

Summary of WBRSI Oral Submission by Pat Duignan on 21 March 2023

As set out in the attached extract from the PC2 Section 32 Report, the Kapiti Coast District Council asserts that they consider the Coastal Inundation Hazard, to which the provisions of the New Zealand Coastal Policy Statement apply, to be appropriately managed by existing District Plan provisions.

Those provisions however manage only a subset of the direct costs of Coastal Inundation, namely physical damage to buildings and direct damage to some infrastructure. (Some provisions also attempt to reduce the increase in the extent of flooding that intensification would cause from increased impermeable site coverage etc.)

The provisions do not manage the indirect costs (ie costs such as economic and other forms of disruption including dwellings and other buildings and services being inaccessible) resulting from Coastal Inundation. The indirect costs will usually be significant and can be as large as the direct costs.

The paper *“Urban flood impact assessment: A state-of-the-art review”* Hammond et al, Centre for Water Systems, University of Exeter, Exeter, UK (2015) states *“Penning-Rowse and Parker (1987) empirically investigated the losses arising from flood events in the UK, and noted that the percentage of indirect losses with respect to the direct losses ranged from 21% for a study in Bristol, to 93% for a study in Chesil.”*

In the case of Cyclone Gabrielle the indirect costs included the costs of supplying towns such as Wairoa where access was cut off and costs are still being incurred because stock cannot be transported. In the case of the Kapiti District, residents of Pekapeka currently still have standing water disrupting their use of their properties for a long period following intense rainfall.

In the Kapiti coastal zone flooding due to intense rain is a Coastal Hazard rather than being a separate type of hazard. The clearance of water accumulations in the area is both dependent on draining to sea and on the level of the water table, which is a function of the sea level. Crucially, the most dramatic form of Coastal Hazard, direct inundation from storm surge, typically will coincide intense on-shore rainfall since the fall in barometric pressure, eg from an ex-tropical cyclone such as Cyclone Gabrielle, results in both coastal storm surge and intense on shore rainfall.

Kapiti District is unique among the Tier One Council districts as regards the percentage of the population which is exposed to Coastal hazards related to sand dunes. Almost the entirety of the Waikanae Beach area is sand dunes. In the sand dune area the hazard of intense rainfall is overwhelmingly associated with coastal effects.

The very same Jacobs reports on which the Council relies upon as justification for the Coastal Qualifying Matter Precinct and for the landward boundary of the Precinct also details the exposure to the coastal hazard of inundation and the effects of climate change on exposure to that hazard. While the issue of what sea level rise scenario is appropriate for the analysis is in dispute, the proposition that climate change will increase the exposure to coastal inundation in the Kapiti District and Waikanae Beach is firmly established.

Once it is recognised that the provisions in the District Plan do not address the indirect costs of inundation in any adequate way, it logically follows that the decision on the landward boundary of the CQMP should take full account of the coast hazard of inundation. The Section 32 reports

justification for the CQMP and for its landward boundary are internally inconsistent since they rely on and address only one of the two hazards detailed in the Jacobs reports.

In summary, the Section 32 report is internally inconsistent in relying on the Jacobs analysis of one hazard addressed in the Jacob report while ignoring the indirect aspect of the second hazard entirely.

The remedy for the glaring omission in the Section 32 report and in the PC2 proposal of any consideration of the indirect effects of coastal inundation is that the CQMP should cover this hazard. That requires a substantial movement in the landward boundary of the CQMP. The landward boundary should be moved east to at least the boundary of the adaptation areas that the Council has determined are relevant to management of the coastal hazard on inundation. Those boundaries are based on Jacobs report and thus have the same status as the Council's proposed CQMP boundary which is based on the Jacobs reports but only on one rather than both coastal hazards considered in those reports.

In the case of Waikanae Beach, the boundary of the CQMP should be at least as far east as the Expressway.

If the Panel accepts the critiques of the Jacobs reports that have been submitted regarding both the assumptions adopted in those reports and other inconsistencies with NZCPS requirements, then the logical response is that the precautionary principle mandated for policy decisions by NZCPS requires that the landward boundary of the CQMP should be the line in the District Plan demarcating the area of coastal influence.

The remain issue is the extent to which the movement eastward of the landward boundary of the CQMP would be beneficial as an adaptation fulfilling the requirements of NZCPS and as an adaptation to climate change. The key observation regarding that issue is that, at least for Waikanae Beach and for most of the other areas in the Kapiti District development under the existing provisions of the District Plan, without the liberalisation of the MDRS, would substantially limit any increase in the exposure to the coastal inundation hazard. The risk of flooding will increase due to climate change but the scale of exposure, in the sense of the indirect costs of a given scale of coastal inundation, will be limited. In particular, the increase in population and economic activity (which would be subject to disruption) will be much less than would occur in the absence of an CQMP with its landward boundary much further to the east than proposed under the Council's proposed CP2.

