

Before Kaipara District Council

IN THE MATTER the Resource Management Act 1991 ("**RMA**")

And

IN THE MATTER of an application for Private Plan Change 83 ("**PC83**") by THE RISE LIMITED to rezone 56.9 ha of land at Cove Road and Mangawhai Heads Road, Mangawhai from Rural Zone to Residential Zone.

STATEMENT OF EVIDENCE OF STEVEN BRENT RANKIN ON BEHALF OF THE RISE LIMITED

CIVIL ENGINEERING

19 February 2024

Michael Savage

Barrister

Park Chambers

1. SUMMARY OF EVIDENCE

- 1.1 This summary of evidence provides an overview of my evidence in support of PC83.
- 1.2 The scope of my evidence covers areas relevant to my expertise, specifically in relation to Flooding, Stormwater Management, Water and Wastewater. It then continues to provide comment on the Section 42A report and responses to the submissions received and my conclusion.
- 1.3 Flooding is estimated to occur downstream of PC83, specific flood mitigation measures are proposed to pre-development levels to mitigate the additional flows.
- 1.4 Specific stormwater quantity and quality measures are proposed to mitigate the environmental impacts of urbanisation, specifically, Stormwater Quality Treatment for all contaminant generating surfaces and Stormwater Quantity Mitigation for stream channel erosion.
- 1.5 Water supply and specifically the adequacy of a water supply is critical when considering PC83; Table 1 is proposed to define what an adequate water supply is. Table 1 considered the size of the roof and the population of the dwelling based on the number of bedrooms to specify a minimum water tank size that can be considered to be adequate for water supply.
- 1.6 PC83 is intended to be serviced with wastewater by an extension and potentially local network upgrades of the reticulated wastewater network before discharging into the existing CWWTP. The CWWTP has capacity currently as well as upgrades currently underway immediately and in the short term to provide capacity through to 2047.
- 1.7 Specific comments are provided in reply to the Council Section 42A report; the comments are summarised below.
 - (a) Point 94 – Correction of the mitigation required.
 - (b) Point 96 – Reply on the effects of impermeable coverage 40% vs 60%.
 - (c) Point 99 – Reply to requested for the insertion of a flood hazard map in the plan change.
 - (d) Point 276 - Reply to comment re staging and fragmented ownership

- 1.8 Response to the common themes identified by the submissions, specifically relating to Flooding, Stormwater, Water and Wastewater.
- 1.9 Conclude that in my opinion that there are no engineering limitations within my area of expertise that prevent the re-zoning of PC83 in accordance with the proposed provisions.

2. INTRODUCTION

- 2.1 My full name is Steven Brent Rankin. I 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 become a Director of Chester in 2014. Chester is a multi-disciplinary consultancy working in the built environment throughout New Zealand and the Pacific.
- 2.2 I am a qualified Civil Engineer with 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).
- 2.3 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.
- 2.4 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in preparing this statement of evidence. Unless I state otherwise, this evidence is within my sphere of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express. I have no conflict of interest to declare with respect of PC83.

3. SCOPE OF EVIDENCE

- 3.1 My evidence is not intended to repeat the information contained within the Chester reports, this evidence is intended to be concise and read in conjunction with the reports. Specific new comments are provided in respect to the Council S42 Report and the Submissions.
- 3.2 In my evidence I will discuss the following civil engineering elements:
- (a) Summarise the key findings from the Chester Reports, specifically.

- (i) Natural Hazards – Flooding,
 - (ii) Stormwater,
 - (iii) Water,
 - (iv) Wastewater.
- (b) Address the Section 42A Report matters relevant to my area of expertise.
 - (c) Address the submissions relevant to my area of expertise, and
 - (d) Conclude.

4. INVOLVEMENT WITH THE PROPOSAL

- 4.1 I have been engaged by The Rise Limited to provide Civil Engineer expertise in support of Private Plan Change Application 83 (“**PC83**”)1. Chester replaced the previous civil engineer following the first round of submissions.
- 4.2 I was engaged as a direct result of the submissions received to strengthen and provide a comprehensive response to the concerns raised through the submission process.
- 4.3 Since my involvement a few of the proposed provisions as lodged have be changed due to engineering inputs, specifically.
 - (a) Minimum Lot size – revert of typical 600m².
 - (b) Water Supply – addition of specific precinct provisions.
 - (c) Stormwater management (quantity and quality) – addition of specific precinct provisions.
 - (d) Onsite Wastewater – removal of precinct provisions.

