Before Kaipara District Council

In the Matter	of the Resource Management Act 1991 (**RMA**)
And	
In the Matter	of an application for Private Plan Change 84 (**PC84**) by **MANGAWHAI HILLS LIMITED** to rezone 218.3 ha of land between Tara Road, Cove Road, Moir Road and Old Waipu Road, Mangawhai from Rural Zone to the Mangawhai Hills Development Area.

Evidence of Steven Brent Rankin on behalf of Mangawhai Hills Limited

(Civil Engineering)

Dated 29 April 2024

Jeremy Brabant

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Foundry Chambers

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Introduction

1. My full name is Steven Brent Rankin. I hold a Bachelor of Environmental Engineering (**BE(Env)**) from Unitec. I am also a chartered member (**CM**) and chartered professional engineer (**CPEng**) of Engineering New Zealand since 2012 and the Fijian Institute of Engineers as well as holding international registration (IntPE/APEC).

2. I have 17 years' experience and am a Director and the Principal Civil Engineer with Chester Consultants Ltd (**Chester**). I have been in the principal civil engineer role since 2008. I became a Director of Chester in 2014. Chester is a multi-disciplinary consultancy working in the built environment throughout New Zealand and the Pacific. Most of my professional experience and expertise is specific to the civil engineering matters related to land development. I have expertise in 3-waters infrastructure, stormwater management, roading, earthworks and sediment & erosion control.

3. I was instructed by Mangawhai Hills Limited in November 2022 to provide civil engineering advice and services in support of this Private Plan Change Application (**PC84**).[1] I am familiar with the area to which the application relates. I have visited the site and surrounds on multiple occasions, most recently on 13 December 2023.

4. Although this is not a hearing before the Environment Court, I record that I have read and agree to and abide by the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023. This evidence is within my area of expertise, except where I state that I rely upon the evidence of other expert witnesses as presented to this hearing. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

[1] Chester produced a Draft Stormwater Management Plan dated 23 February 2023, a Flood Risk Assessment dated 23 February 2023 subsequently updated by the assessment dated 22 March 2024 and produced the infrastructure response to Council's further information request dated 12 May 2023.

Scope of Evidence

5. My evidence will address the following:

    a. Summarise the key findings from the Chester Reports, specifically;

        i. Natural Hazards – Flooding;

        ii. Stormwater;

        iii. Water; and

        iv. Wastewater.

    b. Response to s 42A Report relevant to my area of expertise.

    c. Response to Submitters relevant to my area of expertise.

    d. Conclusions.

Natural Hazards – Flooding

6. As a result of urbanisation, stormwater volumes and stormwater peak flows increase; this increase is due to a reduction of initial water loss to the ground, e.g. less permeable surfaces, reduced surface friction for surface runoff, and the increased water conveyancing associated with conventional piped stormwater networks.

7. Given this change, an engineering assessment is required to estimate the pre-development flood risk. This pre-development assessment forms an effects baseline from which the plan change effects can be assessed.

8. Chester prepared a Flood Risk Assessment dated 22 March 2024[2] which modelled three scenarios:

    a. One pre-development (greenfield) flood risk model to establish an assessment baseline for the existing land zoning;

[2] This supersedes the application report as notified, the report was revised in reply to Council's technical review with the inclusion of 1% AEP mitigation (100-year ARI).

b. One post-development flood risk model to estimate the flows resulting from a maximum probable density (**MPD**) development being completed aligned with the KDC Spatial Plan; and

c. One post-development flood risk model to estimate the flows resulting from a MPD development being completed incorporating this proposed plan change.

9. The Flood Risk Assessment concludes that the proposed private plan change area is expected to increase stormwater depths and velocities along the downstream flow paths for the 50% (2-year ARI), 10% (10-year ARI), and 1% (100-year ARI) Annual Exceedance Probability (**AEP**) storm events. However, due to the nature of the flow path and surrounding environments, there is no expected increase in flooding hazard to existing downstream dwellings except for one dwelling located at 114 Moir Street (LOT 1 DP 490650) during the 1% AEP (100-year ARI) storm event.[3]

10. In acknowledgement of the likely effects for the dwelling located at 114 Moir Street during the 100-year Annual Return Interval (**ARI**) storm event, we have proposed that post-development stormwater flow rates for future developments within the private plan change area be mitigated back to pre-development rates for the 100-year ARI storm event. This change was adopted and included in the 22 March 2024 report in response to the Council's expert's comments.

