

**BEFORE THE HEARING PANEL**

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of an application to Hamilton City Council for Private  
Plan Change 7 to the Hamilton City District Plan by  
Green Seed Consultants Limited

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**SUMMARY STATEMENT OF CALEB CLARKE (STORMWATER)**

**Dated 27 October 2021**

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## **INTRODUCTION**

1. My full name is Caleb Clarke.
2. I hold the position of Director and Environmental Engineer at Morphum Environmental Limited since 2001. I have a Bachelor of Environmental Engineering degree and have 21 years of experience in stormwater engineering, catchment planning and water sensitive urban design.
3. I provided a memo assessing stormwater matters arising under the proposed Rotokauri North Private Plan Change (**PC7**) dated 10 September 2021 which was included in Appendix D to the s 42A report.

## **CODE OF CONDUCT**

4. I have read the Environment Court Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2014 and agree to comply with it. I confirm that the opinions expressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

## **SCOPE OF EVIDENCE**

5. In my evidence I provide a summary of the findings in my memo appended to the s 42A report, and comment on relevant matters raised in the evidence of Green Seed and submitters.

## SUMMARY OF REPORT

6. In my memo I conclude that the Sub-Catchment Integrated Catchment Management Plan (**SCICMP**) including its Appendix K – Stormwater System Report (SSR) sets out clearly how stormwater will be managed in the Ohote and Te Otamanui catchments in the Structure Plan Area and shows that stormwater management in the Mangaheka and Rotokauri South major subcatchments is conceptually feasible but will need to be further worked through in the next design phase.
7. Issues for the catchment include flat topography, multiple outlets to downstream receiving environments, and high groundwater tables.
8. The SCICMP approach addresses the stormwater issues through a green spine concept for the Ohote and Otamanui subcatchments with treatment wetlands and flood storage clustered around restored stream corridors draining to upgraded outlets. The Mangaheka and Rotokauri Subcatchments will have wetland treatment and flood storage likely discharging to watercourses off site. Stormwater will be further managed on- lot and conveyed by a reticulation system including subsoil drain outlets discharging to the treatment wetlands. Specific interim storage, phosphorous treatment and secondary overflow requirements for the Rotokauri South subcatchment can be met through the SCICMP and subsequent design details.
9. Concept level design and modelling shows that 100-year Average Recurrence Interval (**ARI**) water levels can be managed without impacting floor levels including freeboard. In my opinion some current uncertainty on final configuration and discharge criteria could be accommodated during design of the system outlets and storage areas, including resilience to extreme events greater than 100-year ARI events with climate change.

10. Recommendations of my report included modifications to the ICMP. I also recommended at that time more specific detail in the layout of the Mangaheka Catchment shown on the Rotokauri North Structure Plan dated 24 June 2021 and that the staging and trigger rules of the plan change should provide for the implementation of each subcatchment connected to the stage.

#### **UPDATED POSITION**

11. I have read the evidence of Green Seed and submitters relevant to stormwater. I do not disagree with any points raised in the evidence.
12. I was involved in expert caucusing that discussed the recommendations of my memo and led to the incorporation of key changes to the SCICMP to address the majority of recommendations, as indicated in items 7.1 (a), (b), (c) and (e) of the Evidence of Mr Eugene Vodjansky.
13. As indicated by item 7.1 (d) of Mr Vodjansky's evidence, the applicant proposed that inclusion of further detail to the Structure Plan for the Mangaheka sub-catchment was not consistent with the green spine applying to permanent waterways, and would not provide more certainty as the plan change facilitates implementation of the relevant stormwater system by way of the SCICMP approval process prior to subdivision consent. This includes the secondary overflow from the Rotokauri South catchment required by the Mangaheka Integrated Catchment Management Plan.
14. As indicated by item 7.1 (f) of Mr Vodjansky's evidence, the expert caucusing concluded that the matter of appropriate staging and trigger rule text could be developed to better define the stormwater infrastructure "commensurate with that required to service that stage of development" through the discretion and assessment criteria on an RDA rule. I concur

with the evidence and changes recommended with respect to these provisions by Mr Tollemache/Ms Fraser-Smith.

## **CONCLUSION**

15. In summary, based on the assessment outlined above, I consider the proposed stormwater management system is conceptually feasible and the proposed plan change provisions relating to stormwater including the SCICMP allow for flexibility to deal with current uncertainties and allow for the stormwater servicing of the site. Therefore PC7 can be supported with respect to stormwater management.

**Caleb Clarke**

**27 October 2021**