Memo

To:	Damien McGahan – Aurecon		
From:	Iain Smith – Beca	**Date:**	9 September 2025
Subject:	Private Plan Change 17 – Te Rapa North Industrial – Technical Specialist Memorandum for Section 42A Reporting		
Technical Area:	Stormwater		
Version:	Final		

Purpose

1. This memorandum has been prepared to provide technical assessment under Section 42A of the Resource Management Act 1991 (RMA), in respect of stormwater in relation to the Private Plan Change 17 – Te Rapa North Industrial (PPC17).

Introduction

2. My name is Iain Smith. I am a Stormwater Technical Director with Beca. I hold a Bachelor of Engineering from the University of Canterbury. I am a Chartered Engineer and a member of Engineering New Zealand and Water New Zealand.

3. I have over 23 years professional engineering experience in stormwater infrastructure and flood hazard assessments. I specialise in leading stormwater, rivers and flood related assessments and infrastructure design projects. My relevant project experience includes:

    a. Reviewing land development resource consent applications for Waikato District Council (WDC) and Hamilton City Council (HCC) including presenting stormwater evidence at a Council planning hearing.

    b. Flood hazard modelling, or peer reviewing flood hazard modelling, covering most of Hamilton city.

    c. Providing HCC with expert stormwater advice for the Te Rapa Racecourse Private Plan Change (PPC13) including presenting evidence at the plan change hearing.

    d. Leading the stormwater design for HCC's Rotokauri Strategic Infrastructure designation, the hearing for which is scheduled for October 2025.

    e. Providing stormwater technical assessments to support HCC's Te Rapa North Integrated Catchment Management Plan (ICMP). I authored the Stormwater Management Devices technical report and the Stream Erosion Measures assessment that are Appendices to the ICMP. I also reviewed the flood modelling report and contributed to the Receiving Environment report. The latter included a walkover inspection of the Te Rapa stream doing a rapid geomorphic erosion assessment.

Code of Conduct

4. I have read the Environment Court Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023 and agree to comply with it. I confirm that the opinions expressed in this memorandum are within my area of expertise except where I state that I have relied on the advice of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

Scope

5. This memorandum covers the following:

    a. Consideration of the stormwater aspects of the lodged PPC17 Request (PPC17 or the request) and PPC17 Supplementary Information Report (Supplementary Report), received in August 2025, and whether the proposed stormwater management practices will be acceptable.

    b. A technical assessment of the proposed stormwater management, infrastructure and related proposed PPC17.

    c. Relevant matters raised, and relief sought, in submissions.

    d. Recommended amendments to PPC17.

Executive Summary

6. This memorandum provides a technical assessment under section 42A of the Resource Management Act, focusing on stormwater aspects related to PPC17.

7. The stormwater management proposed by the PPC17 is documented in the Infrastructure and Supplementary reports. I have reviewed these reports using HCC's ICMP as a key reference document.

8. I have found there remain gaps and issues that in my opinion need be addressed before I can conclude that the proposed stormwater management is appropriate.

9. These gaps relate to aligning with HCC's ICMP; inclusion of stream erosion resilience works; providing clarification on various aspects of the proposed stormwater management; addressing stormwater integration with areas outside of the PPC17 area; inclusion of a provision for an Infrastructure Plan and inclusion of the stream erosion resilience works in PPC17's staging provision.

10. Addressing these gaps should be documented by providing an updated Infrastructure report.

11. Further, I also consider a provision is needed in PPC17 for an Infrastructure Plan to address the implementation complexities involving the multiple parties and Councils to deliver the strategic stormwater infrastructure.

Documents Considered

12. The following documents have been considered in the preparation of this assessment:

    a. *Te Rapa Private Plan Change 17 Request* (the request):

i. *Te Rapa Private Plan Change Request*, *Harrison Grierson, December 2024.*

ii. *Appendix 06 – Infrastructure Assessment, Harrison Grierson, December 2024* (referred to in the below as the "Infrastructure report").

iii. *Appendix 09 – Illustrative Masterplan* (referred to in the below as the "Masterplan").

iv. *Appendix 10 – Te Rapa North Structure Plan* (referred to in the below as the "Structure Plan").

b. The draft *Te Rapa North ICMP, HCC, May 2025* (referred to in the below as the "ICMP") and the following supporting technical reports:

i. Te Rapa North ICMP Stormwater Management Devices Report, Rev F, 2024, Beca

ii. Te Rapa North ICMP – Stream Erosion Protection Measures, Rev G, 2024, Beca

iii. Receiving Environment Report – Te Rapa ICMP, Rev 3, 2021, Beca

iv. *Te Rapa North ICMP Model Build Report, Rev E, 2021, Beca.*

c. The Submissions listed in Table 1.

Table 1 Submissions that raise stormwater matters

Number	Submitter
7	Empire Corporation and Porter Group
8	Graeme Boddy
9	Hayden Porter
10	Waikato District Council
13	Waikato Regional Council
14	Horotiu Farms Limited and Te Awa Lakes Unincorporated Joint Venture Limited
16	Rachel Caroline McGuire and Stephen Wayne Morth (Morth Trust Partnership)

d. Summary of Submissions, HCC, June 2025.

e. The Further Submissions listed in Table 2.

Table 2 Further Submissions that raise stormwater matters

Number	Submitter
FS03.03	First Gas

f. *Private Plan Change 17 - Fonterra Te Rapa North: Strategic Stormwater Servicing*, *HCC, July 2025 (*referred to in the below as the "Strategic Stormwater Servicing Memo"). Refer Attachment 1.

g. *Private Plan Change 17 Supplementary Information, Harrison Grierson, August 2025.* (referred to in the below as the "Supplementary report").

Site Visit

13. In November 2019, as part of the ICMP work for HCC, I walked over all the watercourses in the ICMP area including those in the PPC17 area. This included the Te Rapa Stream from Ruffell Road to its confluence with the Waikato River.

Analysis

Introduction

14. HCC has prepared an ICMP to identify the stormwater outcomes for the catchment and how stormwater will be managed within the catchment to achieve these in an integrated way. Therefore, the ICMP forms the basis against which the stormwater management proposed under PPC17 is assessed. The ICMP is currently under consultation before being finalised.

15. PPC17's Infrastructure report details the stormwater management, approaches and infrastructure features proposed as part of PPC17. Stormwater features also show on the Structure Plan and the Illustrative Masterplan.

16. Several of the proposed approaches and infrastructure features do reflect HCC's ICMP. However, in my opinion there are several gaps that need to be addressed as part of the PPC17 process. Broadly, these relate to:

    a. how the proposed stormwater management will conform with HCC's ICMP,

    b. how stormwater management will integrate with surrounding land (with various aspects relating to overland flow paths, stormwater quality and stormwater quantity controls), and

    c. how stream erosion resilience works in the Te Rapa Stream will be addressed.

17. The most significant gaps were raised in a joint HCC/Fonterra preliminary technical meeting on the 12 May 2025 and principally relate to the preferred means of mitigating the effect of increased stormwater volume on the Te Rapa stream.

18. All of the gaps in the Infrastructure report were then discussed in detail at a stormwater technical meeting on the 27 May 2025 with Fonterra's stormwater Subject Matter Expert (SME), Mr Scott King of Harrison Grierson. HCC's ICMP author Mr Ari Craven was also present. A schedule of the gaps was provided to Mr King and I noted that these issues should be addressed in a revised Infrastructure report.

19. A Supplementary report was submitted on 21 August 2025 which included additional information on stormwater. It addressed some of the stormwater gaps; proposed amended PPC17 provisions; and provided some information on development staging.

20. However, many gaps remain unaddressed, and some new issues have been identified from the Supplementary report. These are all discussed in further detail in the below sections. At the time of writing this memorandum, a response to all issues raised in the SME meeting on the 27 May is yet to be provided.

21. In parallel with my technical review and in response to the preliminary meetings with HCC, a Strategic Stormwater Memorandum was prepared and issued by HCC and is included in Appendix 1. This sets out how the stream erosion resilience works issue should be addressed

and outlines steps for Fonterra and HCC to take, including providing additional information and provision of a detailed implementation strategy.

Gaps in the Infrastructure and Supplementary Reports

22. For the purpose of this report, I have adopted the same area names used by the proposed PPC17 (as shown in Figure 1), namely:

    a. West block – being the land either side of the Te Rapa Stream between Onion and Te Rapa Roads

    b. North block – being the land north of the Te Rapa diary factory and east of Te Rapa Road.

    c. South East block – being the land south of the Te Rapa diary factory and east of Te Rapa Road.

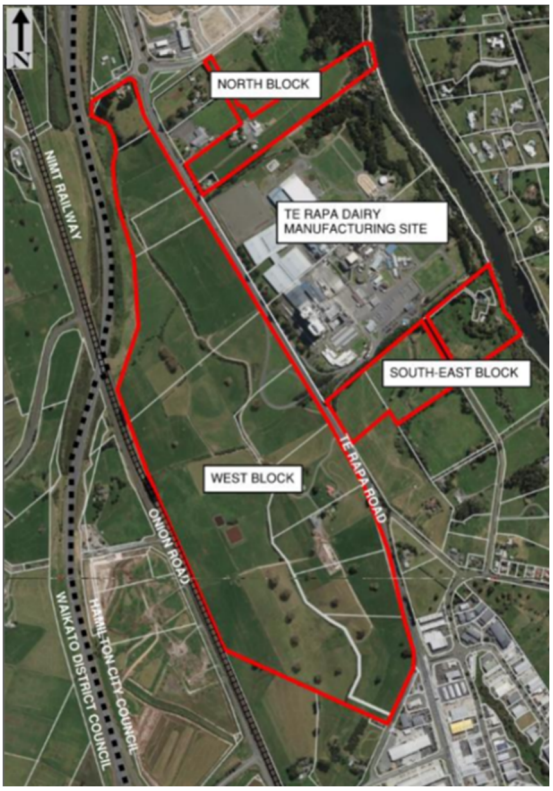


Figure 1 – PPC17 areas (Infrastructure Assessment, Harrison Grierson, 2025, HCC).

23. The gaps in the Infrastructure report provided to Mr King during the 27 May 2025 SME meeting are included and assessed in detail in the table included in Appendix 2. Where additional information has been provided by the Supplementary report, I have included comments incorporating my assessment of this information in this table.

24. In the following sections I summarise the most significant of the gaps and issues from this table that I consider are outstanding and need to be addressed.

25. It was noted at the SME meeting (27 May 2025) that most of the gaps could be addressed by including additional commentary in a revised Infrastructure report. However, some of the more significant issues, such as the preferred option for stream erosion resilience works,

would need more detailed supporting information to be provided. The Supplementary Report addresses about half of the original gaps and the balance remain outstanding.

Alignment with the ICMP

26. The Infrastructure report states the PPC17 stormwater outcomes will need to comply with the ICMP and the Supplementary report notes "*the approach is consistent with ICMP expectations*".

27. An assessment of the PPC17 against the means of compliance contained in the ICMP has not been provided in either report. However, if the gaps identified in this report are addressed, then I would consider the PPC17 to be in accordance with the ICMP.

28. Until this is done, I cannot confirm consistency of the PPC17 with the ICMP. For example, the stream erosion resilience works are not yet included in the amended PPC17 provisions therefore, the PPC17 is not consistent with the ICMP in this area.

29. I note that under proposed provision 3.9.3.3 Strategic Three Waters Infrastructure, there is also no mention of the ICMP. Given the significance of this document to stormwater management I would expect this to be referenced.