[3]Technical note: the AEP terminology used above and within our reporting is a technical term to describe the chance of a given storm occurring in a given year. For example, the 1% AEP storm event has a 1% chance of occurring in a given year. The more widely known terms, 1-in-100, or 100-year storm relates to Annual Return Interval or ARI. The ARI term can confuse the general public and it can give the false impression that this storm would only occur every 100 years rather than a probability as intended. For this document, we have used the more widely known, ARI term which is also consist with the terms used in the proposed provisions.

Stormwater

11. When assessing stormwater in relation to environmental effects resulting from urbanisation, the key considerations are related to the quantity of stormwater runoff flows and the resulting erosion from frequent storm events, and the water quality of the stormwater runoff itself.

12. The approaches proposed within PC84 for both stormwater quantity and quality have been adapted from Auckland Council. With regard to stormwater quantity and quality design, Auckland Council is considered the leader within New Zealand setting the standard for stormwater management.

13. The provisions proposed are above those of the current district plan and have been aligned to the higher order statutory requirements of the more recent Government and Regional Policies. For a full list of these documents, please refer to the Stormwater Management Plan dated 23 February 2023 prepared by Chester. For ease of reference, the key documents are:

    a. National Policy Statement for Freshwater Management 2020;

    b. Resource Management (National Environmental Standards for Freshwater) Regulations 2020;

    c. Regional Water and Soil Plan for Northland; and

    d. Proposed Regional Plan for Northland March 2022 – Appeals Version.

14. The important point to note is that these higher order documents have lifted the expectations for stormwater management substantially higher than they were when the current district plan was created. Auckland Council has become the leader in stormwater management in part due to the timing of these changes and the introduction of the Auckland Unitary Plan, meaning that Auckland Council, at a district level, needed to provide the tools to respond to their requirements as the territorial authority to implement these policies.

15. As councils throughout New Zealand update their existing district plans, I expect that standards will be aligned, and as such I anticipate that the Kaipara District Plan will have stormwater provisions of a comparable nature to the precinct provisions proposed for PC84.

Quantity

16. Current best practice stormwater engineering has identified that stream channel erosion is generally being caused by high frequency storms that have enough intensity to create channel flow of an erosive nature.

17. The means of mitigating stream channel erosion due to urbanisation is achieved through a number of methods with the chosen method being specific to the runoff source and the underlying geology.

18. Through the lens of PC84, in my opinion the targeted storm event to protect the streams from channel erosion is (as proposed in the provisions) that relating to the management of 1/3 of the 2-year ARI storm event. This design rainfall aligns closely to the design approach used by Auckland Council which is currently considered to be best practice. The design rainfall depths are specifically related to erosion generating runoff. In Auckland these are expressed as the 90th and 95th percentile storms—when calculated, these compare closely to be 1/3 of the 2-year ARI storm event. For an example, I refer to a site located in Topuni along the Kaipara/Auckland Boundary where the Auckland data overlaps with NIWA data:

    a. Auckland Council, 90th Percentile Storm – 30mm/24hr[4]

    b. Auckland Council, 95th Percentile Storm – 42mm/24hr[5]

    c. Kaipara District, 2-Year Design Storm– 109mm/24hr[6]

    d. Kaipara District, 1/3 of 50% AEP Design Storm – 36mm/24hr

[4] Rainfall Depth as provided by Auckland Council Guidance Document 01, Figure 5.
[5] Rainfall Depth as provided by Auckland Council Guidance Document 01, Figure 6.
[6] Rainfall Depth as provided by NIWA HIRDS v4 RCP8.5, Year 2100.

19. The means of mitigating these frequent erosive storms are summarised below:

    a. The first 5mm of rainfall runoff depth for all impermeable surfaces is to be retained and either re-used or infiltrated within a 72-hour period.

    b. If it has been determined that there is not enough water demand for re-use to consume, or soakage rates are too low to infiltrate over a 72-hour period, then retention is to be substituted with detention with the resulting volume to be discharged over a 24-hour period using the climate change adjusted rainfall depth for 1/3 of the 2-year ARI storm event.

