CHAPTER 3.5 COASTAL HAZARDS

1.0 INTRODUCTION

1.0.1 Aims

- To provide guidelines for development of land having regard to minimising coastal hazard risks to development.
- To identify relevant assessment considerations in regard to lands within the coastal zone (as defined by the WLEP, 2013), and referred to as the Coastal Hazard Planning Area.
- To minimise risk to life and property from coastal hazards associated with building on land within the Coastal Hazard Planning Area.
- To maintain and improve public access to public land affected by potential coastal hazards.
- To identify relevant assessment considerations for various types of developments including minor ancillary structures, new development and community infrastructure.

1.0.2 Hazard and Risk

This Chapter provides a risk-based planning and assessment tool, with provisions scaled to match the hazard level.

A **hazard** is a situation which poses a level of threat to life, health, property or environment. Most hazards are dormant or potential, with only a theoretical risk of harm; however, once a hazard becomes "active", it can create an emergency situation. Hazard and possibility interact together to create risk.

A **risk** is the potential of losing something of value, which may be avoided through pre-emptive action. Risk is the probability of something happening, multiplied by the cost or benefit if it does.

1.1 Objectives of this Chapter

- To complement and reinforce the objectives and requirements of Clause 5.5 of the WLEP 2013
- To reduce the impact of coastal hazards on individual owners and occupiers of coastal lands within Wyong Shire
- To manage development along Wyong's coastline through a risk-based, adaptive management approach
- To protect beach amenity and public safety
- To consider practical opportunities for minor ancillary development

1.2 Land to which this Chapter Applies

This Chapter applies to the lands identified within Clauses 5.5 and 5.7 of the WLEP 2013, as being within the defined Coastal Hazard Planning Area (CHPA). **The CHPA includes** the lands located seaward of the Low Risk Coastal Hazard Planning Line, also including the landward extent of the identified Geotechnical Hazard Zones and the Combined Bluff, Beach and Dune Zones, as shown on Figures 1 – 12 (Section 2.1).

The Chapter outlines the controls and application requirements applying to development proposals, infrastructure and improvements on the land, seaward of the relevant Planning Line.

Development proposals for new development, modifications or extensions to existing developments will be subject to controls and may be restricted within the identified hazard areas and zones. All applications will need to:

- investigate and address the potential hazard(s);
- not contribute any increased level of risk to other lands; and
- demonstrate the suitability of the proposed development within the zone.

1.2.1 Exempt and Complying Development

Under the NSW planning system, certain low impact or routine development can be classified as Exempt or Complying development and not require development consent. However, the operation of this system is limited according to the location, development type, and compliance with certain standards.

Generally, Complying Development may not be carried out on lands within the CHPA on the basis of the 'sensitivity' of the land.

Therefore, proposals for development within the CHPA which are not identified as Exempt Development, require the submission to Council and approval of a Development Application. Applicants should confirm with Council staff the requirements applying to the subject land before undertaking any development.

1.3 Relationship to other Chapters and Policies

This chapter is to be read in conjunction with other relevant Chapters of this Development Control Plan and policy documents of Council, related to the proposed development type.

The provision of public facilities and infrastructure on any land, by Council or other Government Agencies, is enabled through State Environmental Planning Policy (Infrastructure), 2007.

1.4 Background

This Chapter is based on the Wyong Shire Coastal Zone Management Plan, 2011 (WSCZMP). The two supporting reports for this plan, available on Council's website, are:

- *Wyong Coastal Hazard Study*, SMEC Australia, October 2010;
- *Report on the Geotechnical Issues associated with the Coastline Hazard Management Study*, Shirley Consulting Engineers, Pty Ltd, May 2010.

This Chapter recognises the distinction in these studies between hazards associated with sand dunes (erosion risk) and those associated with cliffs, bluffs and rock formations (geotechnical hazards). It should be noted that some areas are affected by both. Development landward of the CHPA is not constrained by coastal process issues and there are no specific coastal hazard management requirements.

1.4.1 Coastal Erosion Risk

Coastal erosion is a natural phenomenon for beaches. Beaches respond to environmental factors such as:

- Variations in sand supply;
- Changes in season and prevailing wave regime;
- Changes in weather – especially prevailing winds;
- Severe storm events.

As environmental conditions change the beach profile changes, as sand is moved offshore and returned to shore.

The problems associated with coastal erosion occur once shoreline recession threatens property. Urban development within coastal areas is expected to continue to be a major activity and needs to be carefully managed to minimise risks to development and to protect public coastline assets.

Damage to public and private assets and infrastructure occurs in several ways, such as:

- Undermined and eroded private property including fences, swimming pools, decks, and houses; public and private steps, ramps, pathways and viewing platforms; surf club buildings and associated facilities; sea walls; roads; drainage, water, sewerage or other major community infrastructure; promenades and boardwalks. Wave cut (storm bite) may be followed by slope adjustment and slumping as sediments are redistributed.
- Land slip and rock fall caused by saturated soils, high waves or following tree throw.
- Wind-blown sand being deposited across road ways, park land and residential or commercial development sites.
- Inundation of low lying land by wave overtopping of dunes or set up of lake waters.

