STATEMENT OF EVIDENCE By Matthew de Boer for Northland Regional Council
IN THE MATTER OF
Submissions and further submissions
ON
Far North Proposed District Plan - Hearing 15D: Rezoning Kerikeri-Waipapa
by email:

Introduction

1. My name is Matthew de Boer. I have a Bachelor of Science from the University of Queensland and a Post Graduate Diploma in Environment from the University of Melbourne. I am the founder and director of AdapTerra Limited, a specialist consultancy providing professional services on flood risk management, climate change adaptation, risk and resilience. My areas of expertise include decision-making, governance and implementation of risk mitigation actions, as well as climate risk assessment, adaptation planning and options evaluation.

2. I have nineteen years of experience working in the environmental sector in New Zealand and Australia, with ten years working within local government. I am currently project and technical lead on a number of flood management and climate change adaptation planning projects. From 2019 until 2021 I held the positions of Natural Hazards Advisor and Climate Change Adaptation Coordinator at Northland Regional Council (NRC). During this time I led the delivery of region-wide natural hazards datasets, including NRC's region-wide flood model, and coastal erosion and coastal inundation models, as well as providing advice and supporting submissions on natural hazards and climate change issues. I have worked in various roles across local and central government, academia and the private sector in NZ and Australia. I am currently the Regional Director Oceania for the international climate change adaptation practitioner network PEERS, and a member of the New Zealand and Australian Coastal Societies. I have an up-to-date awareness of current leading practice in flood risk management and adaptation through a number of recent relevant projects:
    - Lead author of a review of NZ and international leading flood risk management practice (Hawkes Bay Regional Council 2025)
    - Review of international leading adaptation practice for PEERS (2024-25)
    - Consolidation of NZ adaptation practice (NZ Climate Change Commission 2025)
    - Adaptation Programme technical lead (Far North District Council – 2024-25)
    - Lead Region-wide Integrated Flood Risk Management policy (NRC 2023-4)
    - Lead author Te Taitokerau Climate Change Adaptation Strategy for Climate Adaptation Te Taitokerau (Northland RC, Whangarei DC, Far North DC and Kaipara DC 2021)
    - Lead author Whirinaki Managed Retreat Business Case (NRC 2025)
    - Project lead Whangarei Urban Flood Strategy (Whangarei DC 2024-25)

3. I have prepared this evidence in accordance with the Environment Court Practice Note – Expert Witness and am familiar with the Code of Conduct. The evidence I present is within my area of expertise and I am not aware of any material facts which might alter or detract from the opinions I express. The opinions expressed in this evidence are based on my qualifications and experience. If I rely on the evidence or opinions of another, my evidence will acknowledge that position. In preparing this

evidence I have considered and relied on the provisions of: the Regional Policy Statement for Northland [the RPS] and the documents relating to the Proposed Far North District Plan, including relevant submissions and the Council's s42A Report.

Purpose and Scope of Evidence

4. The scope of my evidence relates to the application of technical information on flood risk management into decision-making processes applied to land-use planning, within the limits of my expertise. The purpose of my evidence is to assist the Hearings Panel in considering the submissions and further submissions by NRC on PDP.

5. My evidence is presented in three sections:
    - A short history of flood risk management by NRC in the area including flood modelling and physical works;
    - Rezoning of flood-prone land adjacent to the Waipapa Industrial estate;
    - The Kiwi Fresh Orange (KFO) submission to rezone flood-prone land between Kerikeri and Waipapa.

NRC responsibilities around Natural Hazards

6. The Northland Regional Council (NRC) is responsible for controlling the use of land for the purposes of avoiding or mitigating natural hazards. The NRC carries out this function in two ways:
    1. Providing information about natural hazard risk in the region (such as flood hazard risk mapping).
    2. Setting policy (principally in the Regional Policy Statement for Northland (RPS)) directing how hazard risk is to be assessed for new development.

7. The NRC also has a flood management programme, which includes undertaking works to reduce damage from flooding. The flood protection schemes are the most significant aspect of the programme.

History of flood modelling by NRC in Kerikeri-Waipapa catchment

8. In 2007, NRC progressed the Priority Rivers project, which assessed flood risk across the region, and shortlisted 27 catchments. For 'priority' catchments, digital topographic data (LiDAR) was collected at the local scale, and hydraulic modelling undertaken to support detailed flood risk assessments and the planning of potential flood mitigation works. In 2008 NRC staff held community meetings in each priority rivers catchment to advise that modelling work was beginning.

9. NRC commissioned consultants GHD to model the Kerikeri-Waipapa catchment in 2013. The consultants used the DHI model suite using available 2009 LiDAR (digital topography) data and NRC river flows and rain gauge records. The model was updated a number of times in following years. The flood map outputs from this model remain the current Kerikeri 'Priority Rivers' flood maps accessible via NRC's Natural Hazards portal, and form statutory hazard maps under the RPS.

