

**BEFORE THE INDEPENDENT HEARING PANEL APPOINTED BY THE
QUEENSTOWN LAKES DISTRICT COUNCIL**

UNDER the Resource Management Act 1991 (RMA)
IN THE MATTER of the Te Pūtahi Ladies Mile Plan Variation in accordance
with section 80B and 80C, and Part 5 of Schedule 1 of the
Resource Management Act 1991.

**JOINT STATEMENT OF STORMWATER AND INFRASTRUCTURE EXPERTS
IN RELATION TO TE PŪTAHI LADIES MILE PLAN VARIATION**

DATED 2 NOVEMBER 2023

Introduction

- 1 This joint witness statement (**JWS**) records the outcome of conferencing of stormwater and infrastructure expert witnesses in relation to the Te Pūtahi Ladies Mile Plan Variation (**TPLM Variation**).
- 2 The expert witness conferencing was held on Wednesday 1st November 2023, at Queenstown Lakes District Council Shotover Street office. Paula Costello facilitated the conferencing.
- 3 Attendees at the conference were:
 - (a) John Gardiner.
 - (b) Amy Prestidge.
 - (c) Warren Ladbrook.
 - (d) Richard Regan.

Code of Conduct

- 4 This JWS is prepared in accordance with sections 9.4 to 9.6 of the Environment Court Practice Note 2023.
- 5 We confirm that we have read and are familiar with the Environment Court Practice Note 2023 and agree to abide by it.

Key information sources relied on

- 6 The following material has been reviewed by and/or relied upon by all attendees when coming to our opinions:
 - (a) The TPLM Variation (and associated documents);
 - (b) The evidence of Amy Prestidge, dated 29 September 2023;
 - (c) The evidence of John Gardiner, dated 29 September 2023;
 - (d) The evidence of Warren Ladbrook, dated 20 October 2023;
 - (e) The evidence of Richard Regan, dated 20 October 2023;
 - (f) The relevant parts of the Section 42A Report as it touches on stormwater issues (**s42A Report**);
 - (g) Ladies Mile Te Pūtahi Masterplan: Three Waters Infrastructure Report (Final) (Candor3 2022);

7 The key facts and assumptions we have agreed on when coming to our opinions are as follows:

- (a) 1% AEP (used in the discussion and Attachment A) means 1% Annual Exceedance Probability, which is also referred to as a 1 in 100 year event, or having a 1 in 100 year Annual Return Interval (ARI)

Purpose and scope of conferencing

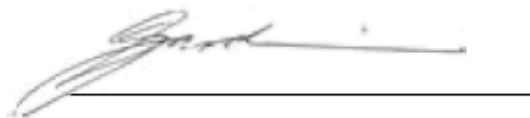
8 The purpose of conferencing was to identify, discuss, and highlight points of agreement and disagreement in relation to stormwater issues relevant to the TPLM Variation, and identify any technical drafting changes to the proposed District Plan provisions (and the reasons for those changes).

9 **Attachment A** records the agreed issues, areas of disagreement and the reasons, along with any reservations, and technical drafting changes to the proposed District Plan provisions (and the reasons for those changes).

Dated: **2 November 2023**



Amy Prestidge



John Gardiner



Richard Regan

A handwritten signature in black ink, appearing to read "Warren Ladbrook". The signature is written in a cursive style with a horizontal line extending from the end of the name.

Warren Ladbrook

ATTACHMENT A – INFRASTRUCTURE / STORMWATER

Participants- John Gardiner (JG), Amy Prestidge (AP), Warren Ladbrook (WL), Richard Regan (RR)

