foreman **Name..... (please print)**

Signature.....

Date.....

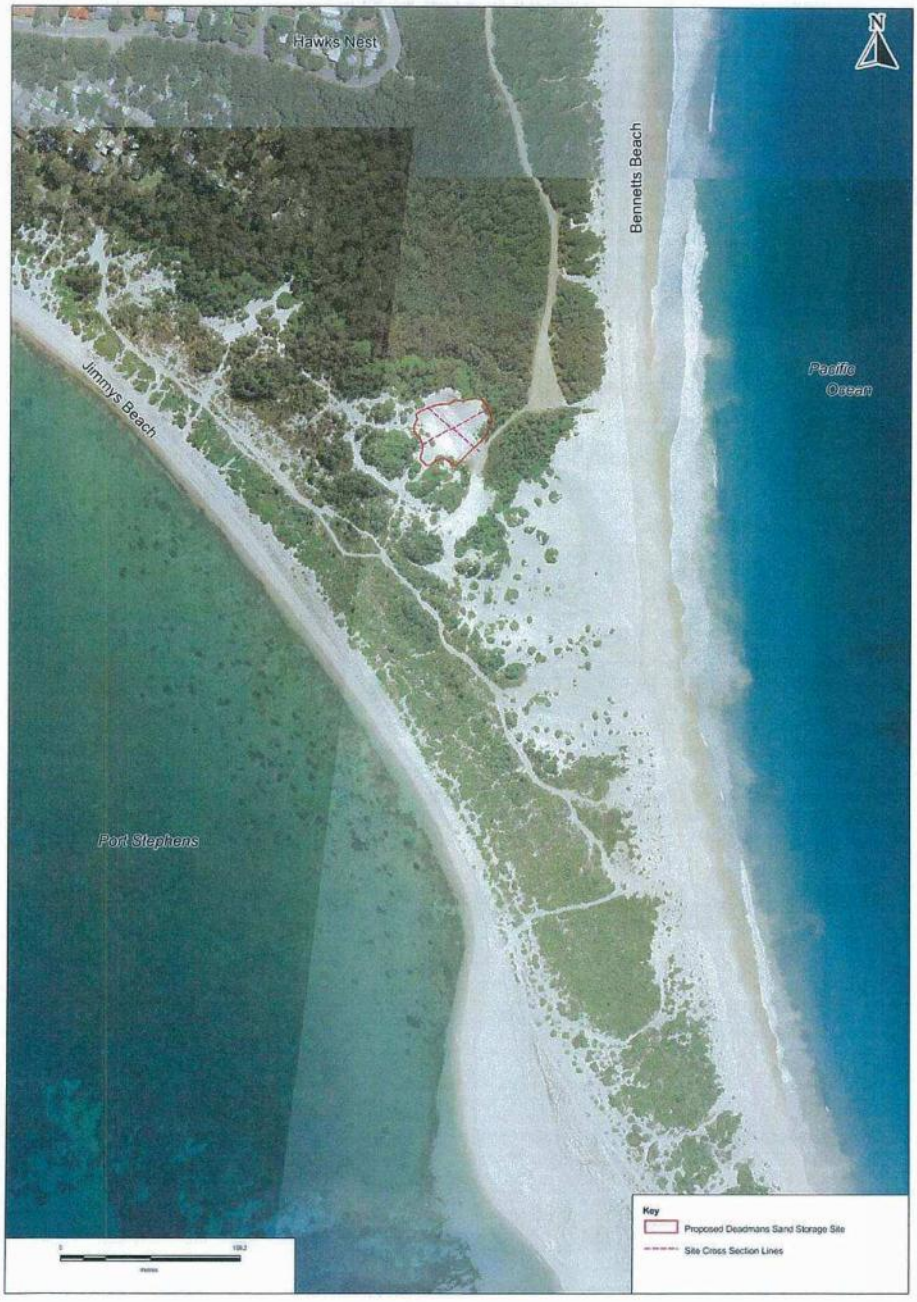
Once signed, this form becomes a working field document and part of the site EMP/ EMS (if applicable). A signed master copy shall be held as a controlled copy by the Project Manager to ensure that all environmental responsibilities are achieved for this project. When protective safeguards are actioned, the master copy shall be updated to reflect this. This form can become part of a site audit for compliance with the REF. Copies of this form shall be carried by all relevant personnel during the construction.

