Before the Hearings Panel
At Wellington City Council

Under	Schedule 1 of the Resource Management Act 1991
In the matter of	the Proposed Wellington City District Plan

Stream 5 Reporting Officer Right of Reply of Jamie Sirl on behalf of Wellington City Council

Date: 25 September 2023

INTRODUCTION:

1 My full name is James (Jamie) Grant Sirl. I am employed as a Senior Planning Advisor in the District Planning Team at Wellington City Council (the Council).

2 I have prepared this Reply in respect of the matters in Hearing Stream 5 raised during the hearing, and in particular to those directed by the Panel in Minute 35.

3 I have listened to submitters in Hearing Stream 5, read and considered their evidence and tabled statements, and referenced the written submissions and further submission relevant to the Hearing Stream 5 topics.

4 The Natural and Coastal Hazards 42A Report section 1.2 sets out my qualifications and experience as an expert in planning.

5 I confirm that I am continuing to abide by the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023, as applicable to this Independent Panel hearing.

6 Any data, information, facts, and assumptions I have considered in forming my opinions are set out in the part of the evidence in which I express my opinions. Where I have set out opinions in my evidence, I have given reasons for those opinions.

SCOPE OF REPLY

7 This reply follows Hearing Stream 5 held from 1 August 2023 to 4 August 2023. *Minute 35: Further Follow-up Directions – Hearing Stream 5* requested that the Council submit a written reply to specific matters

contained in the Minute. The Minute requires this response to be supplied by 25 September 2023.

8 The Reply includes:

- Feedback on specific matters and questions in Minute 35 the Panel has sought further comment on from Council and/or subject matter experts.

Explanation of Fault Hazard Overlay

9 I respond to the further advice sought by the Panel with respect to the Fault Hazard Overlays as follows.

A 'plain English' description of the Fault Hazard Overlay which would be located in the Natural Hazards chapter Introduction section.

10 To assist the Panel, I have sought the advice of Dr Nicola Litchfield from GNS Science (included as Appendix C), who has reviewed the schematic diagram prepared by the Panel, provided comment on the use of such a diagram, and provided detail on the steps involved in identifying a Fault Deformation Zone for each of the Fault Hazard Overlays.

11 In response to the Panel's request, I provide the following explanatory content that could be included in the Natural Hazards Chapter Introduction section:

Fault Hazard Overlay

The Fault Hazard Overlays identify areas likely to experience fault rupture (breaking or buckling of the ground) in a large earthquake, and as such it is necessary to manage the risk to people and property in these Overlays.

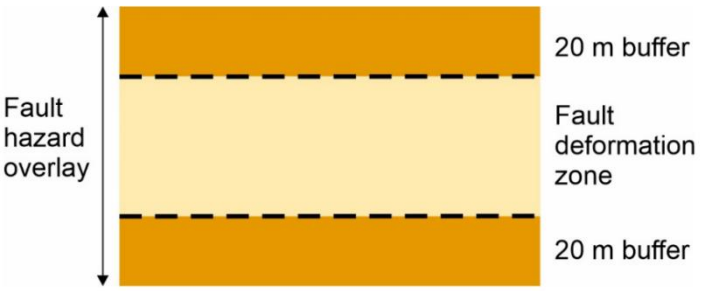
The composition of each of the Fault Hazard Overlays (Wellington, Ohariu, Shepherds Gully, and Terawhiti) differs. Where a fault is well-understood the overlay generally reflects a Fault Deformation Zone (areas identified by geologist as highly likely to experience breaking or buckling of the ground in a large earthquake) and a 20 m buffer, for example most of the Wellington Fault. Where a fault, or parts of a fault, is not well understood or is complex in its composition the overlay is comprised of multiple sections of Fault Deformation Zone, 20 m buffers and also areas of uncertainty where the Fault Deformation Zones are not known, for example the Shepherds Gully Fault.

The Fault Hazard Overlay mapping also includes fault complexity categories (uncertain poorly-constrained, uncertain constrained, distributed, well-defined extended and well-defined) for each of the Fault Hazard Overlays. The fault complexity categories reflect the current understanding of each of the faults (Wellington, Ohariu, Shepherds Gully and Terawhiti) which comprise the Fault Hazard Overlays contained in the District Plan, and enable management of use and development that corresponds with the risk of fault rupture.

Many of the provisions associated with the Fault Hazard Overlays reference the need for buildings or activities to be located more than 20 m from the edge of the Fault Deformation Zone. The Fault Deformation Zone can only be identified by a suitably qualified and experienced geologist or geotechnical (or similar) engineer with geophysics experience.

Confirmation whether the Fault Hazard Overlay diagram prepared by the Panel represents an accurate schematic of the Fault Hazard Overlay, or alternatively, provide a revised/new schematic diagram to illustrate the relevant elements of the Fault Hazard Overlay and a brief commentary.

12 The Fault Hazard Overlay diagram prepared by the Panel is incorrect as it should only include a Fault Deformation Zone and a 20 m buffer/setback, as illustrated below and outlined in technical advice provided by Dr Litchfield (Appendix B).



13 However, in my opinion and as outlined by Dr Litchfield (Appendix B), the revised version of the diagram represents an oversimplification of the Fault Hazard Overlays, which would cause confusion if included in the Plan and could result in inaccurate identification of a fault deformation zone.

14 Dr Litchfield's advice (Appendix B) includes diagrammatic examples of fault avoidance zones for the various faults from the Active Fault Mapping and Fault Avoidance Zones for Wellington City 2021 report, undertaken by Morgenstern and Van Dissen, which directly informs the PDP Fault Hazard Overlays. These examples illustrate that the composition of the various Fault Hazard Overlays varies significantly.

15 As noted above, where a fault is well-understood the Overlay generally reflects a Fault Deformation Zone (shown in light orange) and a 20 m buffer (shown in dark orange), for example most of the Wellington Fault (Figure 1). Where a fault, or parts of a fault, is not well understood or is complex in its composition the overlay is comprised of

multiple sections of Fault Deformation Zone, 20 m buffers and also areas of uncertainty (shown in green), for examples the Shepherds Gully Fault (Figure 2). The black line is the fault trace.