| Issue | Agreed Position | Disagreements or reservations, with reasons |
|--|---|---|
| <p>1. Ability to design stormwater system to ensure disposal to land</p> | <p>The experts agree;</p> <p>That soakage to land is the preferred means of stormwater disposal</p> <p>That there is variation in the soakage environment across the site and that it is reasonable to account for this during detailed design.</p> | |
| <p>a. 1% or 5% AEP event</p> | <p>The experts agree;</p> <p>That the development areas within TPLM are required to put the 1% AEP to ground.</p> <p>That run off from Slope Hill must be managed (natural servitude), and ideally, design of stormwater management devices would put Slope Hill 1% AEP to ground.</p> <p>That consultation and agreement with Council in respect to the management of flows up to 1%</p> | <p>John Gardiner - notes that the TPLM Variation is not changing the nature of Slope Hill in any way and it may be unreasonable to require land owners to treat a pre-existing natural environment for water quality</p> <p>Amy Prestidge - notes the potential for large scale event to result in flows to Lake Hayes, as indicated by land topography</p> |

| | | |
|---------------------------|---|--|
| | <p>AEP off Slope Hill is necessary in the event that the entirety of the 1% AEP is unable to be discharged to ground</p> <p>That in some circumstances there will be discharge to secondary flow paths where disposal to land is not possible for 1% AEP or unforeseen events occur. These overflows will be infrequent but it is important to choose disposal areas wisely given the variation in soakage characteristics to limit the possibility of overflows occurring.</p> <p>That there is a difference between Slope Hill and the flat areas of the TPLM Variation, which will be developed, and that Slope Hill should be separated out from the 'Information Requirements' listed under 27.7.28.1(b)(ii) into a separate section given that stormwater from each of these areas may be managed differently</p> | <p>Warren Ladbrook – notes that</p> <ul style="list-style-type: none"> - with regard to detailed design, with enough resources and space it is possible to design almost any solution, albeit physical and commercial constraints must also be considered. - The preference is for disposing everything up to 1% AEP to ground, specifically to include stormwater runoff from the developed housing areas. - The Slope Hill area requires further consideration on account of the challenges associated with fragmented land ownership and natural servitude responsibilities. <p>Warren Ladbrook – identifies that there are difficulties when contemplating stormwater solutions for an area with multiple land ownership. Specifically this results in different timing and sequencing of land development and becomes a challenge in determining appropriate solution/approach</p> |
| <p>b. Secondary flows</p> | <p>The experts agree that:</p> <p>Secondary flow paths are required</p> | <p>Amy Prestidge – as coordination across the catchment is required it is suggested that a masterplanning exercise in regard to intended overland flow path location and levels is undertaken</p> |

| | | |
|---|--|--|
| | <p>Secondary flow paths need to be co-ordinated across the catchment to ensure that levels grades and capacities work holistically and provide for unforeseen events and large events exceeding the 1% AEP</p> <p>In the event that flow paths are triggered, the general topography of the land means that they are naturally directed towards Lake Hayes, which mirrors the existing situation.</p> <p>It should be recognised that formalised flow paths will not be constructed across the catchment at the same time given that timing of individual developers will be different. Consideration needs to be given to the operation of incomplete flow paths and protection of properties on an interim basis</p> | <p>Warren Ladbrook – notes that the coordination and planning associated with secondary flow-paths should not adversely impact the sequencing or time associated with the consenting, design and construction of developments on any property.</p> |
| <p>c. Climate change considerations and assumptions</p> | <p>The experts agree that:</p> <p>Within proposed provision 27.7.28.1(viii) 'Information Requirement' The reference of RCP6.0 should be updated to read RCP8.5</p> <p>That the recommendations made below in regard to the stormwater management devices being non-proprietary/natural devices encourage the use of lower climate impact solutions</p> | |

| | | |
|--|---|--|
| <p>2. Appropriateness of centralised stormwater solution of up to 4 stormwater devices</p> | <p>The experts agree:</p> <p>That a single device would be ideal, but the experts agree that it is not practical/achievable given the different land holdings.</p> <p>That given the fragmented ownership involved, it is pragmatic that land owners have some choice around the location and detailed design of the devices utilised to manage stormwater (as opposed to for example specifying one single device such as a pond) however this choice is limited to location of and detailed design of devices which must be considered in the context of limiting the number of devices across the catchment and does not mean that the choice offered extends to a device on each individual land holding. The detailed design of devices must be discussed and agreed with Council.</p> <p>That Slope Hill and the TPLM area should be considered separately.</p> <p>a. For the TPLM development area, a centralised solution would need to be led by Council / structure plan approach, and in the absence of this, while a proliferation of devices is not desirable, it is also acknowledged that the number (4)</p> | <p>John Gardiner – reservation in that it is not possible to dictate to each landowner what method to use, resulting in the potential that there is a proliferation of devices (that Council is responsible for) on each landholding</p> <p>John Gardiner – notes that there are potential costs associated with management long term of some devices (for Council), in particular for example if under roads, or for efficiency of maintenance</p> <p>Warren Ladbrook – considers that the ‘costs’ identified by John Gardiner in terms of maintenance (in either the scenario of one versus multiple) devices are able to be appropriately funded by rates. Further, that stormwater disposal devices will not be located beneath roads or other utilities</p> |
|--|---|--|