10. Between 2019 and 2021, new LiDAR data was collected for the entire Northland region, enabling the updating of existing, and development of new, hydraulic flood models for catchments across the region. NRC undertook a project to map flooding

across the region, contracted to the consultants Water Technology. A rain-on-grid' model using the TuFlow 2-dimensional hydraulic model was used, consistent with that used for flood modelling by many councils across NZ. During this process, a number of 'priority rivers' catchments having existing flood maps (including Kerikeri-Waipapa) were excluded due to cost limitations.

11. In 2023 new modelling for Kerikeri-Waipapa was commissioned, but was delayed by demand created post-Cyclone Gabrielle, as well as the need for new LiDAR. New LiDAR data was collected in May 2025 and new flood modelling was completed by consultants Water Technology by September 2025. Selected outputs from this model will be uploaded to the Natural Hazards Portal once reviewed, and will form NRC's statutory hazard maps once published.

Overview of updated flood model outputs.

12. **General comments.** Updated information in the model, which uses the TuFlow software, included updated topography and updated hydrological (rainfall) model. The hydrological model is aligned with that used in NRC's Region-wide model and uses the latest projections from NIWA (HIRDS4). The model was calibrated against 3 historic flood events using flood levels surveyed by NRC. Channel bathymetry and stormwater network from the previous 1-dimensional model was used to check model assumptions. A significant change between the model outputs is the occurrence of additional flow paths, which are associated with the different modelling methodology used. Rain on grid '2-dimensional' hydraulic flood models such as TuFLow estimate how floodwaters flow across floodplains into channels and are stored across the landscape, and are good at picking up overland flowpaths. In comparison, '1-dimensional' models model flows within channels, and where they break their banks and flow across floodplains, and do not represent cross-catchment flows well.

13. The model outputs and methodology have been reviewed by NRC engineers and associates. Key points noted include:
    - Model design flood extents alongside rivers /streams are comparable to the previous 1-dimensional model. Exceptions to this include areas where catchment overflows occur and there is different routing of flowpaths.
    - As with the previous model the 1-in-10-year flood extent and levels are close to records of the January 2011 flood event. The 1-in-100 year (including climate change effects) flood extents are close to previous version. For Kerikeri River, the flood levels for this event are close to the March 1981 flood.

14. Two additional 'possible future scenario' model runs were also completed, a maximum probable development scenario, and a scenario including the K3A dam. A third model run that includes the proposed KFO spillway was planned but has not been completed to date. Notable changes for specific areas relevant to this evidence are described in below sections. These scenarios are presented here to not only support NRC's submission and further submissions around rezoning, but to assist the hearing panel in response to submissions that discuss the a K3A dam.

15. **Maximum probable development (MPD) scenario.** This modelling shows the effects on flooding from an increase in impervious area for all rezoned areas in the PDP, through changes in infiltration and roughness (runoff) rates in the model. It is important to note that the MPD scenario does not include the raising of building platforms or other changes due to earthworks or stormwater infrastructure.
The results show that increases in impervious area do not significantly affect modelled flood extents or depths. There is an overall increase in flooded area of 8.5ha (0.4% increase), with maximum changes in flood depths of around 30mm for a flood event with a one percent chance of occurrence in any given year (i.e. a 1% AEP event) . Across the catchment the number of properties modelled to be inundated in a 1% AEP flood event increased from 70 to 78.

16. **K3A dam scenario.** This modelling scenario alters the model domain to include NRC's K3A dam design, and includes representations of the dam wall, overflow spillway and culverts. The design incorporates a free-draining culvert and drainage channel at the base of the dam, meaning that under low-flow conditions the dam will remain empty, but will hold water under high-flow conditions. Further sensitivity testing of dam outflows may be required to reach optimum storage efficiency.
For 10% AEP events, the model shows a reduction in the flooded area across the catchment by 79ha, from 1332ha to 1253ha – a total of 5.9% decrease. For 1% AEP flood events, the model shows the dam is likely to result in a reduction of 164ha in flood extents, from 2198ha to 2034ha, a total of 7.4% reduction in flooded area. Under a 1% AEP scenario, results show a reduction in the number of buildings exposed to flooding, from 809 to 739, a net decrease of 70 buildings, or 8.7%. However, a small number of buildings previously not exposed to flooding, are now predicted to flood under the K3A dam scenario. These buildings are generally downstream with flooding tending to be very shallow and primarily the result of shallow ponding.

17. **Combined Maximum Probable Development (MPD) and K3A dam scenario.** A model scenario that included the K3A dam and the MPD scenarios was assessed to determine the impacts of the dam alongside increases in impervious area under full development. Results show the dam will likely result in a net decrease in flooded area from the MPD scenario of around 172ha, around 7.8%.

History of physical flood mitigation works by NRC in Kerikeri-Waipapa catchment

18. The Kerikeri Waipapa River Liaison Working Group was initiated in June 2011 to act as a point for community and stakeholder engagement on flood risk management activities by NRC in the area. Since inception, NRC have undertaken local works as well as investigations into the feasibility of major flood interventions in the Kerikeri-Waipapa area, including a flood detention dam and floodway, neither of which have progressed to implementation.

