

IN THE ENVIRONMENT COURT

IN THE MATTER of Two appeals pursuant to Clause 14 of Schedule 1 of
the Resource Management Act 1991

BETWEEN **CLIVE BOONHAM**
(ENV-2021-AKL-000061)

Appellant

AND **MANGAWHAI MATTERS INCORPORATED AND
OTHERS**
(ENV-2021-AKL-000062)

Appellant

AND **KAIPARA DISTRICT COUNCIL**

Respondent

**EVIDENCE OF STEVEN BRENT RANKIN ON BEHALF OF KAIPARA
DISTRICT COUNCIL**

(ENGINEERING - WASTEWATER, WATER & STORMWATER)

11 FEBRUARY 2022

1. INTRODUCTION, QUALIFICATIONS AND EXPERIENCE

1.1 My full name is Steven Brent Rankin. I am a Director and Principal Civil Environmental Engineer at Chester Consultants Ltd.

1.2 I hold a Bachelor of Engineering (Environmental), from the Unitec Institute of Technology, Auckland. I am a Chartered Professional Engineer and a member of Engineering New Zealand as a Professional Member. I have been employed by Chester Consultants since 2008 and practised as an engineer since 2006. During that time, I have worked on a wide range of projects throughout the Auckland region and the wider pacific. Examples of recent projects in which I have had a lead role include:

- (a) Private Plan Change 25 – Warkworth North – Project Director & Engineering Expert for the applicants.
- (b) Cardrona Wastewater Treatment Plant (Queenstown Lakes District Council) – Project Director.
- (c) Meremere Wastewater Treatment Plant Upgrade (Watercare Services Limited) – Project Director.
- (d) Motueka Water Treatment Plant (Tasman District Council) – Project Director,
- (e) Kauri Flats School (Ministry of Education) – Project Director – and winner of the 2018 Arthur Mead Large Project Award – Environmental & Sustainability Award.
- (f) Vunakaba Bay Development in Fiji – Lead Design Engineer

Involvement in PC78

1.3 I have been engaged by the Kaipara District Council (**Council**) to present evidence on behalf of the Council in these appeals against its decision to grant Proposed Private Plan Change 78 (**PC78**).

1.4 I have been involved in PC78 since July 2020 when I was first engaged by Council to support them in the processing of PC78, including providing a technical review of engineering matters and participating in the Council level hearing process.

2. CODE OF CONDUCT

2.1 My qualifications as an expert are set out above. I confirm that I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2014. I have complied with the Code of Conduct in preparing this evidence. Except where I state that I am relying on the evidence of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

3. EXECUTIVE SUMMARY

3.1 In my opinion there are no engineering related reasons to decline PC78.

3.2 With respect to wastewater:

- (a) From an engineering perspective, the wastewater infrastructure necessary to service the PC78 area exists in the form of the Mangawhai Community Wastewater Scheme (**MCWWS**), and can be upgraded in response to growth in the future;
- (b) The Council has committed to the continued operation and expansion of the MCWWS as subdivision and development proceeds to keep up with demand, and is planning for this; however
- (c) Notwithstanding this, the proposed provisions of PC78 in combination with the current operative district plan provide a framework where future subdivision and development can be assessed against the wastewater system at that time; so, in the event demand exceeds capacity then the consents can be withheld until the necessary capacity is in place.

3.3 With respect to water supply:

- (a) For the purpose of this plan change, I am satisfied that engineering solutions exist to service the PC78 area with water.

The onus is on the developer to demonstrate the suitability of the proposed water solution at the time of subdivision or land use consent in accordance with the proposed provisions of PC78.

- (b) Where supply cannot be demonstrated to the satisfaction of Council at the time of resource consent, then the scheme and potentially the density may need to be re-assessed to a point where larger sites with larger roof areas are proposed to utilise rainwater tanks as the primary water supply, and
- (c) Although PC78 allows for increased density, it is not a given that this density will be realised if the adequacy of the water supply cannot be reasonably demonstrated at the time of subdivision.

3.4 With respect to stormwater:

- (a) From an engineering perspective there is no limitation preventing the development being undertaken. The proposed provisions of PC78 give regard to and go beyond the outcomes required under the Council's Stormwater Network Discharge Consent and represent current best practice for stormwater management.