Coastal erosion hazard studies have not been completed for the entire length of beaches in Wyong Shire. Council and The NSW Office of Environment and Heritage (OEH) identified key locations for which hazard studies would be prepared, at the outset of the CZMP project. Generally, these locations correspond with areas of residential development or locations of community infrastructure. Based on the assessment

recommended by OEH, Figures 1 - 12 show areas, outside and including the recognised "hotspots" (or "Authorised Locations"), which are considered to be subject to Immediate Risk Coastal Erosion Hazard along the Wyong coast. Severe coastal erosion could occur in these areas at any time. Having defined the Immediate Risk Hazard Line, the High Risk Hazard and Low Risk Hazard lines and zones have been predicted.

1.4.2 Geotechnical Hazards

Processes that affect the stability and rate of recession by weathering and erosion of coastal cliffs and bluffs are often referred to as geotechnical processes, and are heavily dependent on the geology (stratigraphy, geochemistry and structure) of the underlying bedrock.

Geotechnical assessments have been conducted of cliffs and bluffs along the Wyong coastline where geotechnical processes are likely to affect residential development, public or private infrastructure or recreational access. These locations include:

- Jenny Dixon Beach and Noraville
- Cabbage Tree Harbour
- Norah Head
- Soldiers Point
- Blue Bay and The Entrance Headland
- Toowoon Bay and Bateau Bay
- Yumbool Point and Crackneck Point

The Coastal Hazard Planning Lines for Geotechnical Hazards have been determined based on the Immediate Risk, High Risk and Low Risk Hazard lines. Geotechnical Hazard Zones are also identified, where further detailed investigations and study are required prior to the lodgement and assessment by Council of development proposals.

1.4.3 Combined Bluff, Beach and Dune Zones

The geotechnical or slope instability hazard areas refer to rocky terrain – the headlands and bluffs that separate coastal beach compartments. In some cases, weathering bedrock lies beneath a variable mantle of beach or dune sand and may be exposed at the surface in the future. The hazard is therefore a combination of landslip and soil/sand erosion.

In these areas where there are potential complex interactions of coastal erosion and geotechnical hazards, further investigations are required to provide certainty about the nature and extent of future hazards (for the High Risk and Low Risk planning horizons).

1.4.4 Wave Run-up

Despite the identification of the Hazard Line or Zone on the maps in Section 2.1, there are circumstances when development may also be affected by wave run-up.

Wave run-up is the vertical distance that a wave will reach above the level of the tide and storm surge during a storm event. While these higher levels are infrequent and last for short time periods, they have the potential to exacerbate any storm damage along the foreshore. For these reasons, the identification of the wave run-up is an important planning tool during the design phase of development in this zone.

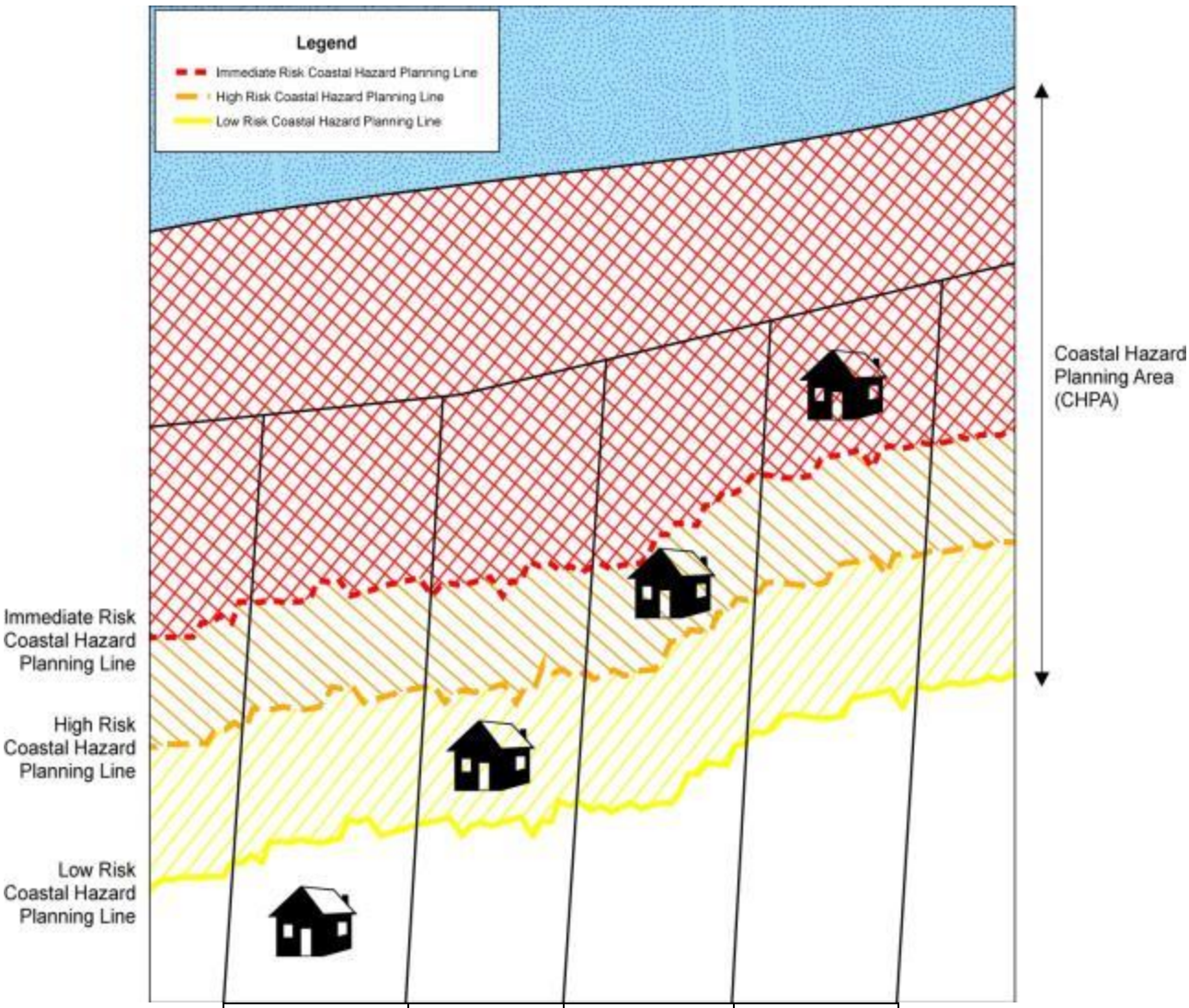
To reduce the impact of wave run-up, it is essential to identify minimum floor levels for development. Minimum floor levels for habitable rooms must not be less than the Immediate Wave Run-Up Height.