19. **Minor flood mitigation work completed in the catchment**

- **Whiriwhiritoa stream.** This small stream with a catchment area of 1.5km2 flows under the state highway near the Waipapa Industrial Estate, with peak flows of around 5-6 m^3/s. Cross catchment overflows from the Kerikeri River (at around $40m^3/s$) overwhelms the stream, causing it to break its banks and flood surrounding areas. NRC undertook work to increase channel flood capacity through benching, completed in 2021. As part of their work on the new roundabout, NZTA upgraded the Maritime lane bridge across Whiriwhiritoa to handle higher flows.

- **Kerikeri River.** During modelling to investigate the floodway project, NRC identified 5 spillout points for small (10% AEP) flood events where the river broke its banks on Waitotora Dr, downstream of SH10. A project was undertaken to restrict overflows at breakout areas in 2% to 10% AEP events by upgrading existing historic stopbanks. The work protects around 30-40 existing houses. Flood levels taken during a 2011 flood event helped ground-truth the modelling.

- **Cobham Rd.** A small spillway project was completed in 2016 to redirect high-level flows across a sharp horse-shoe bend in the Wairoa stream. The works help protect 10-20 houses in a small subdivision upstream.

20. **Detention dam.** The 2012 flood modelling identified flood risks to the wider Kerikeri community, triggering investigations into the potential for an upper catchment detention dam as a solution. Ten potential dam sites were assessed, and the 'K3A' site identified as the best option. A report by dam consultants Riley costed the dam at $17m–$20m, and a high-level cost–benefit analysis was requested.
    In 2015 a targeted rate was struck across the catchment by NRC to help finance any potential works. This was discontinued in 2017 after the dam and spillway (see below) projects were not progressed by the working group.
    In 2020 the K3A dam proposal was reconsidered for flood detention and water storage, but was deemed unfeasible following a reassessment of costs and environmental impacts.
    In 2023, working group members raised concerns about lack of flood risk mitigation in Waipapa catchment, considering the rapid growth that has occurred. Questions were raised about NRC's limited action, including the lack of detailed design for the K3A dam. A concept plan for the K3A dam was considered but deemed unaffordable for ratepayers, and the project was put on hold again. Based on previous experience, NRC engineers recently estimated that initial estimates for the dam's construction are likely significantly underestimated. Present day delivery costs including property purchase, legal and resource consenting fees could potentially reach $50M today.

21. **Kerikeri River floodway.** In 2016 an option for a spillway and floodway on the Kerikeri River was investigated, including geotechnical investigations and concept deign modelling. The floodway largely follows the flowpath across the Brownlie property (similar to the KFO proposal). Following a recalibration of the flood model using updated downstream flow data, NRC engineers found that downstream flood risk had increased unacceptably, with increases in flooding to around 30 downstream

properties. It was estimated that the costs to mitigate this risk was too high, and the project was withdrawn.

Waipapa Industrial area rezoning

22. **Context.** The PDP proposes the re-zoning of land in the Waipapa industrial area which will allow development intensification in a floodplain where flooding issues are already known and mapped. Large areas of the rezoned area are modelled to be inundated in 100-year flood events, including areas closer to the stream that are likely to experience deeper flooding, and more frequent flooding in 10-year flood events.

23. **Updated flood modelling.** New modelling by NRC completed in September 2025 shows that the proposed area for rezoning is exposed to significant flooding under 1-in-10 year (10% AEP) and 1-in-100 year (1% AEP) flood events, showing an increase in flood extents and depths from the 2008 modelling. Much of this change is due to the model better capturing the complex flood flows associated with overflows from the Kerikeri River into the Whiriwhiritoa Stream, confirming that historic flowpaths are activated during flood events.

    Modelling of a 'overdesign flood scenario' equivalent to double the flood flows from a 1% AEP event have also been modelled, showing large increases in flood extents, as would be expected. While this scenario does not relate to specific provisions in the RPS, it indicates the potential for impacts during a rare but extreme flood event.

24. **Additional model scenarios.** Modelling of potential future scenarios, including 1) maximum probable development (MPD), and 2) the proposed K3A dam, show changes in the expected extent and depths of flooding for the area.

    The MPD scenario results in a small increase in flood depths for some parts of the proposed industrial rezoning area. Areas around the vicinity of Pataka Lane shown as orange in Figure A below show increases of 5-10cm of flooding. It is worth noting that this area, currently undeveloped, is actively being infilled, as shown below in the 2025 aerial photo image taken from Google maps (Figure B).

