

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

UNDER the Resource Management Act 1991
IN THE MATTER OF the Te Putahi
Ladies Mile Plan Variation in
accordance with section 80B
and 80C, and part 5 of
Schedule 1 of the Resource
Management Act 1991

EVIDENCE

**MICHAEL HANFF ON BEHALF OF
FRIENDS OF LAKE HAYES (INC.)**

Date 13 December 2023

Introduction

My name is Michael Hanff. I am Chair of Friends of Lake Hayes (FOLH) I am providing lay evidence on behalf of Friends Of Lake Hayes. We would have liked to bring Dr. Marc Schallenberg, a freshwater scientist at the University of Otago, to the hearing as expert support, but given demands on Dr Schallenberg's time and the requirement to be present in person rather than by Zoom, Dr. Schallenberg prepared a fact sheet. This is based on the Lake Hayes State of the Environment 2023 report submitted in our lay expert evidence highlighting the risks to the Lake from increased sediment loads arriving at the lake. The fact sheet is found in Appendix 2 of this submission.

I hold a Bachelors of Science in Chemistry and have gained 7 years worth of science knowledge by engaging with various environmental scientists as the Chair of Lake Hayes. Feel free to ask questions and if they fall within my knowledge, I will happily answer them.

Scope of evidence

This evidence takes our original FOLH submission and subsequent FOLH lay evidence as read.

Stormwater

The Ladies Mile land covered by the proposed Plan change falls mainly within the Wakatipu Basin Lake Hayes catchment. The Lidar based map attached as appendix 1 confirms this. The future occupants of the land covered by the proposed Plan Change will benefit from amenity values provided by the Lake and surrounds.

We refer to ORC submission dated 9 June 2023 which supports the proposed plan variation "in a manner that ensures any adverse effects are appropriately addressed" (see attached ORC submission 9 June 2023). They also outline the regulatory framework including NPS FW 2020.

QLDC have provided an outline of a stormwater proposal which allows sediment laden stormwater into the Lake during higher flow rain events. These rain events will occur as often as the climate determines. As we know percentage and frequency of these events is very unpredictable.

In their Stormwater assessment QLDC have not included potential risk of stormwater arriving into Lake Hayes. No analysis has been done on the effects to the Lake's health and how this will impact on the current circa \$20 million planned investment in other parts of the catchment. A substantial part of this investment is funded by Community targeted ORC rates.

Specifically, the ORC together with the community are working to restore the health of Lake Hayes through initiatives driven by DP Policy 24.2.4.2 and with support existing long standing land owners. As mentioned earlier, these projects totaling circa \$20.0m funded by community / private/Iwi/ORC rates. This work aims to improve water quality by either preventing or extracting nutrient/sediment loads out of the Mill Creek catchment substantially reducing sediment/nutrient loads reaching the lake.

FOLH see the Ladies Mile as an opportunity for QLDC to provide good environmental leadership and take the opportunity to use the Regulatory Framework and development contributions to lead appropriate stormwater design. This should include investment in existing sediment load reduction initiatives either within the Ladies Miles zone change land or off site in other suitable parts of the catchment.

As noted in previous evidence, QLDC and experts now agree that the land associated with the Ladies Mile plan change, mainly falls in the Lake Hayes catchment. QLDC need to be consistent and treat Ladies Mile the same as other land in the catchment that has been rezoned more intensively i.e apply / include Policy 24.2.4.2 as written to ensure potential cumulative pollution effects of this zone change do not undermine the activities in other parts of the catchment.

Refer "Statement of Rebuttal Evidence of Amy Catherine Prestige" 10 November 2023

Point 46 Amy agrees that there is 1-2 % chance a stormwater and associated sediment load overflow will occur within a given year arriving at Lake Hayes. Although we have not seen the science behind the % quantum or what this means in expected annual loads, she accepts that failure of the system will occur regularly leading to increased overland sediment laden runoff entering the lake.

Point 49 Amy agrees " Conveyance infrastructure to Hayes Creek could be necessary to divert flows away from Lake Hayes if water quality impacts are deemed substantial".

When we talk about improvement of water quality we are looking for a contribution to a reduction in sediment/nutrient load though initiatives like wetland reconstruction sediment removal either on or off site to contribute to lake restoration similar to activities currently being undertaken in other parts of the catchment.

Reducing stormwater loads from increased development levels from the creation of 100 ha of hard surfaces at best mitigates the situation, with overflows resulting in cumulative deterioration i.e. the development will cause additional harm to the Lake if the storm water design is approved as outlined.