Wave run-up analysis for the design storm (1974) has indicated that wave run-up level along the Wyong Shire coastline is generally around 6m to 7m AHD, with higher values for North Entrance where the run-up level can reach up to around 8.1m AHD. Specific values for each beach are included in Table 4 within the *Wyong Coastal Hazard Study*, SMEC Australia, October 2010.

This analysis indicates that some overtopping may occur at Blue Lagoon Caravan Park at Bateau Bay, at the southern end of Blue Bay, at South Entrance swimming pool, along Curtis Parade at North Entrance and along Hargreaves Beach. However, the impact to houses and roads would be limited, owing to the dissipation of wave run-up by the dune system.

2.0 COASTAL HAZARD PLANNING LINES

Council will use the planning system to reduce the exposure of development to coastal processes over time (refer diagram below for general principles) and to thereby reduce the associated risk.



✓	?	?	X
Suitable, No specific coastal management requirements	DA requires merit assessment, supported by Coastal and Geotechnical Assessment relevant to the scale of the proposal	DA requires merit assessment, supported by Coastal and Geotechnical Assessment relevant to the scale of the proposal. Generally, no new free-standing, habitable structures	Typically unsuitable for future development. However, some structures (see Table 1) may be permitted if supported by Coastal and Geotechnical Assessment relevant to the scale of the proposal

Diagram adapted from NSW Department of Planning 2010

The following **Table 1** indicates development types (non-exhaustive) which may be considered on merit within the Risk Zones of the CHPA, via the Development Assessment process. The Risk Zone lies seaward of the relevant Risk Planning Line.

Note: For identification of the position of the Lines, and therefore definition of the Zones, refer to the Coastal Hazard Maps - Figures 1 – 12, within Section.2.1.

Outside Coastal Hazard Planning Area	**Low Risk Coastal Hazard Planning Zone**	**High Risk Coastal Hazard Planning Zone**	**Immediate Risk Coastal Hazard Planning Zone**
Merit Assessment as per Land Use Tables for the relevant Zone within WLEP, 2013, & other legislation.	• New single dwellings • Maintenance work to existing dwellings / developments • Works to make existing developments relocatable • New ancillary residential development - sheds, garages, swimming pools, timber gazebos, timber decks & viewing platforms • New commercial developments • Tourist development • Caravan parks (tourist sites) • Recreation facilities • Landscaping structures, paving or drainage works	• Removal of an existing dwelling and replacement with a new single dwelling within, and/or landward of, the pre-existing dwelling footprint. • Landward additions and alterations within the existing building footprint • Maintenance work to existing dwellings / developments, e.g., re-cladding • Works to make existing developments relocatable • Timber decks & viewing platforms (max. $20m^2$, max. 1m from ground) • Timber gazebos (max. $20m^2$) • Sheds, garages, swimming pools and ancillary development no further seaward, or closer to the hazard, than the principal dwelling. • Tourist development • Caravan parks (tourist sites) • Recreation facilities • Coastal Protection Works – groynes, seawalls, break-walls, beach nourishment • Access Pathways – boardwalks / tracks • Timber & wire fencing & railings • Landscaping structures, paving, drainage works • Community facilities (such as surf club buildings)	• Removal of an existing dwelling and replacement with a new single dwelling within, and/or landward of, the pre-existing dwelling footprint. • Landward additions and alterations behind the existing building footprint • Maintenance work to existing dwellings / developments, e.g., re-cladding • Works to make existing developments relocatable • Timber decks & viewing platforms (max. $20m^2$, max 1m from ground) • Timber gazebos (max. $20m^2$) • Sheds, garages, swimming pools and ancillary development no further seaward, or closer to the hazard, than the principal dwelling. • Coastal Protection Works – groynes, seawalls, break-walls, beach nourishment • Access Pathways – boardwalks / tracks • Timber & wire fencing & railings • Landscaping structures, paving or drainage works • Community facilities (such as surf club buildings)

