

BEFORE THE HEARING COMMISSIONERS
KAIPARA DISTRICT COUNCIL

IN THE MATTER OF the Resource Management Act 1991 (**the Act**)

AND

IN THE MATTER of a resource consent application to subdivide

BY **Mangawhai Hills Limited**

Applicant

TO **Kaipara District Council**

Territorial Authority

STATEMENT OF EVIDENCE OF PAIGE PAMELA FARLEY

ON BEHALF OF BERGGREN TRUSTEE CO. C/- MARIA BERGGREN

(Civil Engineering)

6 May 2024

INTRODUCTION

1. My full name is Paige Pamela Farley. I am the Civil Manager and a shareholder of Hutchinson Consulting Engineers Ltd (HCE).
2. I have sixteen years professional civil and structural engineering experience. I hold the qualification of Bachelor of Engineering Civil with first class honours from the University of Auckland, graduating in 2008.
3. I am a Chartered Professional Engineer under the Chartered Professional Engineers CPEng (Civil) of New Zealand Act 2002 specialising in the fields of expertise of civil engineering. I am also recognised as an internationally qualified Professional Engineer, IntPE (NZ).
4. I am a Chartered Member of Engineering New Zealand (CMEngNZ).
5. I have been employed with Hutchinson Consulting Engineers Ltd since graduating from the University of Auckland. During my time at HCE I have progressed from graduate engineer to Structural Manager to my current role as Civil Manager.
6. I am familiar with the Tara Road and Moir Street area and am currently involved with a number of civil engineering projects within Mangawhai. I live in Te Arai and am familiar with the current status of various infrastructure constraints and upgrades in Mangawhai.
7. I confirm that the evidence I present is within my area of expertise and I am not aware of any material facts which might alter or detract from the opinions I express. I have read and agree to comply with the Code of Conduct for expert witnesses as set out in the Environment Court Consolidated Practice Note 2014. The opinions expressed in this evidence are based on my qualifications and experience and are within my area of expertise. If I rely on the evidence or opinions of another, my evidence will acknowledge that position.

SCOPE OF EVIDENCE

8. I have reviewed the following documents:
 - a. "Land Development Report" by Chester, 23 February 2023;
 - b. "Stormwater Management Plan (Draft)" by Chester, 23 February 2023;
 - c. "Flood Risk Assessment" by Chester, 30 April 2024;
 - d. Evidence provided by Mr Steven Rankin on behalf of Mangawhai Hills Limited;

- e. Matters raised in the Section 42A report applicable to my area of expertise.
9. My evidence will address the following matters related to civil engineering:
- a. Natural Hazards – Flooding
 - b. Stormwater
 - c. Water
 - d. Wastewater
 - e. Access