In conclusion, a CQMP with its landward boundary much further east than proposed by the Council is required to comply with the provisions of NZCPS. That is also required in order to remedy the internal consistency in the Section 32 report, and thus the proposal, whereby one section of the hazard analysis in the Jacobs reports is relied upon, while the implications of the other half of the reports is ignored because the indirect effects of coastal inundation are not recognised.

The above conclusion also implies that there is no case for the proposed promotion of intensification by removal of the Waikanae Beach Character Precinct and application of intensification measures to the Te Moana/Ono St Local Centre.

While the application of the CQMP to a significant part of the Kapiti Coast District Council area may seem a startlingly outcome on first consideration, it is simply a reflection of the reality that that part of the district is exposed to coastal hazards that will be exacerbated by climate change to a degree unique among the Tier One Council districts. In particular, the Waikanae Beach area between the Expressway and the coast is a series of sand dunes, with the majority of the area being not much above sea level today, even before sea level rise induced by climate change. The vision of this area of

Kapiti as suitable for intensification is demonstrably invalid. Fortunately, Parliament has provided the Panel with the ability to recommend that the Kapiti Coast District Council correct its glaring omission of the required application of the NZCPS to avoid the major increase in the exposure to indirect costs of coastal inundation that the inappropriate determination of the landward boundary of the CQMP would entail.

Pat Duignan

ANNEX: Extract from PC2 Section 32 Report re the Coastal Matter Precinct Document

New qualifying matter: Coastal Qualifying Matter Precinct

The purpose of the Coastal Qualifying Matter Precinct is to identify the area where it is not considered appropriate to enable the level of development otherwise required by the Medium Density Residential Standards (MDRS) and policy 3 of the NPS-UD until the management of coastal hazards is addressed through a future coastal environment plan change.

Separately to PC2, the Council, iwi and the community are engaged in a planning process to identify and develop solutions to the management of hazards in the coastal environment. The district plan does not currently give effect to the NZCPS with respect to the management of coastal hazards, relying on the 1999 coastal hazard provisions until a plan change giving effect to the NZCPS is prepared and publicly notified. To help inform the future plan change, in 2019 the Council alongside iwi and the community initiated the Takutai Kāpiti Coastal Adaptation Project. The project is a collaborative community-led process working in partnership with iwi, that “aims to encourage the Kāpiti Community to become more aware of the impacts of coastal hazard risks resulting from sealevel rise and climate change, and empower them to take part in developing solutions and pathways for adapting to coming change”⁶⁰. The recommendations of the Takutai Kāpiti project will assist the Council in the development of District Plan provisions to manage a range of coastal environment issues, including coastal hazards. A coastal environment plan change will be notified after considering the recommendations from the Takutai Kāpiti project, and after consulting widely on draft plan change provisions.

In this context, the purpose of the Coastal Qualifying Matter Precinct is to maintain the status quo level of development enabled by the provisions of the operative District Plan in the relevant area, to ensure that the management of coastal hazards can be appropriately addressed through the future coastal environment plan change process, while avoiding intensification in areas that may need to be subsequently reversed as part of this process. This approach is consistent with policy 3 of the NZCPS which requires the Council to adopt a precautionary approach to use and management of coastal resources potentially vulnerable to effects from climate change so that avoidable social and economic loss and harm to communities does not occur. Further to this:

- The precinct is intended as an interim measure and it is expected that the purpose, extent and provisions associated with the precinct will be reviewed as part of the future coastal environment plan change process. This may include providing for more or less development to occur within the area covered by the precinct.
- The precinct is not intended to restrict development to less than what is permitted by the rules of the operative District Plan (although the precinct does not preclude such an approach being considered as part of a future coastal environment plan change process);

- The precinct is not intended to prejudice or predetermine the range of planning options to manage coastal hazard risk that may be considered during the Takutai Kāpiti and subsequent plan change process. It is also not intended to predetermine the spatial extent of these options (particularly in relation to the range of scenarios included within the Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment, see discussion below).

The wording of the policy associated with the precinct has been carefully considered in order to communicate this intent.

Justification for the qualifying matter (s77J(3)(a) and s77P(3)(a) of the RMA)

The Coastal Qualifying Matter Precinct is a qualifying matter under the following provisions of the Act:

- S77I(b) and s77O(b): a matter required in order to give effect to a national policy statement (other than the NPS-UD) or the New Zealand Coastal Policy Statement 2010.

The Coastal Qualifying Matter Precinct is required to ensure that PC2 does not reduce the degree to which the District Plan gives effect to policy 25 of the New Zealand Coastal Policy Statement 2010. Specifically, policy 25(a) and (b) states: 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;
- (b) avoid redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards;
- (c) ...

Enabling an increase in the level of development that could occur in an area potentially susceptible to coastal erosion hazard over at least the next 100 years would reduce the degree to which the District Plan gives effect to this policy. Specifically, enabling more people to live in (and more assets to be located in) areas potentially affected by coastal erosion hazard would result in an increase in the risk of social, environmental and economic harm, as well as exposure to adverse effects, from coastal hazards. Policy 25 of the NZCPS directs the District Plan to avoid this outcome. Policy 3 of the NZCPS also requires the Council to take a precautionary approach so that avoidable social and economic loss and harm to communities does not occur.