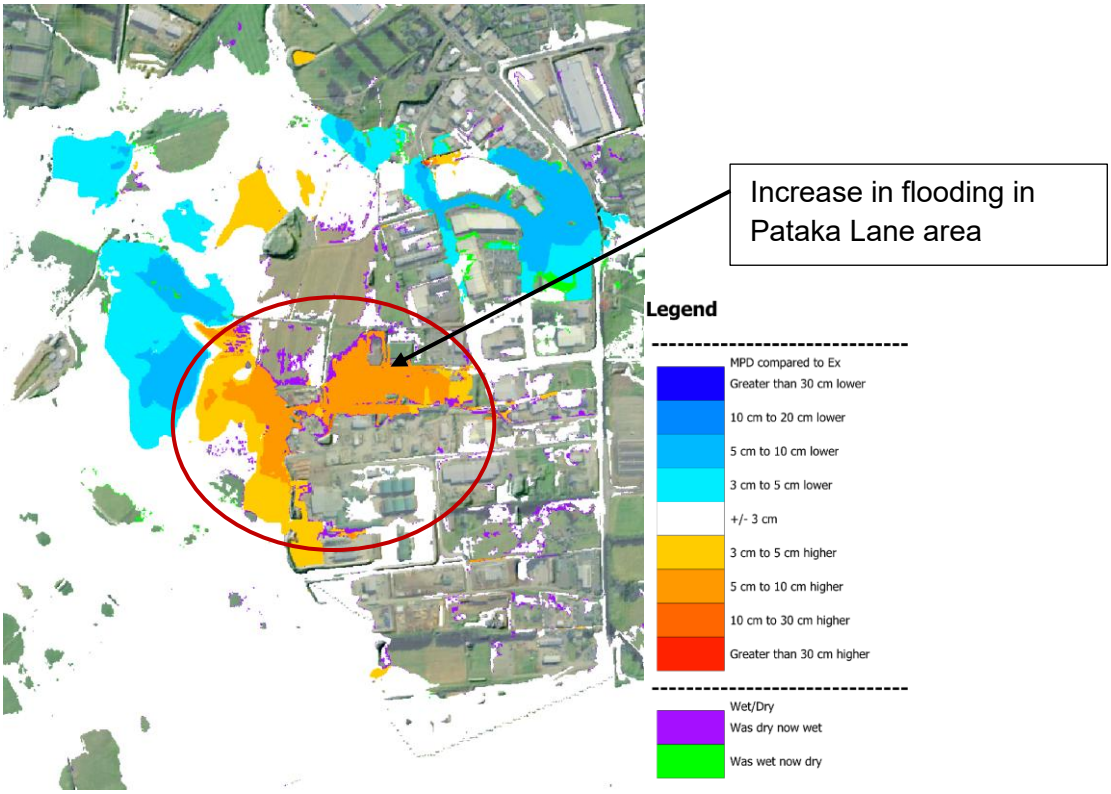

Figure A. Differences in flood extent in the Maximum Probable Development scenario (orange = increase in flood depths) Source: Water Technology 2025.

Figure B. Active infilling for sites between Pataka Lane and Kahikatearoa Lane, Waipu Industrial Estate. Source: Google Maps 2025.

The K3A dam scenario (Figure C below) shows a significant decrease in flooded area across the proposed rezoned industrial area under 10% AEP flood events, with a smaller reduction in flooded area under 1% AEP events. However the historic flowpath between the Kerikeri River and the Whiriwhiritoa Stream remains an active flowpath conveying floodwaters even with the dam operating, indicating the difficulty of mitigating flooding for this area.