Management of ongoing complex stormwater infrastructure and associated maintenance to keep it performing carries many risks of failure.

Modelling of stormwater / loads in this district has been problematic in other parts of the catchment. It is very difficult to predict soakage in frozen ground and subsequent stripping of sediment from high runoff flows across first flush systems and swales designed to capture sediment during average rain events.

FOLH view is that the proposed sediment laden stormwater overflow design as proposed is unacceptable especially as this risk can be avoided by moving overland flows across SH6 and out of the catchment.

This may even prove to be the overall cheapest option. It is possible that had an integrated view been taken including effects on receiving water body, design could balance upstream and downstream treatment and optimize the solution cost delivering outcome meeting all requirements.

QLDC District Plan Policy 24.2.4.2

Background

The current operative District Plan around Policy DP 24.2.4.2 is based on a Report and recommendations of Independent Commissioners which was formally adopted by QLDC. Link below

www.savelakehayes.org.nz/files/ugd/742908_f6b2febee5254444a4a7e0899bde4efb.pdf

refer Page 2 para 8.

“A large part of this area also lies within the Lake Hayes catchment,-

Our conclusions in Report 18.1 (Section 2.8) were that the time to consider up-zoning of land to Precinct (**or any other zone with higher development potential**) is when it can be demonstrated that such a zoning would not result in further degradation of water quality feeding into Lake Hayes (and not before then), and that such an approach gives effect to both the Partially Operative RPS 2019 and the NPSFM. “

In response to this QLDC introduced policy DP 24.2.4.2. into the district Plan . At the time QLDC argued that Ladies Mile Land fell outside the catchment and therefore the Policy should not apply to this land. It has now been agreed that the Ladies Mile land does fall in the catchment. For the Policy to be fair and effective it needs to be applied to an overlay of all Lake Hayes Catchment in the Central Wakatipu basin.

Therefore as part of any Ladies Mile Plan Change, FOLH seek to ensure this policy is included and implemented given 100 ha of land in the new zone will move from rural to hard surfaces as part of the planned residential intensification.

In terms of implementation of this policy we suggest QLDC works with the Wai Whakaata Strategy Group to develop rules on how this Policy is to be implemented consistent with current land zones in other parts of the catchment.

Summary

Through the Wai Whakaata Strategy Group, FOLH continue to be supported and encouraged by QLDC, ORC, community, IWI and others in striving for remediation of Lake Hayes health. We now need to see action from QLDC that ensure that effects on the lake from Ladies Mile Plan change are included in any stormwater design.

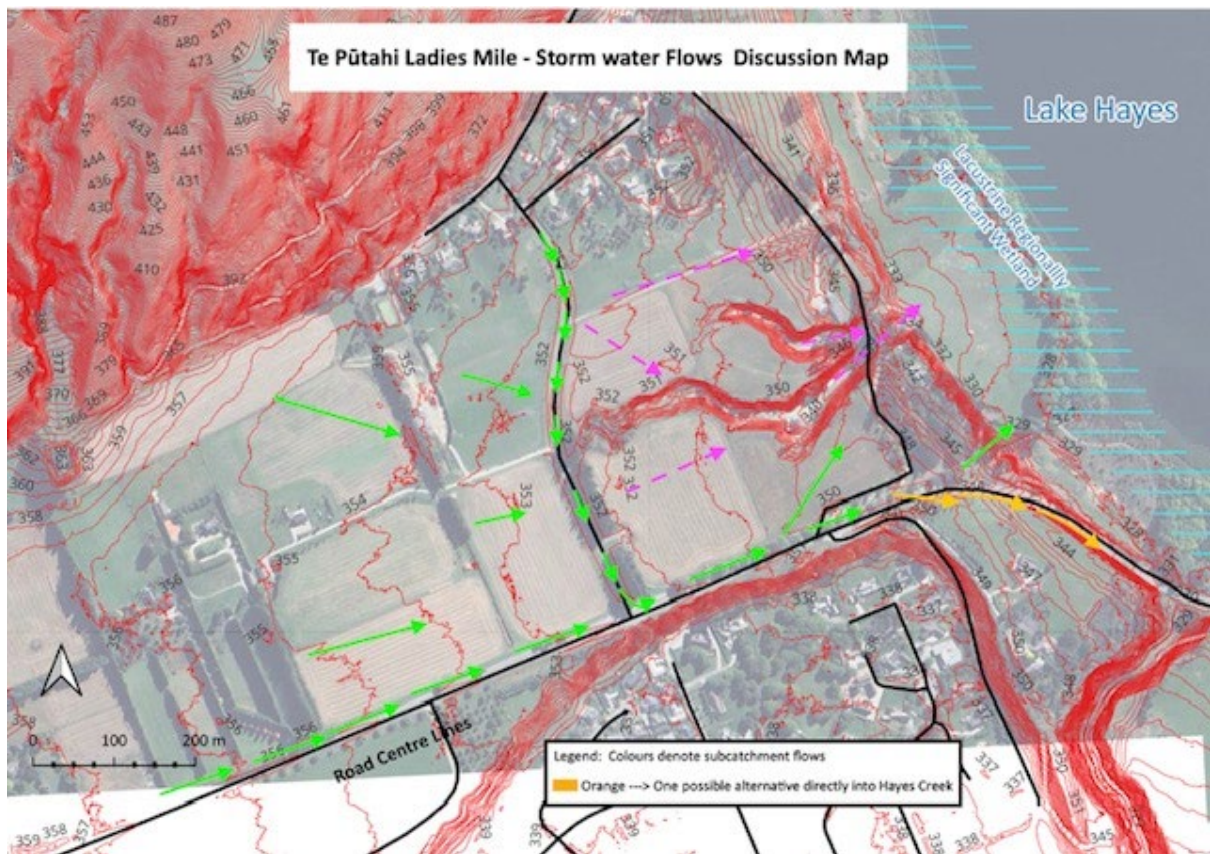
NPS FW supports this through prioritising the health of the Lake.

