

Flood Control Certificate

Date: 30 March 2023 Job No. 2301044

Client: Nina & Kristian Reynolds Engineer: SR

Site: 4c Minkara Road, Bayview

Michael Wachjo and Samuel Ruskin of Northern Beaches Consulting Engineers P/L have performed an inspection at the above site in relation to potential flooding risks.

We hereby certify that:

- There are shelter-in-place refuges available on the lot,
- The development and buildings are located outside of and above the Probable Maximum Flood extent.
- Two risk tables outlined on page 2 of the guidelines for flood emergency response planning for development in Pittwater for the 1% AEP event and the PMF event have been completed (refer Appendix B)

We trust that this certificate meets with your requirements. Please contact the author if further clarification is required.

Note: This certification does not mitigate the responsibility of the owners of the property to properly maintain the installed flood risk management works and adhere to all recommendations outlined in the approved Flood Risk Management Report.

NORTHERN BEACHES CONSULTING ENGINEERS P/L

Michael Wachjo

Senior Engineer | B.E. (Civil) MIEAust Director

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Appendix A

Flood Emergency Response Form No.1

FLOOD EMERGENCY RESPONSE PLANNING FOR DEVELOPMENT IN PITTWATER POLICY
FORM NO. 1 – To be submitted with Development Application

Development Application for

Nina and Kristian Reynolds

(Name of Applicant)

Address of site: 4c Minkara Road, Bayview

Declaration made by hydraulic engineer or engineer specialising in flooding/flood emergency response as part of a Flood Risk Emergency Assessment:

I, Michael Wachjo on behalf of Northern Beaches Consulting Pty Ltd
(Insert Name) (Trading or Business/ Company Name)

on this the 31 March 2023 (Date) certify that I am a hydraulic engineer or engineer

specialising in flooding/flood emergency response and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least \$2million.

Flood Risk Emergency Assessment Details:

Report Title:

2301044 - Flood Risk Assessment

Report Date: 31 March 2023

Author: Samuel Ruskin

Author's Company/Organisation: Northern Beaches Consulting Pty Ltd

I: Michael Wachjo
(Insert Name)

Please tick appropriate box (more than one box can be marked)

☐ have prepared the Flood Risk Emergency Assessment referenced on Form 1 in accordance with Council's guidelines and the Flood Emergency Response Planning for Development in Pittwater Policy.

☐ am willing to technically verify that the detailed Flood Risk Emergency Assessment referenced on Form 1 has been prepared in accordance with Council's guidelines and the Flood Emergency Response Planning for Development in Pittwater Policy.

☒ have examined the site and the proposed development in detail and have carried out a risk assessment (which has been attached to this form), and can confirm that:

☒ The addition/dwelling/building is located outside of the extents for Flood Life Hazard Categories H3-H4, H5 and H6 and a Flood Risk Emergency Assessment is not required.

☒ confirm that the results of the risk assessment for the proposed development are in compliance with the Flood Risk Management Policy for Development in Pittwater and a detailed risk assessment is not required for the subject site.

☒ have examined the site and the proposed development/alteration/addition in detail and I am of the opinion (after carrying out a risk assessment) that the Development Application does not require a Flood Risk Emergency Assessment and I have attached the risk assessment to this form.

☐ have reviewed (provide details of Report) the Flood Risk Emergency Assessment previously prepared for this property and can confirm it is up to date and is still current.

Documentation which relate to or are relied upon in report preparation:

☐ I am aware that the Flood Risk Emergency Assessment referenced on Form 1, prepared for the abovementioned site is to be submitted in support of a Development Application for this site and will be relied on by Pittwater Council as the basis for ensuring that the Flood Risk Management aspects of the proposed development have been adequately addressed to achieve an "Acceptable or Tolerable Risk" level for the life of the structure, taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Hydraulic engineer or engineer specialising in flooding/flood emergency response details:

Signature 

Name Rick Wray

Chartered Professional Status..... CPEng, NER

Membership No. 803938

Company..... Northern Beaches Consulting Pty Ltd

Number of years specialising in flooding/emergency response... 30+

Appendix B

Flood Risk Assessment

Flood Risk Assessment - 1% AEP

Hazard	Likelihood	Consequence	Risk Level
Person in building/dwelling being impacted by floodwaters	RARE	MODERATE	LOW
Persons entering floodwaters on property	RARE	MODERATE	LOW
Building/dwelling being impacted by floodwaters - structural viability	RARE	MODERATE	LOW
Vehicles being impacted by floodwaters	RARE	MODERATE	LOW
Floodwaters entering carport / garage / basement	RARE	MODERATE	LOW
Floodwaters entering dwelling / building	RARE	MODERATE	LOW

Flood Risk Assessment - PMF

Hazard	Likelihood	Consequence	Risk Level
Person in building/dwelling being impacted by floodwaters	RARE	MODERATE	LOW
Persons entering floodwaters on property	RARE	MODERATE	LOW
Building/dwelling being impacted by floodwaters - structural viability	RARE	MODERATE	LOW
Vehicles being impacted by floodwaters	RARE	MODERATE	LOW
Floodwaters entering carport / garage / basement	RARE	MODERATE	LOW
Floodwaters entering dwelling / building	RARE	MODERATE	LOW

Appendix C

Council Supplied Flood Information

FLOOD INFORMATION REPORT – COMPREHENSIVE

Property: 4C Minkara Road BAYVIEW NSW 2104

Lot DP: Lot 53 DP 774017

Issue Date: 13/02/2023

Flood Study Reference: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV

Flood Information for lot ^{1,2,3,4}:

Flood Risk Precinct – See Map A

Flood Planning Area – See Map A

Maximum Flood Planning Level (FPL) ^{2, 3, 4}: 123.29 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level ^{2, 3}: 122.79 m AHD

1% AEP Maximum Depth from natural ground level³: 0.74 m

1% AEP Maximum Velocity: 1.14 m/s

1% AEP Hydraulic Categorisation: N/A See Flood Map D

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level ⁴: 122.82 m AHD

PMF Maximum Depth from natural ground level: 0.88 m

PMF Maximum Velocity: 1.56 m/s

Flooding with Climate Change (See Flood Map E)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

1% AEP Maximum Water Level with Climate change ³: 122.80 m AHD

1% AEP Maximum Depth with Climate Change³: 0.78 m

Flood Life Hazard Category – See Map F

Indicative Ground Surface Spot Heights – See Map G

¹ The flood information does not take into account any local overland flow issues nor private stormwater drainage systems.

² Overland flow/mainstream water levels may vary across a sloping site, resulting in variable minimum floor/flood planning levels across the site. The maximum Flood Planning Level may be in a different location to the maximum 1% AEP flood level.

³ Intensification of development in the former Pittwater LGA requires the consideration of climate change impacts which may result in higher minimum floor levels.

⁴ Vulnerable/critical developments require higher minimum floor levels using the higher of the PMF or FPL.