NATURAL HAZARDS – FLOODING

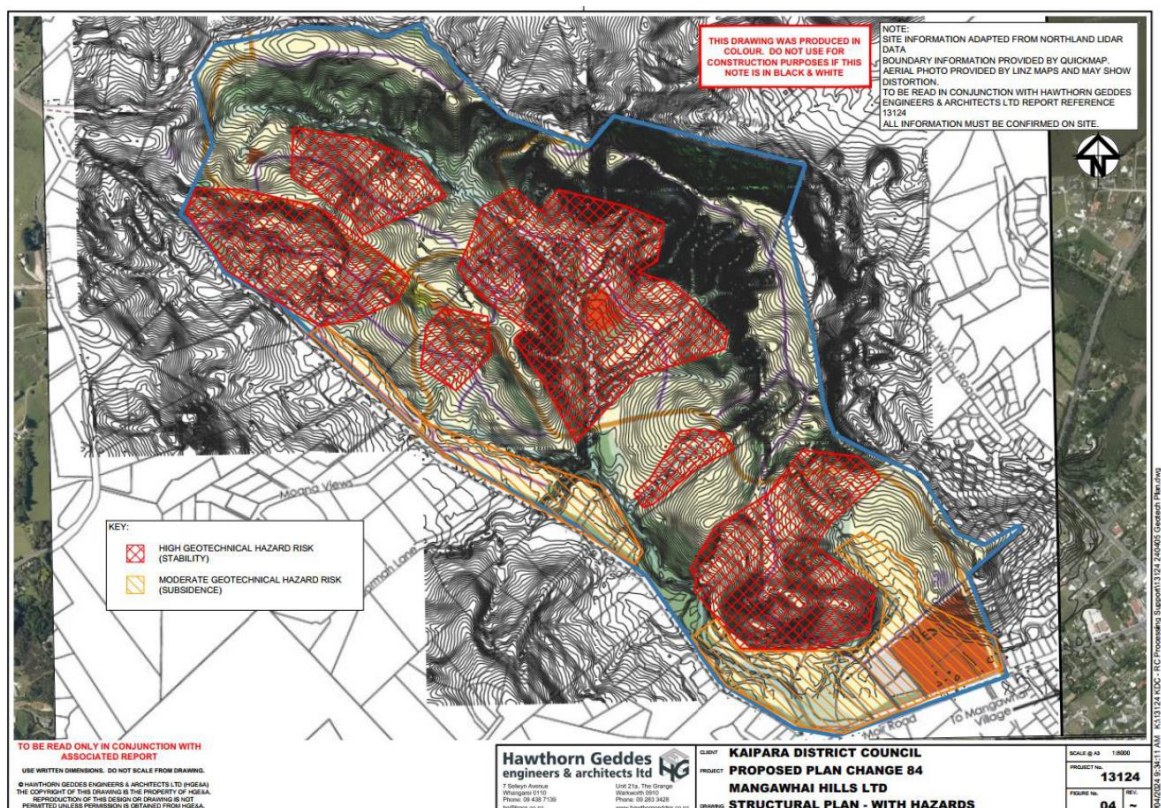
- 10. The Flood Risk Assessment (“FRA”) completed by Chester concludes that there is an increase in stormwater depths and velocities post development. As such they recommend that peak flow attenuation up to the 100 year (0.01 AEP) storm event should be provided for.
- 11. The FRA states that “the details for future mitigation measures will be assessed by KDC as part of the resource consent process for the individual developments at the time of their respective applications for resource consent.” (Section 4.3.1.4, page 9).
- 12. Further consideration should be given to how this increase in peak flow is managed. I describe the reasons why in the Stormwater section below.

STORMWATER

- 13. I have reviewed the Chester Stormwater Management Plan (“SMP”) and agree that the requirement for detention of the 1/3 of the 2-year ARI storm event plus provision of retention volume is appropriate. I note that this is equivalent to Auckland Council “SMAF” rules. I also agree with the suite of water quality toolbox options provided.
- 14. However, the SMP does not refer to the additional requirement for peak flow attenuation (0.01 AEP storm event) that is identified within the Chester FRA and should be updated accordingly.
- 15. The development area information requirement DEV1-REQ1 Stormwater Management should also be updated to refer to the peak flow attenuation requirements, and in my opinion should also reference the Chester SMP.
- 16. Attenuation of the 0.01 AEP storm event needs to be carefully considered and documented now. I note that Mr Carey Senior states “Flood risk mitigation implementation and associated costs are proposed to be the responsibility of each developer and would be assessed in detail at the land use consent stage.” (Para 7.5). Whilst this will work for the applicant’s land holding,

the southern catchment that my client's property forms part of, is made up of a number of land holdings with many landowners. A fragmented approach may result in numerous stormwater devices (i.e. stormwater ponds or wetlands) each with their own maintenance requirements that for the likes of a pond or wetland would be vested to Kaipara District Council to maintain. The coordinated and efficient provision of the stormwater infrastructure is an important consideration for the development of this area, to ensure that the development and ongoing maintenance costs, including environmental outcomes are efficient and effective.

17. At source mitigation such as water tanks, are commonly utilised to provide peak flow mitigation, however, these do not in reality provide attenuation for events up to the 100 year ARI storm event because the stormwater is physically not able to enter the tank (i.e. the size of the spouting and downpipes is not sized for the volume or rate of water occurring in a 100 year ARI event).
18. Given the topography constraints and the geotechnical hazard risk identified by Hawthorne Geddes (refer to the image below) there is limited space available for a stormwater attenuation pond to be sited. In particular, in the southern catchment that is owned by multiple landowners. Further guidance and direction should be provided by Chester within the SMP and appropriate sites for stormwater ponds should be identified and then shown on the Structure plan, with corresponding Development area provisions to secure the construction and vesting of the ponds.



