Noel Bryen
154 Rickard Road
North Narrabeen NSW 2101

L210505_154-RickardSt_SiteFloodAssessment

10 May 2021

Re: 154 Rickard Road North Narrabeen – Site Flood Assessment

1. BACKGROUND

This assessment is in relation to a Development Application (DA) at 154 Rickard Road (Lot 10 DP 22737) – the site, as located on Diagram 1.

Diagram 1: Site Location

WMAwater Pty Ltd

DIRECTORS
M K Babister, RPEQ
R W Dewar
E J Askew
F L N Ling, RPEQ

SENIOR ASSOCIATES
R Hardwick Jones
M E Retallick

ABN 14 600 315 053

Level 2, 160 Clarence St, SYDNEY NSW 2000
Phone: 02 9299 2855 Fax: 02 9262 6208
Email: enquiry@wmawater.com.au
Website: wmawater.com.au

The DA is for a proposed renovation to the existing residential dwelling including:

- an extension to the ground floor of the existing front entry foyer to the residence,
- a new metal roof over the existing carport,
- renovations to an upstairs en-suite bathroom, and
- "scyon" cladding and window treatments on upper storey.

The site is located within the Nareen Creek catchment, which flows into Narrabeen Lagoon, and which was included in the study area for the *Ingleside, Elanora and Warriewood Overland Flow Flood Study* (Reference 1) undertaken by WMAwater for Northern Beaches Council. The site is also affected by backwater flooding from Narrabeen Lagoon, as quantified in the *Narrabeen Lagoon Flood Study* (Reference 2) undertaken by BMT WBM for Pittwater Council. Of these flood mechanisms, Narrabeen Lagoon flooding is the most critical for the site.

WMAwater has undertaken a site-specific flood assessment for the site property based on interpretation of the flood modelling from References 1 and 2, with regard to the flood-related development controls applicable through Council's applicable Development Control Plan (DCP, Reference 3). This letter provides site specific information on flooding, confirmation of flood planning levels in line with Council's Sydney's requirements, and assessment of compliance of the proposed development with the relevant planning controls.

Site-specific flood information was documented in a Flood Information Report prepared by Northern Beaches Council. That report (including mapping) is the primary source of flood information relied upon for this assessment, and is attached to this report. WMAwater checked this information against the modelling from References 1 and 2 and confirmed it is suitable for the assessment.

1.1. Survey and Proposed Development Plans

This assessment relies on the information in the following plans:

- *Sketch showing levels reduced to Australian Height Datum – No. 154 Rickard Road North Narrabeen,* Paul Keen & Company, dated 9 May 1991
- *Ground Floor Plan*, Drawing 367-SK02, Urakawa Jenkins Architecture, dated October 2015
- *First Floor Plan*, Drawing 367-SK03, Urakawa Jenkins Architecture, dated October 2015
- *Material Schedule*, Drawing 367-SK05, Urakawa Jenkins Architecture, dated October 2015

1.2. Description of Site and Flood Behaviour

The available survey information indicates that ground levels within the site range from 2.25 mAHD to 3.2 mAHD. The site slopes generally downwards towards the rear of the site, with the highest levels at Rickard Road and the front entry to the dwelling.

The site lies in the lower part of the Nareen Creek catchment, backing onto Nareen Park. The Nareen Creek catchment drains urbanised areas of North Narrabeen and Elanora Heights, with the catchment bounded approximately by Powderworks Road, Kalang Road and Elanora Road. Runoff from the urbanised area upstream of the site is drained via a major/minor piped stormwater drainage system, with sections of modified creek channel between Eungai Place and Tatiara Crescent, and from Nareen Parade to Pittwater Road. The open channel within Nareen Park, are the rear of the subject site, has a relatively flat grade. Discharge of floodwater is restricted by the relatively limited capacity of the outlet structures into Narrabeen Lagoon at Pittwater Road.

In major storm events where the creek channel and outlet capacity is exceeded, the majority of Nareen Park is affected by flooding. Modelling from References 1 and 2 indicates that the rear of the subject site is inundated in the 1% AEP design storm. Flooding of Narrabeen Lagoon can also cause backwater flooding in Nareen Park (Reference 2).