30. I recommend that compliance with the ICMP should be a requirement of development and so should be included in the PPC17 provisions. This could be a standalone provision under 3.9.3.3. or as part of a provision for an Infrastructure Plan under 3.3.9.4.

31. However, it is noted that the amended provisions submitted under the Supplementary report removed the requirement for an Infrastructure Plan. I discuss the Plan issue in more detail below.

Stream Erosion Resilience Works

32. The ICMP identifies stream erosion resilience works as a significant issue and is a key constraint to be addressed to facilitate land development.

33. The stream erosion issue primarily relates to reaches downstream of SH1 with the worst areas being just upstream of the Waikato River. Figure 2 below shows the Te Rapa Stream catchment and stream reaches colour coded by channel stability (red being unstable through to green being stable). This information is taken from the ICMP's Receiving Environment report.

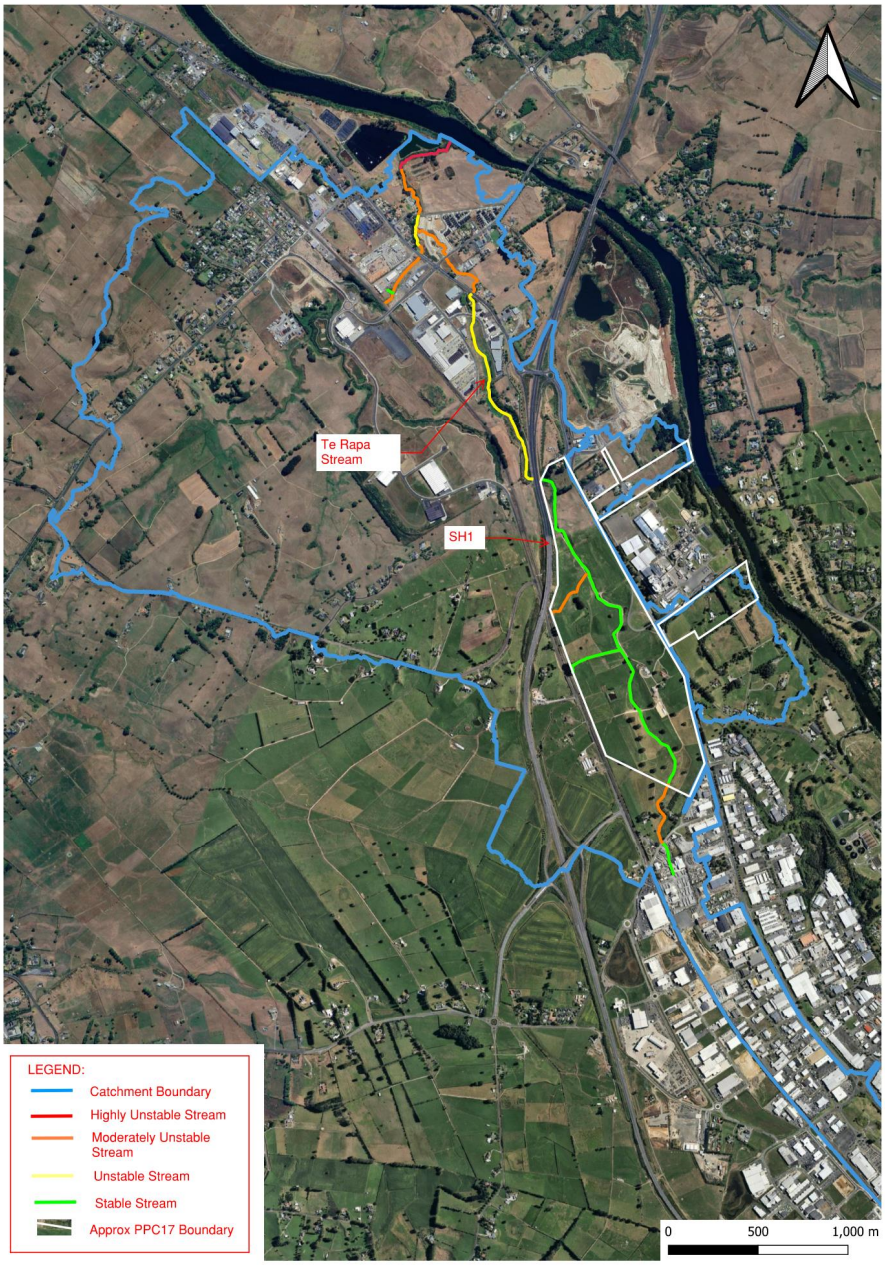


Figure 2 – Te Rapa Stream stability. The stream channel stability classification from the ICMP is shown by the green/yellow/orange/red lines (Te Rapa ICMP, 2025, HCC).

34. The PPC17 documentation does not fully address the impacts of development on erosion in the Te Rapa stream downstream of the PPC17 land. The Supplementary report acknowledges the stream erosion issue needs to be addressed but these works are excluded from the provisions of the PPC17.

35. These works are also not included in the proposed staging set out in Section 3.9.3.3 of the Amended Provisions proposed under the Supplementary report. The report does not address when the stream works need to be implemented (i.e. staging) and maintains that wetlands will be sufficient to manage stormwater quantity in the interim. It notes "*this ensures that stormwater can be managed in a way that is robust, coordinated with wider catchment planning, and responsive to the timing of development within the TRNIZ*".

36. I do not consider that excluding works as significant as the stream erosion works from the staging information is robust nor therefore, does the proposed PPC17 currently coordinate it with wider catchment planning for the zone.

37. I also note that Submission 13 from the Waikato Regional Council specifically raises this issue (refer item 88 below) and that this issue needs to be addressed by the PPC17.

38. Development will increase the volume of stormwater being discharged into the Te Rapa stream. The attenuation and extended detention proposed under the Infrastructure report primarily addresses how flows are discharged but not the overall increase in volume which is also a primary driver of stream erosion. It acts to extend the duration of moderate flow rates being discharged and can result in streams experiencing prolonged exposure to flow rates above the erosion threshold.

39. HCC's practice is to apply extended detention in combination with a range of mitigation measures: on-lot soakage; retention and reuse; attenuation; and in-stream channel protection/resilience works (often with financial contributions made to HCC if implementation is on private property downstream.

40. The bulk of the stream resilience works will be downstream of HCC's jurisdiction within Waikato District Council's jurisdiction. Within the PPC17 area itself, stream erosion impacts are less critical than downstream with the existing Te Rapa stream channel being much less incised and relatively stable.

41. The ICMP proposes two options for addressing this issue either:

    a. stream resilience works along the full length of the Te Rapa Stream (with the more significant interventions in the downstream most reach near the Waikato River); or

    b. constructing a bypass pipe from the West block to the Waikato River that will divert increased flow away from the sensitive areas downstream (it is still coupled with limited stream works downstream).

42. Both options have significant complexities and challenges, but the ICMP preferred the pipe bypass option as it large sat within HCC's jurisdiction and so, more within HCC's control to implement. However, both are feasible solutions and the formation of IAWAI (the Council Controlled Organisation across WDC and HCC) helps to relieve the jurisdiction issue.

43. The proposed PPC17 proposes the stream resilience works option based on their assessment outlined in the Supplementary report. Further information to supporting this preference was requested but, other than restating the highlevel reasons, this has not yet been provided.

44. However, HCC is supportive of the stream works option provided that an acceptable implementation strategy and funding arrangement can be agreed. The importance of an Infrastructure Plan in the PPC17 provisions is therefore a key issue.

45. Given the location of the works is largely within the Waikato District, and development within the Waikato District also contributes to stream erosion, then it is critical that the Waikato District Council and the Waikato Regional Council be involved in agreeing to the implementation strategy. It is likely that these organisations will also need to contribute funding of the works.

Staging of the Stream Erosion Resilience Works

46. Critical to the implementation of the stream resilience works will be its staging with development. This work is not currently included in the staging proposed in the amended provisions submitted under the Supplementary report. Specifically, 3.9.3.3 only includes stormwater wetlands within the development and excludes the downstream stream resilience works.

47. In my opinion the stream resilience works will need to be implemented in a staged manner alongside development to avoid worsening erosion and impacting on adjacent land and infrastructure. While it is not likely to be practical to implement all the works before development occurs, nor is it appropriate to allow all the development to occur in advance of the works. I envisage staging the stream works alongside the development and carrying out the downstream most reaches in parallel with or closely following, the first stage of development in PPC17. From there the stream works would progress from downstream to upstream in step with each subsequent development stage.

48. Based on the above I have set out an indicative staging plan for the stream works in Appendix 3. This is based on coarse analysis and with reference to the Transportation staging set out in provision 3.9.3.2 of the Supplementary report.

49. This approach would first address those parts of the stream that are the most vulnerable to increased scour and the where the consequences of significant scour are the greatest, both on existing infrastructure and the environment.

50. The North and South East blocks are not reliant of the Te Rapa stream works and can be developed independently once resource consents for each river outlet is obtained.

51. I note that the staging information provided in the Supplementary report (provisions 3.9.3.2 and 3.9.3.3) is unclear and the two provisions addressing Transportation and Three Waters staging do not appear to align. Further detail on staging is therefore needed.

52. I also note that delivery and implementation of the stream works will involve multiple key stakeholders, several private landholders and different parties contributing funding to the works. Therefore, careful, coordinated implementation will be needed. This is also the conclusion of the Strategic Stormwater Servicing Memo. This can be done as part of an Infrastructure Plan provision discussed in items 72 to 77 below.

53. I recommend that:

    a. The additional assessment information for the stream resilience works option be provided as part of an updated Infrastructure report.

    b. The requirement for an Infrastructure Plan, including the stream resilience works, be reinstated as a provision of PPC17. This should include identification of the works; a plan for its implementation; staging; and funding arrangements.

    c. The stream erosion resilience works be included in the staging provisions (3.9.3.3).

Overland Flow Paths

54. The Supplementary report provides discussion on overland flow path management. It notes that development in the PPC17 area will be designed not to cause adverse effect on upstream land and will accommodate upstream flows that currently drain onto and through PPC17 land.

This is then qualified with "*when being developed (as per design requirements), stormwater management required within those upstream sub-catchments (such as at-source water quality treatment, flow attenuation etc) is undertaken within those areas, prior to stormwater discharging into the plan change area*".

55. Effects should not be caused on any land whether upstream or downstream of a rerouted overland flow path. I also note that on-lot water quality devices are not significant to managing overland flow in extreme storms which cause overland flow and so this element is not relevant.

56. Further, it is not practical to apply the 100 year attenuation requirement to all areas draining onto PPC17 land and the ICMP does not require this.

57. The ICMP does not require attenuation of 100 year storm flows originating from the existing, developed land upstream of Ruffell Rd due to spatial constraints and flooding there is confined to the road corridor. The ICMP has attenuation of these flows occurring as part of the wider stream corridor flood management within the Western block, not upstream of it. Runoff from storms up to the 10 year storm will still be attenuated.

58. Similarly, 100 year storm attenuation is not required for development upstream of the North and South East blocks as there is no downstream flood issue that needs addressing. Therefore, drainage, overland flow paths and outlets to the river in these blocks need only be designed for full, unattenuated development flows. This will be needed to present an integrated network for the full catchment and not result in delivering fragmented solutions and more stormwater management devices to HCC than envisaged by the ICMP.

59. Requiring this could also result in HCC inheriting additional stormwater attenuation devices than the ICMP envisaged.