Table 1: Development Type by Risk Zone

The following **Table 2** indicates the circumstances in which documentation is required to support applications for the development types within Table 1, particularly where a variation to the adopted Planning Lines is sought. Such proposals will be considered on merit, via the Development Assessment process.

Outside Coastal Hazard Planning Area	Low Risk Coastal Hazard Planning Zone	High Risk Coastal Hazard Planning Zone	Immediate Risk Coastal Hazard Planning Zone
Assessment as appropriate to site conditions.	Coastal and Geotechnical Assessment is required addressing the location, type of coastal hazard and scale of development. Lightweight structures, supported by existing structures or new pad footings, will not require a Geotechnical Report.	Coastal and Geotechnical Assessment suitable to the scale of the proposal is required for new buildings and major additions and alterations requiring continuous footings, slab (including pools) and or masonry construction. Lightweight structures, supported by existing structures or new pad footings, will not require a Geotechnical Report.	Coastal and Geotechnical Assessment suitable to the scale of the proposal is required for new buildings and for major additions and alterations requiring continuous footings, slab (including pools) and or masonry construction.

Table 2: Submission Requirements

OBJECTIVES

- To manage development in coastal areas using precautionary planning tools to reduce coastal hazard risks
- To protect against or manage coastal hazards on sites where this is feasible, affordable and without adversely impacting the locality or the broader environment
- To complement and reinforce the objectives and requirements of Clause 5.5 of the WLEP 2013
- To protect beach amenity and public safety

REQUIREMENTS

2.0.1 Coastal Erosion Hazard (A)

Selected development may be considered with appropriate coastal/geotechnical assessment within the Coastal Hazard Risk Zones (refer to Table 1 as a guide). The principles to be applied for sites subject to erosion hazard include:

a Generally, no new freestanding development, other than works for erosion control and controlled beach access, will be considered seaward (or closer to the hazard) of existing development within the Immediate Risk Coastal Hazard Planning Zone, which extends from the Pacific Ocean Mean High Water Mark to the Immediate Risk Coastal Hazard Planning Line (red).

b Generally, no new habitable development will be considered within the Immediate or High Risk Coastal Hazard Planning Zones, which extend from the Pacific Ocean Mean High Water Mark to the High Risk Coastal Hazard Planning Line (amber), unless supported by Coastal and Geotechnical Assessments which establish that adequate protection or adaptation measures can be designed and implemented (approved by either Council or the NSW OEH);

c Where the removal and replacement of a dwelling within the pre-existing dwelling footprint is proposed, a supporting Coastal and Geotechnical Assessment Statement suitable to the scale of the

proposal will be required. (Note: This is not a significant Coastal Engineering Study, it is a Statement from an appropriately qualified professional);

d Proposals for new freestanding structures requiring continuous footings, slab (including pools) and or masonry construction within the High Risk Coastal Hazard Planning Zone, which extends from the Immediate Risk Coastal Hazard Planning Line (red) to the High Risk Coastal Hazard Planning Line (amber), will require a supporting Coastal and Geotechnical Assessment Statement suitable to the scale of the proposal. Lightweight structures, supported by existing structures or new pad footings, will not require a Geotechnical Report ;

e Floor levels for new development seaward of the High Risk Coastal Hazard Planning Line (amber) must consider the 1% AEP storm wave run-up level for each beach (refer Section 1.4.4, Figures 1 – 12 and Table 4 within the *Wyong Coastal Hazard Study*, SMEC Australia, October 2010);

f Geotechnical Assessments suitable to the scale of the proposal may also be required for new structures within the Low Risk Coastal Hazard Planning Zone, which extends from the High Risk Coastal Hazard Planning Line (amber) to the Low Risk Coastal Hazard Planning Line (yellow), e.g., for major structures requiring continuous footings, slab (including pools) and or masonry construction;

g Council will not approve new subdivisions, vulnerable development (including child care centres, nursing homes and hospitals) or other development that intensifies land use seaward (or closer to the hazard) of the Low Risk Coastal Erosion Hazard Planning Line (yellow); and

h Construction and maintenance of sea walls to protect existing private assets affected by coastal recession will be considered on a merit basis, and will be referred for consideration by the NSW OEH.