Current catchment remediation work, steered by the Wai Whakaata Strategy Group, has made serious inroads into sediment volumes arriving at the Lake. When such gains are being made, we cannot risk putting more sediment into the Lake through new land development especially when an “avoid” solution exists i.e. move the storm-water out of the catchment. The cumulative impact of the historic mitigation of adverse effects has created the untenable situation we are in today.

QLDC existing District Plan Policy DP 24.2.4.2 needs to be included as part of the zone change.

Given that a big part of the Lake Hayes remediation work is funded through rates, if QLDC continue to support a stormwater design with run-off into Lake Hayes QLDC need to be able to explain to the community whether they remain committed to improving the health of Lake Hayes. If QLDC is committed to improving the Lake's health how do they intend to cover the costs associated with cleaning up storm water problems generated by Ladies mile entering the Lake after the event.

Appendix 1



Lake Hayes: Consequences of external phosphorus/sediment loads

A fact sheet produced by Marc Schallenberg (PhD), Department of Zoology, University of Otago

1. Lake Hayes breaches water quality and ecosystem health standards in the National Policy Statement for Freshwater Management¹ and in the Regional Water Plan² (see Table 1)

Table 1. National and regional water quality and ecosystem health standards currently breached

Attribute	Fails standard
Total phosphorus	Otago Water Plan
Chlorophyll <i>a</i>	National Policy Statement for Freshwater Management
Dissolved oxygen (bottom water)	National Policy Statement for Freshwater Management

2. Phosphorus is a key plant nutrient, fuelling algal biomass (chlorophyll *a*) in the lake. The sinking of dead algal biomass to the bottom of the lake depletes oxygen in the bottom waters.
3. This means that the lake condition must be improved and that there is no headroom for further loads of phosphorus to the lake. This was the basis of Policy 24.2.4.2 in the District Plan³.
4. Phosphorus entering the lake is primarily bound to suspended sediment and catchment soils transported to the lake by its inflows. Phosphorus and sediment loads to the lake are linked.
5. Phosphorus is also released from the lake bed sediments, which historically entered the lake and suspended sediment and soils.
6. Numerous studies on Lake Hayes have concluded that the key mitigation for improving the condition of the lake is the reduction of phosphorus loads to the lake from the catchment.
7. The Lake Hayes Strategy (1995)⁴ set a target of 20% reduction in the phosphorus load to the lake. The strategy was inexplicably rescinded in 2003, before the water quality of the lake degraded markedly in 2006.
8. As phosphorus is strongly bound to particles, the lake receives most of its annual phosphorus load during storm events which mobilise soils and sediments into the inflows (see Figs 1 and 2)

¹ Ministry for the Environment (2020)

² Otago Regional Council, Water Plan Change 6A (2014)

³ QLDC Operative District Plan, Wakatipu Basin (2019)

⁴ The Lake Hayes Strategy. QLDC and ORC. (1995)