5. Key Findings

- 5.1 Natural Hazards – Flooding
 - (a) 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 eg. less permeable surfaces, reduced surface friction for surface runoff and the

increased water conveyancing associated with conventional piped stormwater networks.

- (b) 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 from.
- (c) Chester prepared a Flood Risk Assessment which estimates the pre-development flood risk model to establish an assessment baseline and then prepared a post-development flood risk model to estimate the flows resulting from a maximum probable density (MPD) development being completed.
- (d) The Flood Risk Assessment concludes that properties in the catchment are likely flood effected, and that stormwater infrastructure upgrades of the twin culverts under Mangawhai Heads Road (west) are unlikely to relieve any flooding experienced due to the tidal influence.
- (e) In acknowledgement of the likely effects and that remedy options are limited we have proposed that stormwater flows be mitigated back to pre-development levels for the 20% (5-year), 10% (10-year) and 1% (100-year) AEP's.
- (f) It is important to note that these mitigation recommendations are based around capacity constraints and or property impacts, rather than an environmental such as quality or erosive stream flows. This means a constraint could be remedied meaning the mitigation could be reduced; this would be subject to a specific assessment and approvals.

5.2 Stormwater

- (a) Considering stormwater in relation to environmental effects resulting from urbanisation the key considerations are erosive stormwater flows (quantity) from frequent storm events and stormwater quality.
- (b) The approaches proposed within PC83 for both stormwater quantity and quality have been adapted from Auckland Council; Auckland Council is the leader within New Zealand, setting the standard for stormwater management.
- (c) The provisions proposed are above those of the current district plan and they have been aligned to the higher order statutory requirements of the more recent Government and Regional Polices, for a full list of these documents please refer

to the Stormwater Management Plan prepare by Chester; for ease I have inserted the key document references below.

- (i) National Policy Statement for Freshwater Management 2020,
 - (ii) Resource Management (National Environmental Standards for Freshwater) regulations 2020,
 - (iii) Regional Water and Soil Plan for Northland,
 - (iv) Proposed Regional Plan for Northland March 2022 – Appeals Version,
- (d) The important point to note is that these higher order documents have lifted the expectations for stormwater management substantially higher; 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.
- (e) 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 PC83.

Quantity

- (f) Current best practise 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.
- (g) The means of mitigating stream channel erosion due to urbanisation is achieved through a number of methods, the chosen method is specific to the runoff source and the underlying geology.
- (h) Through the lens of PC83 the targeted storm event to protect the streams from channel erosion is in our opinion and as proposed in the provision 1/3 of the 2-year 24-hour rainfall depth. This design rainfall aligns closely to the design approach used by Auckland Council who are currently considered to be leading best practise; the design rainfall in Auckland is expressed as the 90th or the 95th

percentile storm which calculates closely to the 1/3 of the 2-year 24-hour rainfall depth.

90th Percentile Storm – 31.2mm – Auckland Council

95th Percentile Storm – 42.2mm – Auckland Council

2-Year Design Storm– 101mm¹/24 hour – Kaipara District

1/3 2-year Design Storm – 33.67mm – Kaipara District

- (i) The means of mitigating these frequent erosive storms are summarised below.
 - (i) Stormwater retention of the first 5mm of rainfall for all impermeable surfaces is to be provided with the retention volume either to be re-used or infiltrated within a 72-hour period.
 - (ii) If it has been determined that there is not enough water demand for or soakage available to provide retention via re-use or infiltration over a 72-hour period, then retention is to be substituted with detention with the volume to be discharged over a 24-hour period using climate adjust 1/3 of the 2-year 24-hour rainfall depth.

Quality

- (j) The stormwater contaminant load from a rural zone is completely different from an urban environment. In very general terms Rural landuse tends to produce silts and nutrients associated with disturbed land and agricultural chemicals; in an urban setting silts are still present but the agricultural chemicals are replaced with the introduction of heavy metals and hydrocarbons mainly originating for motor vehicles.
- (k) Through the lens for PC83 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.
- (l) Stormwater quality treatment is proposed to treat runoff from all contaminant generating impermeable surfaces; the anticipated method of compliance with

¹ HIRDS RCP8.5 Year 2100

this provision is through the use of Auckland Council guideline document “Stormwater Management Devices in the Auckland Region” (GD01).