60. Therefore, I recommend that the Infrastructure report be updated to acknowledge that attenuation of future flows shall be in accordance with the ICMP and this also be included as part of identifying critical infrastructure in the Infrastructure Plan provision.

Water Quality Treatment of Land Upstream of PPC17 Extents

61. The ICMP sets out conceptual layout of treatment wetlands for the West block and the catchments these serve. The ICMP is fundamentally based on providing subcatchment scale wetlands to minimise the number of devices HCC will inherit and avoid the fragmentation of stormwater networks. These do not necessarily adhere to land ownership boundaries or the PPC17 boundary.

62. One such area noted in my original review was the "triangle" area of land upstream of the PPC17 boundary in the West block. This area is bounded by Old Ruffell/Ruffell Road, Onion Road and the PPC17 boundary.

63. The Supplementary report confirms that this area can be served by the wetlands set out in the Infrastructure report. It notes that "*all land within the existing catchment east of the rail line and north of Ruffell Road had been accounted for in the wetlands that have currently conceptually been sized for PPC17*".

64. However, the ICMP assumes that the treatment wetlands will also need to include runoff from existing roads (or existing roads that may be upgraded as part future development) where it is

practical to do so. These include Te Rapa Road, Old Ruffell Road, Ruffell Road and parts of Onion Road.

65. I recommend that the Infrastructure report includes a requirement for the subcatchment wetlands to treat existing road runoff as well where it is efficient to route this runoff to the wetlands.

Remaining Gaps

66. I consider the balance of the remaining gaps, both moderate and minor can be readily addressed by including additional criteria and/or commentary in an updated Infrastructure report, Structure Plan or the Infrastructure Plan provision.

67. Development should then be carried out in accordance with these documents.

68. These gaps are:

    a. Wetland/catchment drawings. These are referenced in the Infrastructure report but are omitted from the report. They will include important information needed to review and comment on the report. I recommend these be provided in an updated Infrastructure report.

    b. Hierarchy of On-Lot stormwater management measures for the development. Confirming the development will apply HCC's hierarchy of stormwater management, being: soakage disposal (subject to suitable ground conditions); retention and reuse; extended detention; stream resilience works; and financial contribution to HCC to carry out stream works.

    c. The Structure Plan has a note in the legend stating a 5 m riparian margin is required. For the Te Rapa Stream this should be 10m (to either bank) with 5m applying to the smaller watercourses.

    d. Flood Impacts. The ICMP proposes flood management within the stream corridor and this was not clear in the Infrastructure report. The Supplementary report confirms this is the approach adopted by PPC17. This means the road crossings and culverts are significant strategic infrastructure items and integral with flood control and should identified as such under both a revised Infrastructure report and in the Infrastructure Plan.

    e. River outlets for the North and South East blocks. The Infrastructure report should provide conceptual details of the two outlets. These will need to serve maximum development flows from the Zone areas identified in the ICMP. The South East block should be positioned so the future Northern River crossing can connect into and be served by it. Both outlets will need to include scour countermeasures.

    f. Overland flow paths. There are two significant overland flow paths in the South East block and these will need to be conveyed to the river. In the North block, the strip of PPC17 running to Harrison Road crosses a flow path and will need a culvert.

    g. SH1 culvert blockage. This could result in requiring development ground levels to be set above the overflow depth across SH1 and so should be considered in an updated Infrastructure report.

h. Hydrological parameters and climate change increases. Details of what the PPC17 bases its infrastructure design on should be documented in an updated Infrastructure report.

i. The Regional Infrastructure Technical Specification has not been referenced. It is a key HCC design document that the development will need to adhere to. This should be listed in an updated Infrastructure report.

j. Requirement for on-lot activity specific treatment devices should be noted in the Infrastructure report as these will be important for water quality outcomes. While these will be addressed at the individual lot design level, acknowledging this requirement early is appropriate.

k. Groundwater level monitoring. This is required by the ICMP to inform soakage feasibility (for later on-lot devices within the development) and wetland designs. High groundwater tables can preclude soakage and can lead to plant die off/poor establishment and failure of treatment wetlands. Both issues are key to delivering functional infrastructure and given the number of wetlands proposed, monitoring is needed for design. As monitoring is generally a long duration activity, it needs to planned and implemented in advance of the development process to give as long as possible record of information to be useful for design.

l. Swales in the North and South East blocks. The ICMP lists wetland swales as these can be arranged to avoid the issue where regular driveway crossings prevent swales from developing sufficient length to treat runoff. They can also be set deeper and flatter than traditional swales which gives more flexibility in the wider stormwater design and can receive piped outlets but may need more land set aside for road corridors. It is appropriate for a plan change level of design to retain wetland swales until future design can evidence otherwise.

m. Soakage. The Infrastructure report precludes soakage for stormwater disposal. However, there are conflicting statements such as "*moderate soakage rates*" noted in the report. Soakage may well prove not to be feasible, however, there is insufficient information to be conclusive at this stage for all land within PPC17. Soakage should remain an option for on-lot stormwater disposal until site specific testing has been carried out during future design stages. On-lot soakage design also needs to include for road corridor runoff based on a catchment wide average. This is in line with the ICMP. Therefore, the Infrastructure report should be updated to include a requirement for on-lot soakage of the first 10mm of runoff on average across the site as a minimum, unless site specific testing demonstrates otherwise. A mix of soakage and reuse can be used to achieve this requirement.

n. Ongoing pollution management. Maintenance is a key issue to keep stormwater treatment devices performing as designed. HCC's Stormwater Bylaw also requires high risk activities to have a Pollution Control Plan. I recommend this requirement be stated as part of a high level Operation and Maintenance section in an updated Infrastructure report.

69. I recommend that the above gaps and issues be addressed in an updated Infrastructure report.

70. Those issues that also relate to an Infrastructure Plan are addressed in the section below.

Closed Gaps

71. The other issues in Appendix 2 that are not discussed in the above sections have either been closed by the information contained in the Supplementary report or can be deferred for later design stages.

Infrastructure Plan

72. As noted above, the provisions included in the Supplementary report removed the requirement for an Infrastructure Plan.

73. To address many of the more significant gaps and issues raised in this report, I am of the view that an Infrastructure Plan provision is required to document the assessment, design and implement infrastructure for the Plan Change Area as well as for those elements outside the PPC17 area.

74. Therefore, I recommend that the provision for an Infrastructure Plan be reinstated into PPC17.

75. A critical part of the Infrastructure Plan will be having key parties agree to the Plan. These are HCC, WDC, WRC, IAWAI and Waikato Tainui. Therefore, this agreement will need to be in place prior to implementing, constructing the strategic stormwater infrastructure. Similarly, these organisations will have different funding, ownership and maintenance obligations under the Plan. All of which will need to be addressed.

76. Further to that, I recommend that the Infrastructure Plan include the following elements:

    a. A requirement for the infrastructure to be in accordance with the Te Rapa ICMP,

    b. A requirement for the infrastructure to be in accordance with the revised Infrastructure report,

    c. Identification and location on plan drawings of the strategic stormwater infrastructure including:

        i. the preferred solution for the stream erosion resilience works,

        ii. Subcatchment scale wetlands for stormwater treatment and attenuation for flows discharging to the Te Rapa Stream,

        iii. the preliminary arrangement/layout of the river outlets for the North and South East blocks,

        iv. Te Rapa Stream culverts for flood management,

        v. Defining the areas that will be used for the Te Rapa Stream flood storage/flow attenuation,

        vi. the stormwater catchments draining to each treatment device and to the river outlets,

        vii. the key overland flow path routes, and

        viii. the key interfaces and connections with land beyond the plan change boundary.

d. Key design methodologies and performance requirements for the strategic infrastructure. Including use of hydraulic flood models to demonstrate performance of the development's stormwater and ground surface detailed design,

e. A groundwater monitoring plan,

f. Staging of the strategic stormwater infrastructure with development,

g. A Strategic Agreement between WDC/WRC/HCC/IAWAI/Waikato Tainui/Fonterra relating to the Infrastructure Plan,

h. Consultation with WDC/WRC/HCC/IAWAI and Waikato Tainui

i. An implementation Plan defining delivery responsibilities across HCC/WDC/WRC/IAWAI/Waikato Tainui/Fonterra

j. A funding plan including cost allocations agreed to by HCC/WDC/WRC and Waikato Tainui

k. A Vesting and O&M strategy.

77. I note that in practice the above items will result in needing Private Developer Agreements between developers/land owners and HCC. This is also a conclusion made by the Strategic Stormwater Servicing Memo. However, it is acknowledged that this process sits outside of the plan change process.

Response to submissions

78. I have read the submissions where these relate to stormwater and provide my assessment, comments and recommendations on these in the following sections.

Submission 7 (Empire Corporation & Porter Group)

79. This submitter's holdings drain into PPC17's West Block, and the submission supports in part PPC17 and opposes other elements. The stormwater element of the submission focusses on wanting an integrated, cohesive infrastructure solution for stormwater, with staging, to service the entire Te Rapa North Industrial Zone area.

80. A summary of the submission's key points relating to stormwater, the relief sought and my responses to these are set out Table 3 below.

81. I recommended that the relief sought be accepted with the modification that a provision for an Infrastructure Plan relating to the strategic stormwater infrastructure be included in the PPC17 provisions.

Table 3 Submission 7 – Empire Corporation and Porter Group

Submission Point	Summary / Relief Sought	Analysis and Recommendations
7.3	The submission notes: a. From the submitter's perspective, there are no significant constraints related to three waters infrastructure and serviceability that would restrict the entire TRNIZ from being live zoned. b. The current approach does not address the long-term, cumulative infrastructure needs for the full TRNIZ area and has not identified a coordinated infrastructure upgrade approach integrated with surrounding land and in a staged manner. Relief sought: Seeks revision of Chapter 3.9 to identify the infrastructure required to service the entire TRNIZ.	In response I note: a. The statement that there are no significant constraints related to three waters restricting development based on providing interim solutions is incorrect as this does not consider stormwater. Stormwater is constrained as the stream erosion resilience works are needed for the west block prior to development. b. For item b. I note: i. The issue of whether PPC17 should be extended to apply to the full TRNIZ is a planning matter and I refer to the response of Mr McGahan under the S42a report where this is responded to. ii. The stormwater infrastructure for the full catchment including management approaches is covered by the ICMP. This identifies the key infrastructure needed and is integrated with the wider catchment including the submitter's land where this drains to the Te Rapa Stream. However, PPC17 does not fully account for all the ICMP management approaches and infrastructure. Once the gaps I have identified in this report are addressed I will be able to provide a response. iii. To deliver in an integrated approach the implementation needs to be set out in an Infrastructure Plan. This should include staging. I therefore recommend that the relief sought be accepted in part by adding a provision to PPC17 requiring an Infrastructure Plan and that this Plan address these issues.

Submission 8 (Graeme Boddy) and 9 (Hayden Porter)

82. These submissions raise the same stormwater issues as Submission 7. However, both submitter's land holdings are located in the South East block and so there are different issues for this land than those associated with the West block. In the South East block, a new outlet to the river is the critical significant infrastructure of concern, and not the Te Rapa Stream erosion resilience works which are relevant to the West block alone.

83. The same issues, responses, and recommendations noted in items 79 to 81 apply to this submission. No separate assessment and recommendations are therefore made.