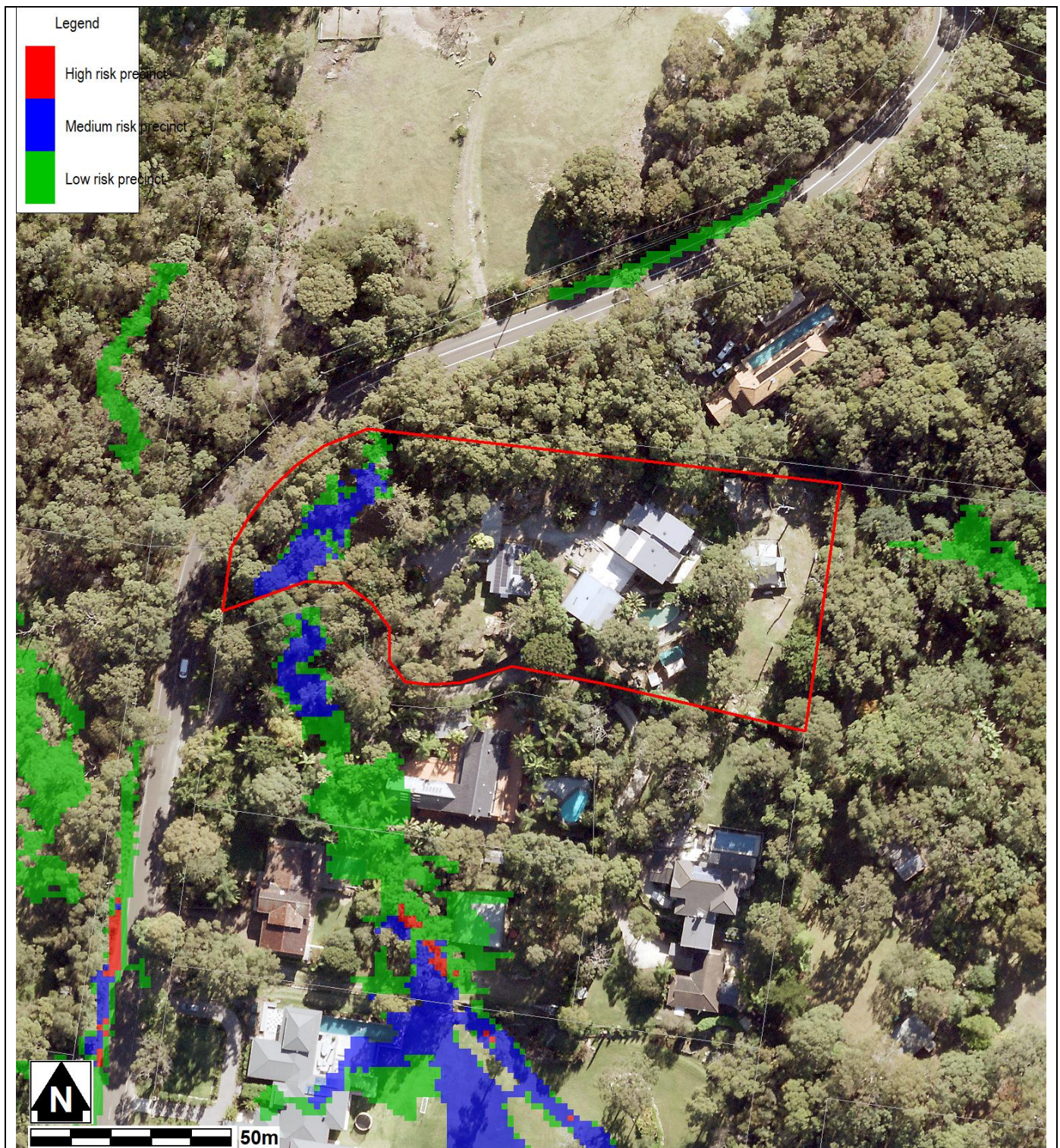
General Notes:

- All levels are based on Australian Height Datum (AHD) unless otherwise noted.
- This is currently the best available information on flooding; it may be subject to change in the future.
- Council recommends that you obtain a detailed survey of the above property and surrounds to AHD by a registered surveyor to determine any features that may influence the predicted extent or frequency of flooding. It is recommended you compare the flood level to the ground and floor levels to determine the level of risk the property may experience should flooding occur.
- Development approval is dependent on a range of issues, including compliance with all relevant provisions of Northern Beaches Council's Local Environmental Plans and Development Control Plans.
- Please note that the information contained within this letter is general advice only as a detail survey of the property as well as other information is not available. Council recommends that you engage a suitably experienced consultant to provide site specific flooding advice prior to making any decisions relating to the purchase or development of this property.
- The Flood Studies on which Council's flood information is based are available on Council's website.

Property Notes:

- Please note that if a development is proposed outside of the Flood Planning Area (Medium Flood Risk Precinct), a formal Flood Management Report would not need to be submitted to council with a DA for Residential Development.