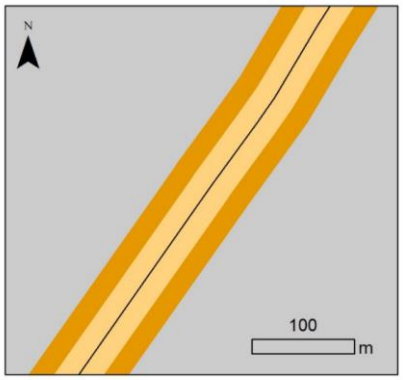


Figure 1. Example of the components of the Wellington Fault hazard Overlay

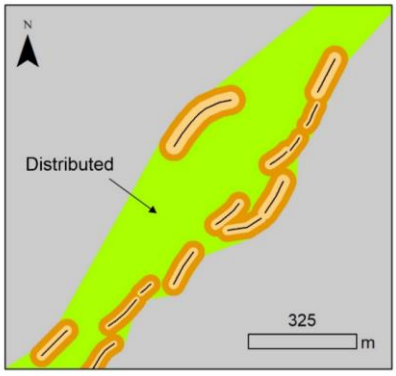


Figure 2. Example of the components of the Shepherds Gully Fault hazard Overlay

Confirm that "the Fault Deformation Zone" is an area that can only be identified by a suitably qualified and experienced geologist or geotechnical (or similar) engineer", particularly with respect to areas of faults that are well-defined (for example, the Wellington Fault).

16 As confirmed by Dr Litchfield (Appendix B), the Fault Deformation Zone identification can only be undertaken by a suitably qualified and experienced geologist or geotechnical engineer.

17 I also note that, with the exception of (NH-P13 and NH-R14), the policy and rule framework associated with buildings containing hazard sensitive activities or potentially hazard sensitive activities in the Fault Hazard Overlays (NH-P10, NH-P11, and NH-P12) provides two consenting pathways – either locating at least 20 m from the edge of

the Fault Deformation Zone, or mitigating the risk associated with fault rupture through building design and materials.

Reconciling Tensions between the NZCPS and NPS-UD

18 I respond to the further advice sought by the Panel with respect to the NZCPS and NPS-UD with respect to the Coastal Hazard provisions as follows.

19 The Panel has requested the identification of the specific NPS-UD provisions that conflict with the NZCPS Policies 25(a) and (b), accompanied by a 'structured analysis' as guided by the Supreme Court decision on Port Otago[1] that addresses how conflict between competing policies within the NZCPS should be resolved. I have prepared a table (contained in Appendix A) that identifies the relevant policies where I consider conflict exists, and an assessment of the 'directness' of the policies.

20 I agree with the Panel that the decision of the Supreme Court in the *Port Otago Limited v Environment Defence Society* case is of relevance, and that a more detailed consideration of the relevant policy direction may be helpful to support the recommendations contained in the Natural and Coastal Hazards s42A report and my Right of Reply. However, I do note the Court's approach and findings were within the context of conflicting policies contained in a single national policy statement, not across separate national policy statements. This is relevant note as I consider little consideration would have been given to the directiveness of the language used in other national direction when drafting the NPS-UD. I also note that the guidance of the Court with respect to the 'structured analysis' was directed at the resource

[1] Port Otago Limited V Environmental Defence Society Incorporated [2023] NZSC 112 [24 August 2023]

consenting stage[2], where this approach would be required where such conflicts are not resolved at the plan-making stage, ideally, through the Regional Policy Statement or Regional Plan. Consequently, I consider that a slightly more holistic assessment of the applicable policies and language is appropriate to determine how to resolve any conflict between national direction at the district plan level and have undertaken my assessment accordingly.

21 I note that the Court remains of the view that an "overall judgment" approach remains inappropriate, and the "structured analysis" approach proposed by the Court provides for greater consideration of balancing policy direction in decision-making. This is evident in the direction of Port Otago decision, which states[3]:

[78] The appropriate balance between the avoidance policies and the ports policy must depend on the particular circumstances, considered against the values inherent in the various policies and objectives in the NZCPS (and any other relevant plans or statements).

22 I consider that the structured analysis in Appendix A illustrates that NZCPS Policy 25 has more 'directive' language than NZCPS Policy 6. However, the policy language in the NZCPS and NPS-UD significantly differs, and as a result I am of the view that it is not simply the case that the 'avoid' policies prevail over the 'enabling' language of the NPS-UD Policies 1, 2, 3 and 6. Indeed, at para [69] the Supreme Court confirmed that policies which are enabling in nature can be directive in the same way that an "avoid" policy is.

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[2] Port Otago Limited V Environmental Defence Society Incorporated [2023] NZSC 112 [24 August 2023] Para [75]

[3] Ibid.

23 In my opinion the structured analysis provides a reasoned foundation to inform placing greater weight on NZCPS Policy 25, whilst not simply disregarding the direction of NZCPS Policy 6(1)(b) and NPS-UD Policies 1, 2, 3 and 6, in resolving higher level direction as it applies to a district plan.

24 I consider that the analysis of the relevant policies, as included in Appendix A, supports the following conclusions:

a. Whilst Policy 6 and Policy 27 of the NZCPS are less directive than the avoidance direction of Policy 25, Policy 6 anticipates built development and the associated public infrastructure in the coastal environment to provide for the reasonably foreseeable needs of population growth without compromising the other values of the coastal environment. Policy 27 also provides for broad consideration for protecting significant existing infrastructure. The coastal hazards policy framework in the PDP achieves consistency with the NZCPS policy direction by ensuring that in those limited exceptions where further development is provided for in the identified high hazard areas (with respect to the CCZ and the airport, port and rail activities), mitigation is required to ensure coastal hazard related risk is mitigated to a level as low as reasonably practicable. This will ensure that redevelopment in these areas, which is required for the on-going operation of significant infrastructure and functioning of the city, adequately mitigates hazard risk.

b. Whilst Policy 25 of the NZCPS requires councils to avoid an increase in coastal hazard risk in areas potentially affected by coastal hazards over the next 100 years, Policies 1, 2, 3 and 6 of the NPS-UD direct Tier 1 Councils to take a comprehensive and extensive approach to enabling urban development within

urban environments to achieve the objectives of the NPS UD. Or, paraphrased, there is an obligation on Tier 1 Councils to enable urban development within urban areas, unless limited by the presence of qualifying matters.

c. I consider that the avoidance directive of NZCPS Policy 25 has provided the starting point for the PDP coastal hazards policy development, and has appropriately been given effect to with respect to the outcomes the plan seeks. However, the directives of the NPS-UD (and intensification policies in the Act) have not simply been dismissed as subordinate to the NZCPS policies and have also been appropriately given effect to in the context of the NZCPS policy direction.

d. The plan review cycle requires Council to revisit these matters within a 10-year period. As noted in paragraph 49 of my supplementary statement of evidence[4] and paragraph 109 of my right of reply[5] dated 28 August, I consider that it would be appropriate for council to consider a scenario of coastal inundation that incorporates a degree of sea level rise that reflects a shorter period of time, 50 years for example, where redevelopment was strongly discouraged (high coastal hazard area approach) to support future managed retreat from those areas most impacted by future sea level rise.