WATER

19. It is proposed to provide onsite water supply for each new lot within the PPC. I agree with this proposal given that there is no reticulated water supply for Mangawhai and consider it appropriate, provided the appropriate rainwater harvesting storage volume is stipulated.
20. Mr Steven Rankin references Table 1 taken from the legacy Auckland Regional Council Countryside Living Toolbox, dated 2010 as the appropriate volumes to utilise. Whilst I agree with this, I note that the table provides minimum tank volumes, and not minimum potable water supply available for reuse.
21. Given the requirement for a 10,000 litre (10m³) dedicated firefighting water supply per house, the numbers within Table 1 would effectively be “short” straight away by 10m³ as it is common practice for the 10,000 litres firefighting water supply to be contained within the lower portion of the water supply tanks.
22. In addition to this, the water quantity detention requirements (1/3 of the 2 year ARI storm event) would also typically be included within the top portion of the water supply tanks. Depending on the proposed impervious area this could equate to approximately 5m³ of further “lost” water supply available for re-use.
23. It needs to be made clear that the minimum volumes provided in Table 1 are available water supply volumes and not tank volumes to take into consideration the “lost” water as described above.
24. I suggest that Table DEV 1-2: Recommended Tank Volumes for On-site Residential Supply, be renamed to “Table DEV 1-2: Recommended Potable Water Supply Volumes for On-site Residential Supply”.
25. I consider as a minimum 2 x 25,000 litre tanks (equivalent of 50m³) are required for each lot.

WASTEWATER

26. It is noted that the preferred option to deal with wastewater is that the 100 lots within the southern third of the Plan Change 84 area connect to the Mangawhai Community Wastewater Treatment Plant. Our client’s land falls within the southern third and therefore will be able to connect into the public network.
27. The southern lots that can be serviced by the Wastewater Treatment Plant should not be subject to minimum lot sizes on the basis of wastewater reasons, accepting that given the need

for onsite water supply sites will need to be of a certain size to ensure tanks can be provided and sites can maintain required onsite amenity and open space areas, unless there is a requirement for tanks to be provided underground and it is certain this outcome can be achieved.

ACCESS

28. Whilst geotechnical engineering is outside of my expertise, it is noted that the primary north south road access proposed from Moir Street (referred to as “Primary Road 2” in the latest structure plan) is shown to fall within an area of high geotechnical hazard risk (stability) as identified by Hawthorne Geddes in the image above and will have an effect on viable access options within the PPC. Similarly, the secondary access proposed to terminate within our client’s land is also indicated to lie within an area of high geotechnical hazard risk (stability). Certainty of the proposed access routes is required and should be obtained as part of the structure plan stage. Without this certainty large tracts of the Plan Change area may not be able to be provided with road access and will therefore not be able to be developed for urban development as planned. This matter is addressed in further detail in the Planning evidence of Ms O’Connor.
29. The topography of the land in conjunction with the ecology and hydrology will make the north south primary road access (“Primary Road 2”) highly constrained and difficult to achieve in terms of required gradients, widths, and associated earthworks.

CONCLUSION

30. To conclude, I consider that the proposed plan change can be adequately serviced in terms of civil engineering infrastructure, noting the matters raised with respect to the ability to construct the identified primary road which is key to be able to serve the proposed urban land, however further detail is required by the applicant.
 - a. Management of peak flow attenuation needs to be included within the Stormwater Management Plan with specific detail on how this will be addressed in the southern catchment and the effects of any proposed methods have to be assessed.
 - b. Water supply provisions should be amended take into consideration the water supply loss from firefighting provisions and detention requirements.
 - c. Additional access options within the southern portion of the plan change should be provided to take into consideration the topography, ecology, hydrology and geotechnical constraints.

A handwritten signature in blue ink that reads "Paige Farley". The signature is written in a cursive style with a large initial 'P' and 'F'.

Paige Farley

6 May 2024