Quality

20. The stormwater contaminant load from a rural environment is completely different from that of an urban environment. In very general terms, rural land uses tend to produce silts and nutrients associated with disturbed land and agricultural chemicals. While urban land uses produce silts as well, nutrients associated with agricultural chemicals are largely replaced with heavy metals and hydrocarbons mainly originating from the increased density of roadways and motor vehicles.

21. Through the lens for PC84, the provisions associated with stormwater quality treatment are in line with current best practice and to my knowledge a higher standard currently does not exist within a New Zealand context.

22. Stormwater quality treatment is proposed to treat runoff from all contaminant generating impermeable surfaces; the anticipated method of compliance with this provision is through the Auckland Council Guideline Document 2017/001, Stormwater Management Devices in the Auckland Region (GD01).

Water Quality (Temporary Works)

23. The Stormwater Management Plan addresses the management of stormwater in the development's final form. However, the temporary construction phase presents stormwater quality risks from civil construction activities if not managed correctly e.g. sediment discharges during construction.

24. Currently the sediment and erosion controls are controlled by the current Kaipara District Council Engineering Standards (**KDCES**); the standards currently reference Auckland Council's Technical Publication 90 (**TP90**) as the means of compliance.

25. TP90 has been superseded by Guidance Document 05 (**GD05**). Therefore it is my recommendation that the Precinct Provisions be adjusted to specify the use of GD05 rather than relying in the KDCES.

26. GD05 is a superior document and represents a progression in sediment and erosion control management following a specific gap analysis and the historical performance of GD05 across the Auckland region.

27. The combination of the Stormwater Management Plan and raising the bar on sediment and erosion control through the application of GD05 applies the best practice water quality controls from temporary works through to final development.

Water

28. Water supply and the need for an adequate water supply to support a residential land use is of the up most importance. Mangawhai, like many areas across New Zealand, does not have a large or extensive public water supply reticulated network, nor does it have a local reliable cost-effective water source sufficient to supply the majority of its population.

29. The current district plan, in the absence of a public water supply network, requires compliance with Chapter G12 of the New Zealand Building Code for private water supply. The functional requirements are defined by Section G12.2: "Buildings provided with water outlets, sanitary fixtures or sanitary appliances must have safe and adequate water supplies."

30. The key element of this functional requirement with respect to PC84 is the term, “adequate.” The term “adequate” is not defined in the New Zealand Building Code, as such the onus is on the Building Consent Authority to define or determine whether an adequate supply has been provided at the time of consent.

31. In acknowledging the importance of an adequate water supply, I have proposed wording to be included in the PC84 provisions which define what is considered adequate.

32. The adequacy of a water supply needs to tie the water source to the water usage as much as practical. Therefore, the critical elements for adequacy are the size of the water source, which in this context is the size of a roof and storage tank, and then the water usage, which is associated with the number of people in a house. The house population is determined from the number of bedrooms in the same way as onsite wastewater systems are designed.

33. Expected provisions of rainwater harvesting storage volume for water supply, in relation to the number of bedrooms per dwelling, are shown in Table 1, below. The values shown in Table 1 have been taken from the legacy Auckland Regional Council’s Countryside Living Toolbox, dated 2010, and are proposed as the provision to define the adequacy of the proposed water supply.

Table 1: Minimum Tank Size for RDC Homes Having Tanks as Sole Water Source (s4.6.6.2)

Roof Catchments (m^2)	Bedrooms				
	1	2	3	4	5
100	$20m^3$	$50m^3$			
120	$15m^3$	$35m^3$	$75m^3$		
140	$10m^3$	$30m^3$	$60m^3$		
160		$20m^3$	$50m^3$		
180			$45m^3$	$75m^3$	
200			$35m^3$	$65m^3$	
220			$30m^3$	$55m^3$	$90m^3$
240			$30m^3$	$50m^3$	$80m^3$
260				$45m^3$	$70m^3$
280				$40m^3$	$65m^3$

300				35m³	60m³

34. This Table appears in the proposed provisions as Table DEV 1-2.

35. This table was developed by the legacy Rodney District Council and was adopted into the Countryside Living Toolbox; currently, to the best of my knowledge, this is the only published document which provides guidance on this topic.