2.0.2 Geotechnical Hazard (B)

As identified above, selected development may be considered with appropriate coastal/geotechnical assessment within the Coastal Hazard Risk Zones (refer to Table 1 as a guide). The following additional controls apply to areas mapped as being subject to Geotechnical Hazards:

a Generally, no new development, other than stabilisation works and controlled access works, will be considered seaward (or closer to the hazard) of existing development within the Immediate Risk Coastal Hazard Planning Zone, which extends from the Pacific Ocean Mean High Water Mark to the (red) Immediate Risk Coastal Hazard Planning Line. Where a minor freestanding structure is proposed, a supporting Coastal and Geotechnical Assessment Statement suitable to the scale of the proposal will be required. (Note: This is not a significant Coastal Engineering Study, it is a Statement from an appropriately qualified professional)

b Generally, no new dwellings will be approved seaward (or closer to the hazard) of the High Risk Coastal Hazard Planning Line (amber). Where the removal and replacement of a dwelling requiring continuous footings, slab (including pools) and or masonry construction within the pre-existing dwelling footprint is proposed, a supporting Coastal and Geotechnical Assessment Statement suitable to the scale of the proposal will be required. (Note: This is not a significant Coastal Engineering Study, it is a Statement from an appropriately qualified professional);

c Any proposal for other new habitable development requiring continuous footings, slab (including pools) and or masonry construction within the area bounded by the Immediate Risk Coastal Hazard

Planning Line (red) and the Low Risk Coastal Hazard Planning Line (yellow) shall be accompanied by appropriate Coastal and Geotechnical assessments of the subject site and a Structural Engineer's Design for the proposed development that addresses the identified geotechnical hazards.

d Any proposal for new development requiring continuous footings, slab (including pools) and or masonry construction within an identified Geotechnical Hazard Zone (green hatching) shall be accompanied by appropriate geotechnical assessments of the subject site and a Structural Engineer's Design for the proposed development that addresses the identified geotechnical hazards. Lightweight structures, supported by existing structures or new pad footings, will not require a Geotechnical Report

e Council will not approve new subdivisions, vulnerable development (including child care centres, nursing homes and hospitals) or other development that intensifies land use between the High Risk Coastal Hazard Planning Line (amber) and the Low Risk Coastal Hazard Planning Line (yellow); and

f Construction and maintenance of sea walls to protect existing private assets affected by coastal recession hazards will be considered on a merit basis.

2.0.3 Combined Bluff, Beach and Dune Zone Hazard (C)

The following additional control applies to areas mapped as being Bluff, Beach and Dune Zones:

a Any proposal for new development requiring continuous footings, slab (including pools) and or masonry construction within an identified Bluff, Beach and Dune Hazard Zone, hatched blue on Figures 1- 12 (SMEC Area of Advice), shall be accompanied by appropriate geotechnical assessments of the subject site and a Structural Engineer's Design for the proposed development.

2.0.4 Requirements for Geotechnical Assessments

a For development in areas affected by geotechnical hazards, the following matters are required to be addressed in any Geotechnical report submitted with an application to Council:

i Professional assessment on the suitability of the proposed development considering surficial soil instability problems, land stability issues, future bluff recession hazards and the design life of the proposed structure.

ii Description of the geotechnical assessment process adopted and the work undertaken to provide the assessment, considering:

- study of geological and topographic maps of the area;
- consideration of the information made available by the Client about the site and its surrounding area, (including previous instability, building distress, and drainage problems) and the development proposals;
- visual appraisal of the site and the surrounding areas, including signs of instability, soil and rock exposures, seepage and vegetation;
- collection of basic topographic and geological measurements at the site, (viz: slope angles, substrata, bedrock type & depth, etc.); and
- production of a documented sketch geological model of the site.

iii A site description, including vegetation, bedrock outcrops, site seepage & groundwater, existing development, etc.

iv Description of site substrata and identification of the geological formations present in accordance with standard geological practice (e.g. Tuggerah Formation (Rnu) or Patonga Claystone (Rnp) etc.)

v The depth to weathered bedrock over the site generally and within the building area in particular.

vi The site slopes observed (expressed in degrees) and maximum site slope. Delineation of the site into areas of common slope and measured slope angles in the various areas.

vii A "Risk Assessment" of the various parts of the land in accordance with the Australian Geomechanics Society Guidelines – "Landslide Risk Management" (2007) or as subsequently amended. Delineation of the land into areas where different degrees of risk are determined, together with a site classification in accordance with As 2870- 1996 (or latest amended edition).

viii A statement of the effect of the proposed site development on the site, and adjoining land, stability.

ix An assessment of the stability of the land immediately surrounding and above/below the site and possible effects of instability (e.g. a rock fall) on the adjoining/nearby land on the site.