| | | |
|--|---|--|
| | <p>is indicative and could be increased as more detail as to the land use becomes available</p> <p>b. For Slope Hill, it is considered that stormwater can be dealt with by way of a planted infiltration swale on the Slope Hill side of the collector road.</p> <p>With regard to the Matter of Discretion 27.7.28.1 (j) proposed within the s42A report, the following suggested amendments are agreed:</p> <p>(additions <u>underlined</u>, deletions striketrough)</p> <p>j) How the stormwater management proposed for the subdivision will be managed as part of a centralised, integrated stormwater management system for the TPLM Zone north of SH6, <u>including management of secondary flow paths and levels of ground surfaces to facilitate the system integration</u></p> | <p><i>Regarding Swale</i></p> <p>Warren Ladbrook – reservation noted with respect to establishing a linear device, that it can be managed but needs design detail to avoid potential impact. Further, that soakage rates are a variable constraint for disposal, meaning a potential conveyance at variable rates along the swale.</p> |
|--|---|--|

| | | |
|--|---|--|
| | <p>That under 27.7.28.1 the suggested addition of a new Matter of Discretion is agreed, in order to address Slope Hill, reading as follows:</p> <p style="padding-left: 40px;">27.7.28.1(x): <u>How a fully integrated stormwater management solution for Slope Hill is to be coordinated via swales for conveyance and soakage to capture and dispose of stormwater on the Slope Hill side of the collector road</u></p> <p>With regard to the Information Requirement 27.7.28.1 (b)(ii) proposed by the s42A report, the following suggested amendments are agreed:</p> <p>(additions <u>underlined</u>, deletions strikethrough)</p> <p style="padding-left: 40px;">27.7.28.1(b)(ii). The manner by which a fully integrated stormwater management solution for Slope Hill and the TPLM Zone north of SH6 (including treatment) is to be co-ordinated across development blocks, <u>with reference to the Stormwater Management Guideline to provide between 1-4 the fewest number of stormwater facilities</u> (detention basins, soakage devices <u>and/or including underground chambers</u>) across the TPLM Zone north of SH6, including co-ordinated</p> | <p>John Gardiner – Still has reservations with the need to ensure integration in the face of different landownership and as subdivision applications are sought in a fragmented way. John Gardiner suggests that Council prepare a ‘<i>Stormwater Management Guideline</i>’ for stormwater including potential location of stormwater devices on a catchment basis, and implications upstream and downstream of siting devices in such locations – with the principle of achieving the fewest number of devices in the TPLM Variation area.</p> <p>Warren Ladbrook – noted that the spatial arrangement of land ownership is not always conducive for collaborative stormwater solutions when the topography and sequenced rate of development do not align.</p> |
|--|---|--|

| | | |
|--|--|--|
| | <p>overland flow paths through the developments to ensure no adverse effects on <u>upstream or</u> downstream properties;</p> <p>*The experts acknowledge that a '<i>Stormwater Management Guideline</i>' for TPLM as referred to in the suggested wording for 27.7.28.1(b)(ii) above does not currently exist and is a suggested method discussed in conferencing that will give designers and Council a framework to use in assessing the adequacy of any design and assist in consistent decision making.</p> | |
| <p>3. Sediment control measures during construction, and subsequently pre-treatment before soakage</p> | <p>The experts agree that:</p> <p>Appropriate measures to control sediment during construction are by way of QLDC EMP and ORC standard processes/consent requirements</p> <p>Pre-treatment before soakage is anticipated to be by way of non-proprietary natural devices, e.g. not storm filters, but swales, forebays, etc. This is in order to reduce ongoing maintenance costs, and align with the principles of Te Mana O Te Wai</p> | |