36. I acknowledge that this table pre-dates recent climate change adjustments applied to engineering calculations where rainfall is relevant; but in general, the expectation is for more rainfall rather than less meaning the table in the absence of updated published documents remains valid and it represents an improvement over the status quo. I confirm my opinion that it is an appropriate method to adopt.

37. With respect to Fire Fighting Water Supplies, PC84 aligns with Plan Change 4, which requires a minimum dedicated firefighting water supply of 10,000L per house or an alternative approved supply in accordance with Plan Change 4. In my view, the Plan Change 4 requirements are appropriate to service the firefighting needs of development enabled by the rezoning of the PC84 site.

Wastewater

38. Currently, the Mangawhai area is serviced by the Mangawhai Community Wastewater Scheme (**MCWWS**) and the Mangawhai Community Wastewater Treatment Plant (**CWWTP**).

39. The ongoing planning and upgrades associated with the CWWTP, to match capacity with the growth experienced in Mangawhai, has anticipated the lower 1/3 of the PC84 area being rezoned to residential with the area being included within the area of benefit for wastewater servicing. Figure 1, shown below, illustrates the existing, future and additional areas considered as residential in the long-term planning for the CWWTP. The

PC84 area is the area denoted within the thick red boundary shown in Figure 1.

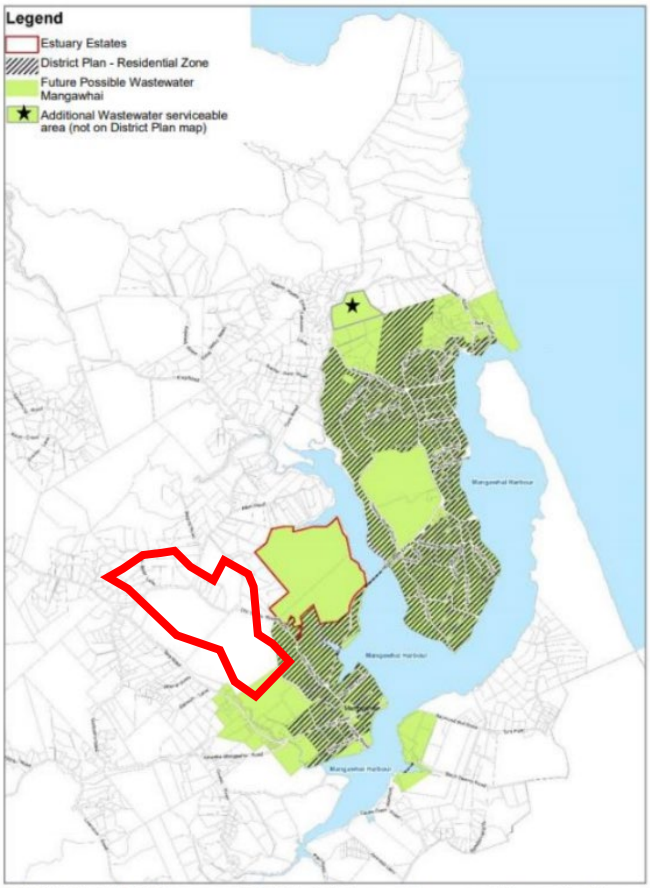

Figure 1: Potential CWWTP Service Area from Page 20, Mangawhai Spatial Plan

40. When considering the capacity of the CWWTP it is important to note that wastewater treatment plants are not generally built to 100% at inception, this is generally due to funding and the wastewater flow available for the efficient operation of the plant.

41. In the specific context of the CWWTP, the plant had immediate capacity for 236 new connections. I note that it has recently completed upgrade works to enable another 550 connections meaning that it has current capacity for 786 new connections (236+550=786 with a total current capacity of 3550 connections).

42. The Council has a further longer-term upgrade for another 1920 connections by 2026/2027. So, an additional 1920 connections are planned

to be provided between now and 2027 increasing the total available capacity from the current limit of 3550 (3000+550) connections to 5470 (3550+1920) connections.

43. The upgrades proposed, when completed, are estimated to provide capacity through to 2047.

44. As noted in the Chester Report, 3 options have been identified for wastewater servicing of the site:

    a. Connection to Council's reticulated network;

    b. A private, standalone reticulated treatment plant on-site; and

    c. Septic tanks on individual lots.