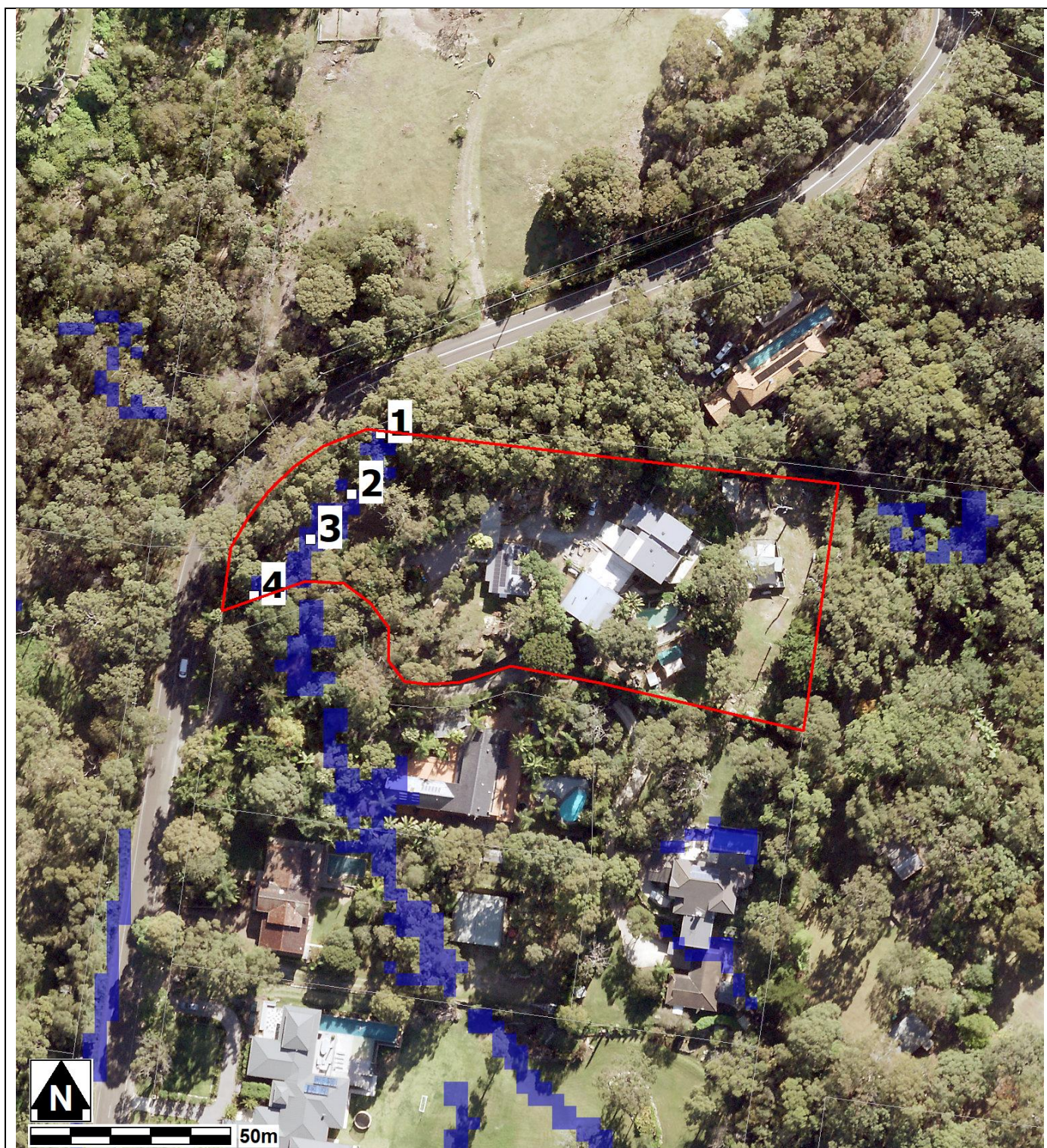
FLOOD MAP A: FLOOD RISK PRECINCT MAP



Notes:

- **Low Flood Risk precinct** means all flood prone land not identified within the High or Medium flood risk precincts.
- **Medium Flood Risk precinct** means all flood prone land that is (a) within the 1% AEP Flood Planning Area; and (b) is not within the high flood risk precinct.
- **High Flood Risk precinct** means all flood prone land (a) within the 1% AEP Flood Planning Area; and (b) is either subject to a high hydraulic hazard, within the floodway or subject to significant evacuation difficulties (H5 or H6 Life Hazard Classification).
- The **Flood Planning Area** extent is equivalent to the Medium Flood Risk Precinct extent, and includes the High Flood Risk Precinct within it. The mapped extent represents the 1% annual Exceedance Probability (AEP) flood event + freeboard.
- None of these mapped extents include climate change.

FLOOD LEVEL POINTS



Note: Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV) and aerial photography (Source: NearMap 2014) are indicative only.

Flood Levels

ID	5% AEP Max WL (m AHD)	5% AEP Max Depth (m)	1% AEP Max WL (m AHD)	1% AEP Max Depth (m)	1% AEP Max Velocity (m/s)	Flood Planning Level (m)	PMF Max WL (m AHD)	PMF Max Depth (m)	PMF Max Velocity (m/s)
1	N/A	N/A	122.79	0.21	0.57	123.29	122.82	0.25	0.96
2	N/A	N/A	120.85	0.16	0.82	121.35	120.93	0.24	1.32
3	119.71	0.16	119.73	0.18	0.17	120.23	119.84	0.29	0.67
4	119.40	0.23	119.42	0.25	0.21	119.92	119.50	0.33	0.38

WL – Water Level

PMF – Probable Maximum Flood

N/A = no peak water level/depth/velocity available in flood event

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	122.80	0.22
2	120.87	0.19
3	119.76	0.21
4	119.44	0.27

WL – Water Level

PMF – Probable Maximum Flood

N/A = no peak water level/depth/velocity available in flood event.

FLOOD MAP B: FLOODING - 1% AEP EXTENT



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event.
- Flood events exceeding the 1% AEP can occur on this site.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV) and aerial photography (Source Near Map 2014) are indicative only.