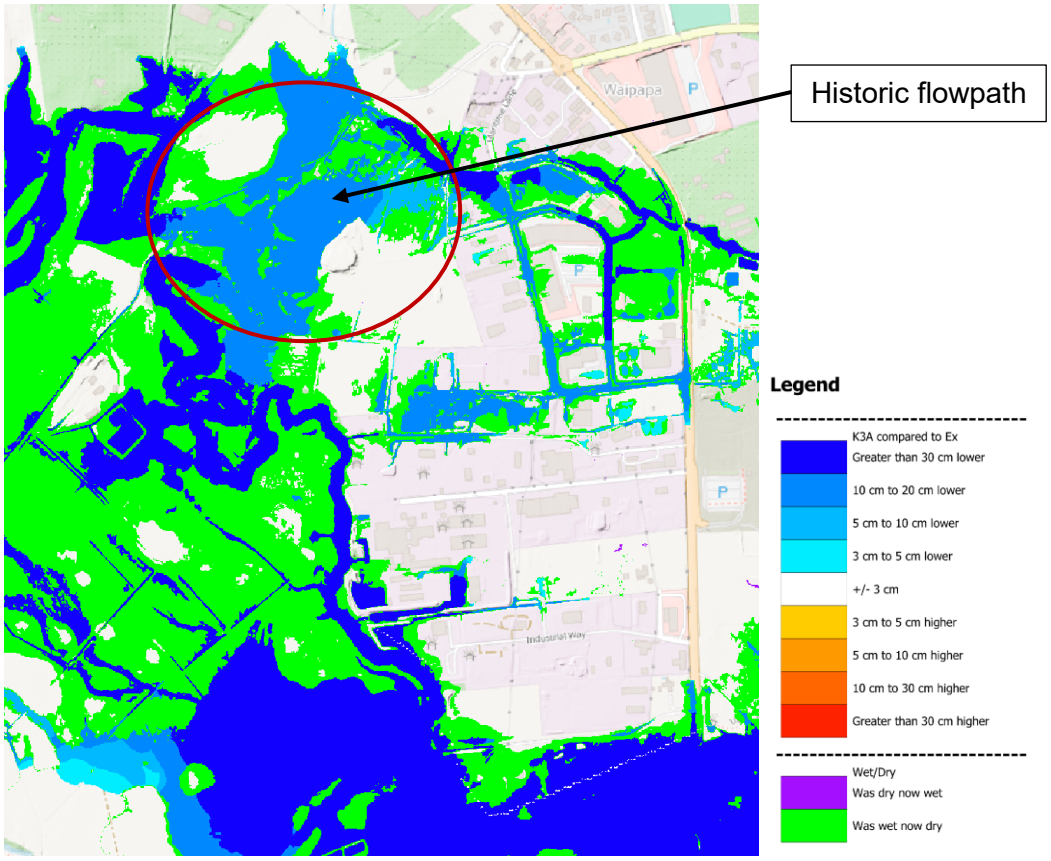

Figure C. Differences in flood extent due to the K3A dam (green = reduction in flooded extent) Source: Water Technology 2025.

A combined scenario of MPD and the K3A dam (Figure D below) show that the dam largely mitigates projected increases in flood depths shown in the previous MPD scenario (Figure A) – although flooding in the flowpath area remains.

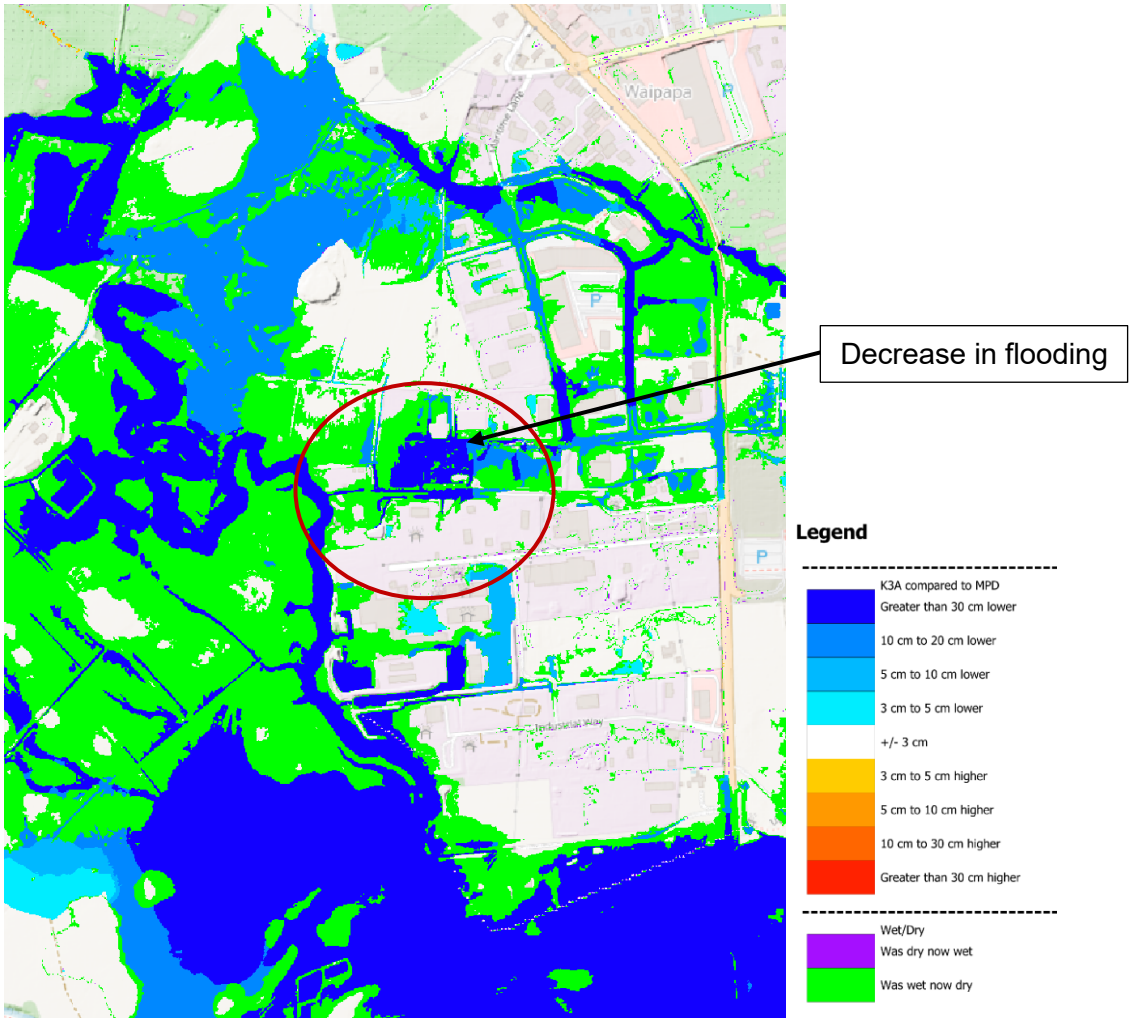

Figure D. Differences in flood extent due to combination of the K3A dam and Maximum Probable Development scenarios (green = reduction in flooded extent) Source: Water Technology 2025.