45. The preferred option is that of the 600 lots currently anticipated to be enabled for future development within PC84, 500 lots are intended to divert, treat, and discharge wastewater through private assets with the remaining 100 lots (in the southern third of the site) connecting to the CWWTP.

46. The Applicant has lodged an application for a Wastewater Discharge Consent with the Northland Regional Council (**NRC**), specifically File 45654. The NRC issued draft conditions on 10 April 2024 and the applicant anticipates the consent would be granted in May once the conditions are reviewed and accepted.

47. The application for this consent and pending granting from NRC illustrates the Applicant's clear intention to continue with the Private Wastewater Treatment Plant for the 500 lots with the balance 100 lots being connected to the CWWTP.

48. The PC84 provisions have been specifically drafted to enable multiple options for wastewater connections for the plan change area. In my opinion the proposed PC84 provisions and the existing and planned upgrades to the public system are suitable to ensure that wastewater servicing is adequately provided.

Response to s 42A Report

49. I have reviewed the s42A Report and the technical reports relevant to my areas of expertise. In summary they support and agree with the analysis I have undertaken. I provide comments for the following specific points raised:

    a. Section 42A at paragraph 105 – As noted above, the Wastewater Discharge Consent is well advanced, and consent is expected to be granted shortly to service the 500 lots anticipated to be enabled in the MHL owned land by PC84 as outlined in the Chester Land Development Report.

    b. Section 42A at paragraph 108 – The Council's wastewater expert and NRC have expressed the need for a minimum lot size to be added to the provisions. I note that the existing operative district plan has a minimum lot size of 3000m^2, whilst the NRC documents do not have a stated minimum lot size. Currently the proposed PC84 provisions address Wastewater Disposal with proposed rule DEV1-S17:

> 3. Where no Council system or community wastewater system is available or utilised, the system shall be designed in accordance with AS/NZS1547:2008 "Onsite Wastewater Management Standards".

        i. Given the presence of this provision, I do not agree with the inclusion of a minimum lot size and or minimum disposal field. The minimum lot size to support an onsite wastewater system must comply with the Standard. This means the designer needs to:

            1. Assess the wastewater design flow based upon the development.

2. Complete a soil classification for the land disposal area including the reserve area considering all the setback requirements and confirm the size of the lot required; and

3. Confirm if the onsite approach is feasible.

ii. The use of a minimum lot or disposal area rule is a blunt tool that doesn't consider the specifics of the development which will vary from site to site given geological and development variance.

iii. I do note the referenced standard AS/NZS 1547:2008 should be amended to AS/NZS 1547:2012

c. Section 42A paragraph 111 c) –The performance requirements for onsite wastewater systems, design, performance and the wider considerations are set within the New Zealand Standard. This standard gets revised and updated based upon national environmental standards by the Ministry for the Environment. My expectation is that onsite wastewater design would be designed in accordance with the current New Zealand Standard at the time of development; therefore, I do not agree with the comment made and believe the proposed provisions are appropriate.

d. Section 42A at paragraph 119 – I do not support the change proposed, specifically the management of the 1/3 of the 2-year ARI storm event being removed with the addition of the 100-year ARI storm. Management of 1/3 of the 2-year ARI storm event is stipulated specifically to manage stream channel erosion and the mitigation of the 100-year ARI storm event is for flood hazard mitigation; so, they have a different purpose thus it is not one or the other; it is both. The correct provisions are contained in the revised recommended provisions DEV1-S15.

e. I make the following comments regarding PC84 – Tracked Provisions within the scope of my areas of expertise.

i. DEV1-P5 - Delete, additional text is superfluous,
ii. DEV1-R2 b. – Delete, this is addressed in DEV1-S17,
iii. DEV1-R2 c. – Additional text, delete; this is addressed in DEV1-S17
iv. DEV1-R19 b. - Delete, this is addressed in DEV1-S17,
v. DEV1-S13d. – Accept,
vi. DEV1-S16 b. – Reject, 1/3 of the 2-year ARI mitigation is required for stream channel erosion mitigation,
vii. DEV1-S17 g. – Reject, the cumulative effects are considered in the New Zealand Standard AS/NZS1547:2012.

Response to Submitters

50. I have reviewed the Submissions and make the following specific comments regarding elements raised within the document relevant to my area of expertise.