Until the District Plan is updated to fully give effect to the NZCPS, the level of development provided for by the operative District Plan more appropriately gives effect to these NZCPS policies than the level of development that would otherwise be required by the MDRS and policy 3 of the NPS-UD.

The spatial extent of the Coastal Qualifying Matter Precinct is identified as PREC3, PREC4 and PREC5 in the proposed District Plan Maps. The spatial extent of the precinct has been determined based on Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment Volume 2: Results (Jacobs, 2022)⁶¹. The Jacobs assessment outlines areas potentially susceptible to coastal erosion hazard by using a probabilistic modelling method to map the “projected future shoreline position” (PFSP) under a range of sea level rise scenarios. The PFSP is mapped over 30-year (2050), 50-year

(2070) and 100-year (2120) time frames. The 2120 PFSP is mapped against four different relative sea level rise scenarios, including:

2120 Scenario	Relative sea rise projection
RCP 2.6(with -1mm/year vertical land movement)	0.60m
RCP 4.5 (with -1 to -3mm/year vertical land movement)	0.85m
RCP 8.5 (with -1 to -3mm/year vertical land movement)	1.25m
RCP 8.5+ (with 3mm/year vertical land movement)	1.65m

The spatial extent of the Coastal Qualifying Matter Precinct is based on the 2120 P10 projected future shoreline position using the RCP 8.5+ (with -3mm/year vertical land movement) relative sea level rise scenario⁶². This scenario is the most landward scenario modelled by Jacobs, and while it is described as highly unlikely, this scenario does have the potential to occur⁶³. Specifically, the Coastal Qualifying Matter Precinct is defined as the parts of the General Residential, Local Centre and Town Centre Zones that are located within this area. For the purposes of PC2, this scenario is considered the most appropriate to determine the spatial extent of the precinct because:

- It represents an area potentially affected by coastal erosion hazard over at least the next 100 years;
- It ensures that PC2 does not reduce the degree to which the District Plan gives effect to policy 25 of the NZCPS in areas potentially area potentially affected by coastal erosion hazard over at least the next 100 years;
- Because it is the most landward of the scenarios modelled, it retains the greatest degree of flexibility for the Takutai Kāpiti and future coastal environment plan change process to determine an appropriate hazard management regime within all areas identified as being potentially susceptible by the Jacobs assessment.

This scenario has been specifically used for the purpose of identifying a qualifying matter in relation to incorporating the MDRS and giving effect to policy 4 of the NPS-UD as part of PC2, in accordance with the justification outlined above. The use of this scenario in PC2 does not predetermine its utility for any future coastal environment plan change process. Whether this scenario (or any other scenario) has any application to a future coastal environment plan change process is a matter to be determined through that process.

There are several reasons that the spatial extent of the Coastal Qualifying Matter Precinct focusses on the area potentially susceptible to coastal erosion hazard, as distinct from coastal inundation hazard (which is also covered by the Jacobs' assessment). These include:

- The Jacobs' assessment represents the best available information in relation to coastal erosion susceptibility in the District;

⁶² This scenario is referred to in the Coastal Erosion Susceptibility Mapping Tool online GIS viewer as the "1.65m RSLR Range of Potential Shoreline Positions (99-10%)". See:

<https://maps.kapiticoast.govt.nz/portal/apps/storymaps/stories/dbc000c7263f4d63b8978047ed0e826b>

⁶³ See Jacobs (2022), Kāpiti Coast Coastal Hazards Susceptibility and Vulnerability Assessment Volume 2: Results. Refer to the discussion on relative sea level rise projections outlined in section 2.1 and the discussion on the probabilistic approach to modelling outlined in section 2.2.6 of the report.

⁶⁴ Within urban zoned areas, 76% of the area identified as being potentially susceptible to coastal inundation hazard under the 1.65m RSLR scenario is already contained within flood hazard category areas identified in the District Plan.

- The existing provisions that relate to coastal erosion date from the 1999 District Plan, predate the New Zealand Coastal Policy Statement 2010, and do not reference the best available information on the hazard;
- Coastal inundation risk is managed by proxy through the existing flood hazard provisions of the District Plan. There is a reasonable correlation between the areas in the urban environment identified as susceptible to coastal inundation in the Jacobs' assessment, and the flood hazard category areas in the District Plan⁶⁴. In addition to this, the flood hazard provisions of the District Plan are dynamic in that the 1% AEP flood event is to be determined using the best available information (which includes site-specific modelling). On this basis, for the purposes of PC2 this hazard is considered to be appropriately managed by existing District Plan provisions. However, a review of the District Plan's flood hazard provisions is planned as part of the future flood risk/stormwater management Plan Change⁶⁵

⁶⁵ The Council is presently updating its district-wide flood hazard model in preparation for this Plan Change. This includes updating the model to reflect the best available information on coastal inundation hazard and the current and future effects of climate change.