25 Following the direction of the Court, I consider that the identified conflict between policy direction of the NZCPS and NPS-UD is best resolved at regional policy statement and regional plan level. However,

[4] Statement of Supplementary Planning Evidence of James (Jamie) Grant Sirl on behalf of Wellington City Council. 24 July 2023.

[5] Stream 5 Reporting Officer Right of Reply of Jamie Sirl on behalf of Wellington City Council. 28 August 2023.

as the WRPS Plan Change 1 and WCC IPI process are occurring concurrently, the WRPS cannot be relied upon with certainty. The NRP, although only recently operative, may also not remain consistent with changes introduced by PC1. Regardless, I consider it of value to revisit both the direction of the WRPS PC1 and NRP.

26 I note that the s42A reporting planner for the Natural Hazards topic[6] of WRPS PC1 has recommended the following:

a. *Objective 19 – a refinement of the terminology to specify risks are minimised;*

b. *Policy 29 – Additional direction in the chapeau; clarity that it applies to new and existing subdivision and development; standardising the terms low, medium and high hazard; including hazard overlays in plans; allowing some activities in high hazard areas that have a functional use or operational requirement to be so located; and*

c. *Policy 51 – including clarity to avoid or minimise risks; allowing some activities in high hazard areas that have a functional use or operational requirement to be so located.*

27 I consider that the PDP and the recommendations to the Panel in the Natural and Coastal Hazards s42A report, and my associated supplementary evidence and right of reply, is consistent with the s42A reporting planner's recommendations.

[6] Natural Hazards Section 42A Hearing Report, Hearing Stream 3: Climate Change Proposed Change 1 to the Regional Policy Statement for the Wellington Region. 14 August 2023.

28 The NRP provides direction that I erred in not emphasising in my Right of Reply:

- **NRP Policy 6: Uses of land and water**

  The cultural, social and economic benefits of using land and water for:

  …

  (j) enabling urban development where it maintains the quality of the natural environment

- **Policy 25: High hazard areas**

  Use and development, including hazard mitigation methods, in on or over high hazard areas shall be managed to ensure that:

  (a) they have a functional need or operational requirement or there is no practicable alternative to be so located, and

  (b) an overall increase in risk of social, environmental and economic harm is avoided, and

  (c) the hazard risk and/or residual hazard risk to the development, assessed using a risk-based approach, is acceptable or as low as reasonably practicable, recognising that in some instances an increase in risk to the development may be appropriate, and

  (d) the development does not cause or exacerbate hazard risk in other areas, and unless effects are avoided, remedied or mitigated in accordance with a hazard risk management strategy, and

(e) adverse effects on natural processes (coastal, riverine and lake processes) are avoided, remedied, or mitigated, and

(f) natural cycles of erosion and accretion and the potential for natural features to fluctuate in position over time, including movements due to climate change and sea level rise over at least the next 100 years, are taken into account.

- **Policy P28: Effects of climate change**

  Particular regard shall be given to the potential for climate change

  (a) to threaten biodiversity, aquatic ecosystem health and mahinga kai, or

  (b) to cause or exacerbate natural hazard events over at least the next 100 years that could adversely affect use and development including as a result of:

  (c) coastal erosion and inundation (storm surge), and

  (d) river and lake flooding and erosion, aggradation, decreased minimum flows, and

  (e) stormwater ponding and impeded drainage, and

  (f) relative sea level rise, using reliable scientific data for the Wellington region.

29 The PDP is consistent with the NRP with respect to identified high hazard areas, and consideration of climate change with respect to coastal inundation and tsunami inundation.

30 In my Reply, as noted by the Panel in Minute 35, I acknowledged that there was some misalignment with the 'minimise risk' approach and the 'avoid' element of Policy 25(b). However, I wish to clarify that I consider that this misalignment has been appropriately resolved through the plan provisions relating to coastal hazards, in particular the Coastal inundation extent – with 1.43m sea level rise and 1:100-year storm scenario that is treated by the plan as a Medium Coastal Hazard Area.

31 The plan provisions associated with the Medium Coastal Hazard Area essentially allow development, subject to requiring that mitigation be incorporated to minimise coastal hazard related risk to as low as reasonably practicable.

32 I consider that in the scenario that the policy direction with respect to the PDP coastal hazards provisions were to revert to the notified language directing the 'avoidance of an increase in risk' to more strictly align with NZCPS Policy 25, particularly with respect to the medium coastal inundation overlay that incorporates sea level rise over a 100 year timeframe, the issue of reconciling the tension between enabling development and ensuring no increase in risk would be left to the resource consenting stage. For example, a decision maker on a resource consent would be required to assess an application to determine whether no increase in risk has been achieved, or if not, whether there is good reason to still grant consent. I anticipate that there will be many applications that will not be able to demonstrate an absolute avoidance of an increase in risk, as there would often be an element of residual risk arising from new development.

33 In my opinion, if the PDP policy direction with respect to coastal hazards were to revert back to a 'no increase' in risk approach, then consideration should be given to whether the associated rules appropriately reflect the avoidance approach. As a result, many of the

activity status would likely need to increase to non-complying to ensure a consistent avoidance approach within the PDP for natural hazards.

Flood Inundation Standards

34 I respond to the further advice sought by the Panel with respect to the Flood Hazard Overlay and associated matters as follows.

Can an explanation be provided how the finished floor level would be determined under this revised condition, ideally by reference to an example or diagram, particularly in relation to a concrete base slab?

and

Does the condition referring to an unquantified allowance for freeboard meet the tests for a condition for a permitted activity in terms of certainty and avoiding an unlawful reservation of discretion?

35 I consider that the Panel has appropriately and helpfully highlighted concern with the unquantified allowance for freeboard in the provisions that address new buildings and activities in the Inundation Areas of the Flood Hazard Overlay.

36 Following further discussion with Wellington Water Limited, and as outlined in a report presented at a Water NZ stormwater conference[7], I can confirm that (dynamic) freeboard is incorporated into the flood modelling that has informed the PDP Flood Hazard Overlay. The result is that the reference to an additional allowance for freeboard can be revised in the relevant provisions to provide greater certainty with

[7] Stokes, K., Fountain, B., & Nitsche, N. (n.d.). The Use of Dynamic Freeboard in Managing Floodrisks. Water New Zealand Stormwater Conference 2020. Retrieved September 20, 2023, from https://www.waternz.org.nz/Article?Action=View&Article_id=1966

respect to required finished floor levels above the modelled 1% Annual Exceedance Probability flood level. For clarity, this is due to the modelled 1% Annual Exceedance Probability flood level already incorporating freeboard. I recommend amendments to the relevant provisions and a new definition for '1% Annual Exceedance Probability flood' as discussed below, and outlined in Appendix C.