5.3 Water

- (a) Water supply and the need for an adequate water supply to support a residential landuse is of the up most importance. Managawhai like many areas across New Zealand does not have reticulated public water supply and network, nor does it have a local reliable cost-effective water source.
- (b) The current district plan in the absence of a public water supply and network stipulates compliance with the New Zealand Building Code for private water supply; specifically, G12; with the functional requirement defined by G12.2 *“Buildings provided with water outlets, sanitary fixtures or sanitary appliances must have safe and adequate water supplies”*.
- (c) The key element in the relation to PC83 of this functional requirement is the term “adequate”. The term “adequate” is not defined in the New Zealand Building Code, the onus is on the Building Consent Authority to define or determine whether an adequate supply has been provided at the time of consent.
- (d) In acknowledging the importance of an adequate water supply we have proposed provisions that define what we believe can be considered adequate.
- (e) The adequacy of a water supply needs to tie the water source to the water usage as much as practical; so, the critical elements are the size of the water source which in this context is the size of a roof, and then the water usage which is associated with the number of people in house. The house population is determined from the number of bedrooms in the same was as onsite wastewater systems are designed.
- (f) The water supply provisions include the use of Table 1 which is inserted below. Table 1 has been taken from the Legacy Auckland Regional Council’s “Countryside Living Toolbox” and are proposed as a provision to define the adequacy if the proposed water supply.

Roof Catchment (m ²)	Bedrooms				
	1	2	3	4	5
100	20 m3	50 m3			
120	15 m3	35 m3			
140	10 m3	30 m3	75 m3		
160		20 m3	60 m3		
180			50 m3	75 m3	
200			45 m3	65 m3	
220			35 m3	55 m3	90 m3
240			30 m3	50 m3	80 m3
260			30 m3	45 m3	70 m3
280				40 m3	65 m3
300				35 m3	60 m3

- (g) With respect to Fire Fighting Water Supplies PC83 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.

5.4 Wastewater

- (a) The intention is to service PC83 by extending the existing public wastewater network at the time of development and discharge the wastewater to the existing Mangawhai Community Wastewater Treatment Plant (CWWTP).
- (b) It is accepted and known that at the time of extending the public wastewater network, the network may require upgrades to either the existing piped network and or pump stations to provide increased capacity. This type of work is a common requirement with details addressed during the subdivision consent process with final details approved at an engineering plan approval stage.
- (c) The ongoing planning and upgrades associated with the CWWTP to match capacity with the growth experienced in Mangawhai has anticipated the PC83 area being rezoned to residential with the area being included within the area of benefit for wastewater servicing. The figure below illustrates the existing, future and additional areas considered as residential in the long-term planning for the CWWTP; the PC83 area is the area denoted with the ★ and detailed

at “Additional Wastewater serviceable area (not on district plan map)”.



Figure 8-5: Potential Mangawhai Wastewater Service Area (extract from Page 20, Mangawhai Spatial Plan)

- (d) 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 wastewaters flow available for the efficient operation of the plant.
- (e) In the specific context of the CWWTP, the plant has immediate capacity for 236² new connections, it then has committed upgraded works to provide another 550³ connections by mid-2024 and a committed longer-term upgrade for another 1920⁴ connections by 2026/2027. So, an additional 2706 connections are planned to be provided between now and 2027 increasing the total available capacity from the current limit of 3000 connections to 5470 connections.

² Kaipara Section 42A Report, Appendix 4, Paragraph 2.3 (a)

³ Kaipara Section 42A Report, Appendix 4, Paragraph 2.3 (b)

⁴ Kaipara Section 42A Report, Appendix 4, Paragraph 2.3 (c)

- (f) The upgrades proposed when completed are estimated to provide capacity to through to 2047⁵.

6. RESPONSE TO S42A REPORT

- 6.1 I have reviewed the S42A and make the following specific comments regarding elements raised within the document relevant to my area of expertise where I have a different view.
- 6.2 Point 94 – Clarification – Stormwater mitigation is suggested for the 5-year, 10-year and the 100-year, the report in this instance does not mention the 5-year.
- 6.3 Point 96 – Comment – From a stormwater management effects-based perspective the 60% vs 40% total impermeable is likely less than minor due to the stormwater management provisions proposed in the PC83 precinct provisions. The combination of stormwater detention for the downstream constraints (5,10, and 100-year) and further mitigation for stream channel erosion governs the stormwater discharges from the PC83 area. The quantifiable difference will be increased size of the devices to achieve the mitigation outcomes with the 20% of additional coverage being allowed for.
- 6.4 Point 99 – Comment – I do not agree with the use of a static plan to illustrate areas of flood risk. Flooding should have a detailed assessment at the time of consent which responds to the development environment when the modelling undertaken in accordance with the current guidance documents. This allows specific engineering design to assess and manage flooding to suit the built form and ensure that the flood risk being assessed is in line with the current guidance documents.