25. **Increase in risk**. The rezoning of flood-prone rural land into industrial and light industrial zoning will enable development in low-lying floodplains where regular (10-year) and infrequent but severe (100-year) flooding occurs. This conflicts with direction in the RPS Policy 7.1.2 (New subdivision and land use within 10 year and 100 year flood hazard areas) and Method 7.1.7, especially 7.1.7(6). Policy 7.1.2 (b) is particularly relevant here; built development and industrial uses of land, particularly the storage of hazardous substances, increases risk for those onsite, as well as creating a wider risk across the catchment due to risk of pollution.

26. **Risk assessment.** Method 7.1.7(6) of the RPS states that the risks of natural hazards are to be assessed prior to zoning that enables intensification of use. Risk assessments generally include an assessment of consequences, or the interaction of hazard and vulnerability. It is unclear to me that a sufficient analysis of potential increases in risk has been undertaken or communicated prior to the PDP.

27. **Floodplain infilling**. Experience shows that the building up platforms with fill to raise floor level in existing light industrial areas in Waipapa is common practice, (for example as evidenced in Fred Terry's submission). This is the rationale behind rules

in the Regional Plan that control earthworks in flood hazard areas (Permitted Activity rule C8.3.1 & controlled activity Rule C8.3.3). Such infilling of the floodplain can create downstream impacts that are difficult to assess during a consenting process, due to the incremental cumulative increase in the negative effects of floodplain infilling. Infill of the floodplain decreases available floodplain storage, resulting in an increase in flood levels. It can also lead to increased flooding of roadways and services and an increase in risks to life and personal safety during flood events.

28. **Development expectation**. While a flood hazard overlay will to some degree operate to control risk via the consenting process, rezoning can create an expectation that the newly zoned land (even that in 10-year flood zone) can be fully developed, thereby increasing risk. Rezoning flood-prone land to enable development can also create an expectation that expensive flood mitigation works over a comparatively large area are required. These works, which are likely to be catchment-scale (such as detention dams) would likely need to be funded by ratepayers across the catchment, raising equity and affordability issues.

Kiwi Fresh Orange rezoning submission

29. **Context.** Approximately 45% of the KFO site is currently exposed to flooding according to 2007 modelling. KFO's submission proposes an engineered flood management solution comprising a 120m wide engineered floodway to enable a larger proportion of the site to be used for residential housing. The design, described in the E2 Environmental report, describes floodway as "*generally follow(ing) the alignment of the existing overland flow path once it has collected floodwaters that spilled across SH10. Floodwaters which spill from the true right bank of the Kerikeri River to Brownlie land are proposed to be blocked off in favour of taking increased flows into Site from the spill over SH10. The design concept is for approximately the same flow rate to discharge from the floodway back into Kerikeri River."*
The proposal seeks to rezone the majority of land onsite to residential, other than natural open space and mixed use. The proposal also seeks to remove the existing River flood hazard zone overlay (100yr ARI event) from the PDP, to be replaced with a flood overlay that covers the floodway area as well as flood-prone areas to the north of the site. This overlay would define the land required for flood hazard management, which would be secured alongside the first development consent on the land, and ahead of any building.

30. **Updated flood modelling.** New modelling by NRC completed in September 2025 shows little change in the flooded extent from the 2008 modelling for the site. Modelling of a 'overdesign flood scenario' equivalent to double the flood flows from a 1-in-100yr event have also been modelled, showing small increases in flood extents, in line with expectations (Figure E below).

Figure E. New flood model extents for the KFO site. Orange = 2 x 1-in-100-yr; Green = 1-in-100-yr with climate change; Blue = 1-in-100-yr; Yellow = 1-in-10yr flood events. Source Water Technology 2025.

31. **Additional model scenarios.** Modelling of the proposed K3A dam shows a reduction in the expected extent and depths of flooding for the area, indicating the likely positive benefits of a potential dam for the site (Figure F below). The green areas show locations that previous model runs indicate would be flooded, but are flood-free in the model scenario that includes the K3A dam.