37 Following the exercise undertaken in response to the Panel's request for an explanatory finished floor level diagram, I consider that a minor amendment to the relevant provisions to separate the pile and slab approach would provide additional clarity to the associated rules. I also recommend a revised version of the advisory note recommended in paragraph 38 of my Right of Reply dated 28 August 2023, to assist Plan users by clarifying how required finished floor levels can be determined.

38 I suggest that a definition of 1*% Annual Exceedance Probability flood* is introduced into the Plan. I note that this definition will only be relevant to the Natural Hazards chapter flood hazard provisions, and will not result in a material change to plan provisions but simply assists with clarifying the required finished floor levels.

1% Annual Exceedance Probability flood

Means the modelled 1% Annual Exceedance Probability flood level that informs the Wellington City Council District Plan Flood Hazard Overlays which incorporates climate change predictions and dynamic freeboard.

39 An example of the proposed restructure of the provision (NH-R8.1a) is set out as follows:

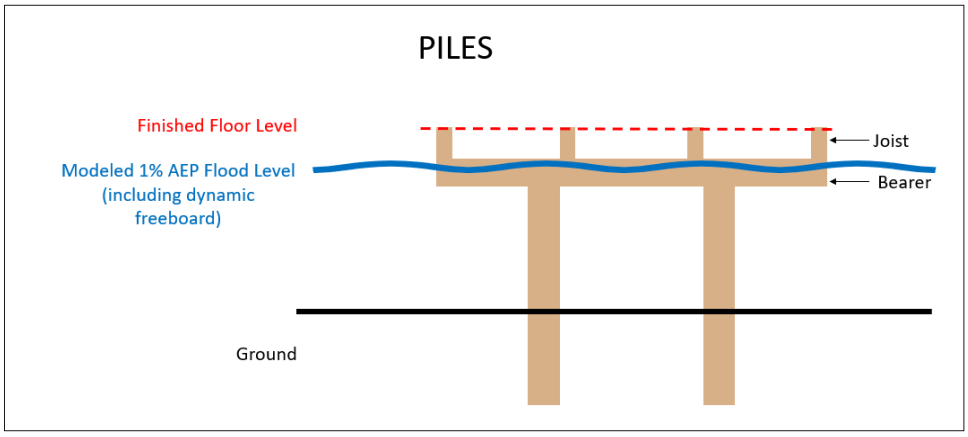
When located within an overland flowpath of the Flood Hazard Overlay, the finished floor levels of the building for the hazard sensitive activity is located above the 1% Annual Exceedance Probability flood level:

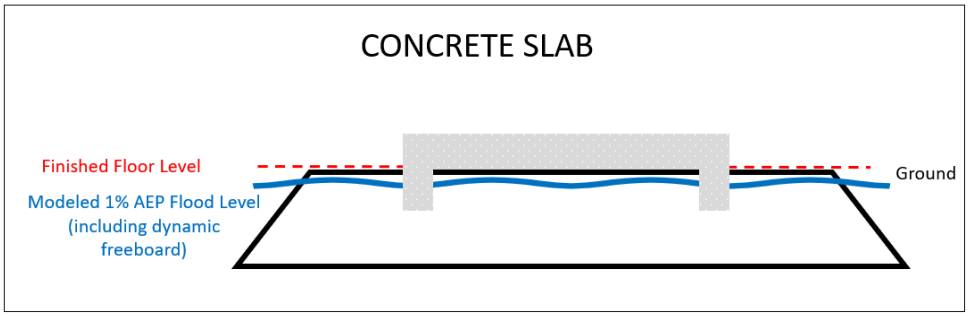
a. plus the height of the floor joists; or
b. to the base of the concrete floor slab.

Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.

40 This proposed restructure of the provisions relating to required floor levels would also apply to NH-R4.1a, NH-R4.3b, NH-R5.1a, NH-R6.1a, NH-R7.1a, and NH-R8.1a, as detailed in Appendix C.

41 The following diagrams illustrate how revised rule outlined in paragraph 39 of this Reply are intended to apply.





42 A section 32AA assessment is not provided for the proposed changes as they are considered to only improve clarity of the plan provisions.

Appendix A Identification and analysis of national direction policies relevant to Coastal Hazard management

New Zealand Coastal Policy Statement 2010 – policies **(emphasis added)**	**National Policy Statement on Urban Development 2020 – policies** **(emphasis added)**	**Discussion**
Policy 6 Activities in the coastal environment (1)(a) ***recognise*** that the provision of infrastructure, the supply and transport of energy including the generation and transmission of electricity, and the extraction of minerals are activities important to the social, economic and cultural well-being of people and communities; Policy 6(1)(b) ***consider*** the rate at which built development and the associated public infrastructure should be enabled to provide for the reasonably foreseeable needs of population growth without compromising the other values of the coastal environment;	**Policy 1**: Planning decisions contribute to well-functioning urban environments, which are urban environments that, ***as a minimum***: (a) have or ***enable*** a variety of homes that: (i) meet the needs, in terms of type, price, and location, of different households; and (ii) enable Māori to express their cultural traditions and norms; and (b) ***have or enable*** a variety of sites that are suitable for different business sectors in terms of location and site size; and (c) ***have*** good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and (d) ***support, and limit*** as much as possible adverse impacts on, the competitive operation of land and development markets; and (e) ***support*** reductions in greenhouse gas emissions; and are resilient to the likely current and future effects of climate change.	**Conflicting policies** In a general sense, conflicting direction is present with respect to coastal hazards and the management of risk associated with redevelopment in the NZCPS and the direction in the NPS-UD that planning decisions contribute to urban environments that enable housing supply and commercial activities. In particular: • Within the NZCPS: the avoidance direction contained within Policy 25 (a) and (b) and the provision for activities in the coastal environment in Policy 6(1)(a) and (b) and the recognition in Policy 27 for the need for considering a range of options with respect to protecting significant existing development from coastal hazard risk. • Between the NZCPS and NPS-UD: in areas where coastal hazards are predicted to impact parts of the city within the next 100 years, a tension exists between the avoidance direction of NZCPS Policy 25 (a) and (b) and the enabling direction of the NPS-UD policies

<table>
<tr>
<td>Policy 7(1) Strategic planning

In preparing regional policy statements, and plans:

(a) consider where, how and when to provide for future residential, rural residential, settlement, urban development and other activities in the coastal environment at a regional and district level, and:

(b) identify areas of the coastal environment where particular activities and forms of subdivision, use and development:

(i) are inappropriate; and

(ii) may be inappropriate without the consideration of effects through a resource consent application, notice of requirement for designation or Schedule 1 of the Act process; and provide protection from inappropriate subdivision, use, and development in these areas through objectives, policies and rules.</td>
<td>Policy 3: In relation to tier 1 urban environments, regional policy statements and district plans enable:

(a) in city centre zones, building heights and density of urban form to realise as much development capacity as possible, to maximise benefits of intensification; and
(b) in metropolitan centre zones, building heights and density of urban form to reflect demand for housing and business use in those locations, and in all cases building heights of at least 6 storeys; and
(c) building heights of at least 6 storeys within at least a walkable catchment of the following:
(i) existing and planned rapid transit stops
(ii) the edge of city centre zones
(iii) the edge of metropolitan centre zones; and within and adjacent to neighbourhood centre zones, local centre zones, and town centre zones (or equivalent), building heights and densities of urban form commensurate with the level of commercial activity and community services.</td>
<td rowspan="3">1, 3, 4 and 6, with the NPS-UD requiring the need to consider impacts of climate change but in a different way to the NZCPS. Also, with respect to coastal hazards as a qualifying matter, the NPS-UD anticipates coastal hazards limiting the enablement of development, but only to the extent necessary to manage that risk.

Analysis of directive language

<u>Within NZCPS</u>

The avoidance direction contained within Policy 25 (a) and (b) is more directive than the requirement to consider (Policy 6 and Policy 7), and the broader recognition within Policy 27 that there is a need to provide for options to protect significant existing development.

<u>Between NZCPS and NPS-UD</u>

The avoidance direction contained within Policy 25 (a) and (b) is strongly directive.

The NPS-UD policy direction to ‘enable’ (Policy 1, 3 and 4) is in my view clearly directive (as the Supreme Court said at [69]). However, the outcomes sought are much broader compared with the Policy 25 of the NZCPS, i.e., contributing to a well-functioning urban environment compared to managing coastal hazard risk.</td>
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<td rowspan="2">Policy 25 Subdivision, use, and development in areas of coastal hazard risk

In areas potentially affected by coastal hazards over at least the next 100 years:

(a) avoid increasing the risk of social, environmental and economic harm from coastal hazards;</td>
<td>Policy 4: Regional policy statements and district plans applying to tier 1 urban environments modify the relevant building height or density requirements under Policy 3 only to the extent necessary (as specified in subpart 6) to accommodate a qualifying matter in that area.</td>
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<tr>
<td>Policy 6: When making planning decisions that affect urban environments, decision-makers have particular regard to the following matters:</td>
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</table>

(b) ***avoid*** redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards; (c) ***encourage*** redevelopment, or change in land use, where that would reduce the risk of adverse effects from coastal hazards, including managed retreat by relocation or removal of existing structures or their abandonment in extreme circumstances, and designing for relocatability or recoverability from hazard events; (d) ***encourage*** the location of infrastructure away from areas of hazard risk where practicable; (e) discourage hard protection structures and promote the use of alternatives to them, including natural defences; and (f) ***consider*** the potential effects of tsunami and how to avoid or mitigate them	(a) the planned urban built form anticipated by those RMA planning documents that have given effect to this National Policy Statement (b) that the planned urban built form in those RMA planning documents may involve significant changes to an area, and those changes: (i) may detract from amenity values appreciated by some people but improve amenity values appreciated by other people, communities, and future generations, including by providing increased and varied housing densities and types; and (ii) are not, of themselves, an adverse effect (c) the benefits of urban development that are consistent with well-functioning urban environments (as described in Policy 1) (d) any relevant contribution that will be made to meeting the requirements of this National Policy Statement to provide or realise development capacity (e) the likely current and future effects of climate change.	Policy 4 is particularly relevant in that it expressly limits a council's ability to modify building height and density requirements of Policy 3 only to the extent necessary to accommodate a qualifying matter. NPS-UD Policy 6 is less directive in only requiring a council have 'particular regard to' the matters contained in this policy. <u>Conclusion</u> In my opinion, the tension between the policy direction is evident in the requirements and language of the individual policies relating to the management of coastal hazards. The NZCPS takes a very strict risk avoidance approach in Policy 25, whereas the NPS-UD directs that qualifying matters such as natural hazards should only limit development to the extent necessary to accommodate the qualifying matter. Whilst building heights and densities have not been directly modified in response to the presence of hazard overlays, the hazard overlays place additional restrictions on development and in places (high hazard areas in particular) severely constrain redevelopment to the scale directed in Policy 3 of the NPS-UD. I consider that the PDP policy and rule framework as recommended through the Natural and Coastal Hazards s42A report, rebuttal evidence, and right of reply appropriately manages risk in relation to coastal hazards whilst still enabling development in the case of the CCZ and regionally significant infrastructure. With respect to the coastal inundation overlay with sea level rise, in my view

Policy 27 Strategies for protecting significant existing development from coastal hazard risk (1) In areas of significant existing development likely to be affected by coastal hazards, the range of options for reducing coastal hazard risk that ***should*** be assessed includes: (a) ***promoting*** and identifying long-term sustainable risk reduction approaches including the relocation or removal of existing development or structures at risk; (b) ***identifying*** the consequences of potential strategic options relative to the option of 'do-nothing'; (c) ***recognising*** that hard protection structures may be the only practical means to protect existing infrastructure of national or regional importance, to sustain the potential of built physical resources to meet the reasonably foreseeable needs of future generations; (d) ***recognising and considering*** the environmental and social costs of permitting hard protection structures to protect private property; and (e) ***identifying and planning for*** transition mechanisms and timeframes for moving to more sustainable approaches. (2) In evaluating options under (1): (a) ***focus on*** approaches to risk management that reduce the need for hard protection structures and similar engineering interventions;		the complete avoidance of any increase in coastal hazard risk could result in either a quasi-sterilisation of development capacity in areas of the city where mitigation may reduce risk to low levels, but not eliminate risk entirely i.e., there will always be acceptable residual risk. It is my view that this approach would be contrary to the NPS-UD. I also note that with coastal hazards, there are still decisions to be made around what areas will be defended and what areas will be retreated from. In simple terms, I consider that a district plan policy direction to avoid an increase in risk with respect to the part of the CCZ, the airport, port and rail activities impacted by coastal hazards, and the areas of the city impacted by the coastal inundation with sea level rise overlay, would compromise council's ability to give effect to the NPS-UD and intensification requirements within the Act, particularly in light of the ability to require mitigation to adequately address coastal hazard risks.

(b) ***take into account*** the nature of the coastal hazard risk and how it might change over at least a 100-year timeframe, including the expected effects of climate change; and (c) ***evaluate*** the likely costs and benefits of any proposed coastal hazard risk reduction options. (3) Where hard protection structures are considered to be necessary, ***ensure*** that the form and location of any structures are designed to minimise adverse effects on the coastal environment. (4) Hard protection structures, where considered necessary to protect private assets, ***should not be*** located on public land if there is no significant public or environmental benefit in doing so.		