4. SCOPE OF EVIDENCE

4.1 In my evidence I address:

- (a) The wastewater infrastructure associated with PC78 and in particular the ability, from an engineering point of view, for the MCWWS to be upgraded (as required) to service the growth enabled by PC78.
- (b) The water related infrastructure required for PC78 and in particular the ability to provide potable water supply to service development from rainwater tanks, and in respect of the Residential 3A and 3B subzones, from a reticulated water supply.

- (c) The stormwater approach for PC78 to align with the Mangawhai Stormwater Network Discharge Consent

4.2 In preparing my evidence I have reviewed the following:

- (a) The evidence of Ms Davidson, the Council's acting General Manager Infrastructure Services, that addresses the Council's infrastructure planning for wastewater and water in Mangawhai.
- (b) In relation to wastewater, I note that the Council's infrastructure planning, summarised in Ms Davidson's evidence, has been informed by advice set out in a number of specialist reports commissioned by the Council from WSP, which I have reviewed as part of preparing my evidence. Of the reports available I believe two are of particular relevance to PC78, these are:
 - (i) WSP Opus – Mangawhai Community Wastewater Treatment Plant: Future Options Development (pub. 28/11/2019)
 - (ii) WSP - Mangawhai Community Wastewater System - Master Plan Strategy (pub. 21/01/22)

All of these reports are available on the Council's website at:
<https://www.kaipara.govt.nz/services/water-services/wastewater/mangawhai-wastewater>

- (c) With respect to the evidence-in-chief lodged on behalf of Mangawhai Central Limited (**MCL**) on 17 December 2021 I have reviewed the statements of evidence prepared by:
 - (i) Rob Van de Munckhof (stormwater).
 - (ii) Jon Williamson (water supply); and
 - (iii) James Dufty (engineering).

In addition to these three statements which relate to my core topics I have reviewed the statements of evidence prepared by:

- (iv) Dr Shane Kelly (marine ecology)

- (v) Dr Martin Neale (freshwater ecology, except wetland 3); and
- (vi) Richard Montgomerie (terrestrial ecology/freshwater ecology for wetland 3).

These statements in my opinion have overlap in particular to stormwater therefore I considered them necessary reading.

4.3 As part of preparing my evidence, I have also considered the notices of appeal lodged by Mangawhai Matters Inc and Mr Boonham, and all of the section 274 notices so as to understand the general nature of their concerns, as relevant to my evidence.

5. WASTEWATER

5.1 As explained above, in relation to wastewater, I have reviewed the evidence of Ms Davidson and the various reports from WSP.

5.2 I understand that the Council's current strategy for wastewater in Mangawhai is as generally set out in the Technical Document by WSP entitled "Mangawhai Community Wastewater System, Master Plan Strategy" dated 21 January 2022.

5.3 I rely on the accuracy of the work completed by WSP and the evidence from Ms Davidson given their specific areas of expertise to inform my assessment.

5.4 The WSP document outlines the current and future works at the MCWWS and the associated disposal options necessary to upgrade the capacity of the MCWWS in the future, in response to growth.

5.5 Ms Davidson's evidence addresses the Council's commitment to these works, and how the required upgrades to the MCWWS will be funded under the Council's Long Term Plan. As explained in Ms Davidson's evidence, and the WSP document:

- (a) The capacity of the MCWWS involves the capacity of the Wastewater Treatment Plant (**WWTP**), the capacity of the

mains (pipes), and the capacity of the current effluent disposal field at Brown Road Farm.¹

- (b) The Council is committed to upgrading the capacity of the WWTP, mains, and securing additional capacity for effluent disposal as required; with the next option for effluent disposal after capacity at Brown Road Farm is exhausted being the discharge of treated effluent to the Mangawhai Golf Club for irrigation.

5.6 Based on Ms Davidson's evidence and the WSP reports, it is my opinion that:

- (a) From an engineering perspective, the wastewater infrastructure necessary to service the PC78 area does exist, and can be upgraded as required; and
- (b) The Council has demonstrated commitment to the MCWWS and is planning the upgrades needed to align with the growth in Mangawhai, including PC78.