Submission 10 (Waikato District Council)

84. This submission supports PPC17, but this support is conditional on it aligning with the ICMP to address volume effects in the Horotiu (Te Rapa) Stream and having a right of review of the staging / subdivision documents in order to assess effects, mitigation proposed and the need for a financial contribution for mitigation downstream or out of jurisdiction mitigation. The submission highlights that volume control (under either the ICMP's stream works or pipe to the river solution) has not been addressed by the PPC17. The submission also raises concerns with existing culvert and watercourse capacity and associated flood impacts that development can affect.

85. A summary of the submission's key stormwater points raised, relief sought and my responses to these are set out Table 4 below. I also note that the submission raises other stormwater concerns under the subject of Ecological Values and Effects. Other than the items noted in Table 3, these other issues are either already adequately addressed in the Infrastructure report or will be as part of the standard, design and resource consenting process that will be carried out in the future.

86. I recommended that the relief sought by WDC relating to stormwater be adopted in part by including WDC as a party to be consulted as part of any application for the staged development of the PPC17 area and a party to the Infrastructure Plan.

87. Further, I also recommend WDC be consulted on and a party agreeing to the Infrastructure Plan noted under items 72 to 77. WDC will need to be an active party in the implementation of this Plan.

Table 4 Submission 10 – Waikato District Council

Submission Point	Summary / Relief Sought	Analysis and Recommendations
10.2	The submission notes: a. The PPC17 documents do not address how volume will be mitigated. b. PPC17 needs to align with the ICMP c. Development could impact on ability of downstream culverts/streams to convey the increased runoff. Relief sought: Refer point 10.6 below.	In response I note: a. I concur that the PPC17 documents do not adequately address volume effects on Te Rapa stream and this is one of the gaps I have identified and discussed in the report above. b. PPC17 and the Infrastructure report states it is in accordance with the ICMP however, further amendments/inclusions are needed before this can be concluded. c. This is correct and the measures in the ICMP mitigate this. PPC17 needs to better align with the ICMP to address this issue. Refer to 10.6 for response to the relief sought.
10.6	The submission requests that: a. At subdivision consent stage that design documents be provided for WDC review b. That if WDC consider that the volume effects are not mitigated then the design will be changed and/or financial contributions be made to WDC to mitigate the effects. Relief sought:	In response to both a. and b., I note: a. WDC assets and urban developments within WDC's jurisdiction could be impacted by PPC17 development (flood hazard, performance of WDC assets, stream scour etc). WDC will also need to be a party involved with implementing the stream erosion works as a large proportion of the stream works are within WDC's jurisdiction. For these reasons, WDC should also be listed as a party to be consulted under the PPC17 provisions and will be a key party to

Submission Point	Summary / Relief Sought	Analysis and Recommendations
	WDC requests that stormwater designs, including but not limited to constructed wetlands, ponds and swales, and rain gardens at the subdivision consent stage, are provided to WDC for review and if there are adverse effects on the Waikato District then WDC will request design changes be made by the developer and/or make financial contributions to the WDC to mitigate those effects.	implementing the Infrastructure Plan provision for PPC17 recommended in the report above. b. I note that historic stream erosion can also be partially attributed to runoff from land and development in WDC's jurisdiction. Therefore, I expect that WDC will need to contribute to the remedial works (or obtain development contributions to support implementing them). This means that WDC should have review responsibilities. I also not it is standard practice if effects are not within the power of the developer to mitigate then financial contributions are made to Council's to undertake the works. I therefore recommend that the relief sought be addressed by including WDC as a party to be consulted in the provisions of PPC17 and a requirement of the Infrastructure Plan be that WDC shall be involved in its preparation and agree to the Plan.

Submission 13 (Waikato Regional Council)

88. This submission supports PPC17 in part, but requests updates related to align with the ICMP, to include stream erosion measures, and to carry out additional flood modelling.

89. A summary of the submission's key stormwater points raised, relief sought and my responses to these are set out Table 5 below.

90. I recommend that the relief sought by WRC be accepted with amendments as set out in Table 5.

Table 5 Submission 13 – Waikato Regional Council

Submission Point	Summary / Relief Sought	Analysis and Recommendations
13.13	The submission notes: a. The submitter considers further assessment is required for the Infrastructure Assessment. The submitter notes the proposed stormwater management objectives for the three blocks of land are generally consistent with the Waikato Stormwater Management Guideline and the draft HCC Integrated Catchment Management Plan (ICMP) for the Te Rapa North Catchment. b. The submitter also notes one significant omission that has not been addressed is the current state of the erosion susceptibility in the Te Rapa North Stream and how the West Block will need to retain the significant stormwater volume that will be generated. The submitter notes HCC and WRC have been working together with the development of the Te Rapa North ICMP and the significant erodibility of the stream is one of the limiting factors for development in this catchment.	In response I note: a. I concur that there are gaps in the Infrastructure report that need to be addressed. b. I concur that stream erosion from volume increases has not been adequately addressed and the Infrastructure report, the Supplementary report or PPC17 provisions and this is needed. This needs to be included in an Infrastructure Plan. Other measures such as soakage or on-lot retention (should soakage be found not to be feasible) all of which is in accordance with the ICMP. I therefore recommend that the relief sought for stormwater be accepted and the Infrastructure report be updated to address these issues and an Infrastructure Plan be included in the provisions of the PPC17.

Submission Point	Summary / Relief Sought	Analysis and Recommendations
	Other measures need to be explored to either reuse large amounts water within the plan change area to reduce volumes, or explore options with HCC to undertake erosion control measures within the stream to address future adverse effects. The submitter consider the Infrastructure Assessment should acknowledge this. Relief sought: Seeks the Infrastructure Assessment is updated to acknowledge that the proposed development of the plan change area will result in significant volumes discharging to the Te Rapa Stream and that volume retention will be required as part of the stormwater management system due to the erosion susceptibility of the stream. The submitter notes options for addressing this adverse effect should start to be investigated now, prior to lodgement of resource consent applications for the proposed development.	
13.15	The submission notes: The West Block of the plan change area is located within WRC's Waikato Central Land Drainage Scheme. This drainage scheme is designed to service rural areas and remove ponding prior to pasture damage occurring. The submitter also notes the plan change application provides little assessment of effects on the drainage scheme, and if PPC17 is approved, the drainage network in this location will no longer be supporting rural land uses as the area would be almost entirely urbanised. The submitter considers that HCC should take over the management of the scheme drains within the plan change area and upstream, where existing land use is already industrial. Relief sought: WRC seeks that HCC takes over management of the land drainage network within the plan change area and upstream, as part of the plan change process, due to the proposed urbanisation of this area. The submitter also seeks HCC to work with WRC's Integrated Catchment Management Directorate to enter into an agreement for this, including an agreed date for HCC to take over management of this part of the drainage scheme.	In response I note: I consider this a reasonable and appropriate request but if done at the right time. As development changes the nature of the stream from serving rural land drainage to being a naturalised, urban waterway that is part of stormwater HCC's network (rather than just receiving runoff from HCC's network). As such it will no longer be WRC's responsibility under its land drainage scheme and so maintenance responsibility should be transferred to HCC. However, HCC would not seek to adopt the maintenance responsibilities before this. Clarifying the transfer of responsibility should logically be included in the PPC17 as part of an Infrastructure Plan. An appropriate time of transfer would be after development is complete when assets (roads, esplanade reserves, 3 Waters infrastructure etc) are vested to HCC as part of the standard subdivision completion process. Before development occurs, the stream remains servicing the current pastural land. I recommend the relief sought be included as part of the Infrastructure Plan provision within PPC17.

Submission Point	Summary / Relief Sought	Analysis and Recommendations
13.16	The submission notes: Further assessments in relation to natural hazards that will be required prior to development of the plan change area. Large parts of the plan change area are situated within the HCC 1% AEP flood extent. The entire West Block is also within WRC's drainage scheme, typically situated in low-lying flood prone land. Earthworks for the proposed industrial development may potentially have the effect of occupying flood storage, displacing flood volumes and increasing local flood levels, which may result in flood impacts both upstream and downstream. Relief sought: That further modelling and assessment in relation to natural hazards be required at detailed design stage; including modelling of design landform and hydrology/hydraulics to ensure there are no upstream and downstream impacts on flooding to property.	In response I note: I support additional modelling being carried out at detailed design. This will be essential and the Infrastructure report already acknowledges this. Extensive flood modelling was carried out for the ICMP and the flood approach set out in the Infrastructure and Supplementary reports aligns with the ICMP. I therefore recommend the relief be adopted.

Submission 14 (Horotiu Farms Limited and Te Awa Lakes Unincorporated Joint Venture Limited)

91. This submission opposes PPC17 on stormwater issues and requests it is updated to confirm water quality treatment requirements and require resource consents to be obtained as part of the PPC17.

92. A summary of the submission's key stormwater points raised, relief sought and my responses to these are set out Table 6 below.

93. I recommended that the relief sought by Horotiu Farms Limited and Te Awa Lakes Unincorporated Joint Venture Limited be rejected for the reasons set out in Table 6.

Table 6 Submission 14 – Horotiu Farms Ltd and Te Awa Lakes Unincorporated Joint Venture Ltd

Submission Point	Summary / Relief Sought	Analysis and Recommendations
14.27	The submission notes: a. That there are no specific provisions relating to stormwater discharge and treatment matters and considers these should be included in the plan change to ensure they are dealt with in a comprehensive manner and that water quality outcomes are appropriate. b. Further, the submitter considers that it is also best practice to apply for a comprehensive discharge consent in conjunction with a plan change as a joint approach will ensure that unnecessary repetition is avoided and will enable a fully integrated process.	In response I note: a. In the main, PPC17 includes appropriate stormwater treatment measures in accordance with the ICMP. This is by wetlands, swales and catchpit inserts. However, there are some clarifications needed to the Infrastructure report to some address gaps. b. There is no requirement to obtain discharge resource consents as part of a plan change process. These are obtained via a separate statutory process. Following the ICMP will also deliver an integrated approach. I therefore recommend that the relief sought for stormwater not be adopted.

Submission Point	Summary / Relief Sought	Analysis and Recommendations
	Relief sought: a. PPC17 to include provisions relating to stormwater management and water quality. b. The applicant applies for a comprehensive stormwater discharge consent to the Waikato Regional Council to be heard and decided in conjunction with PPC17.	

Submission 16 (Rachel Caroline McGuire and Stephen Wayne Morth (Morth Trusts Partnership))

94. This submission supports PPC17 in part the three water provisions and requests that the infrastructure be sized for full catchment development.

95. A summary of the submission's key stormwater points raised, relief sought and my responses to these are set out Table 7 below.

96. I recommend that the relief sought by Morth Trusts Partnership be accepted in part.

Table 7 Submission 16 – Morth Trust Trusts Partnership

Submission Point	Summary / Relief Sought	Analysis and Recommendations
16.4	The submission notes: That any permanent infrastructure upgrades within PPC17 should be designed to support the entire TRNIZ. This approach would prevent the need for costly and disruptive upgrades in the future when the rest of land is developed. That there are no specific provisions requiring this. Relief sought: That appropriate provisions are incorporated into Chapter 3.9 to ensure that any permanent infrastructure upgrades are provided to service the entire TRNIZ.	In response, and as it relates to stormwater, I concur that the infrastructure should be designed to support the entire TRNIZ and following the ICMP.
16.5	The submission notes: The proposed Te Rapa North Structure Plan under PPC17 currently shows a watercourse on the subject site (see Figure 7 below). Unless the zoning of the subject site is uplifted through this plan change process, it is requested that the watercourse be removed from the structure plan as it relates to the subject site. As the subject site does not form part of the plan change, no features should be shown on it. Relief sought: Remove the watercourse currently shown on the subject site from the proposed Te Rapa North Structure Plan.	In response I note that the Amended Structure Plan provided in the Supplementary report has removed this watercourse and so the issue has been resolved.