Appendix B – Fault Hazard Overlays -advice from Dr Nicola Litchfield

Response to points 3-5 of Minute 35: Further follow-up directions – Hearing Stream 5

Nicola Litchfield, 15 Sept 2023

Points 3-4 Components of the fault hazard overlays

The schematic diagram of the fault hazard overlay in point 3 was incorrect and should have only two zones – the fault deformation zone and a 20 m buffer zone. A revised diagram is shown in Figure 1[1].

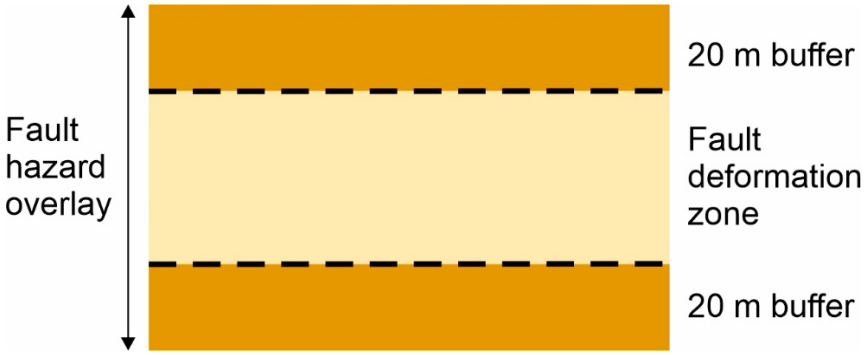

Figure 1. A) Revised version of the schematic diagram in point 3 of Minute 35.

However, the inclusion of such a diagram in the District Plan could be misleading in that it only applies to some of the fault hazard overlays – the remainder are more nuanced.

This is illustrated in figures 2-4 with examples of the actual components used to develop the fault avoidance zones (FAZs) of Morgenstern and Van Dissen (2021). It should be noted that these components were not developed specifically for the fault hazard policies in the Wellington City Council PDP but are provided to illustrate the nuances of the mapped faults.

The schematic diagram applies to parts of the faults where they have a single trace and a well-defined fault complexity. In the Wellington City Council area, this applies to much, but not all, of the Wellington Fault (Figure 2A) and the northern half of the Ohariu Fault (Figure 2B).

The remainder of these faults (Figure 3) and all of the Shepherds Gully and Terawhiti Faults (Figure 4) are more nuanced, with multiple, overlapping traces or large gaps where the fault is known to exist, but traces couldn't be mapped using the lidar data.

In my opinion, these nuances mean that the GNS Science (Morgenstern and Van Dissen, 2021) map data cannot and should not be added to the fault hazard overlay to show whether a property is within 20 m of a fault deformation zone. Instead, the edge of the fault deformation zone needs to be defined by site-specific studies.

[1] The colour scheme in all these figures follows Figure 2.1A of the Morgenstern and Van Dissen (2021) report showing the components of the FAZs that provided the footprint and complexity classes for the fault hazard overlays.

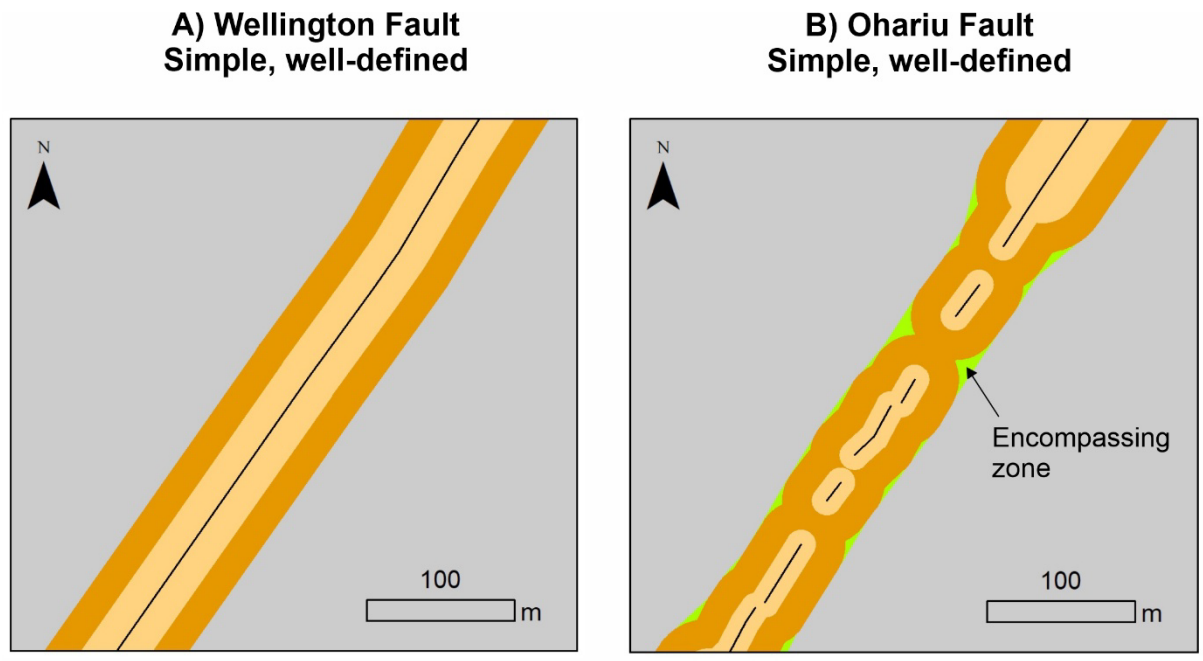

Figure 2. Examples of the components of simple parts of the Wellington and Ohariu Fault FAZs (Morgenstern and Van Dissen, 2021). The black lines are the fault traces mapped using lidar data.