5.7 Notwithstanding this, the proposed provisions of PC78 in combination with the current operative plan provide a framework where future subdivision and development can be assessed against the wastewater system at that time; so, in the event demand exceeds capacity then the consents can be withheld until the necessary capacity is in place.

5.8 The capacity requirements of the MCWWS are not PC78 centric and nor are connections allocated geographically.

5.9 The upgrade works to the wastewater system need to be aligned to development within the entire wastewater catchment of which PC78 is only a part of; with the capacity aligning to the cumulative demand from the entire catchment as illustrated in Figure 1.

¹ Evidence-in-chief of Ms Davidson, paragraph 4.7.

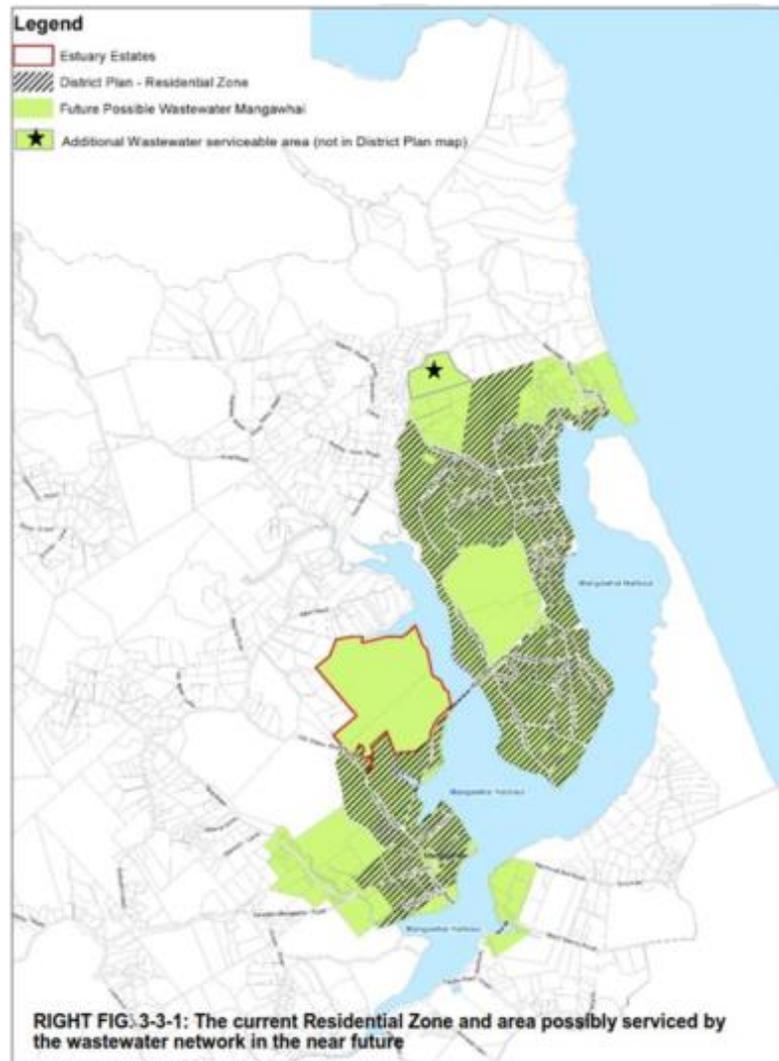


Figure 1: Extracted from Technical Document by WSP entitled "Mangawhai Community Wastewater System, Master Plan Strategy" dated 26 November 2021.

- 5.10** Overall, my opinion is unchanged from the opinion I expressed in the Council level Hearing for PC78. Namely, In my view:
- (a) From an engineering perspective, the wastewater infrastructure necessary to service the PC78 area exists, and can be upgraded;
 - (b) The Council has committed to the continued operation and expansion of this infrastructure as subdivision and development proceeds to keep up with demand, and is planning for this; and
 - (c) The proposed provisions of PC78 in combination with the operative district plan provide a suitable framework to stop

subdivision and development where the rate of subdivision or development exceeds the available capacity at that time.

6. WATER SUPPLY

6.1 In relation to water supply, I have reviewed the evidence of Mr Williamson (water supply) and Mr Dufty (engineering) on behalf of MCL, and considered the various issues raised in, in relation to water supply, in the notices of appeal and section 274 notices.