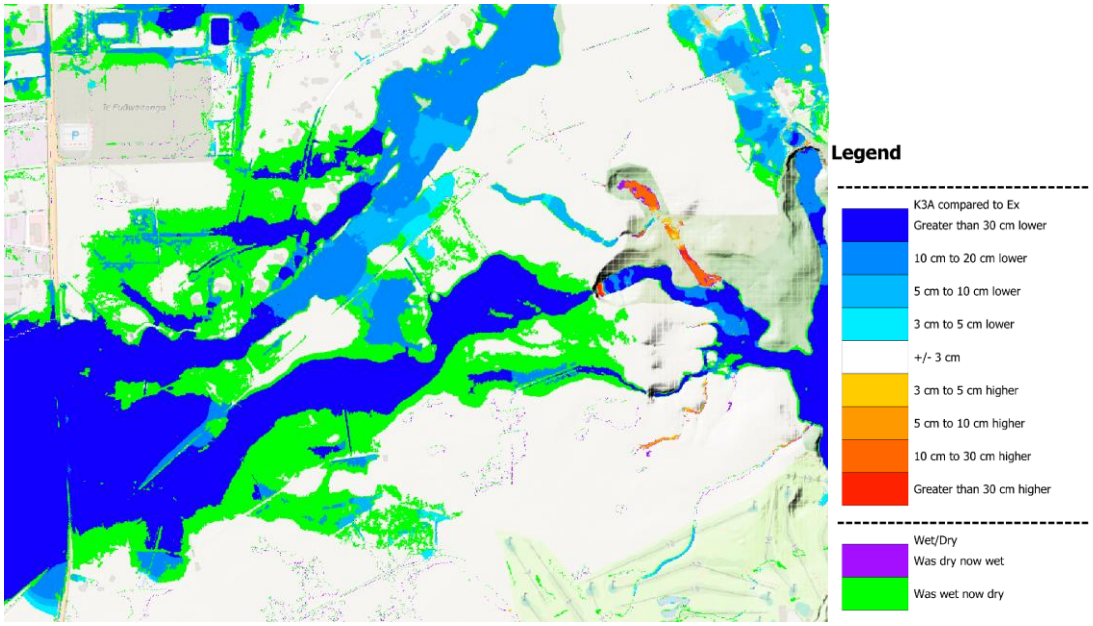

Figure F. Differences in flood extent due to the K3A dam (green = reduction in flooded extent) Source: Water Technology 2025.

32. **Comments on leading practice.** The development of floodplains using engineered protection is not aligned with leading practice in flood risk management. I concur with the evidence of Jon Rix in that the proposed use of large-scale engineered protection mechanisms to enable greenfield floodplain development at this scale is not typical of recent practice in NZ. The approach also runs counter to international principles of Integrated Flood Risk Management, where greater emphasis is placed on reconnecting floodplains and making space for rivers.

33. **Design uncertainty.** While the modelled design presented by E2 Environmental appears to be in theory possible, it is my opinion that there is insufficient evidence regarding civil and construction design provided in the KFO submission. There is potential that significant changes in the proposed concept design (such as a greater reliance on stopbanks) could be required, due to factors such as geotechnical constraints, consenting requirements, design/construction costs, and stakeholder feedback. Such design changes could affect the resulting residual risk, impacts on downstream properties and the alignment with provisions in the RPS. I believe that more detailed evidence on the practical implementation of the proposed scheme would be required to support a plan change to residential.

34. **Construction feasibility.** It remains unclear whether the floodway would be formed by excavation, bunding, or a combination. Excavation would reduce residual risk and improve drainage, though shallow bedrock may limit feasibility. Previous geotechnical testing by NRC in 2014 in the region intended for the spillway indicated a soil profile of between 1.5 and 4m before encountering basalt bedrock. Surveys indicate a range of depths to bedrock along the floodway alignment, with the lowest being 2m (LDE Geotech report). This may limit the feasibility of excavation and lead to greater reliance on bunding, increasing residual risk for future development, as well as increasing the complexity of on-site stormwater drainage. Without a more detailed

geotechnical assessment, it is difficult to assess the feasibility of the proposed design.

35. **Pluvial flooding.** While the final land and floodway bank and channel levels are yet to be confirmed, there is the potential for the floodway design to interrupt natural drainage paths allowing gravity-driven overland flows from areas on site pegged for development, causing localised ponding. While this may be able to be reconciled at the detailed design stage, pluvial flows are likely to be sensitive to floodway bank levels, in particular if channel depths are unable to be achieved resulting in greater reliance on stopbanks or bunds. Stormwater attenuation almost certainly will require additional land outside the floodway area.

36. **Extreme events.** Following Cyclone Gabrielle, many regional councils are focussed on understanding and planning for over-design events, recognising the significant personal and social harms as well as material and economic damages that can result from large, infrequent flood events. For urban flood protection assets across the country, levels of service well above 100-year flood event are currently being implemented. For example, stopbank improvements by Hawkes Bay Regional Council for residential areas in Taradale now protect against one-in-five hundred year storms. Levels of service for Te Ara Kairangi (Riverlink) in Lower Hutt are at 440-year flood events (Greater Wellington Regional Council). The Waimakariri secondary stopbanks protecting Christchurch for overdesign events are designed to withstand approximately a one in ten thousand year flood event. I believe that additional modelling to test more infrequent (i.e. more severe) flood events is needed to test the limitations of the structural intervention and sensitivity test residual risk.