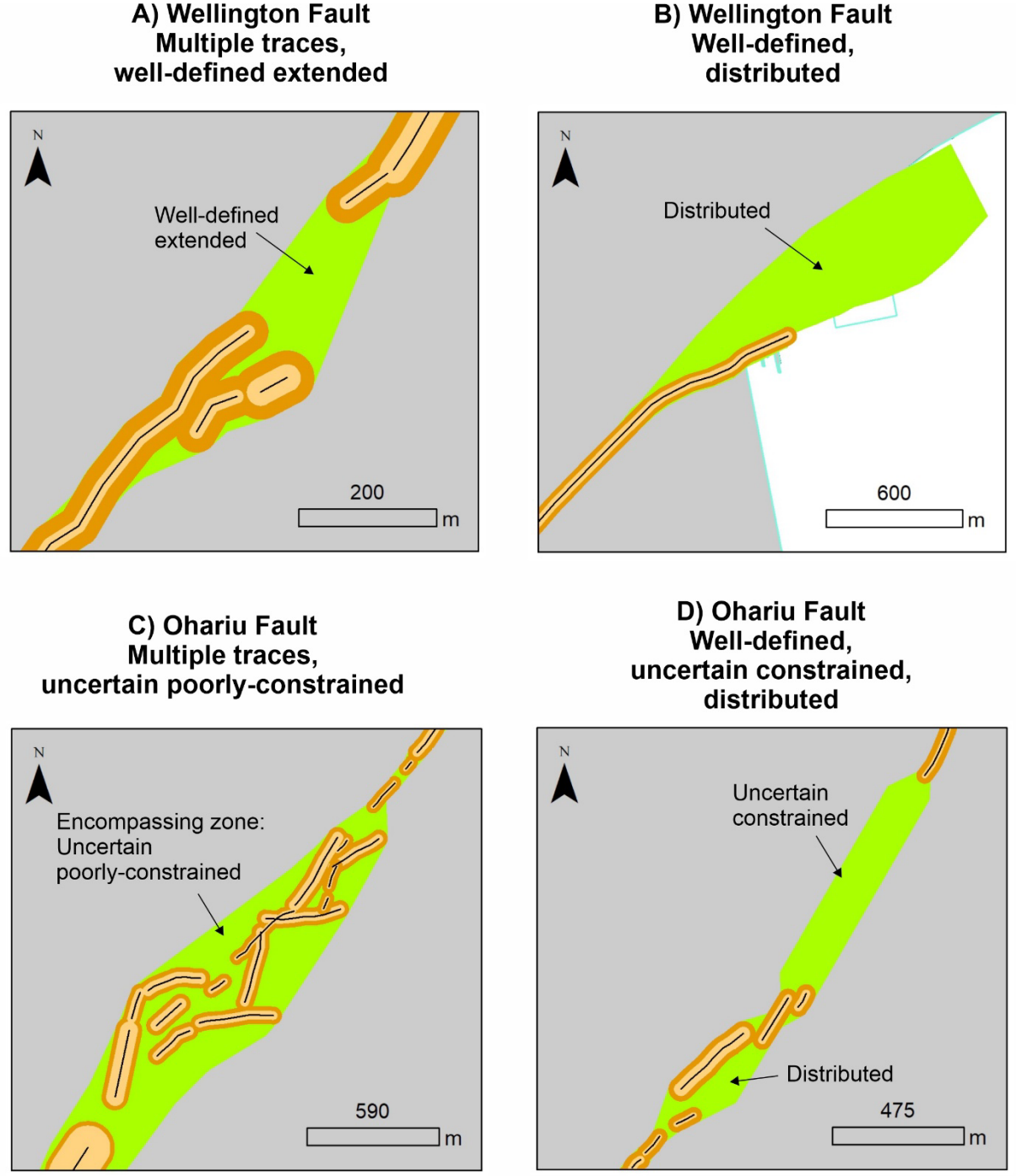

Figure 3 Examples of the components of more nuanced (or more complex) parts of the Wellington and Ohariu Fault FAZs (Morgenstern and Van Dissen, 2021).

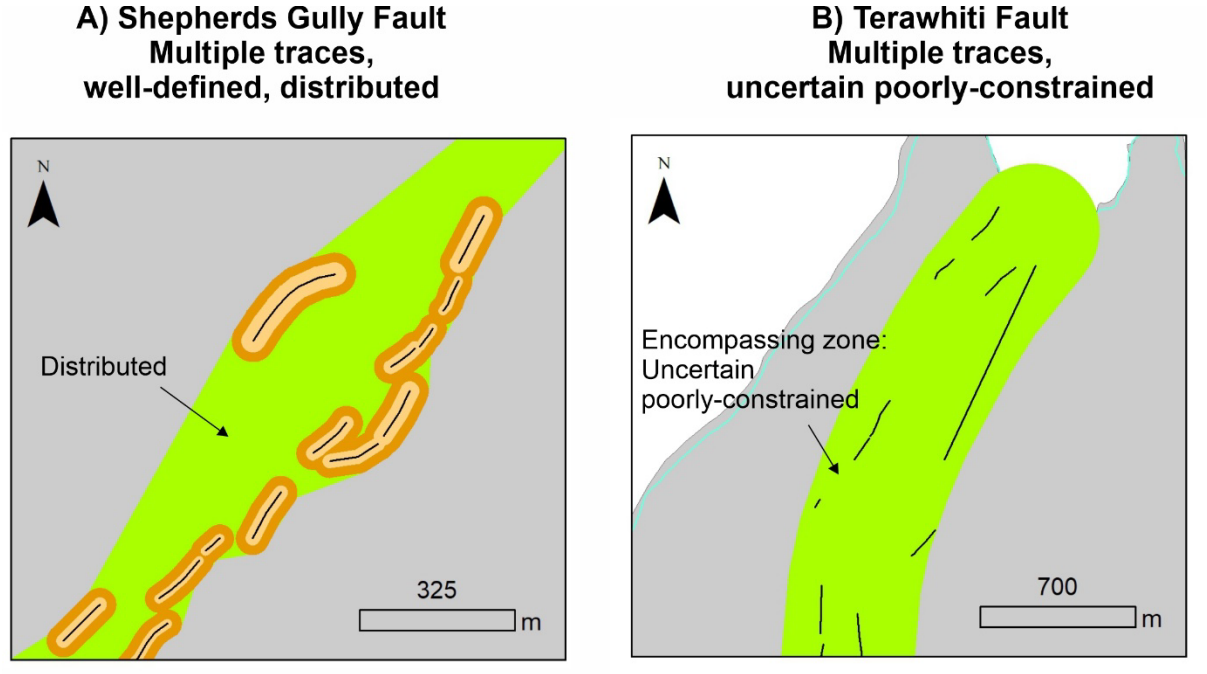

Figure 3 Examples of the components of the Shepherds Gully and Terawhiti Fault FAZs (Morgenstern and Van Dissen, 2021).

Point 5 Identification of the fault deformation zone

Site-specific identification of a fault deformation zone can be technically challenging and I concur that it can only be undertaken by suitably qualified and experienced geologists or geotechnical engineers.