x Sufficient detailed information and recommendations for a structural engineer and/or civil engineer to provide a design for the development to accommodate any instability, or potential instability, considered to affect the land and/or related land.

b For areas affected by high or immediate hazard, Council also requires the following:

i A site plan indicating relevant geological features & location of proposed development on the land relative to those features (preferably at a scale of 1:200);

ii At least one geological section through the site and proposed development (preferably at a scale of 1:200); and

iii Logs of boreholes put down to determine depth of soil/weathered rock strata. The borehole to penetrate the site strata to bedrock and at least one borehole to be within the building area of the site

c Geotechnical reports are to be prepared by a "Geotechnical Engineer", meaning any geotechnical engineer and/or engineering geologist who is listed on the National Professional Engineer's Register, Level 3 (NPER-3), or a current Member or Fellow of the Australian Institute of Geoscientists. The Geotechnical Engineer must have a minimum of five years practice as a geotechnical engineer, or engineering geologist, with appropriate experience in assessing geotechnical hazards in coastal environments and in advising on building works in regions underlain by Terrigal Formation, Patonga Claystone, Tuggerah Formation and Munmorah conglomerate geological strata, or who is able to demonstrate considerable relevant experience with similar geology. The geotechnical engineer should be familiar with the Engineers Australia Code of Ethics, Sustainability Charter, legal responsibilities and duty of care. The Geotechnical Engineer shall also be covered by appropriate professional indemnity insurance with a cover of at least $2,000,000 and provide the Council with proof of the currency of such insurance policy(s) with the geotechnical report.

2.1 Coastal Hazard Maps: Figures 1 - 12

Figures 1 – 12 show the Wyong LGA coastline from North to South, indicating the identified coastal hazards which must be taken into account in the design of development proposals.

The maps indicate the extent of the Immediate, High and Low Risk Hazard areas. The mapping also shows areas of geotechnical hazard or Bluff, Beach and Dune zones.

The Assessment Method required is also identified (A, B or C), having regard to the coastal hazard. These maps are available online or directly from Council's Customer Contact Centre.

Figure 1 – Budgewoi Beach to Lakes Beach: Figure 1 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable.

Figure 2 – Jewfish Point to Hargraves Beach: Figure 2 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable at Hargraves Beach. An area identifying Geotechnical Hazard Planning Lines, where Assessment Method B applies, is located along the cliffs heading south toward Jenny Dixon Beach.

Figure 3 – Hargraves Beach to Jenny Dixon Beach Noraville: Figure 3 identifies Geotechnical Hazard Planning Lines, where Assessment Method B applies, located along the cliffs heading south toward Cabbage Tree Harbour. Geotechnical Hazard Zones are also identified adjacent to Jenny Dixon Beach and Cabbage Tree Harbour.

Figure 4 – Cabbage Tree Harbour to Soldiers Point: Figure 4 identifies the continuation of Geotechnical Hazard Planning Lines, where Assessment Method B applies, located along the cliffs heading south from Cabbage Tree Harbour and Norah Head to Soldiers Headland. Combined Bluff, Beach and Dune Zones, where Assessment Method C applies, are also identified adjacent to Cabbage Tree Harbour and Pebbly Beach.

Figure 5 – Soldiers Beach to Pelican Beach: Figure 5 predominantly identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable.

Figure 6 – Magenta Beach: Figure 6 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable.

Figure 7 – Magenta Beach to North Entrance Beach: Figure 7 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable.

Figure 8 – North Entrance Beach: Figure 8 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable.

Figure 9 – North Entrance Beach to South Entrance Beach: Figure 9 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable at North Entrance and Blue Bay Beaches. Geotechnical Hazard Planning Lines, where Assessment Method B applies, are identified located along the rocky coastline to the south from South Entrance Beach. An identified Geotechnical Hazard Zone, where Assessment Method B applies, is located landward of Blue Bay Beach.

Figure 10 - Blue Bay to Little Bay: Figure 10 identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable at Blue Bay, Toowoon Bay and North Shelly Beaches. Geotechnical Hazard Planning Lines, where Assessment Method B applies, are identified located along the rocky coastline to the south from Toowoon Bay and Little Bay Beaches to North Shelly. An identified Geotechnical Hazard Zone, where Assessment Method B applies, is located landward of Blue Bay and Toowoon Bay Beaches.

Figure 11 – North Shelly Beach to Blue Lagoon Beach: Figure 11 predominantly identifies Coastal Erosion Hazard Planning Lines, where Assessment Method A is applicable. Geotechnical Hazard Planning Lines, where Assessment Method B applies, are identified located along the rocky coastline to the south from Blue Lagoon Beach. An identified Geotechnical Hazard Zone, where Assessment Method B applies, is located landward of Blue Lagoon and Bateau Bay Beaches.

