

Technical Memorandum – Fast-track Application

Waikanae North Development Limited Urban Subdivision Development

Date: 16 July 2026

Author and position: Charlotte Lockyer, Principal Hydrologist, SLR Consulting

Discipline/expertise: Stormwater, flooding & hydrology

Issued to: Monique Leith, Consultant Planner for Kāpiti Coast District Council

Introduction

This memo responds to a request for comment from the expert panel assessing Waikanae North Development Limited's ("WNDL") substantive application to undertake an urban subdivision development at 169-171 Peka Peka Road, Kāpiti, under the Fast-track Approvals Act 2024 (the Act).

This memo provides comments on the effects of the project on stormwater and flooding matters, insofar as they relate to potential flooding effects on adjacent properties, and stormwater and flooding concerns within the proposed development site.

The following documents were reviewed as part of this assessment:

- Appendix 7A, 7B, and 7C – Landlink. Stormwater design drawings/plans.
- Appendix 14 – Landlink, 25 March 2026. Engineering & infrastructure report.
- Appendix 16 – Landlink, 26 March 2026. Stormwater management plan.
- Appendix 17 – O'Callaghan Design Ltd, March 2026. Hydrology report.
- Appendix 20 – Awa, 16 March 2026. Flood hazard assessment of effects, v05.

Pre-lodgement feedback on the draft application

Mr Paul Busing (Stormwater and Coastal Assets Project Manager, KCDC) has been actively involved in pre-lodgement engagement with the Applicant in relation to stormwater matters.

My pre-lodgement feedback was consolidated into KCDC's response to the applicant on 13 February 2026. This was in addition to the various engagements between Mr Busing and the applicant over the preceding 12 months. The key issues raised in my feedback were:

1. The hydrological mass balance calculation was unclear and relied heavily on unsubstantiated assumptions.
2. The need to separate out water storage for water demand management (reuse) from stormwater attenuation to achieve hydraulic neutrality.
3. Concerns regarding the potential effects from flooding associated with changing the groundwater regime on upgradient and downgradient properties.
4. Clarification regarding how hydraulic neutrality rules are being applied across the drainage zones.
5. Management and maintenance requirements of stormwater infrastructure. Particular concern associated with shared detention and treatment areas being managed privately.
6. Flood hazard modelling report was not provided.

In addition to these points, it is noted that Mr Busing had raised concerns specifically associated with managing the water level within the Te Harakeke Wetland. From an ecological perspective, it had been agreed that additional inflow of treated stormwater into the wetland would be beneficial to increase soil saturation and enhance the ecological value. However, from a flooding perspective, greater inflow to the wetland has the potential to raise groundwater levels within the shallow unconfined aquifer.

Without appropriate management, this may result in adverse impacts to properties west of the development through inundation from high groundwater levels. Further, this can result in health concerns as septic tanks become inundated. There is evidence of this in 2022 when groundwater levels were particularly high and properties adjacent to Paetawa Road became inundated.

Higher groundwater levels are exacerbated by vegetation blockage of Black Drain downstream of the oxidation ponds. Council has found it difficult to obtain approval to remove vegetation build-up and maintain stream conveyance as the works will result in drainage of a natural inland wetland which triggers a non-complying activity status.

Review of application (and regulatory assessment)

Following lodgement of the application, some of the issues previously raised were addressed. However, there remained some concerns that were deemed critical. These were highlighted as needing to be addressed to demonstrate proof of concept to ensure a suitable and workable solution was viable. These are summarised below.

Critical concerns

1. The hydrology report has attempted to explain the hydrogeological environment and effects of raising the groundwater level. However, this has not been prepared by a suitably qualified and experienced person in wetland hydrology, hydrogeology or geologist. The report is unclear and the conclusion of effects is not well supported by the assessment. A robust analysis, including development of a groundwater model, is recommended for a development of this scale, to assess the effects. In addition, qualitative statements are not supported by quantitative analysis or assessment.
2. What control measures are proposed to prevent Te Harakeke Wetland receiving too much water from stormwater discharges and groundwater inflow, which may then

inundate properties to the west of the site. KCDC has limited ability to manage wetland water levels due to NPS-Freshwater and GWRC's NRP regulations.

Sea level rise associated with the effects of climate change is also expected to raise groundwater levels and exacerbate the flood hazard.