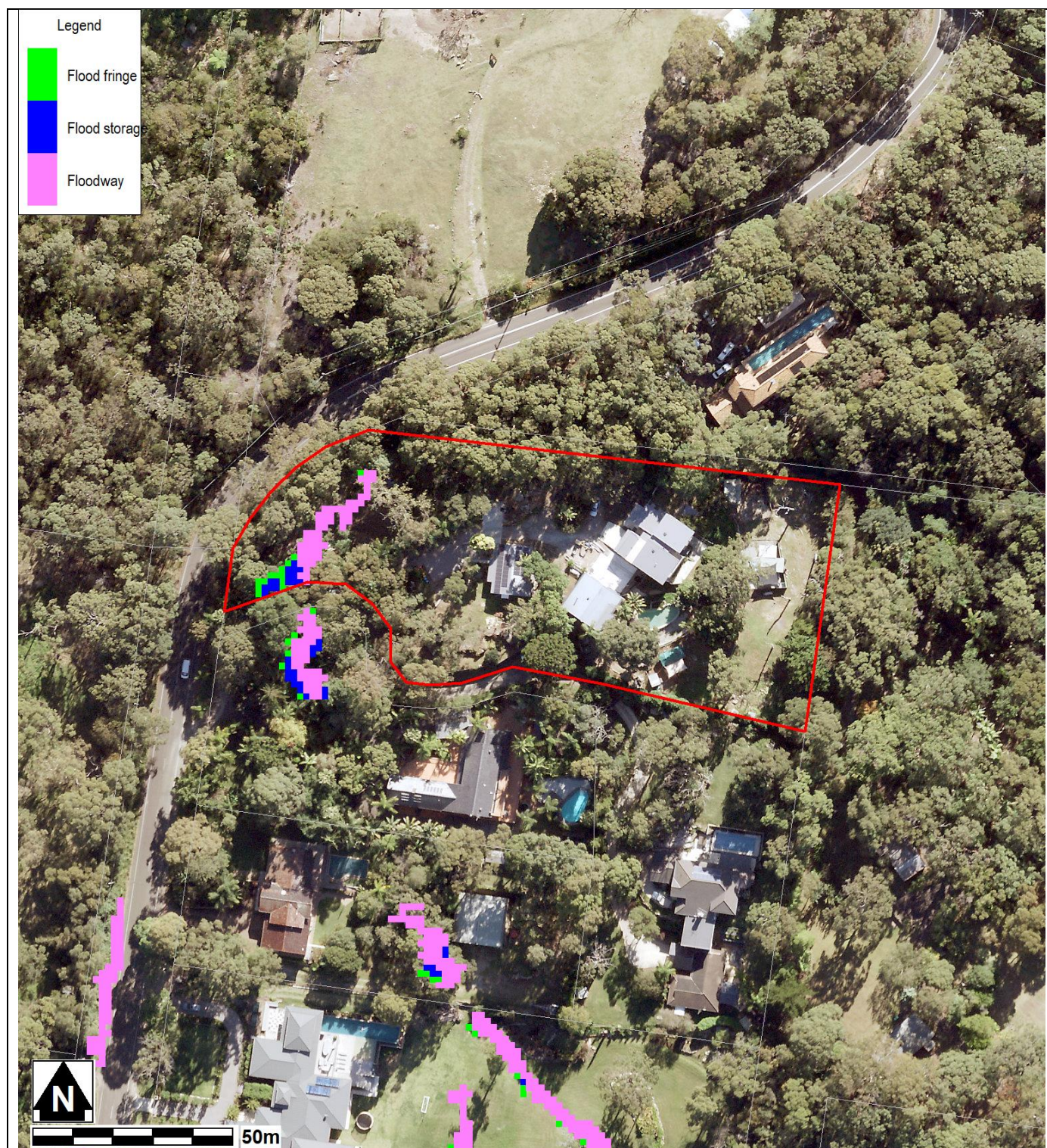
FLOOD MAP C: PMF EXTENT MAP



Notes:

- Extent represents the Probable Maximum Flood (PMF) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP D: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV) and aerial photography (Source: NearMap 2014) are indicative only

