

**BEFORE THE PALMERSTON NORTH CITY COUNCIL
INDEPENDENT HEARINGS PANEL**

IN THE MATTER OF the Resource Management Act 1991 and
the Local Government (Auckland
Transitional Provisions) Act 2010

AND

IN THE MATTER Plan Change G (**PCG**) Amendments to
the Palmerston North City Council
Operative District Plan

Stormwater Statement of Evidence of

Jack Out on behalf of the submitter

Heritage Estates (2000) Limited (“HEL”)

SUMMARY

[1] The key points addressed in this evidence are the remaining matters of concern in PCG:

- (a) The stormwater systems
- (b) The Geotech

INTRODUCTION

[2] My name is Jack Out, and I reside in Auckland. I am a Civil Engineer I am engaged by the submitter, Heritage Estates (2000) Limited (**“HEL”**) and I am familiar with the land at Aokautere on the southeastern side of the Manawatu River.

[3] I hold the following qualifications B App Management and NZCE.

[4] I am a Civil Engineer and Project Manager with 40 years of experience in land development and construction management. I have experience in the use of CAD design programmes and their use for the design of 3 waters systems in land development applications.

[5] I also provide **Stormwater** evidence (inclusive of Geotech comments from my colleague Mr. Gareth Williams) in support of HEL's primary and further submissions on the Plan Change **G SO 51** and **FS 5** retrospectively.

CODE OF CONDUCT

[6] I confirm that I have read and agree to comply with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. I confirm that I have stated the reasons for the opinions I express in this report and have considered all the material facts that I am aware of that might alter or detract from those opinions.

SCOPE

[7] Stormwater evidence on behalf of HEL for PCG (the hearing) addresses submission number (**#51**)/further Submission number (**#5**) relating to PCG in its entirety.

[8] In preparing my evidence I have considered the following:

- (a) SOE Allison Reiko Baugham and Tony Miller – Stormwater
- (b) SOE Eric Bird - Geotechnical
- (c) SOE Anita Copplestone – Planning (Stormwater only)
- (d) Tonkin & Taylor Aokautere slope stability: considerations for consenting dated 12 May 2022 (Appendix 9 notified PC-G), also attached to the SOE Eric Bird - Geotechnical
- (e) GHD Stormwater Management Strategy PC-G Aokautere, Palmerston North City Council, revision 2, dated May 2022.
- (f) PC-G Appendix 3 Structure plan (notified) modified by the s 42A report contained in

EVIDENCE

[9] HEL's submission opposes the structure plan¹

Stormwater

[10] The SOE of Eric Bird - Geotech, paragraph 36, Page 11 includes the following statement.

Liquefaction is influenced by seismicity, soil type, and the presence of groundwater. The geotechnical reporting on PCG also considered the potential for liquefaction on in the PCG site.

¹ Precinct Plan, Masterplan being included in the Operative District Plan for Palmerston North City Council from Plan Change G.

In paragraph 41, on page 11;

The depth of groundwater in the Turitea Stream valley is unknown.

In paragraph 43, on page 11;

*On the basis that there is no geotechnical information on or groundwater data for this area, both the upper and lower terrace areas should be classified as **Liquefaction Category is Undetermined** in accordance with the MBIE/MfE Guidance (2017) at this time. This category reflects the fact that insufficient information exists to determine whether liquefaction is possible or is unlikely.*

In paragraph 66, on page 16 Mr Bird states that a geotechnical assessment on Class D soil would include item 66 (g) *Assessment of likely groundwater levels and piezometric pressures in the strata during extreme infiltration conditions* amongst other items, all to be undertaken by a suitably qualified person prior to subdivision, building or other development. Similarly, in paragraph 73 *Mr Bird says I would expect a geotechnical assessment on land with uncontrolled fill to include, 73 (e) Assessment likely groundwater levels and effects of fluctuating or changing groundwater.* I have conferred with Mr. Gareth Williams on Geotechnical Matters but will comment further on the groundwater in terms of its effect on stormwater and flood modelling.

It is proposed to discharge stormwater to existing streams through a series of ponds check dams and other structures. This will increase the stormwater flow from developed areas into streams that are likely to have their erosion potential increased with the increased possibility of slope instability.

The report further states that the depth of groundwater of the Turitea stream is unknown and that the makeup of the deposits has liquefiable soils. The development will have increased stormwater discharge to the stream as well as ponds and other stormwater mitigation structures put in place. There is therefore a risk of damage to such structures in the event of seismic activity, notwithstanding whether such ponds are full or not.

Further, the report states that at this point there has been no Geotech investigation carried out in the area and that the **liquefaction potential is undetermined**. If that is the case, then there is doubt that the setbacks for 20 and 30-degree slopes are adequate for determining where house structures can be built.

- [11] SOE Anita Renie Coppleson – Planning. Topic 4: Stormwater, flooding and erosion, Paragraphs 18-36, Pages 85-92

Recommendations have been made for repair and upgrade works to streambeds and it is proposed that these will occur in the Long Term Plan, Clause 23, yet there will be increased stormwater flows into the gullies and streams that will continue to erode bank structures and during storm events have the potential to cause greater damage than has already occurred.

Further on in the same clause, it is recommended that the stormwater mitigation works are constructed in the upstream catchment at the time of subdivision. It is not clear where the works are to be carried out and what the extent of the works is or who will be responsible for ensuring that the work is carried out.

Clause 25 proposes the idea of a 5m setback for the construction of a swale that has sufficient capacity for the 1% AEP. Such a swale will only serve those properties that are adjoining the gully structures that are capturing stormwater flows from the development and the stormwater in such swales will be allowed to soak into the edge of the gully. This will lead to saturated ground, which may lead to ground instability.

Comment has been made that piped infrastructure and the use of rainwater tanks will be both expensive and of little value. I would suggest that any measures that reduce the stormwater flows and help mitigate them to predevelopment flows can only be beneficial to the runoff to the existing streams.

- [12] SOE Anita Renie Copplesstone – Planning. Topic 4: Stormwater, flooding and erosion, Paragraphs 43-66, Pages 95-101

The streams are not currently shown on the Structure Plan but are shown on the proposed zoning map. No indication is given of how the ponds interact with the streams and the outfall to them.

- [13] SOE Anita Renie Copplesstone – Planning. Topic 4: Stormwater, flooding and erosion, Paragraphs 68-73, Pages 101-102

The wetlands are not labelled on the structure plan and the ponds are not provided relative to known contours. There is no indication of the size of the ponds, depth, or outfall structures for the ponds and their discharge location.

The use of swales for stormwater use is not shown on any plan and is only called up as a 5.0 m setback, so it is unclear where these are proposed what area they would serve, or where their outfall will be. It is unclear whether the swales would function to reduce stormwater runoff in these ground conditions with the slope instability identified in parts of the PC-G documents.

Conclusion

- [14] Many components of the stormwater and geotechnical considerations, including the existing groundwater conditions that underpin a full stormwater analysis are incomplete. The strategic approach of the masterplan/structure plan cannot be confirmed as the stormwater ponds, outfall structures are all subject to change. The catchments are designed to mitigate effects, but the timing of the interrelated system is too uncertain.