97. In summary, I consider that the matters raised in the submissions identify the same stormwater gaps that I have identified in my review of the Instructure and Supplementary reports.

98. These can be resolved by providing additional information; an updated Infrastructure report and including an Infrastructure Plan in the PPC17 provisions.

99. Several matters raised by submissions, in my opinion, should not be adopted.

Response to Further Submissions

100. One further submission raised a matter relating to stormwater. This is addressed below.

Further Submission– Firstgas Ltd

101. This submission supports in part the PPC17 and that designs be submitted to WDC for review and requests that it be expanded to Firstgas.

102. A summary of the submission's key stormwater points raised, relief sought and my responses to these are set out Table 8 below.

103. I recommended that the relief sought by Firstgas relating to stormwater be accepted.

Table 8 Firstgas Ltd

Further Submission Point	Summary / Relief Sought	Analysis and Recommendations
FS03.03	The submission agrees that further details regarding stormwater designs should be provided to WDC. The submitter requests that this is expanded to include provision to Firstgas where such options intersect or are near the existing pipeline or access routes. The submitter supports this position due to potential consenting or financial burdens that may arise from stormwater systems and their unintended consequences. Relief sought: Seeks that Submission Point 10.2 is expanded to include provision for Firstgas where such options intersect or are near the existing pipeline or access routes.	I note WDC does not have a stormwater interest in the North Block as it does not drain into WDC's jurisdiction. However, I consider that the request to expand the review provision to include Firstgas is a reasonable request given the nature of their gas pipeline in the North block. A gas line that serves Fonterra's Te Rapa factory itself. I recommend that Firstgas be included as a party to be consulted under the provisions of the PPC17.

Conclusions

104. In my opinion, there are stormwater issues and gaps in the Infrastructure and Supplementary reports which are not yet resolved.

105. These gaps relate to aligning with HCC's ICMP; inclusion of stream erosion resilience works; providing clarification on various aspects of the proposed stormwater management; addressing stormwater integration with areas outside of the PPC17 area; and staging of the stormwater works alongside land development.

106. Additional information and clarifications are required to confirm alignment with the ICMP. In my opinion, addressing these gaps will then allow me to conclude that the PPC17's proposed stormwater management practices are acceptable.

107. Addressing these gaps should be documented by providing an updated Infrastructure report.

108. Further, I also consider a provision is needed in PPC17 for an Infrastructure Plan to address the complexities of delivering the strategic stormwater infrastructure in a coordinated manner. Such a plan will be central to delivering stormwater infrastructure.

Recommendations

109. The recommendations noted throughout this report are listed below:

110. The Infrastructure report be updated to address the gaps and issues identified in this report. These are:

    a. Confirming that the Infrastructure will be designed in accordance with the ICMP,

    b. Assessment of the stream erosion resilience works and identification of the preferred option,

    c. Confirmation that attenuation of runoff from land outside of the PPC17 boundary will be in accordance with the ICMP,

    d. Subcatchment scale wetlands will include treatment of existing roads where it is more efficient to route runoff to these areas,

    e. Provision of the omitted wetland and catchment drawings,

    f. Inclusion of the hierarchy of stormwater management practices for on-lot drainage: soakage disposal (subject to suitable ground conditions); retention and reuse; extended detention; stream resilience works; and financial contribution to HCC to carry out stream works,

    g. The Structure Plan remove the "5 m riparian margin" note from the legend,

    h. Identification of the approach of flood management in the stream corridor and the significance of the road culverts (and embankments) in achieving this,

    i. Include conceptual details, indicative locations and performance requirements for the North and South East block river outlets,

    j. Addressing the overland flow paths in the North and South East blocks,

    k. The implications of SH1 culverts blocking,

    l. Document hydrological parameters, inputs and climate change scenario used,

    m. Reference the Regional Infrastructure Technical Specification,

    n. The requirement for on-lot activity specific treatment devices,

    o. A groundwater monitoring plan,

p. Inclusion of wetland swales for the North and South East blocks,

q. Keeping soakage as the preferred method for on-lot disposal of stormwater (unless site specific testing shows this is unfeasible). This soakage should be a minimum of 10mm of runoff on an average basis across the site, and

r. Comment on operation and maintenance requirements including the need for Pollution Control Plans for high risk developments.

111. I recommend that the provision for an Infrastructure Plan be reinstated in the proposed PPC17 provisions. Further, that this Plan include:

a. A requirement for the infrastructure to be in accordance with the Te Rapa ICMP,

b. A requirement for the infrastructure to be in accordance with the revised Infrastructure report,

c. Identification and location on plan drawings of the strategic stormwater infrastructure including:

i. The preferred solution for the stream erosion resilience works,

ii. Subcatchment scale wetlands for stormwater treatment and attenuation for flows discharging to the Te Rapa Stream,

iii. The preliminary arrangement/layout of the river outlets for the North and South East blocks,

iv. Te Rapa Stream culverts for flood management,

v. Defining the areas that will be used for the Te Rapa Stream flood storage/flow attenuation,

vi. The stormwater catchments draining to each treatment device and to the river outlets,

vii. The key overland flow path routes, and

viii. The key interfaces and connections with land beyond the plan change boundary.

d. Key design methodologies and performance requirements for the strategic infrastructure. Including use of hydraulic flood models to demonstrate performance of the development's stormwater and ground surface detailed design,

e. A groundwater monitoring plan,

f. Staging of the strategic stormwater infrastructure with development,

g. A Strategic Agreement between WDC/WRC/HCC/IAWAI/Waikato Tainui/Fonterra relating to the Infrastructure Plan,

h. Consultation with WDC/WRC/HCC/IAWAI and Waikato Tainui

i. An implementation Plan defining delivery responsibilities across HCC/WDC/WRC/IAWAI/Waikato Tainui/Fonterra

j. A funding plan including cost allocations agreed to by HCC/WDC/WRC and Waikato Tainui

112. I recommend that the Staging set out under proposed provision under 3.9.3.3 include the stream erosion resilience works, stream culverts and river outlets.

113. I recommend that WRC, WDC, IAWAI, Waikato Tainui and Firstgas be included in the provisions as organisations to be consulted about the development designs and the Infrastructure Plan.

Appendix 1 – Strategic Stormwater Memorandum

Memo

Plan, Strategy, Programming – Infrastructure & Assets Group

To:	Blair Bowcott – General Manager, Strategy, Growth & Planning		
From:	Andrew Parsons – General Manager, Infrastructure and Assets		
Subject:	Private Plan Change 17 - Fonterra Te Rapa North: Strategic Stormwater Servicing		
Date:	3 July 2025	File:	

1. The purpose of this memo is to provide a high-level position on the stormwater servicing of the Plan Change 17 (PC17) area.

Stormwater

2. HCC have developed the Te Rapa ICMP over the past six years. This process has included engagement with Fonterra, Iwi/Mana Whenua, WRC and other key stakeholders. The ICMP document sets out the requirements for future strategic stormwater infrastructure within the catchment, including the PC17 area (design parameters and means of compliance).

3. HCC and Fonterra representatives are largely in agreement with respect to stormwater management approaches necessary to support development of the PC17 area, and the plan change itself. The approaches align with standard citywide requirements and include:
    a. Provision of on-lot retention (10mm) for all new development.
    b. Treatment of high traffic volume and industrial roading corridors.
    c. Construction of centralised wetland devices to provide treatment and attenuation.
    d. Construction of a central stream corridor providing flood storage and riparian planting.
    e. An infrastructure solution to mitigate stream erosion effects on the Te Rapa stream due to development.

4. The report from Fonterra's stormwater technical consultant Harrison Grierson (HG) largely aligns with the discharge parameters and means of compliance outlined in the Te Rapa ICMP. The Report specifically notes the requirement for ongoing coordination with the ICMP team.

5. As part of recent engagement between the ICMP team and Fonterra PC17 representatives, two areas of initial misalignment were identified, namely minimum stream corridor width and mitigations for increased downstream erosion effects.

<u>Minimum stream corridor width:</u>

6. The draft ICMP document supports establishment of a 20m corridor either side of the existing watercourse, which is consistent with RMA esplanade widths. HG expressed concern that in some limited areas provision of the proposed corridor width would impede the ability to provide typical industrial block dimensions based on the preferred roading corridor layout.

7. A mutually acceptable solution for the minimum stream corridor width has been agreed and the draft ICMP was modified to allow for minimum corridor widths of less than 20m either side of the watercourse where this conflicts with achieving a suitable sub-division layout.

Mitigations for increased erosion effects resulting from development of the PC17 area:

8. Volume control is required as part of developing the PC17 area and unlikely to be achieved on-site due to soil conditions. In addition, there are existing downstream erosion issues on the last 300 – 500m reach of the Te Rapa Stream and at the confluence with the Waikato River. Further development in the catchment will exacerbate these issues if not appropriately mitigated.

9. The draft ICMP identifies two feasible options to mitigate the existing erosion issues and increased erosion effects of development on the stream:
    a. Construction of a diversion pipeline directly to the Waikato River and implementation of stream resilience works to address existing erosion issues along the last 300 – 500m reach of the stream, within the Waikato District area.
    b. More extensive stream resilience works to address existing erosion issues and mitigate the impacts of increased discharge volume on the last 300m – 500m reach of the stream within the Waikato District area.

10. Both teams agree that the potential effect exists, and an infrastructure solution beyond the current PC17 extent will be required to address the effect. The teams have been in ongoing discussions around the preferred approach to mitigate the potential for increased erosion effects resulting from impervious surfaces as a result of development of the PC17 area.

11. Currently, the draft ICMP identifies the diversion pipeline option and stream works as the preferred option. HCC options analysis highlights implementation challenges for both approaches of the feasible options described above. Attachment 1: outlines the primary challenges that must be addressed to progress downstream channel resilience initiatives.

12. The Fonterra team have indicated that they support the approach of implementing downstream channel resilience works to address the effect of development based on engineering assessment of both options. In the most recent meeting between the two technical teams (27th May 2025) HG have indicated that additional evidence documenting their assessment of both options will be supplied to the ICMP team for consideration.

13. Currently, the draft ICMP identifies the diversion pipeline as the preferred option, mainly because it may offer HCC greater control over implementation. However, the diversion pipeline option still requires downstream stream improvement works to address the existing erosion issues, and a responsible party must be identified to carry out those works.

14. With Waikato District Council and HCC establishing a joint CCO, that will be contracted to provide stormwater services, earlier concerns about HCC's limited control over works outside its jurisdiction have been somewhat alleviated. This reduces the diversion pipeline's perceived advantage over the stream resilience option.

15. As noted above, two viable solutions have been identified as part developing the Te Rapa ICMP. Fonterra preference is to undertake extensive stream resilience works downstream of the PC17 area. HCC are supportive of this solution provided that an acceptable implementation strategy and funding plan can be agreed.

16. The key issues around either option relate to implementation responsibility, funding, and timing of the works relative to development in the PC17 area. These matters still need to be addressed to ensure a timely and acceptable solution for Waikato Regional Council and downstream landowners that does not place undue risk and liability onto HCC.