The relevant peak flood levels for the site are as follows:

- 1% AEP flood level – 2.52 mAHD (Nareen Creek catchment flooding)
- 1% AEP flood level – 3.03 mAHD (Narrabeen Lagoon flooding)
- Flood Planning Level (1% AEP plus 0.5 m freeboard) – 3.53 mAHD
- Probable Maximum Flood Level – 3.70 mAHD (from Nareen Creek catchment flooding)
- Probable Maximum Flood Level – 4.90 mAHD (from Narrabeen Lagoon flooding)

The primary flood mechanism for the site is the mainstream backwater flood inundation from Narrabeen Lagoon. The peak 1% AEP flood levels from Nareen Creek catchment flooding are lower than those from Narrabeen Lagoon flooding, and therefore it is the Narrabeen Lagoon information which drives design levels for the site. There is also a minor local overland flow path from Rickard Road, along the boundary of the site with 152 Rickard Road. The minor local flow path is not relevant to the proposed development , as the depths/levels are less than those produced by Narrabeen Lagoon backwater flooding, and this local drainage path is not considered further in this assessment.

These levels are in agreement with the Flood Information Report provided by Northern Beaches Council (attached). Mapping from the Council report indicates the site is primarily classified as being in a “Medium Flood Risk Precinct.”

This flood risk is typically addressed for new development by ensuring that entry points to buildings and floor levels of development are sufficiently high to mitigate flood damages up to and including the 1% AEP event, and that there is sufficient refuge within the dwelling to mitigate risk to life in extreme events up to and including the Probable Maximum Flood. The specific Northern Beaches Council flood-related development controls are assessed in Section 2 below.

These controls contain concessions to the requirements for minor alterations and additions such as those assessed in this report.

2. ASSESSMENT OF DCP COMPLIANCE

The Pittwater DCP specifies the following prescriptive controls for a Medium Flood Risk Precinct

		Medium Flood Risk Precinct				
		Vulnerable & Critical Use	Residential Use	Business & Industrial Use	Recreational & Environmental Use	Subdivision & Civil Works
A	Flood effects caused by Development	A1 A2	A1 A2	A1 A2	A1 A2	A1 A2
B	Building Components & Structural	B1 B2 B3	B1 B2 B3	B1 B2 B3	B1 B2 B3	
C	Floor Levels	C2 C3	C1 C3 C4 C6	C1 C3 C4 C6 C7	C3	C5
D	Car Parking	D1 D2 D3 D4 D7	D1 D2 D3 D4 D5 D6	D1 D2 D3 D4 D5 D6	D1 D2 D3 D4 D5 D6	D1
E	Emergency Response	E1 E2	E1	E1	E1	E3
F	Fencing	F1	F1	F1	F1	F1
G	Storage of Goods	G1	G1	G1	G1	
H	Pools	H1	H1	H1	H1	H1

2.1. Flood Effects Caused by Development

The Pittwater DCP specifies the following controls for residential development in a Medium Flood Risk Precinct:

A1	Development shall not be approved unless it can be demonstrated in a Flood Management Report that it has been designed and can be constructed so that in all events up to the 1% AEP event: (a) There are no adverse impacts on flood levels or velocities caused by alterations to the flood conveyance; and (b) There are no adverse impacts on surrounding properties; and (c) It is sited to minimise exposure to flood hazard. Major developments and developments likely to have a significant impact on the PMF flood regime will need to demonstrate that there are no adverse impacts in the Probable Maximum Flood.
A2	Development shall not be approved unless it can be demonstrated in a Flood Management Report that in all events up to the 1% AEP event there is no net loss of flood storage. Consideration may be given for exempting the volume of standard piers from flood storage calculations. If Compensatory Works are proposed to balance the loss of flood storage from the development, the Flood Management Report shall include detailed calculations to demonstrate how this is achieved.

The proposed ground floor extension is located on ground that is above the 1% AEP flood level. The proposed works are entirely outside the 1% AEP flood extent and therefore will not result in adverse flood impacts from a loss of flood storage or conveyance, either for mainstream or local overland flow. There will be no adverse impacts on surrounding properties and the extension is situated in the part of the property where exposure to flood hazard would be minimised.

