

**Before the Panel of Hearing Commissioners
For the Queenstown Lakes Proposed District Plan**

In the Matter of the Resource Management Act 1991

And

In the Matter of the Queenstown Lakes Proposed District Plan
(Stage 2 – Hearing Stream 14)

**Statement of Evidence of James William
Peter Hadley for Trojan Helmet Limited
(Submitter 2387 and Further Submitter
1157)**

Dated: 13 June 2018

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INTRODUCTION

1. My name is James William Peter Hadley. I am a consulting civil and structural engineer and Principal of the consulting engineering company Hadley Consultants Ltd (**HCL**).
2. I hold the qualifications of Bachelor of Engineering (Civil) with Honours. I am a Chartered Member of Engineering New Zealand (CMEng), a Chartered Professional Engineer (CPEng) and a member of the International Professional Engineers Register (IntPE). I have over 25 years' experience in the design and construction of civil and building structures with particular expertise in the design and construction of development infrastructure for roading, water supply, wastewater and stormwater disposal systems. I have extensive experience in design and implementation of infrastructure works for both private companies and for Local Authorities throughout the lower South Island.

CODE OF CONDUCT

3. While this is not an Environment Court hearing, I confirm that I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note dated 1 December 2014. I agree to comply with this Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

4. HCL has been engaged by Trojan Helmet Limited (**THL**) to assess the natural hazard risks and servicing and infrastructure requirements in respect of THL's submission on Stage 2 of the Proposed District Plan (**PDP**) for a bespoke resort zoning over its approximately 162 ha block of land bounded by and located between Lakes Hayes Arrowtown Road and McDonnell Road.

5. My firm prepared the Infrastructure Feasibility and the Natural Hazards Assessments¹ that supported THL's submission on Stage 1 of the PDP (Submission 437) (**Stage 1 Reports** or **Stage 1 Assessment**), which I understand were also lodged with THL's Stage 2 submission, although I understand that THL's submission on Stage 2 of the PDP now differs from its Stage 1 submission.

6. I understand that the current THL Stage 2 proposal seeks to provide for, in summary, the establishment of up to 150 residential units (which includes the existing units/dwellings on the Site), within identified development nodes (described in the submission as 'Activity Areas') located around the existing golf courses. In addition, the submission seeks to provide for the ongoing operation and development of the existing golf courses and sculpture park, and a limited range of commercial activity around the existing Clubhouse, provided it is related to the purpose of the resort. I understand that all development must be undertaken in accordance with the proposed Structure Plan for the new zone and that the maximum development level is 150 residential units plus a small commercial demand allowance of 10 residential unit equivalents. This takes the total maximum potential demand to an equivalent of 160 residential units. I further understand that all buildings will require a controlled activity resource consent, with the Council's control limited to infrastructure provision.

7. My evidence will address the following:
 - (a) Confirmation of the basis and conclusion of HCL's Stage 1 Assessments.

 - (b) The changes now made to the current Stage 2 proposal and in particular the change in water demand volumes and wastewater flow generation that will occur after increasing the maximum yield of Residential Units from 100 (as assessed in the Stage 1 Report) to the potential 160 maximum now proposed by THL.

 - (c) Commentary on the impacts, if any, of changes to the wider Arrowtown fringe area which might affect previous assessments (i.e.

¹ 'The Hills Golf Course Land, Infrastructure Feasibility', dated 21 October 2015 and 'Hills Golf Course Land (Including McDonnell Road Land') and Hogans Gully Land', Natural Hazards Assessment', dated 21 October 2015.

the Stage 1 Reports) of the 3 Waters Infrastructure feasibility and/or natural hazard matters.

- (d) Assessment of whether the new Stage 2 proposal alters the previous Stage 1 Assessment of Natural Hazards for the Site and whether any constraints exist for development.
- (e) Assessment of the feasibility of 3 Waters Infrastructure servicing for the Stage 2 proposal.

DOCUMENTS REVIEWED

- 8. In preparing this evidence I have reviewed the following documents and reports:
 - (a) HCL's Stage 1 Reports.
 - (b) THL's Stage 2 submission, including the relevant accompanying expert reports.
 - (c) The evidence of Andrea Jarvis for the Queenstown Lakes District Council (**QLDC**), dated 28 May 2018.
 - (d) NZS4404:2010 Land Development and Subdivision Infrastructure.

PREVIOUS REPORTING

- 9. Previous investigation and reporting by HCL in 2015 related to the feasibility of infrastructure services and the impact of Natural Hazards on the earlier Stage 1 proposal for a bespoke resort zone across THL's 162Ha golf course land.
- 10. The earlier 2015 work for the Stage 1 proposal assessed a maximum of 100 Residential Units. The Stage 1 Report concluded that;
 - (a) It was feasible to service the development enabled the by Stage 1 proposal with both potable water and wastewater disposal solutions which would satisfy QLDC standards.
 - (b) Stormwater runoff could be adequately managed in accordance with QLDC Standards, including use of Low Impact Design (**LID**) principles.

- (c) Natural hazard issues, particularly liquefaction, did not inhibit the development proposal.

THE KEY CHANGES IN THE STAGE 2 PROPOSAL

- 11. The key changes in the Stage 2 proposal that are relevant to the assessment of the feasibility of infrastructure services and natural hazard impacts are as follows:
 - (a) The extent and location of Activity Areas and some potential Homesites have been refined and altered from the Stage 1 proposal. These changes are not significant in terms of the effects on infrastructure and natural hazard and do not materially affect the Stage 1 assessment of global natural hazards for the Site in terms of the location of potential development.
 - (b) The development potential of some of the Activity Areas has changed. This does impact the Stage 1 Assessment in that potential water demand and wastewater flows have increased.
 - (c) The change in development potential under the Stage 2 proposal has increased in development yield from 100 Residential Units (Stage 1 proposal) to 160 residential unit equivalents under the current Stage 2 proposal. I understand that whilst the Activity Areas proposed include differing extents than Stage 1, the proposal is capped at a maximum of an equivalent 160 Residential Units across the Zone, including some provision for small scale commercial activity.