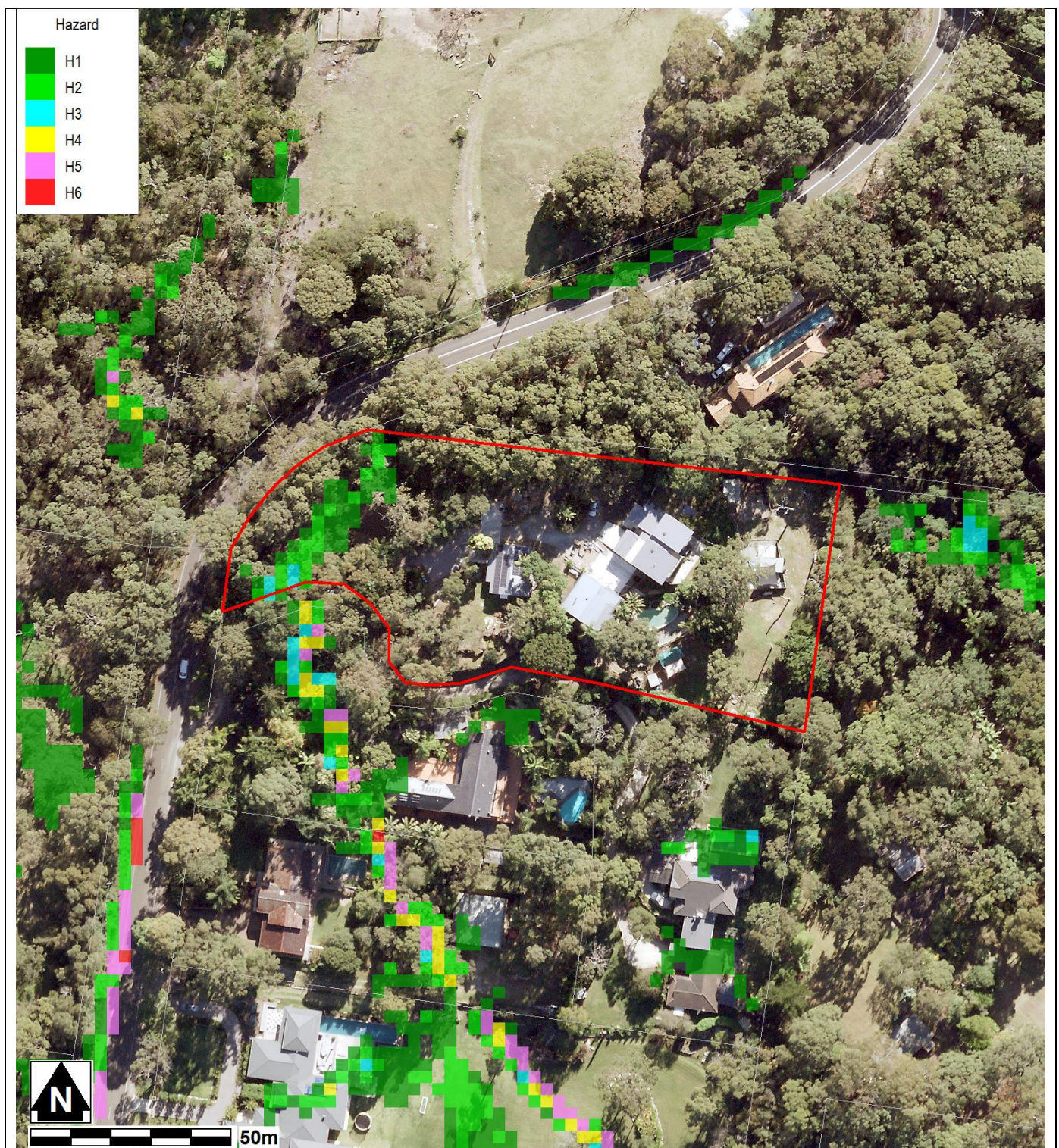
FLOOD MAP E: FLOODING – 1% AEP EXTENT PLUS CLIMATE CHANGE



Note:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP F: FLOOD LIFE HAZARD CATEGORY



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: McCarrs Creek, Mona Vale and Bayview Flood Study Review 2017, Royal HaskoningDHV) and aerial photography (Source Near Map 2014) are indicative only.

MAP G: INDICATIVE GROUND SURFACE SPOT HEIGHTS



Notes:

- The surface spot heights shown on this map were derived from Airborne Laser Survey and are indicative only.
- Accuracy is generally within $\pm 0.2\text{m}$ vertically and $\pm 0.15\text{m}$ horizontally, and Northern Beaches Council does not warrant that the data does not contain errors.
- If accuracy is required, then survey should be undertaken by a registered surveyor

Preparation of a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on how to determine what rules apply on flood prone land, and how to prepare a Flood Management Report. The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood related planning requirements.

Planning Requirements for Flood Prone Land

Development must comply with the requirements for developing flood prone land set out in the relevant Local Environment Plan (LEP) and Development Control Plan (DCP). There are separate LEPs and DCPs for each of the former Local Government Areas (LGAs), although preparation of a LGA-wide LEP and DCP is currently under way.

The clauses specific to flooding in the LEPs and DCPs are as follows:

LEP Clauses	DCP Clauses
Manly LEP (2013) – 6.3 Flood Planning	Manly DCP (2013) – 5.4.3 Flood Prone Land
Warringah LEP (2011) – 6.3 Flood Planning Warringah LEP (2000) – 47 Flood Affected Land *	Warringah DCP (2011) – E11 Flood Prone Land
Pittwater LEP (2014) – 7.3 Flood Planning Pittwater LEP (2014) – 7.4 Flood Risk Management	Pittwater 21 DCP (2014) – B3.11 Flood Prone Land Pittwater 21 DCP (2014) – B3.12 Climate Change

* The Warringah LEP (2000) is relevant only for the “deferred lands” which affects only a very small number of properties, mostly in the Oxford Falls area.