2.2. Building Components and Structural Soundness

The Pittwater DCP specifies the following controls for residential development in a Medium Flood Risk Precinct:

B1	All buildings shall be designed and constructed with flood compatible materials in accordance with "Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas", Hawkesbury-Nepean Floodplain Management Steering Committee (2006).
B2	All new development must be designed and constructed to ensure structural integrity up to the Flood Planning Level, taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. Where shelter-in-place refuge is required, the structural integrity for the refuge is to be up to the Probable Maximum Flood level. Structural certification shall be provided confirming the above.
B3	All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed and/or located above the Flood Planning Level. All existing electrical equipment and power points located below the Flood Planning Level within the subject structure must have residual current devices installed that turn off all electricity supply to the property when flood waters are detected.

The proposed extension is at the existing floor level, which is approximately 0.2 m above the 1% AEP level but 0.3 m below the Flood Planning Level. Requirement B2 is met for structural integrity up to the FPL due to the shallow depths and low velocity – special construction is not required to ensure structural integrity up to the FPL. WMAwater has not assessed whether the existing building would have structural integrity up to the PMF level. This is not strictly necessary as there is rising evacuation from the property and shelter in place is not required (see Section 2.5).

It will be necessary to construct the portion of the extension below the FPL (3.53 m) using flood compatible materials (as per requirement B1), and with no electrical equipment below this level. This corresponds to approximately the lowest 0.3 m of the extension above natural ground. Given the proposed use as an entry foyer, and brick cladding shown on the drawings, this requirement should not present a significant constraint, although there is insufficient detail on the drawings provided to fully assess compliance with this requirement.

2.3. Floor Level Requirements

The Pittwater DCP specifies the following controls for residential development in a Medium Flood Risk Precinct:

C1	New floor levels within the development shall be at or above the Flood Planning Level.
C3	All new development must be designed and constructed so as not to impede the floodway or flood conveyance on the site, as well as ensuring no net loss of flood storage in all events up to the 1% AEP event. For suspended pier/pile footings: (a) The underfloor area of the dwelling below the 1% AEP flood level is to be designed and constructed to allow clear passage of floodwaters, taking into account the potential for small openings to block; and (b) At least 50% of the perimeter of the underfloor area is of an open design from the natural ground level up to the 1% AEP flood level; and (c) No solid areas of the perimeter of the underfloor area would be permitted in a floodway
C4	A one-off addition or alteration below the Flood Planning Level of less than 30 square metres (in total, including walls) may be considered only where: (a) it is an extension to an existing room; and (b) the Flood Planning Level is incompatible with the floor levels of the existing room; and (c) out of the 30 square metres, not more than 10 square metres is below the 1% AEP flood level. This control will not be permitted if this provision has previously been utilised since the making of this Plan. The structure must be floodproofed to the Flood Planning Level, and the Flood Management Report must demonstrate that there is no net loss of flood storage in all events up to the 1% AEP event.
C6	Consideration may be given to the retention of an existing floor level below the Flood Planning Level when undertaking a first floor addition provided that: (a) it is not located within a floodway; and (b) the original foundations are sufficient to support the proposed final structure above them. The Flood Management Report must include photos and the structural certification required as per Control B2 must consider whether the existing foundations are adequate or should be replaced; and (c) none of the structural supports/framing of existing external walls of are to be removed unless the building is to be extended in that location; and (d) the ground floor is floodproofed.

The existing dwelling has a ground floor level of 3.18 mAHD to 3.20 mAHD based on the provided survey plan, which is below the FPL of 3.53 mAHD.

As far as WMAwater is aware this provision has not been previously utilised at this address. The extension is located above the 1% AEP flood level so there is no loss of flood storage up to the 1% AEP event, and control C3 does not apply.

Clause C4 is relevant to the proposed ground floor extension, since the proposed entry foyer is below the FPL, is less than 30 square metres, and is an extension to the existing foyer which is below the FPL. No part of the proposed extension or renovation is below the 1% AEP flood level.

Control C6 is not applicable to the proposed renovation due to the minor nature of the first floor alterations.