4. Impacts of stormwater on Lake Hayes

The experts agree that:

The premise of the stormwater solution proposed- being discharge to land of the 1% AEP event from the development areas into the underling aquifer which flows away from Lake Hayes - greatly reduces the probability of any discharge to Lake Hayes, except in very extreme events (being in excess of the 1% AEP event)

Based on the fact that stormwater post development will be discharged to the aquifer and not to Lake Hayes, the proposed stormwater solution is highly unlikely to worsen the water quality of Lake Hayes.

In the case that less than 100% of the 1% AEP event from Slope Hill is not able to discharge to land, then excess flows will overflow towards Lake Hayes. While the intention is not to have overflows, it is prudent to provide for them, to cater to infrequent unforeseen events. The quality of stormwater is unlikely to be worse than current discharges.

Amy Prestidge & Warren Ladbrook – record that the infiltration quality of the land is good currently. Further analysis of the area would be required to understand fully the pre-development condition in relation to Lake Hayes to compare to the post development design.

Warren Ladbrook- notes that a detailed study of Lake Hayes, in its entirety, is not required prior to the development of TPLM development areas, providing these development areas include land disposal of stormwater (up to 1% AEP), and secondary flow paths as noted.

| | | |
|--|---|---|
| <p>5. Addressing stormwater if Anna Hutchinson Family Trust to be rezoned, including impacts on Shotover River</p> | <p>The experts agree;</p> <p>That this land area is a different stormwater catchment than the TPLM Variation area as notified</p> <p>That the same principles in terms of disposal to land (as for TPLM) apply for this extension area, being that land disposal to ground is appropriate</p> | <p>John Gardiner –records that he has not reviewed the site and is unable to provide comment in terms of ground conditions but does agree that a stormwater solution would be available even were it a piped discharge to the Shotover River.</p> <p>Amy Prestidge – has only reviewed the topography of the land to confirm that it does not fall within the TPLM catchment, but has not checked the suitability of stormwater discharge solutions</p> <p>Warren Ladbrook – notes that a viable stormwater solution can be developed during detailed design, in alignment with the principles outlined in this document, and with an expectation that suitable ground conditions are available for disposal of stormwater to land. Further, that post-developed conditions would include a reduction in any stormwater leaving the site as compared with pre-development conditions.</p> |
|--|---|---|

Water Supply and wastewater servicing

6. Water supply and wastewater servicing associated with Glenpanel Development Limited land

Amy Prestidge:

– has reservations as to whether the development is able to be supplied (water supply) using the existing infrastructure (150mm diameter pipe) and suspects that the new trunk reticulation would need to be in place. Amy Prestidge has not had the opportunity to clarify this with Callum Wood

– is of the view that in general, limiting the number of wastewater pump stations is preferred. However Amy Prestidge acknowledges that Glenpanel is essentially an island and that discharging via gravity to the east through private property is unlikely to be feasible.

- notes that the current rising main is a poor condition PVC pipe. While it might be feasible to put in a temporary pump station, installing a section of the new wastewater discharge pipe would be desirable to protect the integrity of the existing network pipe. This pipe can be extended as further development comes online

| | | |
|---|---|---|
| | | - notes that this problem is potentially likely to happen for many individual development sites before there is a holistic gravity network in place. Direct connection from temporary pump stations into a new pressure main is considered by Amy Prestidge to be a feasible interim solution prior to the terminal pump station being completed. |
| 7. Addressing water supply and wastewater if Anna Hutchinson Family Trust to be rezoned | Amy Prestidge & Richard Regan agree that: Connection to the existing networks for water supply and wastewater solutions are technically feasible, subject to consultation and acceptance by QLDC | John Gardiner – has not considered this matter Amy Prestidge – notes that there is finite spare capacity within both the existing wastewater and water supply networks which may impact the sequencing of development |