Based on the hydraulic gradient information presented, higher water levels in the eastern area may also increase the water level within the Te Harakeke Wetland, and result in the same outcome.

3. The Flood Hazard Assessment of Effects report presents flooding results based on hydraulic modelling of the catchment. A key assumption in this modelling is that the proposed development is hydraulically neutral, meaning that increases in runoff from additional impervious surfaces are not reflected in the flood model. To achieve hydraulic neutrality, runoff from many catchments is assumed to discharge to treatment and detention areas.

However, during significant flood events, these treatment/detention areas are likely to be at capacity. In the flood model, many are modelled as being inundated, as they have been used to provide compensatory storage for the loss of floodplain area. This creates a conflict: during a flood event, the treatment/detention areas cannot simultaneously provide stormwater attenuation (because they are already full) and compensatory flood storage (because they are already inundated).

4. High concern around whether the treatment/detention areas (including the main eastern detention basin) will be adequately maintained over the asset's design life if they are in private ownership. No clear ownership, financial management, maintenance and renewal framework has been put forward. Without adequate ownership and operation, these devices will not function as intended and may result in adverse effects in terms of both water quality treatment and water quantity storage attenuation.
5. There is insufficient detail presented regarding the sizing and location of the piped stormwater network. The Stormwater Management Plan has determined the stormwater runoff under pre- and post-development conditions using a representative 1-hectare catchment. However, sizing of a pipe network needs to be cumulative as stormwater flows downstream from the intake to the outlet, receiving additional inflows along the way. Also, the location of the piped network is not presented. Given the high groundwater levels within the eastern low-lying area of the catchment, there is a risk that there will be insufficient cover between the network and the road, and insufficient clearance between the required pipe invert level and the groundwater level.

Further to this critical list, high, medium and low concerns were also raised. The high concerns are summarised below. Medium and low concerns are not reproduced as it is expected that a suitable resolution can be obtained through the detailed design phase.

High concerns

6. It is acknowledged that the Flood Hazard modelling ran a scenario assuming 50% blockage of the downstream control structure culverts. It is conceivable that in a large event, 100% blockage could occur. Modelling should include a 100% blocked scenario to confirm the flood hazard is acceptable.

7. The modelled inundation depth across design events as frequent as the 1 in 2-year, is significant in proposed treatment/attenuation areas (based on the map legend, possibly up to 0.5m). What safety measures will be employed to ensure these areas remain safe to people, particularly small children, from drowning.
8. The 1 in 100-year flood modelling results suggest the inundation depth across some roads may exceed KCDC's LDMR rules which limit inundation depth to a maximum of 200mm. Within the same model results, the inundation depth on private properties may exceed KCDC's LDMR rules which limit inundation depth to a maximum of 300mm.
9. Minimum building floor levels across flood hazard areas should be explicitly noted.
10. The SMP is unclear and the assessment of effects is heavily reliant on the assumptions of the hydrology/hydrogeology and flood hazard assessments, both of which have 'critical' issues being raised. Being unclear may lend itself to different interpretation during detailed design. For example,
 - a) Figure 5-1 (SW-400) outlines the catchment scale approach to stormwater management. It refers to the purple area as being 'not hydraulically neutral'. However, Figure 5-2 (SW-401) which presents the stormwater management approach at a lot-scale, and these same areas are identified as 'attenuated/treated areas' with runoff managed at the lot level to achieve hydraulic neutrality. It is unclear how both strategies can apply.
 - b) Section 5.4 - what is a 'macro' flow?
 - c) Typographical error referring to the development as 70% pervious and 30% impervious.
11. The Awa report titled Stormwater Impact Assessment and macro stormwater modelling, has not been provided.

In addition to the above, Mr Busing has identified four additional key issues for Council as follows:

- A. While Section 9.2 provides some loose details around what is intended to be vested in Council and what will be retained in public ownership, it is very important to have a clear understanding at the consenting stage what the proposed vesting and long-term maintenance arrangements and responsibilities are proposed to be. Suitable alternatives will need to be found if the proposed arrangements are inadequate or untenable for Council. Therefore, more detailed information is needed as part of the application assessment stage around the assets (including land) that are proposed to be vested. To this end, Council's comments are limited without having a clear understanding about what assets are proposed to be vested and any alternative proposed long-term maintenance arrangements.
- B. Infrastructure report (page 33) notes that there is a loss of flood plain storage by 6.4% in Q100 between Phase 1 and 2. The works should not be staged if that increases the risk of flooding within the catchment during construction. There are no guarantees that additional stages would progress and therefore there would be a risk to the community should the development fail during this time.
- C. Confirmation is required regarding the easement on 55 End Farm Road which provides the appropriate protection in regard to the long-term maintenance of the

Ngarara Stream. This easement will be needed by whichever party takes over the maintenance in the long-term. It is currently in favour of the Applicant.