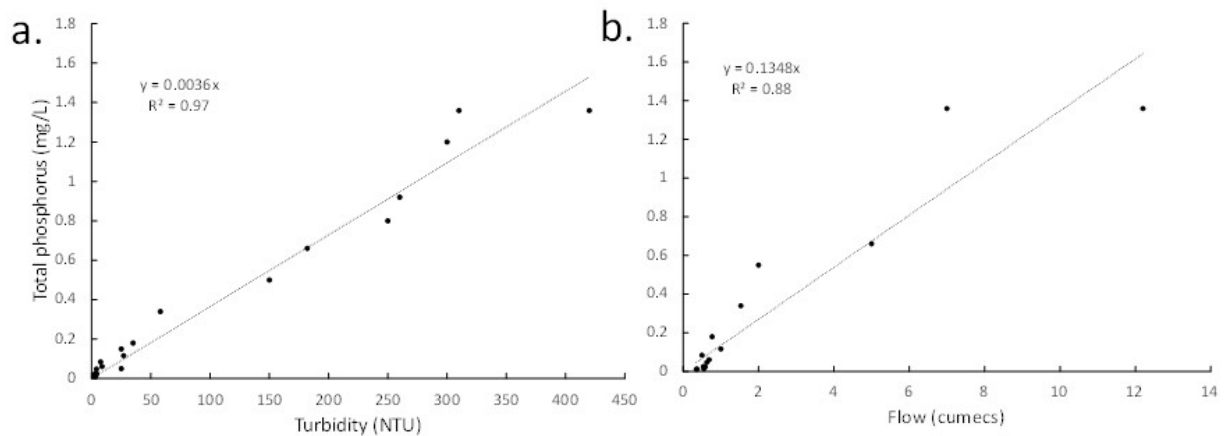


Fig 1. Relationships of phosphorus concentrations in Mill Creek with turbidity (a.) and flow (b.).⁵

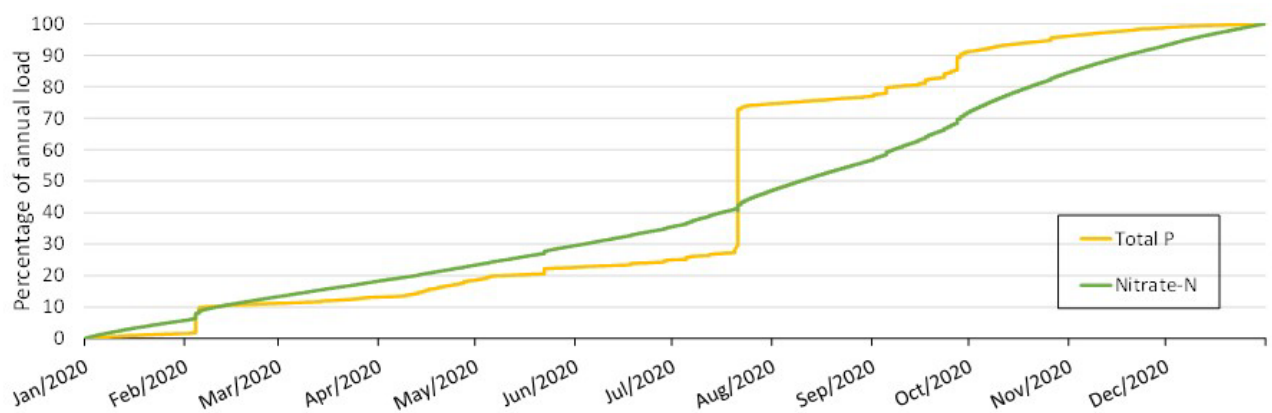


Fig 2. Cumulative annual load of total phosphorus and nitrate from Mill Creek to Lake Hayes. A single flood in Aug. 2020 contributed approx. 50% of the annual phosphorus load to the lake.⁵

9. The estimated annual load of phosphorus to the lake in 2020 was 2.6 t yr⁻¹, 71% of which was retained in the lake, available for recycling from the lake bed⁵.
10. The estimated annual load of sediment to the lake in 2020 was 2302 t yr⁻¹, 95% of which was retained in the lake⁵.
11. Earthworks and conventional urban development both tend to increase runoff, overland flow and sediment and contaminant loads to waterways⁶.
12. To prevent the Lake from degrading further, to facilitate its recovery, and to achieve national and regional water quality standards for Lake Hayes, additional loads of sediment and phosphorus to the Lake should be prevented as implied by policy 24.2.4.2³.

⁵ Schallenberg and O'Connell-Milne (2023) Lake Hayes State of the Environment 2023. https://www.savelakehayes.org.nz/_files/ugd/742908_003ee998c0b246fea6ba61fe32d202b8.pdf

⁶ ORC Regional Plan: Water for Otago. Proposed Plan Change 8, Section G. (2022)