17. These are not expected to be unsurmountable issues, and it is anticipated that the HCC, WDC and Fonterra will work together to reach an acceptable agreement on these matters. To achieve this outcome, it is recommended that HCC representatives work with Fonterra representatives to:
    a. understand their proposed solutions and staging to mitigate downstream erosion impacts from the development of the PC17 area – noting that HG have undertaken more detailed assessments and evaluation of the stream resilience option.
    b. develop and agree the relative funding contributions for the stream resilience works that key parties should be responsible for (i.e. HCC (on behalf of the existing developed areas of the catchment located within HCC jurisdiction), Waikato DC (on behalf of the areas of catchment located with the WDC jurisdiction), Fonterra on behalf of the PC17 area draining to the stream.
    c. Develop a proposed implementation strategy and funding plan for relevant parties (Fonterra, HCC, WDC, WRC) to consider.
    d. Develop and enter into a Partnership Contract that define the infrastructure, land holdings and financial contributions that different parties will make to servicing and mitigating the impacts of developing the PC17 area.
    e. Negotiations would also be required with WDC and WRC to agree on their financial contributions, timing of implementation and agree who will be responsible for delivering and maintaining the works.

Partnership Contract

18. I recommend that a Partnership Contract be required and entered with Fonterra. The matters to be addressed in the Partnership Contract include, but are not limited to, establishing a joint position on a range of matters critical to the success of PC17 including stormwater, water supply, wastewater management.

19. The Partnership Contract should define the infrastructure, land holdings and financial contributions that different parties will make to servicing and mitigating the impacts of developing the PC17 area and implementation and staging of works relative to growth and development.

Conclusions

HCC and Fonterra representatives are largely in agreement with respect to stormwater management approaches relating to the PC17 area. Discussions between our representatives have resolved several detailed stormwater matters which will be incorporated into the PC17 stormwater documentation. With these items set to be addressed in the documentation, the only outstanding issue remains the identification of a suitable solution, implementation strategy, and funding mechanism to address downstream erosion issues.

20. Two viable solutions have been identified as part developing the Te Rapa ICMP. Fonterra preference is to undertake extensive stream resilience works downstream of the PC17 area. HCC are supportive of this solution provided that an acceptable implementation strategy and funding plan can be agreed.

21. Through PPC17, Fonterra will lead with input from HCC, the development of a staging plan and associated provisions to be included in the District Plan, that will address interim and final stormwater solutions to enable the industrial development of the PPC17 land.

Recommendations

22. That a Partnership Contract be negotiated and entered in to with Fonterra now that addresses the matters in this memo and the matters relating to water supply, wastewater management, transportation and parks and reserves.

23. That HCC and Fonterra representatives develop an implementation strategy, appropriate cost allocation and funding plan to mitigate downstream erosion effects from development of PC17.

24. That Fonterra facilitate and co-ordinate discussions with WRC, WDC and HCC to reach agreement on the above.

25. That HCC, WDC and Waikato Tainui discuss and agree to fund and direct the CCO to lead delivery of the agreed solution.

26. That a Private Developer Agreement is negotiated with Fonterra and WDC outlining the infrastructure, land, and financial contributions of each party, along with responsibilities for servicing and mitigating the impacts of developing the PC17 area.

27. That a staging plan and provisions are developed and introduced through PPC17 to address 3-waters and transport infrastructure requirements to enable the development of the PPC17 land.

Date: 3 July 2025

Recommended by :

Andrew Parsons
General Manager
Infrastructure and Assets

Agreed by:

Blair Bowcott
General Manager
Strategy, Growth & Planning

ATTACHMENT 1:
HCC options analysis highlights implementation challenges for both approaches. The following outlines the primary challenges that must be addressed to progress downstream channel resilience initiatives:

Common Challenges:

- **Lack of Funding:** Hamilton City Council (HCC) currently has no allocated funding explicitly to support Te Rapa North development in the Long-Term Plan. There could be opportunities for HCC to prioritise erosion control funding currently in the LTP for its proportional contribution to address the existing erosion issues. However, if this is not a feasible option, then any commitment that Council makes would either need to be accompanied by an unbudgeted financial contribution, and/or made on the assumption that council will include the funding needed to deliver on the commitments made in future Long-Term Plans. We understand that Waikato DC do not have any funding allocated for its proportional contribution to address the existing erosion issues and would have to consider how they may commit to fund their contribution.
- **Timing Certainty:** Having certainty over when the erosion impact mitigation will be implemented is another key issue. It is agreed that there are existing erosion issues downstream of the PC17 area. While these issues already exist, it is agreed that development of the PC17 area will exacerbate these issues. Securing agreement from Waikato Regional Council (WRC) that development can proceed ahead of or in parallel with the existing issues being addressed and mitigation measures being in place may be challenging.
- **Property Access:** Gaining and maintaining access to private land to complete and maintain the works presents challenges for both options. These would need to be worked through.
- **Medium to Long-Term Responsibility:** HCC has a comprehensive stormwater discharge consent. Greenfield developments require the developers to secure stormwater discharge consents from Waikato Regional Council. At the appropriate times, developers seek to have stormwater management for the new development areas included within the scope of the HCC Integrated stormwater consent.

Challenges Specific to the Downstream Channel Resilience Works Only Option:

- **External Funding:** Identifying and securing financial contributions from other territorial authorities.
- **Project Leadership:** Uncertainty around which entity will lead the project. However, following the recent decision regarding the Council-Controlled Organisation (CCO), it is likely the CCO would take the lead—subject to funding confirmation.

Challenges Specific to the Diversion Pipeline Option:

- **Downstream channel works:** HCC would still need to contribute to downstream channel resilience efforts.
- **Project Coordination:** Aligning with the Northern River Crossing project, which currently has uncertain timing.

Appendix 2 – Gap Analysis Table

Notes on the Appendix 2 Table

1. The table includes each item as raised in the SME meeting on the 27 May 2025. The original gap is provided in bold italic text.

2. Where these have been added or responded to by the Supplementary report these have been reassessed the issue and then a recommendation made relating to the gap.

3. Where issues cross over with another and can be consolidated into one item, then this is noted.

4. Some items can be deferred to future design stages and do not need to be addressed at the PPC17 stage. These have been noted as such.

5. Indication on the relative significance of each issue to the PPC17 as either minor, moderate or major is noted.

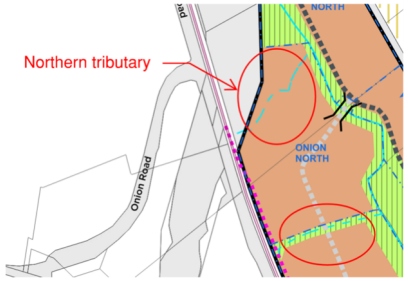
6. If the issue has been addressed or not, then this is indicated as such with an open or closed status.

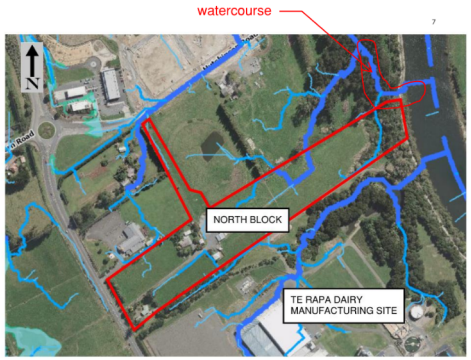
Issue	Importance / Status	Description and Assessment	Recommendation
1	Minor / open	***Drawings (A2212331.01-HG-ZZ-DR-Z-027 to 030) referenced in the Infrastructure report were not provided.*** The referenced drawings remain outstanding and as such the Infrastructure report it is incomplete. I consider this to be a relatively minor gap as these drawings relate to stormwater catchments and wetlands and so will be subject to change with future design stages. However, review of these drawings may result in the identification of additional issues that need to be resolved.	I recommend that the omitted drawings be provided in a revised Infrastructure report.
2	Moderate / open	***A subcatchment ICMP is not required provided as PPC17 uses HCC's ICMP in its place to assess against. However, while compliance with the ICMP is stated, an assessment against the ICMP has not been included and this is needed. Similarly, some statements later in the report need clarification to read that the PPC17 is in alignment with the ICMP (eg Section 2.4, bullet 4) rather than infer the other way around.*** While compliance with the ICMP is stated as being achieved within the Instructure report there are some conflicting statements, such as that referenced, that creates uncertainty and should be clarified. An assessment against the means of compliance in the ICMP has not been included. If the issues raised in this report are resolved, then I consider that the stormwater management proposed by the PPC17 is consistent with the means of compliance in the ICMP and so this assessment would no longer be necessary for the plan change.	I recommend that the Infrastructure report be updated to explicitly state that the development will be carried out in accordance with the Te Rapa ICMP. I also recommend that PPC17 includes this as provision.

Issue	Importance / Status	Description and Assessment	Recommendation
3	Minor / closed	***The ICMP and PPC17 have been prepared in parallel so there is a risk of these being inconsistent. Please reference the latest version used / update assessment for the latest version issued.*** The Supplementary report states that Fonterra has been engaged with HCC in consultation on the ICMP inferring that the latest ICMP has been used however, the requirement for development under PPC17 to be in accordance with the ICMP is not explicitly stated and it should be. This will be addressed by the recommendation under item 2 above and so this issue is addressed by the recommendation made against item 2.	
4	Moderate / closed	***Generally, more discussion/detail is needed around how the PPC17 area will integrate with the stormwater management for the wider land surrounding it i.e. the remainder of the catchment. This includes needing to cover flow paths running onto the PPC17 area; the impacts on flooding outside of the PPC17 area; impacts on stream erosion downstream of the PPC17; and treatment for adjacent land that could be accommodated into joint devices. The outcome of the PPC17 needs to be a whole of catchment management approach consistent with the ICMP.*** This is a summary statement the details of which are individually addressed under items below so no separate assessment or response is need against this item.	
5	***Existing Watercourses***		
5a	Major / open	***The PPC17 does not address options for stream erosion protection downstream of the PPC17 area caused by increased volumes discharged ie via a pipe to river or stream works.*** The PPC17 documentation does not fully address development impacts on stream erosion downstream of the PPC17 land in the Te Rapa Stream. The ICMP has identified a significant issue with stream erosion that will be exacerbated by increased stormwater volume discharged into the Te Rapa stream. Attenuation and extended detention within the wetlands will not fully mitigate this issue and stream resilience works are needed. This is a key constraint to development in the West block. The ICMP proposes two options for addressing this issue either: stream resilience works along the full length of the Te Rapa Stream (with the more significant works in the downstream most reaches near the Waikato River) or a constructing a bypass pipe from the West block to the Waikato River (coupled with limited stream works downstream). The bulk of the stream works are downstream of HCC's jurisdiction and sit within Waikato District Council's jurisdiction.	I recommend that the additional assessment on the stream works option be provided as part of an updated Infrastructure report. I recommend that the staging provisions (3.9.3.3) be updated to include the necessary stream works, required for each stage of development within the PPC17. I recommend that the requirements for implementing the stream erosion protection works be included as part of an Infrastructure Plan and this be a provision of the PPC17.