- D. The existing and new stream channels need to make allowance for long term maintenance requirements. Adequate maintenance access and widths need to be preserved along at least one side of the streams to allow for the necessary long-term maintenance to occur. In many cases, this would require enough space for excavator access. This is a matter that can be confirmed by detailed plans at the detailed engineering design stage, however it is important to recognise this requirement in the consent.

Other matters raised by Mr Busing, such as the need to have flexibility over the specific materials and stormwater devices installed for cost-benefit purposes, have been discussed with the Applicant as part of post-lodgement engagements and will be commented on with respect to the proposed consent conditions.

Post-lodgement work with the applicant

On 7 July 2026, representatives of Council and the Applicant met to discuss the matters raised above. Through these discussions, a number of the concerns have been addressed or partially addressed. These are outlined below.

Concern 3 – Interaction between flood modelling and stormwater modelling

The applicant acknowledged that the flood modelling and stormwater modelling were undertaken independently, and that the concern raised regarding the interaction between the two modelling approaches was valid. Both models required numerous iterations throughout the design process and were progressed separately to facilitate timely development of the civil design.

Subsequent review has included a comparison of the flood inundation volumes with the stormwater runoff volumes stored within the proposed treatment, detention and ponding areas. This assessment concluded that the additional inundation resulting from the concurrent operation of the stormwater management system during flood events is relatively minor. Flood levels within these areas are estimated to increase by up to approximately 60 mm.

Based on the information provided, this matter appears capable of being addressed through detailed design. This should include confirmation that outlet control structures, weir levels and earthworks are configured to ensure the treatment and detention systems function as intended while minimising any increase in flood hazard to people and property.

Concern 4 – Ownership and maintenance of stormwater assets

Through ongoing discussions between the applicant and Council, it has been agreed in principle that shared stormwater assets will be vested in Council, subject to review of the final engineering design and consent conditions.

Council has emphasised the importance of ensuring that these assets are designed as low-maintenance systems with appropriate maintenance access. Examples include the provision of forebays to treatment ponds, excavator access to channels, and vegetation management

approaches that avoid dense growth and debris accumulation that may reduce hydraulic conveyance or increase blockage of waterways and control structures.

An outstanding matter remains regarding the need for the Stormwater Management Plan to clearly articulate design objectives that minimise long-term maintenance requirements. In addition, any final consent conditions relevant to stormwater maintenance will be reviewed by Council to ensure they are practical, enforceable and consistent with Council's existing approach to stream and stormwater asset maintenance, including the framework established under Council's Global Maintenance for Stormwater consent application.

Concern 5 – Stormwater network design

The applicant has advised that the detailed engineering design will be undertaken in accordance with Council's Land Development Minimum Requirements (LDMR). Compliance with these requirements should ensure that minimum pipe sizing, grades, cover depths and other engineering standards are achieved.

The applicant also noted that parts of the development site are proposed to be raised by approximately 1.5m, which is expected to provide adequate separation between the stormwater network and groundwater levels.

An outstanding matter remains in relation to demonstrating the feasibility of the proposed piped stormwater network. During discussions, the applicant offered to provide an indicative stormwater network layout to demonstrate that a practicable design solution can be achieved across the site. Review of this information would provide greater confidence that suitable pipe grades, cover depths and groundwater clearances can be achieved, particularly within the low-lying eastern portions of the development area.

Concern 6 – Culvert blockage scenario

The applicant considers that modelling a 100% blockage scenario is unnecessarily conservative given the characteristics of the site and catchment. Following discussion, I accept that a complete blockage is unlikely due to the flat grades and low flow velocities through the development, as well as the absence of large vegetation that could generate substantial debris.