2.4. Car Parking

The Pittwater DCP specifies the following controls for residential development in a Medium Flood Risk Precinct:

D1	Open carpark areas and carports shall not be located within a floodway.
D2	The lowest floor level of open carparks and carports shall be constructed no lower than the natural ground levels, unless it can be shown that the carpark or carport is free draining with a grade greater than 1% and that flood depths are not increased.
D3	Carports must be of open design, with at least 2 sides completely open such that flow is not obstructed up to the 1% AEP flood level. Otherwise it will be considered to be enclosed. When undertaking a like-for-like replacement and the existing garage/carport is located on the street boundary and ramping is infeasible, consideration may be given for dry floodproofing up to the 1% AEP flood level.
D4	Where there is more than 300mm depth of flooding in a car park or carport during a 1% AEP flood event, vehicle barriers or restraints are to be provided to prevent floating vehicles leaving the site. Protection must be provided for all events up to the 1% AEP flood event
D5	Enclosed Garages must be located at or above the 1% AEP level
D6	All enclosed car parks (including basement carparks) must be protected from inundation up to the Flood Planning Level. All access, ventilation, driveway crests and any other potential water entry points to any enclosed car parking shall be above the Flood Planning Level. Where a driveway is required to be raised it must be demonstrated that there is no net loss to available flood storage in any event up to the 1% AEP flood event and no impact on flood conveyance through the site. Council will not accept any options that rely on electrical, mechanical or manual exclusion of the floodwaters from entering the enclosed carpark

The proposed renovation includes construction of a new roof over an existing open carport at natural ground level. The carport would remain "open," is not located within a floodway, and is not affected by depths greater than 0.3 m in a 1% AEP event. The existing carport and proposed modification therefore meets the requirements of controls D1 to D4, and D5/D6 are not relevant.

2.5. Emergency Management

The Pittwater DCP specifies the following controls for residential development in a Medium Flood Risk Precinct:

E1	If the property is affected by a Flood Life Hazard Category of H3 or higher, then Control E1 applies and a Flood Emergency Assessment must be included in the Flood Management Report. If the property is affected by a Flood Life Hazard Category of H6, then development is not permitted unless it can be demonstrated to the satisfaction of the consent authority that the risk level on the property is or can be reduced to a level below H6 or its equivalent. If the property is flood affected but the Flood Life Hazard Category has not been mapped by Council, then calculations for its determination must be shown in the Flood Management Report, in accordance with the "Technical Flood Risk Management Guideline: Flood Hazard", Australian Institute for Disaster Resilience (2012). Where flood-free evacuation above the Probable Maximum Flood level is not possible, new development must provide a shelter-in-place refuge where: a) The floor level is at or above the Probable Maximum Flood level; and b) The floor space provides at least $2m^2$ per person where the flood duration is long (6 or more hours) in the Probable Maximum Flood event, or $1m^2$ per person for less than 6 hours; c) It is intrinsically accessible to all people on the site, plainly evident, and self-directing, with sufficient capacity of access routes for all occupants without reliance on an elevator; and d) It must contain as a minimum: sufficient clean water for all occupants; portable radio with spare batteries; torch with spare batteries; and a first aid kit Class 10 classified buildings and structures (as defined in the Building Codes of Australia) are

	excluded from this control. In the case of change of use or internal alterations to an existing building, a variation to this control may be considered if justified appropriately by a suitably qualified professional. Note that in the event of a flood, occupants would be required to evacuate if ordered by Emergency Services personnel regardless of the availability of a shelter-in-place refuge.

Council's mapping indicates the existing dwelling is affected by a "Flood Life Hazard Category" of H5. This level of hazard arises from a Narrabeen Lagoon PMF event, due to the depth of backwater inundation that would occur across the site in such an event. At the front of the site, ground levels rise away from the floodplain. Flood free refuge is available less than 25 m along the footpath from the front door of the dwelling on Rickard Road.

Evacuation of the dwelling to Rickard Road is therefore the recommended emergency response strategy in an extreme event, when it becomes apparent that ground floor inundation is imminent or when advised to evacuate by the SES. Ground levels rise away from the direction of flooding (floodwaters rise from the rear of the property).