Figure 12 – Bateau Bay Beach to Yumbool Point: Figure 12 identifies Geotechnical Hazard Planning Lines where Assessment Method B applies, located along the rocky coastline to the south from Bateau Bay Beach. An identified Geotechnical Hazard Zone, where Assessment Method B applies, is located landward of Bateau Bay Beach and extends along the coast, south to the boundary of the LGA.

2.1 Coastal Hazard Maps: Figures 1 - 12

Figure 1 Budgewoi Beach to Lakes Beach

Figure 2 Jewfish Point to Hargraves Beach

Figure 3 Hargraves Beach to Jenny Dixon Beach Noraville

Figure 4 Cabbage Tree Harbour to Soldiers Point

Figure 5 Soldiers Beach to Pelican Beach

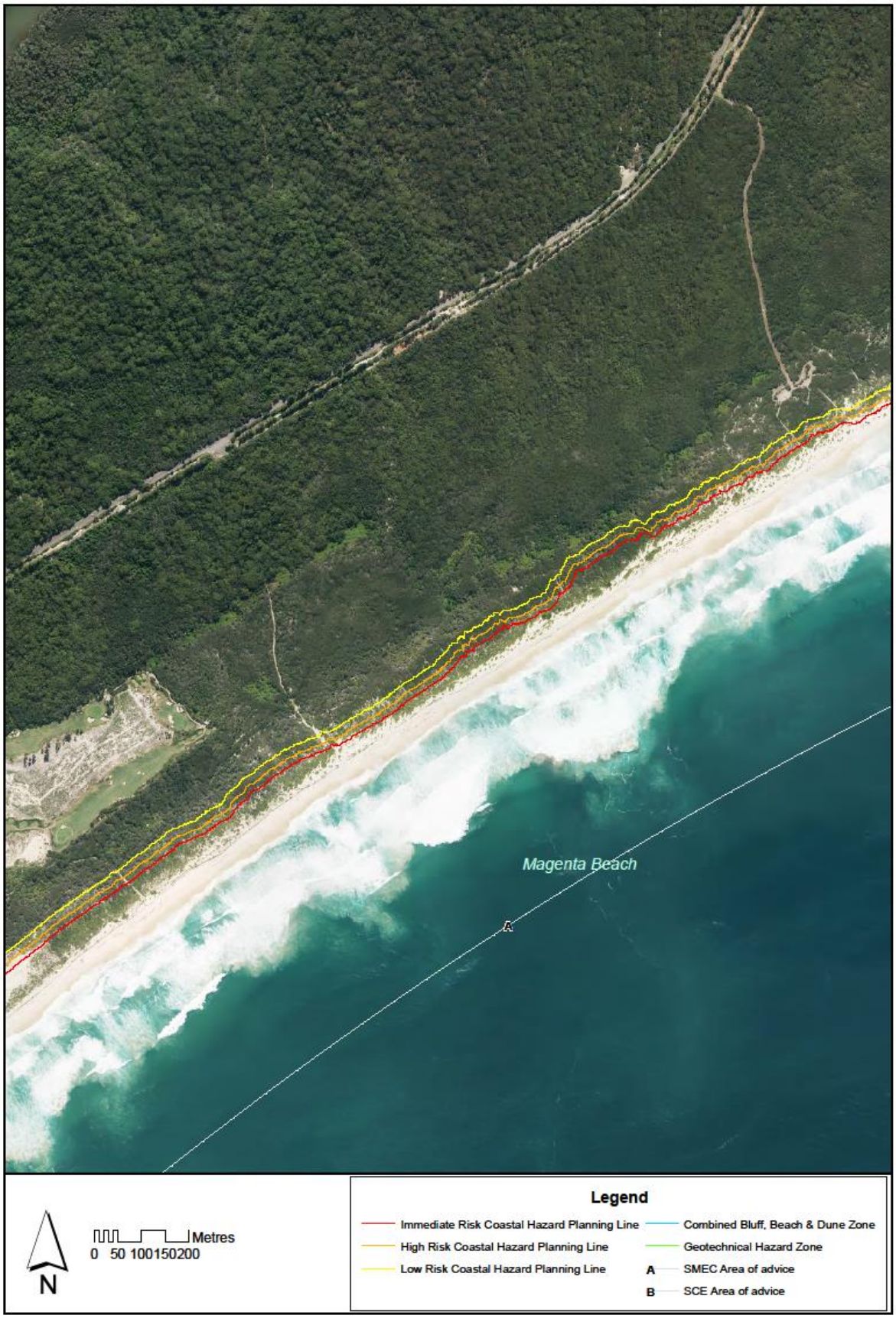


Figure 6 Magenta Beach

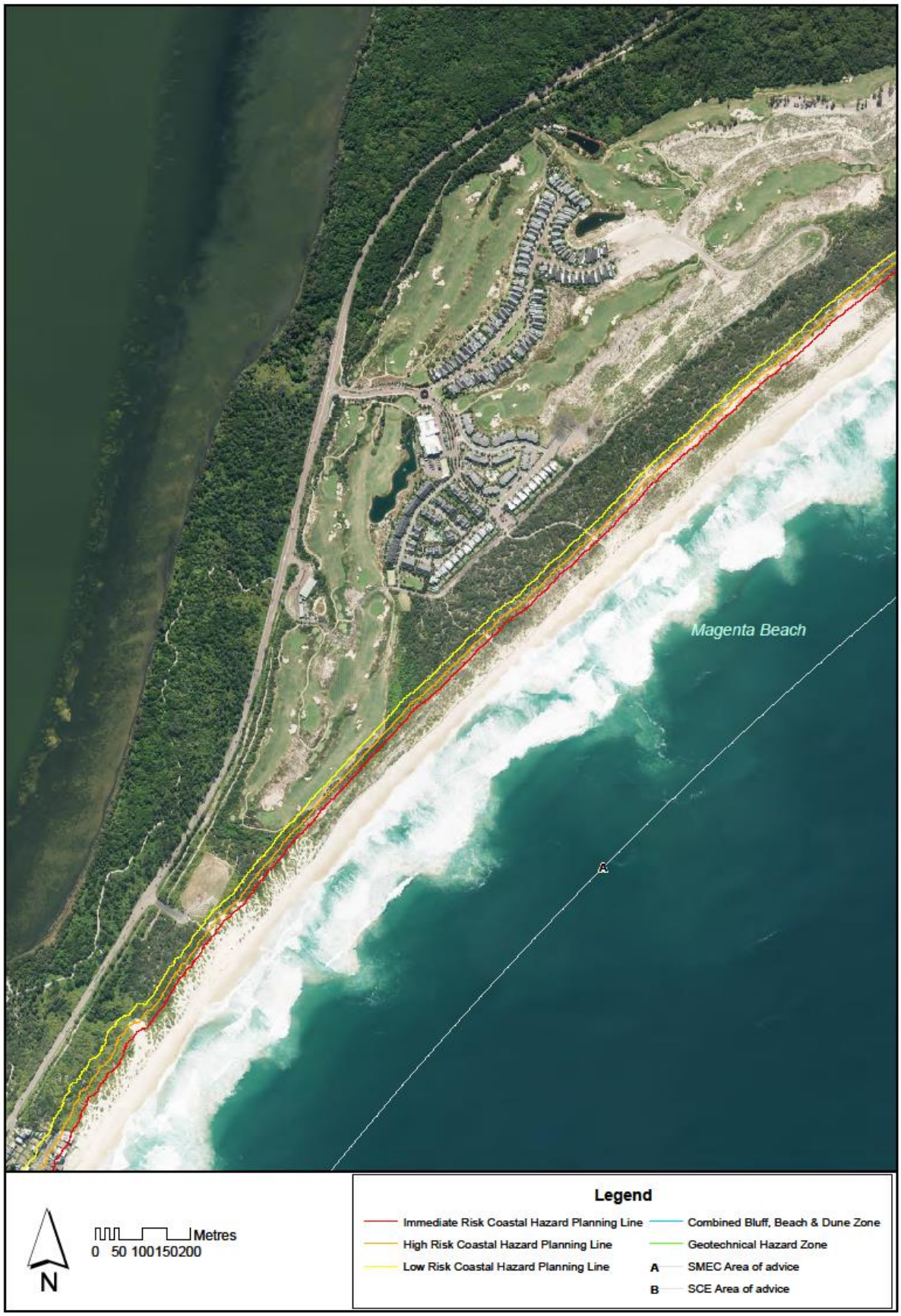


Figure 7 Magenta Beach to North Entrance Beach

Figure 8 North Entrance Beach

Figure 9 North Entrance Beach to South Entrance Beach

Figure 10 Blue Bay to Little Bay

Figure 11 North Shelly Beach to Blue Lagoon Beach

Figure 12 Bateau Bay Beach to Yumbool Point

2.2 Other Areas

Where a development is proposed in a coastal area not addressed by this Chapter, Council requires that a Coastal Hazard Definition Study (which may include a Geotechnical Report) be prepared by a Coastal Engineer, before an application prepared by a Civil Engineer can be considered.

The following requirements shall be addressed with the application:

a identification of the location of the Coastal Hazard Planning Lines and Stability Zones for Immediate Risk, High Risk and Low Risk hazard lines on the site, addressing:

  i general stability of the site and locality in respect to the effect of the proposal on adjacent structures and land;

  ii stability of the site and locality in a severe storm event. Reference should be made to the reports identified in Section 1.4 of this Chapter. The following factors are to be considered:

    - oceanic inundation as a result of elevated sea levels, wave setup & run-up;
    - beach scour levels and dune scarp stability; and
    - the effect of the proposal on adjacent structures.

  iii stormwater disposal from buildings with the objective being to prevent water concentration and bank scouring;

b all options, including locating the proposal some distance from the identified High Risk Coastal Hazard Planning Line or Geotechnical Hazard Zone, must be examined. Development should be located landward of these areas unless it can be demonstrated that there is no other suitable option.