Development on flood prone land must also comply with Council's Water Management for Development Policy, and if it is in the Warriewood Release Area, with the Warriewood Valley Water Management Specification. Guidelines for Flood Emergency Response Planning are available for addressing emergency response requirements in the DCP. These documents can be found on Council's website on the [Flooding page](#).

Note that if the property is affected by estuarine flooding or other coastal issues, these need to be addressed separately under the relevant DCP clauses.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land (with exceptions noted below), for Council to consider the potential flood impacts and applicable controls. For Residential or Commercial development, it is required for development on land identified within the Medium or High Flood Risk Precinct. For Vulnerable or Critical development, it is required if it is within any Flood Risk Precinct.

There are some circumstances where a formal Flood Management Report undertaken by a professional engineer may not be required. However the relevant parts of the DCP and LEP would still need to be addressed, so as to demonstrate compliance. Examples where this may apply include:

- If all proposed works are located outside the relevant Flood Risk Precinct extent
- First floor addition only, where the floor level is above the Probable Maximum Flood level
- Internal works only, where habitable floor areas below the FPL are not being increased

Note that development on flood prone land will still be assessed for compliance with the relevant DCP and LEP, and may still be subject to flood related development controls.

What is the purpose of a Flood Management Report?

The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood planning requirements, particularly the development controls outlined in the relevant LEP and DCP clauses. The report must detail the design, measures and controls needed to achieve compliance, following the steps outlined below.

A Flood Management Report should reflect the size, type and location of the development, proportionate to the scope of the works proposed, and considering its relationship to surrounding development. The report should also assess the flood risk to life and property.

Preparation of a Flood Management Report

The technical requirements for a Flood Management Report include (where relevant):

1. Description of development
 - Outline of the proposed development, with plans if necessary for clarity
 - Use of the building, hours of operation, proposed traffic usage or movement
 - Type of use, eg vulnerable, critical, residential, business, industrial, subdivision, etc
2. Flood analysis
 - 1% AEP flood level
 - Flood Planning Level (FPL)
 - Probable Maximum Flood (PMF) level
 - Flood Risk Precinct, ie High, Medium or Low
 - Flood Life Hazard Category
 - Mapping of relevant extents
 - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the relevance to the proposed development

If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL. If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.

3. Assessment of impacts
 - Summary of compliance for each category of the DCP, as per the table below.

	Compliance		
	N/A	Yes	No
A) Flood effects caused by Development			
B) Building Components & Structural Soundness			
C) Floor Levels			
D) Car parking			
E) Emergency Response			
F) Fencing			
G) Storage of Goods			
H) Pools			

- Demonstration of how the development complies with any relevant flood planning requirements from the DCP, LEP, Water Management for Development Policy, and if it is in the Warriewood Valley Urban Land Release Area, with the Warriewood Valley Water Management Specification (2001)
- For any non-compliance, a justification for why the development should still be considered.
- Calculations of available flood storage if compensatory flood storage is proposed
- Plan of the proposed development site showing the predicted 1% AEP and PMF flood extents, as well as any high hazard or floodway affectation
- Development recommendations and construction methodologies
- Qualifications of author - Council requires that the Flood Management Report be prepared by a suitably qualified Engineer with experience in flood design / management who has, or is eligible for, membership to the Institution of Engineers Australia
- Any flood advice provided by Council
- Any other details which may be relevant

Further information and guidelines for development are available on Council's website at:

<https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/development-applications/guidelines-development-flood-prone-land>

Council's Flood Team may be contacted on 1300 434 434 or at floodplain@northernbeaches.nsw.gov.au .