Action	PROJECT MANAGER - Action Complete	SITE WORKS FOREMEN - Action Complete
STANDARD PROTECTIVE SAFEGUARDS APPLICABLE TO ALL PROJECTS/ ACTIVITIES		
General disruption and disturbance		
All site works shall be conducted within appropriate and defined work hours, with the exception of the emergency transport and deposition of sand for the protection of Jimmys Beach from erosive storm events	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Water quality control and protection		
Prior to any commencement of works that disturb the ground surface: • A sediment and erosion control plan shall be prepared. The plan shall detail the measures and actions to prevent and/ or manage the generation and mobilisation of sediments, the erosion of land and the contamination of receiving waters by sediment. It shall be prepared to comply with relevant Council plans and policies.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The approved sediment and erosion control plan shall be fully implemented during all relevant stages of the project/ activity.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
With regards to the timing/ scheduling of the works (other than re-nourishment activities on Jimmys Beach): • The physical works shall be timed, where possible, to avoid inclement weather (rain and high winds), and • The works shall be completed as expediently as possible.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
In regards to machinery working on the site: • All machinery shall be serviced and functioning efficiently and all seals and gaskets shall be inspected prior to commencement of the work to minimise the risks of a fuel or oil spills. • All machinery shall be washed down and disinfected prior to transport to the work site to reduce risks associated with the spread of weeds and plant diseases. • Machinery on site shall contain appropriate spill containment equipment, which shall be deployed when required. • Refuelling shall be conducted with care to avoid spills and accidents and shall be undertaken in a suitably bunded area to avoid fuel and oil spills from entering drainage channels or natural waterways. • Any fuel, oil or chemical spills shall be reported immediately to the relevant authorities and the area in the vicinity of the spill shall be closed to the public. • Prior to work, the exhaust of all construction machinery shall be inspected for smoke emission. If the machinery is producing extensive smoke, it shall be appropriately serviced prior to commencing work on the site.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Protection of culturally sensitive material		
During all excavation and landform modification works, site personnel shall visually monitor the presence of cultural sensitive material and if such material is detected: • The works shall immediately cease, and • OEH and the Karuah Local Aboriginal Land Council shall be immediately notified and consulted, and • Any management actions devised by those agencies/ organisations shall be fully deployed during all relevant stages of the works	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Impacts on flora and fauna and habitat		
Compounds, pipelines and stockpiles shall be established in previously cleared and disturbed areas. There shall be no clearing of native vegetation for any purpose associated with the works	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

Action	PROJECT MANAGER - Action Complete	SITE WORKS FOREMEN - Action Complete
With regards to the clearing of native vegetation: • The area to be modified shall always be strictly minimised and natural vegetation shall be retained, wherever possible, • Native vegetation is to be pruned/ cut to create the temporary overland pipe corridors. No native vegetation is permitted to be removed. • The removal of hollow-bearing trees is not permitted • Tree/ shrub pruning/ cutting shall be conducted using appropriate techniques and no chemical herbicides shall be used on native vegetation as part of the project, and • Vegetation removed shall not be burnt, but shall be retained as cover on site.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
With regards to noxious or environmental weeds: • If any Noxious or Priority Environmental Weeds occur in the works area, Council's Noxious and Environmental Weeds Officer (or suitable contractor) shall be engaged to treat noxious weeds and priority environmental weeds as part of these works. Weed control activities shall protect native vegetation, at all times.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The works shall not harm or prejudice the wider strategic Yacaaba Peninsula dune restoration and weed control activities.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Monitoring		
All water quality control structures and downstream receiving waterbodies shall be visually monitored for water pollution, particularly during and after rain events.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Dust generation as a consequence of the works shall be visually monitored.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
SPECIFIC PROTECTIVE SAFEGUARDS APPLICABLE TO THIS PROJECT/ ACTIVITY		
The upper limit/ maximum amount of dredged material stockpiled in Deadman's Quarry shall be not more than 22,000m^3 and which shall be periodically removed from the nominated area of Port Stephens periodically in the manner described in this REF.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Prior to the commencement of works, an appropriately trained person shall prepare a Traffic Management Plan for the transportation of sand products from the quarry stockpile to Jimmys Beach. The adopted plan shall be implemented at all times.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The dredge operator shall make all necessary arrangements with the NSW Maritime, commercial fishers, any other commercial users of Port Stephens prior to the commencement of each dredging activity to minimise any unnecessary disruptions to vessel/ boating movements and safety. The dredge and other plant/equipment must display at all times the correct navigation signals	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Any dredge operator, quarry site operator and transporter of any material shall prepare to the written satisfaction of Council a safety management plan to ensure the safety of the community and operators is achieved and maintained throughout the approved works. Upon approval, all aspects of the safety management plans must be implemented by the responsible parties	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
No seagrass beds shall be harmed or disturbed by any aspect of the approved works.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The operation of the dredge and associate pump lines will not impede the passage of fish and other marine animals. The dredge operator is to take all necessary action to avoid any adverse interaction with marine animals. In the event of any action potentially leading to fish kill in the vicinity of the works, all dredging activities must cease until such time as the fish kill has been investigated.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
If the dredging and pumping activities are proposed for the breeding season of the Pied Oystercatcher, then a qualified Ecologist shall be engaged to undertake a survey of nesting activities of this species. In the event that a nest site is identified, the pipelines shall not be established within 50-metres radius of each nest until such time as the nesting activity has been completed.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Noise associated with all mechanical plant and equipment, including the dredge and all machinery on the proposed temporary deposition site shall not be a source of "offensive noise" at the nearest affected residence as defined by the *Protection of the Environment Operations Act 1997* at any time. "Offensive noise" means noise: a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances: i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulation.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The dredge operator must undertake daily monitoring of waters in the return discharge pipeline. In the event that testing identifies the presence of return waters outside the ranges of turbidity >50 NTU, then the operator must prevent the discharge of such waters until such time as the waters demonstrably meet the stated quality criteria. The dredge operator must provide the results of the return water turbidity sampling program to the Contract Superintendent on a weekly basis during the dredging program	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Visible plumes from the return water pipeline to Port Stephens should not exceed 50m from the discharge point. If plumes do exceed this limit dredging should cease until settlement has occurred and appropriate measures should be incorporated to ensure this requirement is met (e.g. silt curtain, settlement pond modification)	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