37. **Residual risks.** The use of hard protection structures such as stopbanks creates the risk of overtopping and structural failure. Northland RPS (s.3.13(e), 7.2.2(b)) and Proposed Regional Plan (s.D6.1(2)(c)) only support hard protection structures for existing development, and as part of a long-term hazard management strategy. No such strategy is currently in place. The e2 report also does not model over-design events or make allowances in the design to cater for such scenarios. Recent national reviews such as the 2024 *Hawkes Bay Independent Flood Review* recommends incorporating overdesign scenarios into planning in response to the catastrophic failure of flood defences during Cyclone Gabrielle. Managing residual risk goes beyond the location and floor heights of buildings and should include access and egress, emergency access, extreme events and any future changes to hazards.

38. **Wider catchment issues.** The proposal shows a lack of alignment with catchment-wide flood risk management planning and does not contribute to flood risk reduction benefits other than those directly on-site. It is not obvious that any attempt has been made by the developer to work with NRC on aligning the proposed scheme with a broader catchment flood risk management programme. Rather, the proposals put the responsibility of managing flood risk upstream and downstream on the regional council. The proposal locks in part of the catchment to a scheme that may be poorly aligned with the broader flood risk management objectives of a catchment wide scheme. If implemented the proposed scheme may increase the pressure on councils to pursue other flood mitigation solutions to manage flooding in other areas

(for example using large scale upper catchment detention dams), increasing costs to ratepayers across the catchment. A further potential impact is the potential for development intensification and location of infrastructure (e.g. bridges, roads) on areas that are under consideration for future sites of broader catchment flood mitigation actions such as riparian benching.

39. **Offsite effects.** Given the complexity of the catchment processes, and the potential sensitivity of the model, outputs relating to upstream and downstream effects require further investigation, given the potential for disbenefits to properties outside the site. During the evaluation of possible impacts of a proposed floodway on the same site, NRC modelling indicated that downstream flood risk would likely increase for more than 30 properties as a result of a floodway. I believe that off-site effects require more thorough investigation.

40. **Transport implications.** The modelling predicts increases in flood levels and flows at SH10 during larger flood events. For 10% AEP events, a 0.4m/s increase in overtopping flow velocity is expected, raising vehicle safety concerns if SH10 is not closed. The proposed flood scheme may constrain future options to raise the SH10 to improve flood resilience. If SH10 is elevated, the KFO's mitigation design may not function as intended. NZTA should be engaged in case they have plans to mitigate flood risks at SH10. Many of the road transport access points to the site are also affected by flooding, raising concerns about access to the site during large flood events.

41. **Asset Ownership and Maintenance**: Responsibility for ownership, maintenance, and operation of mitigation assets (likely FNDC) has not been clarified. Landscaping and reinstatement costs following floods should be factored into design and resilience planning. Presumably the flood assets will be vested to the district or regional councils, to be maintained at the expense of ratepayers. If the scheme was designed as part of a catchment-wide strategy that included wider benefits this would be more appropriate.

Conclusion

42. In summary, I am of the opinion that the rezoning of flood-prone land to enable development intensification increases risk and is not consistent with provisions in the RPS. Specifically:

Waipapa Industrial estate

- Rezoning of land in Waipapa to extend the industrial estate is occurring in areas known to be flood-prone, with few options for mitigation.
- Development is likely to lead to an increase in local flooding, due to the increase in surface runoff
- The likely raising of building platforms during development, difficult to assess or control at the site-scale during the consenting process, will reduce storage in the floodplain, increasing risk elsewhere.

- While the unbuilt K3A dam has the potential to reduce flood extents, the area of the historic flowpath from the Kerikeri River to Whiriwhiritoa Stream remains flood-prone.
- Rezoning in flood-prone areas can send market signals and creates the expectation for full development.

Kiwi Fresh Orange Submission

- In light of the recent North Island Weather events, greenfields development in floodplains using engineered protection is not appropriate and out of step with current and best practice. There is the potential for significant residual risk with the proposal.
- The design of the floodway presented is not sufficiently developed to warrant the removal of the flood overlays for the site, due to uncertainties in modelling and construction feasibility that create the potential for significant and material changes in design that could affect the type and level of flood mitigation provided.
- The proposal is not aligned with catchment-wide flood management planning, and it is unclear that how the resulting scheme would be integrated and managed following vesting to councils.
- There is insufficient evidence to show how impacts on the State highway will be mitigated, and how any potential changes to the state highway may affect the functioning of the proposed floodway.
- There is the potential for significant up- and down-stream impacts to properties and the transport network that are insufficiently explored.

43. In conclusion I believe the proposed rezoning in the PDP Waipapa Industrial estate and the KFO submission increase the likelihood of maladaptation and increasing risk. Both show a lack of alignment with wider catchment flood risk planning, and have the potential to create the need for additional flood mitigations to manage risks to affected upstream and downstream properties, as well as SH10.

Matthew Steven de Boer
Thursday 18 September 2025