Issue	Importance / Status	Description and Assessment	Recommendation
		The ICMP notes both are viable with a preference for the pipe to the river option. At the SME meeting Mr King noted they had prepared additional evidence documenting his assessment of both options and this information was requested. Since the SME meeting HCC issued a Strategic Stormwater Servicing memorandum setting out the process and criteria for agreeing a solution for the stream works with Fonterra and other stakeholders. It notes HCC is supportive of the stream works option provided that an acceptable implementation strategy and funding plan can be agreed. I consider these would form part of a wider Infrastructure Plan and should be included in the provisions of PPC17. The Supplementary report acknowledges the stream erosion issue needs to be addressed but proposes the stream works option over the bypass pipe to the river. High level reasons for preferring the stream works option are noted but this is not substantiated by a detailed assessment. The stream works are also not included in the proposed staging set out in Section 3.9.3.3 of the Amended Provisions proposed in the Supplementary report. The report does not address when the stream works need to be implemented and maintains that wetlands will be sufficient to manage stormwater quantity in the interim. It notes the "this ensures that stormwater can be managed in a way that is robust, coordinated with wider catchment planning, and responsive to the timing of development within the TRNIZ". I do not consider that excluding works as significant as the stream erosion works from the staging information is robust stormwater management or coordinated with wider catchment planning. In my opinion the stream works will need to be implemented in a staged manner alongside development to avoid worsening erosion and impacting on adjacent land and infrastructure. While it is not likely to be practical to implement all of the works before development occurs nor is it appropriate to allow all of the development to occur in advance of the works. I envisage staging the stream works with development to carry out the downstream most reaches in parallel with, or closely following, the first stage of development. From there the works would progress from downstream to upstream in step with blocks of subsequent land development. This approach would first address those parts of the stream that are the most sensitive to increased scour and the where the consequences of significant scour are the greatest, both on existing infrastructure and the environment. The North and South East blocks are not reliant of the Te Rapa stream works and can be developed independently once resource consents for each river outlet is obtained.	

Issue	Importance / Status	Description and Assessment	Recommendation
		The Strategic Stormwater Servicing memorandum sets out the process to be followed to coordinate, agree and implement the works. The staging, developed design and consenting, stakeholder consultation, funding arrangements and programme would all need to be addressed in an implementation strategy. These are not insurmountable issues but are complex in nature and will not be addressed in the timeframes of the PPC17 process. Therefore, an Infrastructure Plan that covers these issues is needed in the PPC17 provisions.	
5b	Major / closed	***The PPC17 does not describe how either of the above options these will be integrated into the future development however, unlocking development is predicated on providing infrastructure to manage these stormwater effects.*** This is covered by the comments made under item 5a. Further separate recommendations are not needed.	
5c	Moderate / open	***The hierarchy of stream erosion measures should be covered off starting with maximising on lot soakage (subject to site suitability), then reuse, then providing extended detention, then stream resilience works, and finally financial contributions to HCC to carry out stream erosion works. Using extended detention alone typically ends with developers also then providing financial contributions for HCC to carry out stream works as part of a wider programme.*** The on-lot management requirements are significant to the overall stormwater management strategy and to comply with the ICMP. These should be included in the Infrastructure report. Soakage is discussed separately in items below. The parts relating to the stream works are covered under item 5a.	I recommend that the hierarchy of stream erosion mitigation measures be included in an update Infrastructure report.
5d	Moderate / closed	***The PPC17 does not address the Te Rapa stream currently being a WRC Scheme Drain and how that responsibility would shift with the PPC17 and the subsequent development.*** It is natural that as development expands that HCC takes over the maintenance of the stream where it is within HCC's jurisdiction. The drain will no longer serve its original rural, pastural drainage purpose. In my opinion the natural time for the responsibility to be transferred to HCC will be when the development is complete and other infrastructure, such as 3 Waters assets and roads etc are vested to HCC. This issue would be addressed as part of the Infrastructure Plan recommended in item 5a and therefore no separate recommendation is needed.	

Issue	Importance / Status	Description and Assessment	Recommendation
5e	Minor / closed	***The Masterplan layout appears to show the existing tributaries in the West block being largely maintained as open waterways and not piped but on the Draft Structure Plan this is not as clear.*** The Amended Structure Plan in the Supplementary report has added a riparian corridor to the southern tributary but not the northern one. This is indicated on the below marked up image.  The northern tributary is a farm drain that runs dry in summer and in my opinion does not necessarily need to be retained as an open channel and decisions on retaining it can be deferred to later design stages. I therefore consider this issue has been addressed and no further recommendations are needed.	
5f	Minor / Open	***The Structure plan notes 5m riparian and should be 10m with 5m for branches.*** The Amended Structure Plan included in the Supplementary report still has this note ("5m riparian margin required") in the legend. The ICMP has riparian zones of 5m per bank for the be larger watercourses ie 10m. This note will therefore lead to confusion and should be removed from the Structure Plan. I note that the riparian zone is different to the stream Esplanade Reserve width within which the riparian zone sits. The riparian width relates to the width of planting needed for ecological reasons whereas the Esplanade Reserve includes maintenance access in a wider corridor. HCC and Fonterra have agreed an appropriate Esplanade Reserve width that varies along the stream corridor and so this comment does not seek to revise the Esplanade corridor agreed but just relates to the stream planting width.	I recommend the Structure Plan be revised to remove this note from the legend.
6	Moderate / Closed	***Stream esplanade widths to be updated as per recent discussions [with HCC].***	

Issue	Importance / Status	Description and Assessment	Recommendation
		Refer comment made under item 5f, the updated Esplanade corridor is shown on the Amened Structure Plan provide in the Supplementary report. This is addressed under the Strategic Stormwater Servicing Memo.	
7	Minor / Closed	***The Infrastructure report states there is no identified watercourse in the North block. While technically correct, the northern block does contribute catchment to the existing watercourse just to the north of this block as shown circled below. The possible effects of the PPC17 on this stream have not been discussed and mitigation measures proposed (if required). Given the proposed outlet to the river, this is not envisaged to need a substantial update. The outlet to the river should be positioned alongside the existing culvert where the watercourse passes under the cycleway or incorporated into a joint outlet.***  No further information has been provided to address this issue. Implementation of a new outlet to the river sized for full catchment developed flows will address this issue. This issue is addressed in item 8b so no separate recommendations are needed.	
8	***Flood Impacts***		
8a	Moderate / Open	***While the PPC17's wetlands could be sized to provide a similar level of flood control to the ICMP's wetland/stream floodplain combination, this has not been demonstrated to be equivalent. The wetlands have been sized using the hydrological software HEC-HMS and so present an incomplete hydraulic assessment (in that the downstream effects are unable to be demonstrated by HEC-HMS). The combination/cumulative effects of multiple flow attenuation wetlands and volumetric effects of the discharges coupled with lost floodplain storage are therefore not yet sufficiently demonstrated to accept the PPC17 method as an alternative to the arrangement set out in the ICMP. The application notes***	I recommend that the stream road culverts be identified in the revised Infrastructure report with the staging provisions as integral with a staged development and feature in the Infrastructure Plan.

Issue	Importance / Status	Description and Assessment	Recommendation
		additional flood modelling will be needed as the design develops, while this is correct, understanding how much land is needed for flood attenuation and the associated floodlevels is a key issue. The Supplementary report confirms that flooding in the West block will be managed in a central stream corridor with inundation able to spread over the adjacent treatment wetlands. This matches the flood management hydraulically modelled for the ICMP and so provides confidence the proposed flood management under PPC17 will be achievable. Further modelling will be needed to support a future resource consent application and detailed design but is not necessarily needed to support PPC17. The Supplementary report also notes that upstream development in PPC17 area cannot cause adverse effects upstream land. However, it is important that the flood mitigation is sized so development does not cause significant flood increases on land downstream (i.e. on SH1 and beyond) as well as on upstream land. The ICMP modelling has demonstrated this is possible meaning PPC17 will be able to do so in future design and resource consenting. I note that the design of the road crossings of the Te Rapa are integral to the attenuation within the stream corridor as it will be the road culverts and embankment across the stream that will control the flows and so the flood performance overall. The design of these crossing points are key to defining and managing flood mitigation in the stream corridor and installation of these controls as development progresses will be a key part of the overall development staging. These will need to feature in the Infrastructure Plan noted under item 5a.	
8b	Moderate / Open	***The South-east block has two existing gullies that fill with flood water and provision to route flows to the Waikato River will need to be made in developing this block. More detail/certainty is needed around the new outlet to the river.*** The issue of overland flow path management is addressed under item 8d below. The outlets to the river for both the North and South East blocks are noted in the Supplementary report but no high level details, conceptual arrangements or locations are provided. This information is still required. The North block outlet should be located adjacent to or incorporated into the existing stream culvert outlet into the Waikato river. The South East outlet should be positioned and sized to serve the full catchment under maximum probably development conditions. The location should give consideration to a future northern river crossing being able to connect to it.	I recommend that conceptual details of the two river outlets be included in the Infrastructure report and the requirement for these to serve the maximum development flows.

Issue	Importance / Status	Description and Assessment	Recommendation
		Both outlets need to be sized to accommodate maximum development flows from the full extents of the zones identified in the ICMP to drain to these outlets.	
8c	Minor / Open	***The North block is outside HCC's model extents and so existing flooding is not defined. This could be an issue for the strip of land in the PPC17 that looks to be an access corridor to Hutchison Road. It crosses an existing overland flow path and another flow path also crosses onto the North block (along the northern/side boundary) and back out again. Comment is needed on how development will impact on flood levels in these areas and what features/ mitigation measures are needed. These impacts would occur on adjacent land/private property that is outside of the PPC17 area.*** ***More detail/certainty is needed around the new outlet to the river.*** The potential flooding issue related to the strip of the PPC17 that runs north to Hutchinson Road and the flow path crossing onto PPC17 remains to be addressed. Presumably a culvert will be needed to convey overland flows below the access. A highlevel assessment of this crossing should be provided in the Infrastructure report to demonstrate the development will not cause flood effects on upstream land. The requirement not to cause significant flood effects is discussed in the Supplementary report and addressed under item 8a above. Separate comment here is not needed. The issue is of concerning the river outlets is addressed under item 8b above. Separate comment here is not needed.	I recommend that conceptual details of the access road crossing the flow path be included in the Infrastructure report.
8d	Moderate / Open	***Flood and flow path management/routing will still be needed within each block as part of a future earthworks/roading/lot design and should be conceptually covered by the report*** Flooding is addressed under item 8a above. Further discussion on overland flow path management has been provided in the Supplementary report. It notes that development in the PPC17 area will be designed not to cause adverse effect on upstream land and needs to accommodate upstream flows that currently drain onto and through PPC17 land. This is then qualified with the proviso that "when being developed (as per design requirements), stormwater management required within those upstream sub-catchments (such as at-source water quality treatment, flow attenuation etc) is undertaken within those areas, prior to stormwater discharging into the plan change area". I note that on lot water quality devices are not significant to managing overland flow in extreme storms which cause overland flow and so this element is not relevant. Also, it is not practical to apply the attenuation requirement to all areas draining onto PPC17 land.	I recommend that management of overland flow paths and the performance requirements of these be clarified in the Infrastructure report. I also recommend that the PPC17 Infrastructure Plan includes these requirements.