The proposed renovation is minor and does not significantly change the development intensity or risk to life relative to the existing dwelling. Regardless of this, the existing dwelling is suitably located such that rising flood-free evacuation above the Probable Maximum Flood level is available, and occupants would not need to rely on on-site refuge. On-site refuge is feasible as a secondary option, given the upper storey is at approximately 6.1 mAHD, which is more than 1 m above the PMF level.

It is not necessary for the site to implement an active flood monitoring or warning system, or detailed site specific flood response plan. The evacuation conditions are consistent with those accounted for in the relevant SES Local Flood Plan.

3. SUMMARY AND CONCLUSIONS

Minor alterations and additions are proposed at 154 Rickards Road. The site is subject to flooding, with the critical flood mechanism being from backwater due to flooding of Narrabeen Lagoon.

The additions include a small extension of the existing entry foyer on the ground level. The existing ground floor is below the Flood Planning Level (FPL) but above the 1% AEP level. The proposed extension is outside the 1% AEP extent. Council's development control policies allow for minor additions of this nature with concessions on the prescriptive requirements that would apply to new development or major additions.

The proposal floor was assessed against the flood-related development requirements from the Pittwater 21 Development Control Plan. A summary of the assessment is provided in Table 1.

Table 1: Summary of DCP compliance

	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	✓		

* *It will be necessary to construct the portion of the extension below the FPL (3.53 m) using flood compatible materials (as per requirement B1), and with no electrical equipment below this level. This corresponds to approximately the lowest 0.3 m of the extension above natural ground. Given the proposed use as an entry foyer, and brick cladding shown on the drawings, this requirement should not present a significant constraint and can be easily complied with, although there is insufficient detail on the drawings provided to fully assess compliance with this requirement.*

WMAwater considers that the proposed minor alterations and additions are compliant with the relevant flood-related development controls.

4. REFERENCES

1. WMAwater
   Ingleside, Elanora and Warriewood Overland Flow Flood Study
   Northern Beaches Council, June 2019

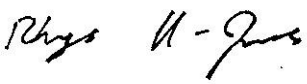
2. BMT WBM
   Narrabeen Lagoon Flood Study
   September 2013

3. Northern Beaches Council
   Pittwater 21 Development Control Plan
   Accessed online, April 2021.

Please do not hesitate to contact the undersigned for clarification of this assessment.

Yours Sincerely,

WMAwater



Rhys Hardwick-Jones

Associate

Attached:

FLOOD INFORMATION REQUEST – BASIC at 154 Rickards Road North Narrabeen

FLOOD INFORMATION REQUEST - BASIC

Property: 154 Rickard Road NORTH NARRABEEN NSW 2101
Lot DP: Lot 10 DP 22737
Issue Date: 29/03/2021
Flood Study Reference: Narrabeen Lagoon Flood Study 2013, BMT WBM,

Flood Information for lot [1]:

Flood Risk Precinct – See Map A

Flood Planning Area – See Map A

Maximum Flood Planning Level (FPL) [2, 3, 4]: 3.53 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level [2, 3]: 3.03 m AHD