INCREASED WATER DEMAND

- 12. The increase from 100 to 160 Residential Unit equivalents in the proposed Zone increases both water demand and wastewater flow generation.
- 13. Previous assessment work for the Stage 1 proposal confirmed that there were two options available to service the proposed Zone with water supply;
 - (a) Connection to the QLDC Arrowtown Water Supply Scheme where QLDC supply pipes already border or are adjacent to the Site along both Arrowtown – Lake Hayes Road and McDonnell Road.

- (b) Use of existing water bores on the Site or development of new bores as required to meet demand. These bore sources would be developed to become a private water scheme separate from any public QLDC scheme.
14. The increase in Residential Units from 100 and 160 under the Stage 2 proposal equates to a 60% increase in daily water demand from 210m³/day to 336m³/day. This increase does not alter the feasibility of the solution reported in our Stage 1 Assessment and it remains feasible to service the Site with water as described in the Stage 1 Report, despite the increase in Residential Units.
15. I note that our Stage 1 Assessment assumed an average daily water demand of 2,100 litres/day/Residential Unit equivalent prescribed by QLDC.. I am aware that for some recent development proposals such as Housing Infrastructure Fund projects, QLDC has accepted that scheme designs and scheme assessments which include all new infrastructure may be advanced on the lower demand figures described in NZS 4404:2010 Land Development and Subdivision Infrastructure. Adoption of the NZS 4404:2010 parameters would result in a lowering of the per capita Residential Unit demand to 1,400 litres/day. This would result in a total daily demand of 224m³/day under the Stage 2 proposal including 160 Residential Units. This approximates the basis of the Stage 1 assessment (210m³/day), and I note that the d Option 1 service solution described in our Stage 1 Report was not opposed from an infrastructure perspective by Andrea Jarvis for the QLDC.
16. The feasibility of supply to the proposed 160 Residential Units is not contingent on the lower per capita demand figures noted above however. The Stage 2 proposals can still be serviced using the higher, more conservative demand figure of 2,100 litres/day. The potential adoption of the lower 1,400 litres per day is mentioned only to assist and alert QLDC should they wish to minimise cost when assessing capacity of their scheme and scheme upgrade options, if indeed upgrades and developer contributions are found to be necessary.

INCREASED WASTEWATER FLOW GENERATION

17. The Stage 1 Assessment confirmed it was feasible to service the Site with wastewater by one of two options;

- (a) Connection to the QLDC wastewater scheme which runs through and adjacent to the Site.
 - (b) Development of a private communal on-site wastewater disposal scheme within the Site.
18. The increase from 100 to 160 Residential Units equates to a 60% increase in daily wastewater generation from 105m³/day to 168m³/day. This increase does not alter the feasibility of the solutions reported in the Stage 1 Assessment and it remains feasible to service the Site with wastewater reticulation and disposal solutions for the new Stage 2 proposal by adopting the solutions as outlined in the Stage 1 Report.
19. There is significant land area available outside the proposed Activity Areas which makes accommodation of a 60% increase in wastewater flows within a private scheme (should it be the option advanced) very feasible, with few, if any, limitations.

NATURAL HAZARDS

20. The Stage 1 assessment of Natural Hazards was global for the Site. The relatively minor amendments to the Structure Plan and Activity Areas do not alter or impact the findings of the Stage 1 work, and I confirm that there are no natural hazard issues which constrain the Stage 2 Proposal.

STORMWATER

21. The Stage 2 proposal does not alter the Stage 1 Assessment of the feasibility of control of Stormwater. I therefore confirm that the collection and subsequent disposal of Stormwater from the proposed Stage 2 development is entirely feasible via collecting and controlling the Stormwater runoff and disposing by draining to the local water courses passing the Site.

ADJACENT DEVELOPMENT AND DEVELOPMENT PROPOSALS

22. Since 2015 when the assessment of the Stage 1 proposal was carried out, new developments have been constructed in the area (Arrowtown Lifestyle Retirement Village) along with numerous rezoning and development proposals put forward by owners of land neighbouring and nearby the THL Site. Some of these proposals will result in significant increases in demand on both the QLDC Water and Wastewater networks.

23. Whilst the solutions outlined for the THL Stage 2 proposal in our assessment work are feasible, it is suggested that a potentially more efficient approach would be for QLDC to lead an Area Wide expansion of its water and wastewater networks in the Arrowtown area to provide capacity for all zoned areas and approved developments. This would avoid a first come first served approach to existing system capacity, it would maximise development contributions to QLDC to fund infrastructure expansion.

SUMMARY

24. To summarise, the changes in the current Stage 2 proposal materially impact the previous Stage 1 assessment work only in terms of the increase in the maximum number of Residential Unit equivalents from 100 to 160. I have examined the effect of this increase in demand and confirm that it is still feasible to service the Stage 2 proposal with 3 Waters infrastructure as per the solution outlined in HCL's Stage 1 Reports. Further, HCL's Stage 1 conclusion with regard to Natural Hazards is unchanged and there are no Natural Hazard issues which adversely impact the Stage 2 proposal.

J W P Hadley

June 2018