6.2 Of the three areas addressed in my evidence (Wastewater, Water & Stormwater) the water assessment for me is the most important. In my view, the wastewater servicing is an operational undertaking with planned upgrades and funding. Stormwater is the implementation of stormwater tools for managing the effects arising from development which need to align to the requirements of the various statutory planning documents (which I understand are addressed in the planning evidence of Mr Badham). However, water and the sustainability of a water supply is a more complex assessment given climate change, variance in usage, sustainable yields in water takes from bores, or high flow water takes etc.

6.3 Given the complexities associated, I consider that the water services provided need to be well-considered and appropriate.

6.4 With respect to the evidence provided on behalf of MCL in relation to water supply:

(a) I am reliant on Mr Williamson as a water expert with respect to the modelling he has prepared in relation to the ability of a reticulated water supply, using surface water takes, to be provided to service residential and commercial development within PC78.

(b) My expertise is aligned to that of Mr Dufty (a civil engineer). I generally agree with Mr Dufty's evidence in relation to water supply², and in particular his evidence that:

² As set out at paragraphs 33 - 39 of his evidence-in-chief dated 17 December 2021.

- (i) There is currently no catchment wide reticulated water supply in Mangawhai, and under the Operative Chapter 16 provisions, the PC78 area (and the rest of Mangawhai) is relying on rainwater tanks and/or an alternative solution.
- (ii) Water source options proposed for PC78 by MCL so far include rainwater harvesting tanks, high-flow water takes in combination with a 100,000m³ water storage reservoir on site (as addressed in Mr Williamson's evidence), and a water supply from groundwater.

6.5 In my opinion, the expert evidence provided on behalf of MCL demonstrates that engineering solutions for water supply do exist to support the application for the plan change. In my view, this is not to say that the solutions currently proposed by Mr Dufty and Mr Williamson are the only or the correct solutions for the development.

6.6 For instance, future development could utilise rainwater tanks, bore supply, high-flow water takes, desalination, low flow devices, or a council lead reticulated water network. Although the evidence of Mr Dufty and Mr Williamson put forward various solutions, PC78 is not in any way tied to those solutions proposed to date.

6.7 For the purpose of a plan change, I am satisfied that engineering solutions exist to service PC78 with water. The onus is on the developer to demonstrate the suitability of the proposed water solution at the time of subdivision or land use consent in accordance with the proposed provisions of PC78.

6.8 Where water supply cannot be demonstrated to the satisfaction of Council at the time of resource consent, then the scheme and potentially the density may need to be re-assessed to a point where larger sites with larger roof areas are proposed to utilise rainwater tanks as the primary water supply.

6.9 So, although PC78 allows for increased density (compared to the density currently provided for under the Operative District Plan), it is not a given

that the density will be realised if the adequacy of the water supply cannot be reasonably demonstrated at the time of subdivision.

- 6.10** Mangawhai Matters Inc in its notice of appeal seeks that:
- (a) All reticulated residential sites to provide minimum on-site storage capacity of 25 cubic metres.
 - (b) All non-reticulated sites required to provide a minimum of 50 cubic metres water storage on site.
 - (c) No subdivision below 600m² allowed prior to confirmation of NRC consent for intakes and storage capacity sufficient to reticulate 600 dwellings.³
- 6.11** The notice of appeal by Mangawhai Matters does not explain precisely how these amendments would be given effect to within the PC78 provisions. However, I make the following general comments below.
- 6.12** With respect to (a) and (b), as an engineer I understand the intent and the relief sought, and it does strengthen the existing provisions.
- 6.13** Maximising water as a resource and the utilisation of rainwater harvesting on reticulated sites is supported.
- 6.14** I do caution that simply requiring a rainwater tank of a certain size does not by default provide adequate water supply which in my view could be inferred by the proposed provision.
- 6.15** The proposed inclusion of the 5m³ of water storage for the reticulated sites is beneficial providing the water is made available for non-potable water supply within the house, specifically for toilets and outdoor taps. The specificity of the toilets is required as they can account for 20-30% of water usage and without being specific the benefit might not be realised. In my experience where the requirement is not specific the development outcome fails to meet the intention eg. a water tank is connected to a single outdoor tap which has little to no continuous benefit vs a toilet with continuous usage and benefit.