Rainfall depths and rainfall patterns are evolving as global and local weather patterns vary with climate change. It is expected that the design rainfall depths for assessing flood hazards is about to increase across the country to align with the Ministry for the Environment's "Adapt and thrive: Building a climate-resilient New Zealand – New Zealand's first national adaptation plan" which shifts the climate change horizon from year 2100 to 2130. This change in will mean that many flood models including the NRC flood models are out of date as the NRC flood model is based on a year 2100 horizon.

⁵ Kaipara Section 42A Report, Appendix 4, PDF Page 24, Table 5

So, in my opinion a static plan current at a moment in time is not suitable when we look forward over a longer period of time; my preference is for planning provisions that detail the expected outcomes and performance in and around flood hazards. I support the recommended provisions set out in Attachment X of the planning evidence.

- 6.5 Point 276 – Comment – The fragmented ownership, coupled with the need for stormwater management is not a new or unique issue. Joint ventures and larger single ownerships are preferred but these constraints are in my opinion of a commercial nature and are not material to the ability for the land to be rezoned. Stormwater management would need to be considered as one of many considerations when someone is considering undertaking a development in PC83; this is not dissimilar to any development being considered outside of PC83.

7. RESPONSE TO SUBMITTERS

- 7.1 I have reviewed the Submissions and make the following specific comments regarding elements raised within the document relevant to my area of expertise.
- 7.2 I have grouped the replies rather than reply to individual submissions.

Flooding

- 7.3 Impermeable Coverage – As covered previously in my evidence the stormwater runoff from the PC83 is proposed to have stormwater mitigation for the 5-year, 10-year and the 100-year storm event to a pre-development (greenfield) scenario. With these stormwater controls in place the amount of impermeable coverage albeit for 40% or 60% will be mitigated through the stormwater devices with the outflow equal to the pre-development flow.
- 7.4 Lot Sizes – Lot sizes do not have direct influence on stormwater discharge as the stormwater is generated from a defined catchment area and is governed by the impermeable coverage. The lot site does need to be considered when sites require onsite stormwater management devices as you need area for tanks, raingardens etc if the subdivision doesn't go the route of common devices. In my opinion the 600m² lot size is sufficient to provide the stormwater controls onsite except for the 100-year mitigation which in my view is best done in a common device.
- 7.5 Flooding – The downstream area is estimated to flood, we have recognised this and in response stormwater detention is recommended to mitigate flows back to pre-development levels (Greenfield). The pre-development scenario is the estimated flows

that would current occur with the climate change adjusted rainfall; at the time of development the flows that result must be equal to or less than the pre-development flows.

- 7.6 Silt – I have focused this response on silt and sediment being eroded from the existing waterways. I agree that silt / sediment management is critical; excluding construction activities the bulk of silt/sediment discharged resulting from urbanisation is material being eroded from the existing stream channels due to increased erosive flows. This subject is well covered in TR2013/035 – Auckland Unitary Plan Stormwater Management Provisions; this document is one of the technical documents that feed into the Auckland Unitary Plan and the Design Guideline Document eg. GD01. In respect to PC83 we are proposing stormwater management in accordance with TR2013/035 which is specifically targeting the management of erosion stream flows with if unmitigated could erode the existing stream and deposits silts in the marine environment.
- 7.7 Stormwater Management – A PC83 specific stormwater management plan has been prepared and is contained within the application. The purpose of a stormwater management plan is to provide a over arching framework to achieve the stormwater management outcomes required within the catchment. This removes an ad-hoc approach and provides a toolbox of methods that the designer can used as appropriate based on the context of the development being proposed. This style of managing stormwater outcomes via a stormwater management plan is how Auckland Council is successfully managing Auckland.
- 7.8 Climate Change – The reporting completed to date has allowed for climate change, with the rainfalls factored up for the estimated future rainfall; specifically, a 2.1 degrees Celsius increase which was based on year 2090 estimate. As stated earlier in the evidence I expect this to increase in the near future with the country likely adopting a year 2130 horizon with a likely temperature increase of 3.8 degrees Celsius. So, the current reporting is inline with climate change considerations and as standards and guidance changes the assessments will change accordingly.
- 7.9 Submission 56 – R and R Davies – We reject the need for this provision. We acknowledge that the amount of mitigation being specified in this request is emerging particularly in Northland with Far North District Council, Whangarei District Council and it is also present in Kaipara District Council Engineering Standards that are under review (Draft KDCES).