Issue	Importance / Status	Description and Assessment	Recommendation
		For example, it is not practical to attenuate 100 year storm flows originating from the existing, developed land upstream of Ruffell Rd. The ICMP has attenuation of these flows occurring within the stream corridor in the Western block, not upstream of it. However, the peak flow from this area is largely limited/controlled by the capacity of the existing drainage pipes that convey water to the stream so the peak flow is not expected to significantly increase with development although volume will. Similarly, 10 and 100 year storm attenuation is not required for the North and South East blocks as there is no downstream flood issue that needs addressing. This is on the provision that the new drainage network and outlets to the river (and associated overland flow routes through the development) are designed for fully developed flows from the catchment. This will be needed to present an integrated network and not result in delivering fragmented solutions. Attenuation of run off upstream of PPC17 land needs to be consistent with the ICMP so not to deliver more stormwater management devices/areas than set out on the ICMP. Therefore, the Infrastructure report should be updated for these issues and provision for these outcomes should be confirmed in PPC17.	
8e	Minor / Open	***Details of the hydrology (parameters, rainfall etc) used behind the HEC-HMS modelling should be documented.*** This information has not been provided in the Supplementary report and this should be included in an updated Infrastructure report to show that the infrastructure proposed under the PPC17 applies the same inputs as the ICMP and meets HCC's development standards (the Regional Infrastructure Technical Specification).	I recommend that summary details be included in an updated Infrastructure report.
9	***Overland flow paths***		
9a	Moderate / Closed	***More information is needed on how overland flow paths running onto the PPC17 areas will be accommodated without impacting upstream land and how safe egress can be accommodated for on-road flow paths.*** This has been discussed and addressed under items 8d and 11. No further separate recommendations area needed.	

Issue	Importance / Status	Description and Assessment	Recommendation
9b	Minor / Closed	***OLFPs or flood mapping has not been shown for the full South-east block as the figures in the report cut this off. The figures should be expanded to show this area. There will need to be a significant OLFP associated with the south block. Similar to the comments apply to the South-east block.*** This has been discussed and addressed under items 8d. No further separate recommendations area needed.	
10	Minor / Open	***Climate change. It is not clear what climate change horizon/parameters used. This should be confirmed.*** For the same reasons as set out under item 8e, this can be addressed with a simple update to the Infrastructure report. A separate recommendation to 8e is not required provided this is included in that update.	
11	Moderate / Open	***The Regional Infrastructure Specification (RITS) is not referenced as a standard to which future stormwater infrastructure design will need to adhere to.*** This information has not been provided in the Supplementary report and as it is a key design standard for HCC infrastructure, it should be referenced in the Instructure report.	I recommend that the RITS be referenced in an updated Infrastructure report.
12	Minor/ Open	***Design requirements/measures for secondary overflow at culverts in the instance of blockage is not covered off and needs to be discussed. Please consider the implications of the SH1 culverts blocking on the PPC17 landform design.*** This has not been included in the Supplementary report. Without considering this it could result in HCC requiring floor levels to be set above the highway level when future Building Consents are applied for. It would be preferable to assess and comment on this issue at this stage prior to significant design being undertaken. The RITS requires functional secondary overflow paths in the case of the primary system fails. While these are existing culverts with limited overland flow paths, it may result in blockage countermeasures being needed or higher upstream ground levels should the development be sensitive to ponding from culvert blockage.	I recommend that the Infrastructure report be updated to include a high level assessment of SH1 culvert blockage on development ground and floor levels within the West block.
13	***Water quality***		
13a	Minor / Open	***The requirement for on-lot activity specific treatment devices has not been mentioned (for example, oil/water interception for petrol stations/workshops).*** This has not been included in the Supplementary report. Activity specific treatment on lot will be important to an industrial development and this should be noted in the Infrastructure report and included as a provision in the PPC17.	I recommend that the Infrastructure report be updated to note the requirement for activity specific treatment devices will be needed on lot.

Issue	Importance / Status	Description and Assessment	Recommendation
13b	Minor / Closed	***Subcatchment wetlands are proposed for the West block and these have been sized for 4% of the catchment area. While this is sufficient for water quality, we note extended detention will likely drive larger footprints and this should be recognised in the report.*** This has not been included in the Supplementary report. However, this issue can be addressed in future design stages where the design can be optimised. No further action is needed.	
13c	Minor / Closed	***Summary of general wetland design parameters including the use of highflow bypasses, liners etc should be discussed.*** This has not been included in the Supplementary report. However, this issue can be addressed in future design stages where the design will be fully documented. No further action is needed.	
13d	Moderate / Open	***Groundwater monitoring requirements at devices (wetlands/swales) in accordance with the IMCP should be stated.*** This has not been included in the Supplementary report. High groundwater has adversely affected several wetlands around Hamilton and the ICMP. This information will also be critical in determining soakage feasibility for future on lot device design. Requirement for monitoring to inform design should be included in the Infrastructure report and the PPC17 provisions. The earlier these are installed the more use these will provide for future design.	I recommend that the Infrastructure report be updated to note the requirement for ground water monitoring. This should also be made a provision in the PPC17.
13e	Minor / Closed	***Additional non-aquatic biodiversity elements and amenity access needs to be included in the design of wetlands and this should be stated in the report.*** This has not been included in the Supplementary report. However, this issue can be addressed in future design stages where the design can be optimised. No further action is needed.	
13f	Minor / Closed	***There appears to be a wetland missed from the layout in figure 6 of the Infrastructure report (and from the associated table 1). Refer location "A" below.***	

Issue	Importance / Status	Description and Assessment	Recommendation
		 We understand from the SME meeting that this is not an omission and the catchment can drain to a wetland further to the north. No further action is needed.	
13g	Moderate / Open	***The report assumes that upstream land will be treated outside of the PPC17 area before discharge into the Te Rapa Stream. This is reasonable for some locations that match with the conceptual wetland layout in the ICMP but not all. Wetlands "C" and "A" should be sized and located to serve those parts of the upstream greenfield land that are outside of the PPC17 extents (locations "B" & "C" in the above). The PPC17 needs to minimise the number of wetlands that HCC will inherit or show how these areas cannot be integrated (if there are constraints on the falls available) and what treatment would look like for the remaining land.*** The Supplementary report confirms that treatment for the specific area of land noted in the original comment has been allowed for in the wetland designs. This confirms this specific area can be addressed in accordance with the ICMP and as such this aspect is closed. However, the ICMP intends that new wetlands serve as subcatchment scale devices and so this includes treating existing (or upgraded) roads where these roads drain into PPC17 land. For, example the northern end of Te Rapa Road would be served by PPC17's wetland A; the southern part of Te Rapa road by wetland B etc. The Supplementary report states that treatment is needed prior to discharge into PPC17 land for the existing/upgraded roads, this is not in accordance with the ICMP. The ICMP has treatment to the existing developed land upstream of Ruffell Road and the land to the west of the Onion Road in wetlands/devices that are outside of the PPC17 extents.	I recommend that the Infrastructure report be updated to include for the wetlands to be designed as subcatchment scale devices and so include treatment of existing/upgraded roads adjacent to but outside of the PPC17 boundary.
13h	Minor / Open	***We note that swales are proposed for the North and South-east blocks whereas the ICMP recommends wetland swales. Please confirm wetland swales can be used.***	I recommend that wetland swales are stated in an updated Infrastructure report.

Issue	Importance / Status	Description and Assessment	Recommendation
		Wetland swales are noted in the ICMP and while ordinary swales and present different constraints (depth, width and longitudinal grades) for design. While ordinary swales may be justified with further assessment, at this stage wetland swales should be noted in the Infrastructure report.	
14	***Soakage***		
14a	Moderate / Open	***The report "precludes" soakage but notes "moderate" soakage rates from testing. It proposes to use soakage on-lot for 10mm depth of rainfall. While the 10mm on-lot is consistent with the ICMP this needs to include the potential to account for 10mm from road areas as well on a catchment wide basis.*** Irrespective of the soakage test results detailed in the Infrastructure report, soakage disposal should not be precluded at this stage of development. Site specific testing for each lot should still be required to demonstrate soakage is not feasible and if it is feasible then soakage should be used on lot as a preferential method for disposing stormwater. Where soakage is found not to be feasible then other measures (retention and reuse etc) will be needed.	I recommend that the Infrastructure report be updated to include the provision for on lot soakage including accounting for the road corridor on a catchment wide basis. Soakage shall be used preferentially over other methods unless site testing demonstrates ground conditions make it unfeasible.
14b	Minor / closed	***The 1.37x10-8 m/s stated in the Infrastructure report is a very low figure given the stated "sands, gravels, silts" noted in the report and at odds with "moderate soakage rates". This needs further explanation as to how the conclusion that soakage has "been precluded" was arrived at.*** Addressed by item 14a comment and recommendation. This relates more to future design and so is considered closed.	
14c	Minor / Closed	***The soakage testing did not pre-soak and although this is noted in the geotechnical report the implications are not discussed. Comment is also needed on how groundwater levels could influence viability of soakage.*** Addressed by item 14a comment and recommendation. This relates more to future design and so is considered closed.	
14d	Minor / Closed	***Section 5.2 of the Geotechnical report is named 'Soakage Testing' but relates more to 'Permeability Testing' or 'Hydraulic Conductivity determination'. The reported rates are as low as 1x10-9 m/s and this seems very low. The curve fitting used in the Appendix D (Hvorslev and Bower-Rice methods) appears part of why these results are so low. Alternative fitting could lead to higher orders of magnitude results. This should be reviewed and discussed.*** Addressed by item 14a comment and recommendation. This relates more to future design and so is considered closed.	

Issue	Importance / Status	Description and Assessment	Recommendation
14e	Moderate / Open	***Irrespective of the test results the PPC17 should not preclude soakage at this stage. Site specific testing should still be required for each lot to demonstrate soakage is not feasible and if it is feasible then soakage should be used on lot as a preferential method for disposing stormwater. Where soakage is found not to be appropriate then other measures (retention and reuse etc) will be needed.*** Refer item 14a comment and recommendation.	
15	Minor / Open	***Ongoing Pollution Management. The requirement for High Risk activities to have a Pollution Control Plan should be listed.*** Ongoing Pollution Management will be a significant issue in an industrial area and needs continual attention and maintenance to keep the devices performing as designed. This is also required under HCC's Stormwater Bylaw. The requirement for High Risk activities to have a Pollution Control Plan is also required by the Bylaw and should be documented in the Infrastructure report.	I recommend that the Infrastructure report be updated to cover Operation and Maintenance requirements and also include the Bylaw's requirement for Pollution Control Plans.
16	Minor / Closed	***The use of 85% imperviousness is acknowledged as below 90% under the Operative District Plan. Please confirm whether this is a required mitigation measure or an enhancement measure*** Given the areas will be industrial, a 5% reduction from the maximum in the Operative District Plan will be difficult to control and maintain over the long term so the PPC17 design, at this stage, should apply the maximum allowable % imperviousness. Opportunities to incorporate reduced % imperviousness can be explored as part of resource consenting once the whole suite of effects has been assessed and mitigation measures developed. This can be addressed in later design stages.	

Appendix 3 – Stream Erosion Resilience Works Indicative Staging

PPC17 Indicative Erosion Stream Works Staging

ICS 5.08.2025

Stage 1A/B Streamworks

Stage 2 Streamworks

(extent TBC)

Streamworks subsequent to stage 2

(extent TBC)

Streamworks subsequent to stage 2

Te Rapa Stream

SH1

River outlet Stage 1B

Stage 1A/B Streamworks

Stage 2 Streamworks

Streamworks subsequent to Stage 2

River outlet Independent of Stages 1A/B & 2

LEGEND:

- Catchment Boundary
- Highly Unstable Stream
- Moderately Unstable Stream
- Unstable Stream
- Stable Stream
- Approx PPC17 Boundary

0 500 1,000 m