51. I have grouped the replies thematically rather than reply to individual submissions.

Flood Risk Assessment

52. The flood risk assessment was undertaken using the current adopted guidance for both climate change rainfall (2.1 Degrees at 2090 or RCP 8.5 2081-2100) and sea level rise (3.2m at 2130). We acknowledge that this space is being reviewed with both rainfall and sea level rise likely to increase especially as the horizon (year) being assessed extends along with the modelling of greenhouse gas emission targets and compliance. Within the provisions, we have not locked in the increases for rainfall or sea level rise so, as decisions are made and adopted into regional and district plans, the designs and assessments will be undertaken to suit.

53. I note that the adopted sea level rise is in line with the Ministry for the Environment's recent guidance document "Coastal Hazards and Climate Change Hazards" February 2024.

54. I note the rainfall used in the report is higher than the 2081 – 2100 RCP 8.5 which is currently adopted by the NRC. The NRC rainfall is 275mm/24 hours whereas the rainfall used in our assessment is 324mm/24 hours, meaning our assessment is more conservative than the NRC. Upon review, our report has increased the climate change adjusted rainfall by an additional 17% over the allowance already embedded in the KDC engineering standards – Table 6.7, resulting in an over estimation. The Flood Risk Assessment is currently being revised for the corrected rainfall to align with the NRC rainfall; the amended document will be provided as supplementary evidence. The resulting mapping would be suitable for inclusion as flood hazard mapping for the plan change.

Impermeable Coverage

55. The Flood Risk Assessment has analysed the conveyance of the downstream network for the climate change adjusted 100, 10 and 2-year ARI storm events. The analysis indicates sufficient stormwater conveyance exists for the maximum probable density along the entire reach to the discharge point except for a minor peak flood elevation increase at the base of the catchment during the 100-year event. Given that the 100-year event is the design storm we assess as a natural hazard, we have added in stormwater peak flow mitigation of 100-year design storm to pre-development levels to mitigate the increase observed (in the analysis) in the lower catchment. So, whilst the impermeable coverage is proposed to be increased, the flood hazard experienced within the catchment for the 100-year design storm is to be maintained at pre-development elevations using peak flow controls onsite.

56. In addition, it is important to note that the flood analysis was undertaken using a static 3.2m R.L sea level elevation which allows for a sea level increase of 1.2m over the NRC's required 2.0m as predicted in 2130. This aligns to the current high-emission climate change adjustment documented by the NRC. This means that the flood model is assuming the design storm events are occurring at the same time as a king tide event coupled with 1.2m of sea level rise. The analysis is conservative as the probability of those two events occurring together is extremely low.

Infrastructure

57. The new stormwater infrastructure designs will be accordance with the current KDCES, which sets the performance standard for infrastructure within the district. So, while I agree some existing infrastructure is currently undersized, new assets will be designed to the standard and potentially upgrades maybe identified through the resource consent process. In the instance of PC84, very few assets exist along the stormwater conveyance route, which is positive.[7]

58. Further to this, the operative KDCES isn't explicit on wider infrastructure needs, however we understand this is being corrected in the draft KDCES. Therefore, in terms of submitters concerns about the wider community, moving forward the MPD catchment will be considered through the revised engineering standards.

59. We acknowledge the extreme rainfall event experienced in Mangawhai in 2023, as we understand this storm exceeded the climate change adjusted 100-year design event. Within the engineering community we design to a level which is determined by national policy, seeking to balance the magnitude of an event against the probability of the events occurrence. Events will occur in excess of design standards, so a balance needs to be found between cost and benefit. Currently the 1% probability (100-year ARI) is the adopted threshold I consider for flooding which is constantly being adjusted with climate change predictions.

Wastewater

60. Concerns have been raised about wastewater capacity by submitters. The KDC Wastewater Expert Mr Cantrell has confirmed the current and future capacity in the CWWTP, with capacity to accommodate the 100 southern lots which are contained within the area of benefit and then the 500 northern lots albeit with likely upgrades.

[7] In comparison, in circumstances where the downstream route is not so free from obstructions, (for example Plan Change 83 (The Rise) which has an extensive number of undersized stormwater assets downstream of the plan change area) this would trigger a higher level of mitigation or upgrades than what is proposed for PC84.