By way of illustration, here is a list of steps that are commonly undertaken, most of which require expertise and experience:

1. Compilation of existing data. There is generally no published data for most sites, but there may be some unpublished reports, for example, held by WCC.
2. Initial field visit and mapping. To field check any existing mapping or data and to assess what further fieldwork is feasible with the aim of further defining the location and extent of the fault deformation zone.
3. Fieldwork to define the edge of the fault deformation zone. At most sites there are no natural exposures, so there are two main ways that are commonly undertaken:
    a) Excavation and surveying of a trench(s) across, and at a high angle to, the fault.
        - The location and number will depend on logistics such as site access and the length will depend on the size of the fault deformation zone and proposed activity.
        - The depth and width will depend on factors such as the nature of the sediments exposed, the water table, and benching for safety purposes.
        - Ideally, the edge of the fault deformation zone can be interpreted from the last seen fault in the trench, or sometimes the edge of significant deformation (e.g., folding) This should be documented through photographs and a log. This will require careful cleaning (smoothing the walls with hand

tools) and examination of the trench walls and interpretation of offset layers.

b) Geophysical (e.g., ground penetrating radar and shallow seismics) surveys/profiles across, and at a high angle to the fault. Depending on factors such as the site, the style and amount of movement on the fault (vertical strike-slip faults can be hard to see in geophysical profiles) and likely sediments near the surface, a geophysical study could be undertaken as a first step, or as an alternative to trenching. This work has to be undertaken by a specialist, who owns and can run the equipment and will likely process and interpret the data. Additional data (e.g., test pits or cores) may be needed to ground-truth the sediments and to help identify faults and the edge of the fault deformation zone.

4. Survey the edge of the fault deformation zone at the ground surface and then the 20 m buffer zone to accommodate suspected high-strain (potentially damaging) ground deformation that is not readily identifiable in trench exposures or geophysical surveys.

Reference:

Morgenstern, R.; Van Dissen, R.J. 2021. Active fault mapping and fault avoidance zones for Wellington City. GNS Science consultancy report 2020/57. 94 p.

Appendix C – Tracked Changes to Natural Hazards Chapters.

Note: Red underline and ~~strike out~~: show additions and deletions to the notified Natural Hazards Chapter and Coastal Environment Chapter, as recommended by in the section 42A report dated 3rd July 2023. Note that the Coastal Environment policy number has been retrospectively updated as a result of the recommended new policy.

Blue underline and ~~strike out~~: show further additions and deletions to the section 42A report version of Natural Hazards Chapter and Coastal Environment Chapter, as recommended by Jamie Sirl, Statement of Supplementary Planning Evidence dated 25th July 2023.

Green underline and ~~strike out~~: show further additions and deletions to those recommended by Jamie Sirl, Statement of Supplementary Planning Evidence dated 25th July 2023, as recommended by Jamie Sirl, Right of Reply dated 28th August 2023. Note that this version does not track the changes to the provision numbering, including where cross-refenced within the chapters.

Purple underline and ~~strike out~~: show further additions and deletions to those recommended by Jamie Sirl, Jamie Sirl, Right of Reply dated 28th August 2023, as recommended by Jamie Sirl, Right of Reply dated 25th September 2023. **Note that this version does not track the previous officer recommended changes to PDP version of provisions or the provision numbering.**

Definitions and Natural Hazards chapter – recommended amendments to provisions relating to floor level requirements

Definitions

Term	Definition
1% Annual Exceedance Probability Flood	means the modelled 1% Annual Exceedance Probability flood level that informs the Wellington City Council District Plan Flood Hazard Overlays which incorporates climate change predictions and dynamic freeboard.

NH-R4	Additions to all buildings in the inundation area, overland flowpaths or the stream corridor of the Flood Hazard Overlay

		1. Activity status: **Permitted** Where: a. When located within an inundation area, the finished floor levels of the addition for hazard sensitive activities or potentially hazard sensitive activities are demonstrated to be above the 1% ~~Flood~~ Annual Exceedance Probability flood level: i. plus the height of the floor joists; or, ii. to the base of the concrete floor slab ~~and an allowance for freeboard~~; b. The additions are not located within an overland flowpath~~s~~; ~~or~~ and c. The additions are not located within a stream corridor. Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.
	All Zones	3. Activity status: **Discretionary** Where: a. Compliance with the requirements of NH-R4.1.b cannot be achieved; and b. The finished floor levels of the addition (excluding non-habitable additions) to a building containing a hazard sensitive activity located within an overland flowpath is demonstrated to be above the 1% Annual Exceedance Probability flood level: i. plus the height of the floor joists; or ii. to the base of the concrete floor slab ~~and an allowance for freeboard~~. Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.

NH-R5	**The construction of buildings or the conversion of existing buildings that will contain a potentially hazard sensitive activity in the inundation area of the Flood Hazard Overlay**

	All Zones	1. Activity Status: **Permitted** Where: a. When located within an Inundation Area of the Flood Hazard Overlay, the finished floor levels of the building for the potentially hazard sensitive activity is located above the 1% Flood Annual Exceedance Probability level: i. plus the height of the floor joists; or ii. to the base of the concrete floor slab ~~and an allowance for freeboard~~. Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.

NH-R6	**The construction of buildings or the conversion of existing buildings that will contain a hazard sensitive activity in the inundation area of the Flood Hazard Overlay**

	All Zones	1. Activity Status: **Restricted Discretionary** Where: a. When located within an Inundation Area of the Flood Hazard Overlay, the finished floor levels of the building for the hazard sensitive activity is located above the 1% Flood Annual Exceedance Probability level: i. plus the height of the floor joists; or ii. to the base of the concrete floor slab ~~and an allowance for freeboard~~. Matters of discretion are: 1. The impact from the 1% Annual Exceedance Probability flood is low due to either the: a. Implementation mitigation measures; b. The shallow depth of the flood waters within the building; or c. Type of activity undertaken within the building; and 2. The risk to people and property is not increased from flooding, including displacement of flood waters. Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.

NH-R7	**The construction of buildings or the conversion of existing buildings that will contain a potentially hazard sensitive activity in the overland flowpath of the Flood Hazard Overlay**

	All Zones	1. Activity Status: **Restricted Discretionary**

		Where: a. When located within an overland flowpath of the Flood Hazard Overlay, the finished floor levels of the building for the potentially hazard sensitive activity is located above the 1% Flood Annual Exceedance Probability level: i. plus the height of the floor joists; or ii. to the base of the concrete floor slab ~~and an allowance for freeboard~~. Matters of discretion are: 1. The matter contained in NH-P7 Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.

NH-R8	**The construction of buildings or the conversion of existing buildings that will contain a hazard sensitive activity within the overland flowpaths of the Flood Hazard Overlay**

All Zones	1. Activity Status: **Discretionary** Where: a. When located within an overland flowpath of the Flood Hazard Overlay, the finished floor levels of the building for the hazard sensitive activity is located above the 1% Flood Annual Exceedance Probability level: i. plus the height of the floor joists; or ii. to the base of the concrete floor slab ~~and an allowance for freeboard~~. Note: Technical advice on finished floor levels required to comply with this rule can be sought and obtained from Wellington Water Limited.