The application of stormwater controls needs to be for a specific purpose and the controls need to be reviewed holistically and in the context of the area being assessed. In this instance the purpose for the controls has not been specified, so we are assuming the requirement has been taken from the Draft KDCES. The 80% of pre-development mitigation appears in Section 4.1.6 of the Draft KDCES, I have inserted the text below.

4.1.6. Managing Effects of Land Use on Receiving Environments

Impervious surfaces and piped stormwater systems associated with development have an effect on catchment hydrology. Faster runoff, reduction in base flows and accelerated channel erosion and depositions alter the hydrology and adversely affect the quality of receiving environments. Flow and contaminant increases can have implications for the biodiversity of the aquatic biological community and post development maintenance requirements on systems such as piped networks, stormwater treatment devices, streams and channels.

To mitigate these effects developments are to achieve a hydrological regime where any impacts are managed and/or minimised.

Hydrological balance can be partly maintained by limiting the maximum rate of discharge and peak flood levels for post-development to that at pre-development levels and enabling infiltration to minimise impacts on base flow and ground water recharge.

Peak flow management can be achieved using detention storage, utilising extended duration, for the duration of a limited peak flow event. Therefore, in the absence of more detailed assessment of stream stability, the discharges from detention devices into a stormwater network shall be constrained to 80% of pre-development peak flow rate. These constraints may be relaxed, subject to detailed assessments and hydrological/hydraulic modelling of the catchment being provided.

The text indicates the requirement is to address stream channel erosion and the adverse effects that can result; and the 80% mitigation is proposed as a means of compliance in the absence of a more detailed assessment of stream stability. Table 4-1 of the Draft KDCES includes another reference to 80% of pre-development, see below.

Criteria	Design Parameter	When Required
Flood Control (1% AEP event)	Detention required, limiting the post-development 1% AEP event flow rates to 80% of the pre-development 1% AEP event flow rates.	Where downstream flooding hazard has been identified. Where there is no CMP or site-specific SMP Refer to Flood Hazard Areas in the District Plan and any known downstream restrictions causing flooding.

It is important to note that the requirement specified above is where applications have no CMP or site specific SMP.

In the context of PC83 a SMP has been produced which has included an assessment of the existing streams. The findings are that stream channel erosion needs to be

addressed and specific provisions have been proposed to address stream channel erosion as the specific target; specifically.

- (i) Stormwater retention of the first 5mm of rainfall for all impermeable surfaces is to be provided with the retention volume either to be re-used or infiltrated within a 72-hour period.
- (ii) If it has been determined that there is not enough water demand for or soakage available to provide retention via re-use or infiltration over a 72-hour period, then retention is to be substituted with detention with the volume to be discharged over a 24-hour period using climate adjust 1/3 of the 2-year 24-hour rainfall depth.

So, in my opinion the application of the 80% pre-development requirement is not necessary in this instance as the SMP has assessed the PC83 area and suitable specific provisions are proposed in the PC83 provisions.⁶

Water

- 7.10 Tank Sizing – The water tank sizing needs to consider the water source and the demand thus a static volume is not considered suitable. A table has been provided to tie water tank size to roof area and house population to provide an adequate water supply.
- 7.11 Firefighting Water Supplies – I agree with both Fire and Emergency New Zealand and the reporting planner that the provisions need to be amended to bring the fire fighting water supplies required from the ODP into the proposed provisions. I support the recommended provisions set out in Attachment X of the planning evidence.

Wastewater

- 7.12 Wastewater Capacity – As detailed above and by Mr Cantrell the CWWTP has committed funded upgrades underway in both the immediate and short term to provide capacity.

⁶ As updated January 2024.

7.13 Onsite Wastewater Disposal – Changes are no longer proposed to the ODP regarding onsite wastewater disposal as set out in the PC83 provisions⁷.

8. CONCLUSION

8.1 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.

8.2 I am of the opinion that there are no engineering limitations within my area of expertise that prevent the re-zoning of PC83 in accordance with the proposed provisions.

Steven Brent Rankin

Date: 23 February 2024

⁷ As updated January 2024.