Debris originating from upstream catchments is also considered unlikely to significantly affect the site, as the culverts beneath SH1 and Main Road would be expected to intercept much of the sediment and larger debris before it reaches the development.

The request for a 100% blockage scenario was primarily intended to assess residual flood risk under extreme conditions. However, it is understood that the applicant has considered residual risk through other aspects of the design and flood assessment. On balance, I am satisfied that the omission of a 100% blockage modelling scenario does not represent a significant outstanding concern.

Concern 7 – Safety of treatment and detention areas

The safety of treatment and detention areas will be considered during the detailed design phase and reviewed through Council's engineering approval process. This should confirm that the design appropriately manages risks associated with inundation depth, side slopes, and public access. On this basis, I do not consider this to be a significant outstanding concern.

Concern 8 – Flood depths on roads and private property

The applicant has confirmed that the final engineering design will comply with Council's LDMR. Accordingly, inundation depths on roads are expected to remain below the LDMR limit of 200 mm, and inundation depths on private property are expected to remain below the 300 mm limit.

The development does not propose the use of roads as stormwater flow paths during the 1% AEP event. However, under larger events and model sensitivity scenarios, some minor inundation of the road may occur. Based on the information provided, this does not appear inconsistent with the intended function of the roading network and is not considered to be a significant outstanding concern.

Outstanding matters

I consider the following matters to remain outstanding.

Concern 1 – Groundwater and wetland response

While additional background information was provided during discussions with the applicant, there remains uncertainty regarding the hydrogeological response of the site and surrounding area to the proposed development.

The applicant stated that there is limited groundwater data available to inform the assessment. As a result, the conclusions presented in the hydrology assessment are based largely on expected groundwater behaviour rather than site-specific monitoring data or quantitative groundwater modelling. Consequently, there remains uncertainty regarding how groundwater levels and flow paths may respond to the proposed changes in landform, stormwater management and wetland hydrology.

Concern 2 – Effects on Te Harakeke Wetland and adjacent properties

The applicant advised that seasonal variations in Te Harakeke Wetland water levels are likely to be greater than any changes resulting from additional stormwater inputs associated with the development. The applicant also considers that elevated groundwater levels affecting properties west of the development are primarily attributable to reduced conveyance within Black Drain rather than the proposed development.

While I accept that wetland water levels are naturally variable and are strongly influenced by downstream drainage conditions, Council's concern is that the development should not exacerbate an existing problem. The groundwater monitoring period presented by the applicant is relatively short and does not adequately capture the full range of inter-annual groundwater variability, including wetter years.

The applicant has proposed an adaptive management approach whereby additional monitoring data would be collected prior to development of the western zone. This would potentially provide a further 5–6 years of groundwater and wetland monitoring data and allow the proposed design to be reviewed and refined, if necessary, during the subsequent engineering approval process.

While this approach is beneficial and may reduce uncertainty over time, it does not fully resolve the concerns identified above. Accordingly, some residual uncertainty remains

regarding the long-term groundwater and wetland response and the potential effects on adjacent properties.

Concern 9 – Minimum building floor levels

Council's preference is for minimum building floor levels to be explicitly defined through the consenting process, rather than through building consent / engineering approval. This provides certainty for both Council and future landowners and helps prevent subsequent earthworks or site modifications that could alter overland flow paths, reduce flood storage, or otherwise increase flood hazard on neighbouring properties. Accordingly, this matter should be addressed through appropriate consent conditions.

Concern 10 – Clarity of SMP

The matter remains unresolved. While some clarity may be provided through consent conditions, other matters may depend on the SMP for direction.

Concern 11 – Stormwater Impact Assessment report and macro stormwater modelling

The matter remains unresolved. The Awa report has not been provided.

The outstanding matters identified under Concerns 4 and 5 are reiterated here for completeness. These relate to:

- review of the Stormwater Management Plan and proposed consent conditions to ensure the long-term maintenance, operation and renewal obligations for stormwater assets vested in Council are clearly defined, practical and consistent with Council's maintenance approach; and
- review of the applicant's indicative stormwater network concept design to confirm that a feasible solution can be achieved across the site.

These matters are considered capable of being resolved through further review.

Proposed conditions

Feedback will be provided on the proposed consent conditions when the updated set is received, as per Minute 1 from the Expert Panel.

Other matters (if relevant)

There are no other matters to note.