1% AEP Maximum Depth from natural ground level[3]: 1.00 m

1% AEP Maximum Velocity: 1.57 m/s

1% AEP Hydraulic Categorisation: Flood storage **See Flood Map D**

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level [4]: 4.90 m AHD

PMF Maximum Depth from natural ground level: 2.86 m

PMF Maximum Velocity: 1.91 m/s

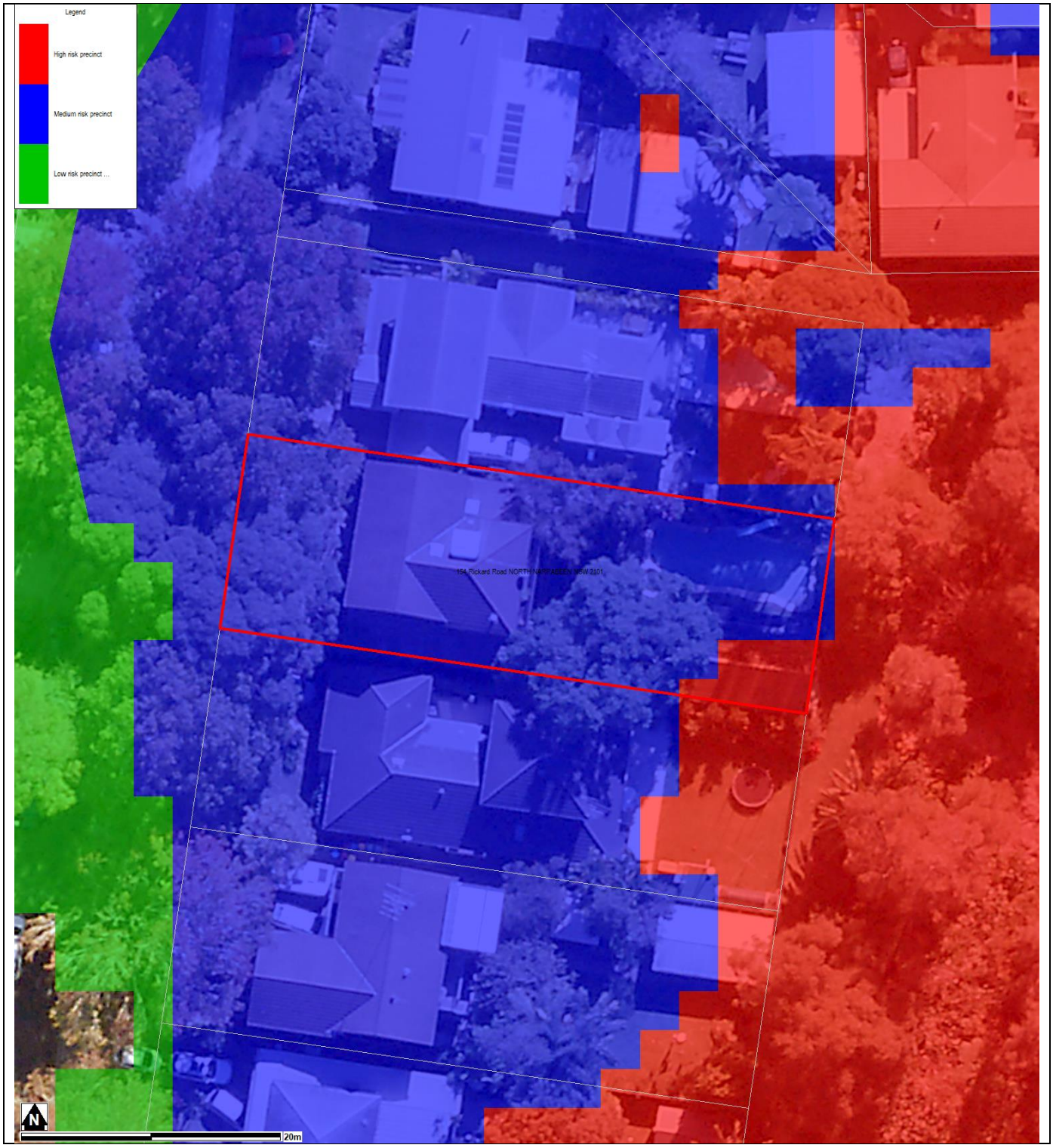
Flood Life Hazard Category – See Map E

[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.

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 MAP B: FLOODING - 1% AEP EXTENT

Notes:

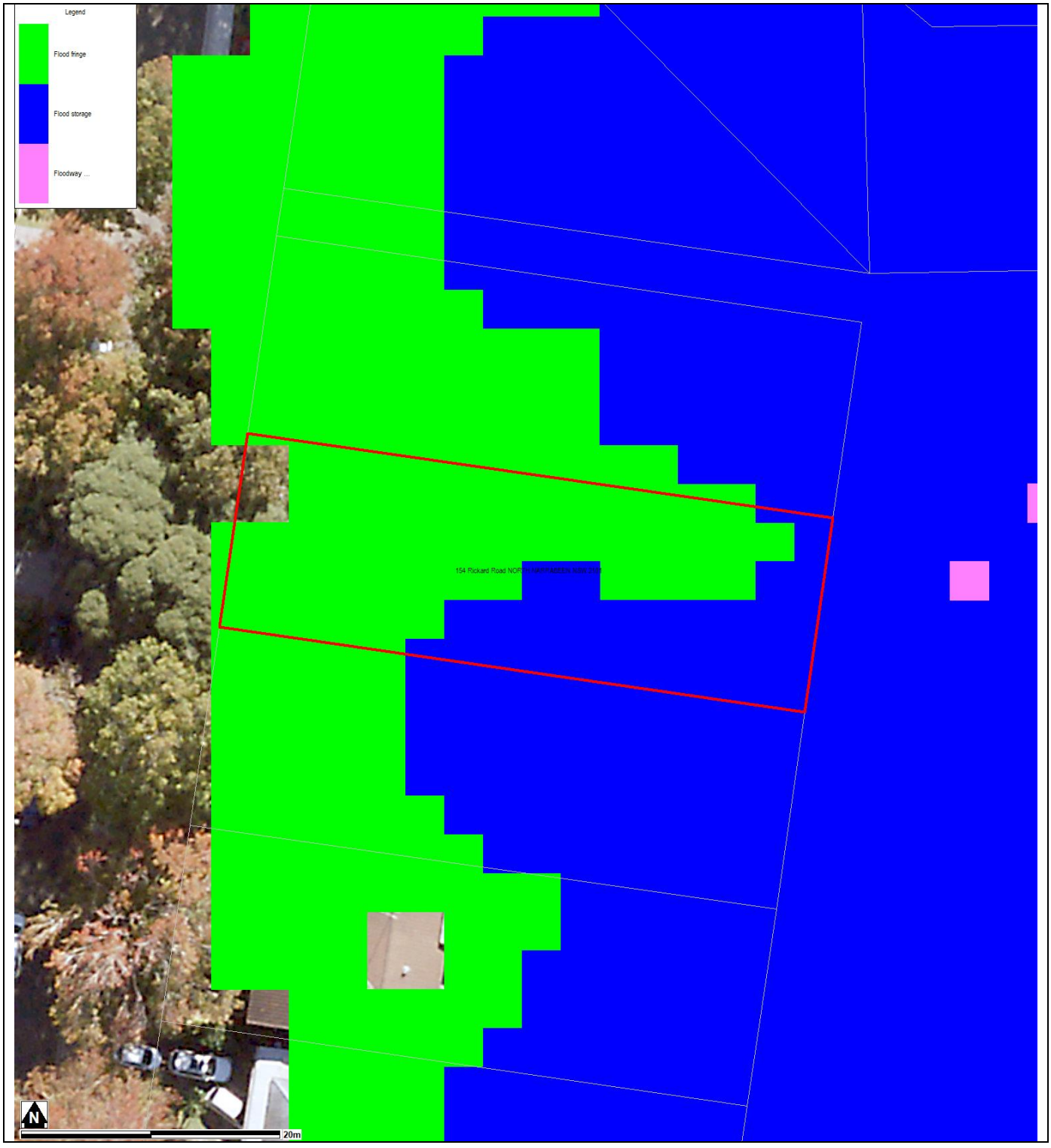
- Extent represents the 1% annual Exceedance Probability (AEP) flood event.
- Flood events exceeding the 1% AEP can occur on this site.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM, Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMAwater) and aerial photography (Source: NearMap 2014) are indicative only.

FLOOD MAP C: PROBABLE MAXIMUM FLOOD EXTENT

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: Narrabeen Lagoon Flood Study 2013, BMT WBM, Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMAwater) 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: Narrabeen Lagoon Flood Study 2013, BMT WBM, Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMAwater) and aerial photography (Source: NearMap 2014) are indicative only.

FLOOD MAP E: FLOOD LIFE HAZARD CATEGORY

Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Narrabeen Lagoon Flood Study 2013, BMT WBM, Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMAwater) and aerial photography (Source: NearMap 2014) are indicative only.

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

For further information please contact Council's Flood Team on 1300 434 434 or by email at floodplain@northernbeaches.nsw.gov.au .