61. The applicant has continued the path towards providing a private onsite wastewater treatment plant for the 500 northern lots with an NRC consent expected to be granted shortly.

62. As mentioned prior this is not withstanding that the provisions of the plan change are and should be able to allow multiple options regardless of the applicant's intentions. In my opinion the provisions are suitable to ensure that wastewater servicing is adequately provided, whichever methodology is ultimately advanced.

63. The private wastewater treatment plant costs and ongoing maintenance are to be met by the residents benefitting from the wastewater treatment plant services, so the potential burden of additional wastewater catchment is not being passed on to the community.

64. The 100 lots within the catchment which are intended to be connected to the CWWTP have already been accounted for in the future planning of the plant and the development of these sites would increase the rate base contributing towards the CWWTP.

65. The public infrastructure costs will be met by the developer, this is a known and expected cost of development. No public/council funding is required.

Servicing

66. Views have been expressed around the certainty of infrastructure. Regarding 3-waters, in my opinion there is a high level of certainty that the PC84 area can be serviced. At a plan change level the development specifics around 3-waters are not typically provided as the zoning needs to inform the scheme and the scheme informs the 3-waters design. We do know the following:

    a. Stormwater will be treated (where contaminants will be present eg. roads), retention provided, and mitigation deployed for 1/3 2-year design storm event, prior to further detention to pre-development peak flows for the 100-year design storm before being discharged into the existing stream system. Note – land disposal is not

proposed for stormwater management, recharge will occur where the ground allows to maintain ground water and wetland health, but the primary discharge is via the stream system.

b. Potable water and firefighting water supplies are provided via water tanks with the minimum tank size for supply to provide adequate water supply provided in Table DEV 1-2, and firefighting water supplies in accordance with Plan Change 4.

c. Most water supply systems are not free from the threat of droughts, with the exception of desalination. Rainwater tanks, bores, and open water reservoirs have a finite capacity which can be influenced by external factors such as drought. In my opinion the use of Table DEV 1-2 is appropriate and provides guidance where none currently exists; providing direction on what should be used as a minimum.

d. The wastewater from the applicant's land (500 Lots anticipated to be enabled by PC84) is intended to be treated and disposed of onsite by a private wastewater treatment plant. The wastewater discharge consent from the NRC is nearing approval. The balance 100 lots anticipated to be enabled by PC84 can be serviced by the CWWTP and the existing conveyance network as detailed by the Council Wastewater Expert Mr Cantrell and assessed in the reports and evidence I have completed.

Sediment & Erosion Control

67. Silt, and by extension water quality, being received in the Mangawhai Estuary is a significant issue and it is agreed that protection of our waterways is critical. In response, the provisions are applying the best practice stormwater management practices to the entire plan change area where contaminants are targeted and treated prior to discharge and erosive stormwater flows are mitigated (detention of the 1/3 2-year storm event)

to protect the receiving environment from cumulative erosive flows which could otherwise accelerate stream channel erosion.

68. In addition to the stormwater management from the built development, I have recommended that the use of the KDCEC sighted Sediment and Erosion Guidelines but updated to the current best practice document (GD05) which has superseded the currently sighted document in the KDCES.

69. The strengthening of the earthwork's provisions combined with the stormwater provisions provides the framework for quality stormwater outcomes to be required and achieved.

Stormwater Management

70. The use of Stormwater Management Plans, whilst a new approach within the district, has been used in Auckland for a number of years. A stormwater management plan provides the designers the information they require for performance and consistency throughout the plan area. In my experience ad hoc and inconsistent outcomes have occurred where a stormwater management plan hasn't existed, in the absence of a specific plan inconsistency appears and outcomes are reduced or lost where the individuals used subjective decision making on limited information and experience.

71. As an example, Hobsonville Point in Auckland was one of the first large scale developments where this approach was adopted and implemented due to the identified sensitive receiving environment. Hobsonville Point is one of the most successful land development projects in New Zealand, the stormwater planning, integration, and outcomes have been successful.

Conclusion

72. I have read the submissions and the Council Section 42 report, and I have provided responses to the areas relevant to my area of expertise.

73. I am of the opinion that there are no engineering limitations within my area of expertise that prevent the re-zoning of PC84 in accordance with the proposed provisions.

Steven Brent Rankin

Dated 29 April, 2024