³ See page 4 of the Mangawhai Matters Inc appeal, under the heading "Relief Sought".

- 6.16** With respect to the capacity of the proposed water storage for reticulated sites, the 25m³ of water storage sought by Mangawhai Matters on reticulated sites is, in my opinion excessive given it is a secondary water supply. In my opinion, the benefit is more effectively realised using the smaller 5m³ tanks as proposed.
- 6.17** Where a rainwater tank is proposed as part of development with no reticulated water supply, consideration needs to be given to the specifics of the site (e.g., roof area, number of occupants of the dwelling, the type of water fixtures etc) as to whether an adequate supply of water is provided. The proposed provision of 50m³ of water storage for non-reticulated sites is in my opinion the minimum quantity of storage that should be provided. I consider there needs to be the ability under the plan provisions for there to be an assessment to validate the proposed minimum of 50m³ is suitable (taking into account the factors I have described above) and not a default.
- 6.18** In respect of point (c) of Mangawhai Matters relief, in my opinion it is too prescriptive as it infers the supply is suitable when these two elements are met. Obtaining a consent for a water take from the Northland Regional Council and providing a certain volume of storage does not, in my opinion, demonstrate the adequacy of the supply. Obtaining a water take consent does not mean the water is available to take and the storage volume is a function of both inflow and outflow. Any reservoir design would be specific to the particulars of the water source e.g. the reservoir or the storage elements for a high-flow water take would be different from a bore, which is different from a desalination system which is different from a larger reticulated supply.
- 6.19** Overall, my opinion is unchanged from the opinion I expressed in the Council level Hearing for PC78. Namely, in my view from an engineering perspective a number of water supply solutions are possible; and in addition, the proposed provisions of PC78 require that the water supply solution be demonstrated at the time of resource consent, and where the applicant is not able to sufficiently demonstrate a suitable solution the development will not be able to proceed.

7. STORMWATER

7.1 In relation to stormwater, I have reviewed the evidence of Mr Van De Munckhof and Mr Dufty on behalf of MCL and have considered the various issues raised in the Appeals and s274 notices with respect to stormwater.

7.2 Stormwater management within the PC78 site is proposed to be undertaken in accordance with the KDC Stormwater Network Discharge Consent (**NDC**)⁴. This regional consent authorises the diversion and discharge of stormwater within the Mangawhai Area including PC78. The NDC provides specifics on the performance and requirements for stormwater management. The consent conditions that are of interest in my opinion, are those that advise of the required outcomes sought regarding stormwater quantity and quality. Those conditions are⁵:

- 1 The stormwater network system shall be in general accordance with the **attached** MWH Ltd drawings entitled "Mangawhai Stormwater Catchment Management Plan", Project Number 80500973, Sheet Number 1 to 31, Date 15/04/2015.
- 3 The stormwater collection system for new industrial and commercial developments shall be either:
 - (a) Designed to avoid any contaminants stored or used on the site from being entrained in any stormwater discharge; or
 - (b) Include an appropriately designed stormwater interceptor system.
- 7 The stormwater discharge shall not result in any permanent scouring or erosion of the bed of a waterbody or the coastal marine area. For compliance purposes, "permanent" is defined as scouring or erosion that will not be fully remediated by natural processes during the following six month period.
- 8 There shall be no obstructions within any watercourse or identified overland flow path within the stormwater network system owned by the Consent Holder, as shown on the plans referred to in Condition 1, that could result in an increase:
 - (a) To the frequency of flooding of a property; or
 - (b) The scale or extent of the ponding areas shown on the plans referred to in Condition 1.

⁴ NRC File 2111 dated 26.07.2017.

⁵ Ibid

- 15 The exercise of these consents shall not result in the concentration of metals in sediment, as measured at or beyond a 30 metre radius from any final outlet from the network system, to exceed the following:

Metal	Milligrams per kilogram dry weight
Copper	65
Lead	50
Zinc	200
Chromium	80
Nickel	21
Cadmium	1.5

- 16 The exercise of these consents shall not result in any of the following effects on water quality, as measured at or beyond a 30 metre radius down current from any final outlet from the network system:
- (a) The production of any conspicuous oil or grease film, scums or foams, or floatable or suspended materials, or emissions of objectionable odour;
 - (b) The destruction of natural aquatic life by reason of a concentration of toxic substances;
 - (c) Shellfish to become tainted so as to make them unpalatable or contain toxic substances to the extent that they are unsafe for human consumption.