Action	PROJECT MANAGER - Action Complete	SITE WORKS FOREMEN - Action Complete
To avoid water quality impacts from breakage of the discharge pipeline and return waters pipeline, the dredge operator must conduct continuous monitoring of the hydraulic systems on board the dredge and pressure in the suction head and pipeline dredge to provide warnings about possible blockages and leakages. Daily inspections must be conducted of the dredge pipe by dredge personnel to identify signs of potential blockage and breakage and rectify potential problems. In the event that there is any blockage, rupture or breakage of the dredge pipeline, the dredging and deposition activities must immediately cease until such time as the pipeline has been repaired or replaced or the blockage removed. At all times, the dredge operator must implement effective measures to prevent any spillage and have an effective spillage contingency plan in place (and all necessary equipment on site) before the commencement of dredging activities.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The finished contour of each sand stock pile shall be tapered to the north east during storage to reduce sand blow.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Sand stockpiles at the Quarry Site shall be surveyed pre- and post renourishment and deposition works to ensure that adequate supplies are maintained and to measure the amount of material used in each re-nourishment event.	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
The works must comply with the recommendations of Umwelt 2006 (Ecological Management and Monitoring Requirements for the Sand Renourishment Program Jimmys Beach NSW).	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A

SCHEDULE 2 – ENGINEERING/ DESIGN PLANS ON WHICH THIS REF IS BASED



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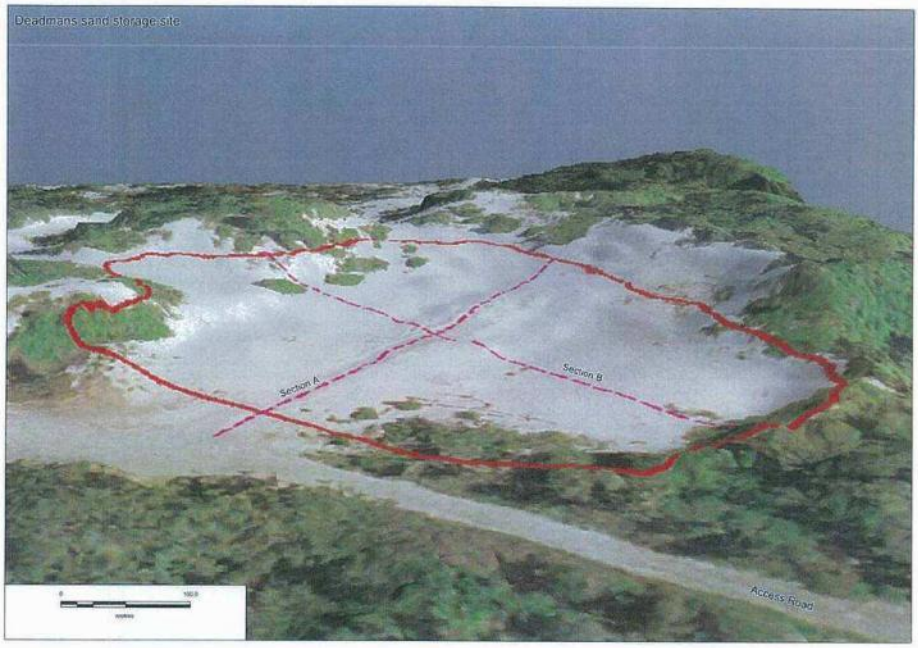
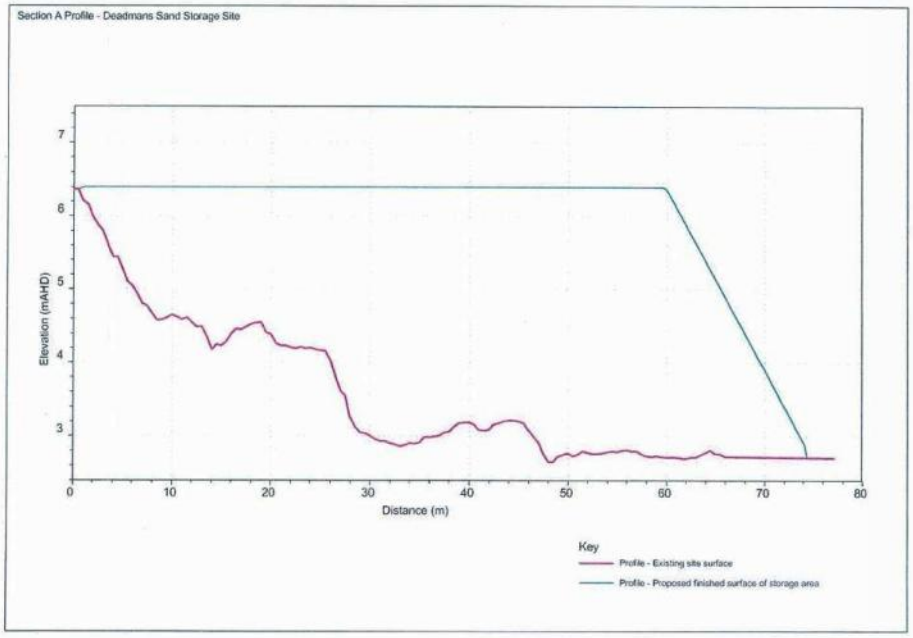

Deadmans sand storage site
Section A
Section B
Access Road


Section A Profile - Deadmans Sand Storage Site
Elevation (mAHD)
7
6
5
4
3
0
10
20
30
40
50
60
70
80
Distance (m)
Key
Profile - Existing site surface
Profile - Proposed finished surface of storage area

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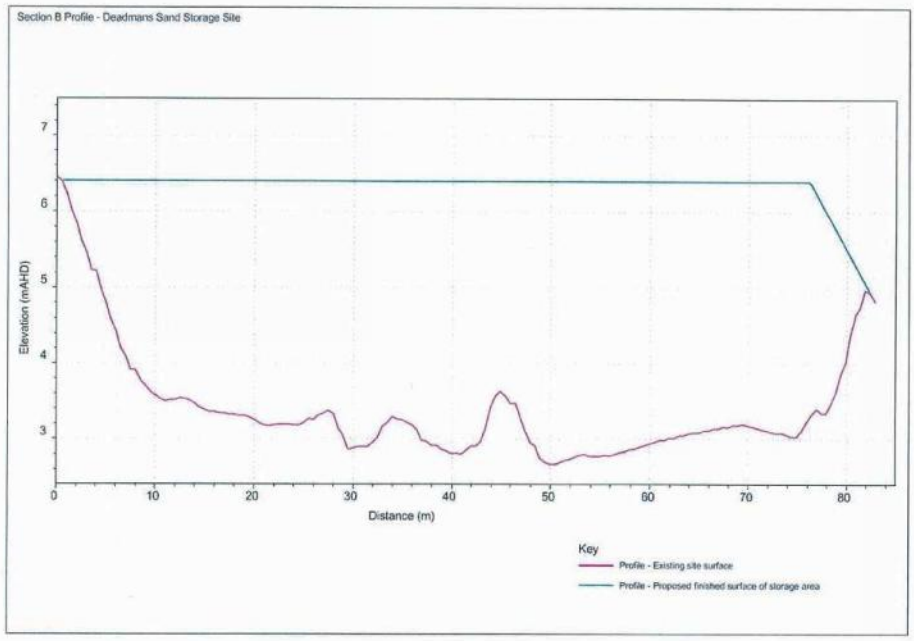
Section B Profile - Deadmans Sand Storage Site
Elevation (mAHD)
7
6
5
4
3
0
10
20
30
40
50
60
70
80
Distance (m)
Key
Profile - Existing site surface
Profile - Proposed finished surface of storage area

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