Figure 2: Conditions extracted from Stormwater Network Discharge Consent (NRC File 2111, dated 26.07.2017)

- 7.3 In summary the consent is focused on the quality of the stormwater discharge as well as the potential for permanent erosion / scour in the receiving environment; it is not prescriptive on quantity stormwater controls.
- 7.4 I note that permanent scour could occur in the receiving environment without any stormwater quantity controls when the stream geomorphology is not considered. To prevent permanent scour a form of peak control maybe considered necessary likely in combination other stormwater controls such as retention or soakage.
- 7.5 So, although stormwater quantity measures are not specifically prescribed under the NDC, it is likely that quantity measures will be required as part of the stormwater infrastructure for PC78 in order to avoid permanent scouring (and therefore comply with Condition 7 of the NDC).
- 7.6 In my opinion, the proposed provisions of PC78 go further than the performance outcomes sought by the NDC and they significantly strengthen and enhance the existing provisions of Chapter 16.

7.7 I agree with the evidence statement prepared by Mr Munckhof, and it is my view that paragraphs 6.3 through 6.17 of Mr Munckhofs evidence accurately articulates the improvements proposed over the existing provisions of Chapter 16.

7.8 MCL provided a Stormwater Management Plan (**SMP**) within the plan change application submitted to Council and this is referenced in the evidence of Mr Dufty, Mr Munckhof, and Mr Kelly. The SMP outlines the application of a contemporary stormwater design approach which, in my opinion, is aligned to current best practise stormwater management. This represents a shift away from end of pipe type solutions, such as ponds or wetlands, to an at source treatment approach with treatment trains and the implementation/integration of water sensitive design (WSD) principles.

7.9 The notice of appeal by Mangawhai Matters seeks that:

- (a) That minimum lot size for a housing unit should not be less than 600 square metres;
- (b) That all lots include at least one 25 cubic metre storage tank to be used for stormwater flow attenuation and detention, which can also be used for water supply;
- (c) That best practice approaches aimed at maximizing retention and soakage are adopted rather than best practicable engineering options;
- (d) That subdivision applications should demonstrate to the satisfaction of a qualified engineer hydrologic neutrality in the event of 1 in 100-year storm event.⁶

7.10 The notice of appeal by Mangawhai Matters does not explain precisely how these amendments would be given effect to within the PC78 provisions. However, I make the following general comments from an engineering perspective:

- (a) Lot size does not automatically translate to stormwater discharge rates. Provided smaller lots have the same percentage rate of building coverage and impermeable

⁶ See page 6 of the Mangawhai Matters appeal under the heading "Relief sought".

coverage restriction applied, the total discharge is unchanged via density. Therefore, I do not support this change.

- (b) In terms of Stormwater tanks, I note that at present these may be utilised as part of a package of measures proposed when the SMP is developed. However, I do not support prescribing that a stormwater device that must be used.
- (c) The stormwater provisions proposed in PC78 require a wider lens to be applied to stormwater management, which means the best practical option needs to go beyond hard engineering. Further to this, the requirement for the implementation of water sensitive design in line with current best practise actively promotes ground water recharge. Accordingly, in my view, the PC78 provisions are already in alignment with this request.
- (d) Hydraulic neutrality for the 1 in 100 year storm event has, in my opinion, no engineering basis given the location of PC78 and the receiving environment. Typically hydraulic neutrality would only be considered necessary where a catchment has a known significant flood risk downstream of the development area which is not the situation with PC78.

7.11 With respect to stormwater, overall, my opinion is unchanged from the opinion I expressed in the Council level Hearing for PC78. Namely, in my view from an engineering perspective there is no limitation preventing the development being undertaken. The proposed provisions of PC78 give regard to and go beyond the outcomes sought by the NDC and represent current best practice for stormwater management.

Steve Rankin

11 February 2022