

**Before Independent Hearings Commissioners  
At Wellington**

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Under the Resource Management Act 1991

In the matter of Applications for resource consents, and a Notice of Requirement for a Designation, by Wellington Water Limited ('WWL') on behalf of Upper Hutt City Council, for the construction, operation and maintenance of the structural flood mitigation works identified as the Pinehaven Stream Improvements Project

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**Joint Witness Statement - Aquatic Ecology**

Dated 16 July 2020

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## **Experts participating:**

1 Dr Alex James (EOS Ecology representing WWL)

2 Dr Evan Harrison (GWRC)

### **1 Introduction**

1.1 All experts confirm that they have read and are familiar with Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014) and agree to comply with it.

1.2 The primary purpose of expert conferencing is to assist the Commissioners and to reduce hearing time.

1.3 The issues discussed by the witnesses were:

- a Existing aquatic ecology values of the Pinehaven Stream;
- b The effects of the project construction on aquatic ecology;
- c The effects of the project on aquatic ecology post-construction;
- d Whether any alternative construction methods would have reduced effects on aquatic ecology; and
- e Recommended mitigation (including proposed conditions).

1.4 The following drawings, data and published standards/ papers were relied upon in coming to their opinion:

- a *The General Arrangement plans [dated June 2020]*
- b *Landscape Planting plans [dated 24 September 2019]*
- c *The GWRC draft resource consent conditions [dated 7 July 2020]*
- d Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., & Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

- 1.5 The proposed conditions pertaining to freshwater ecology the experts discussed are as follows (not reproduced in full here):
- a Fish Relocation and Recovery Programme - GWRC Draft Condition 12
  - b Habitat complexity – GWRC Draft Conditions 49, 50, and 51
  - c Compaction – GWRC Draft Conditions 52 and 53.
  - d Sedimentation – GWRC Draft Conditions 54 and 55.
  - e Fish relocation and recovery – GWRC Draft Conditions 56 and 57.
  - f Fish passage – GWRC Draft Conditions 58–62.
  - g Reclamation design report – GWRC Draft Condition 63.
  - h Riparian planting - GWRC Draft Conditions 64–69.
  - i Post-construction monitoring – GWRC Draft Conditions 70–74.

## 2 Statement of key facts and assumptions

- 2.1 The key facts and assumptions agreed upon by the experts are:
- a Pinehaven Stream in the Project area is assessed as being of “moderate” ecological value.<sup>1</sup>
  - b Based on the best practice ecological value-magnitude of effect matrix of Roper-Lindsay *et al.* (2018)<sup>2</sup>, the overall adverse effect of the construction phase will be “moderate”. However, provided the recommended avoidance, remedy, and mitigation measures (as proposed in the draft consent conditions) are adequately implemented, the overall adverse effect of the construction phase based on the ecological value-magnitude of effect matrix (Table 10) of Roper-Lindsay *et al.* (2018)<sup>3</sup> can be reduced to a “low” level. In the context of the RMA, this would be considered a “minor adverse effects” level of impact to aquatic ecology.

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<sup>1</sup> James, A. Pinehaven Stream Improvements Project – Assessment of Freshwater Ecological Effects: Main Works. EOS Ecology Report No. JAC01-18078-01. 40 p. (included in Appendix S of the project Resource consent application and notice of requirement).

<sup>2</sup> Judith Roper-Lindsay, Stephen Fuller, Scott Hooson, Mark Sanders and Graham Ussher *Ecological Impact Assessment (EiA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems* (2<sup>nd</sup> ed, Environmental Institute of Australia and New Zealand Inc, Melbourne, 2018). Available at: <https://www.eianz.org/document/item/4447>.

<sup>3</sup> Roper-Lindsay *et al.* (2018) *Ecological Impact Assessment (EiA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems* (2<sup>nd</sup> ed)

- c The magnitude of operational phase effects was deemed to be “negligible” to potential positive. Based on the best practice ecological value-magnitude of effect matrix of Roper-Lindsay *et al.* (2018),<sup>4</sup> will be “very low” to “net gain”. Provided the recommended mitigation measures are adequately implemented, the adverse operational effects can be reduced to a “less than minor adverse effects” or “nil effects” level of impact to aquatic ecology, in the context of the RMA. The Project may potentially have positive effects on aquatic ecology.
- d The proposed works will result in an unavoidable disturbance to aquatic ecology, however the aquatic fauna will recover relatively quickly (months for macroinvertebrates, up to a few years for fish). After construction there will be potentially some improvements in the ecological condition of Pinehaven Stream over time resulting from:
  - i The stream having more physical space for natural processes to occur within;
  - ii The establishment of a more natural riparian zone dominated by native plants;
  - iii A potentially increased fish diversity and/or densities resulting from remediation of the fish barrier at the confluence with Hulls Creek.

### 3 Methodology/ standards

- 3.1 The methodology or standards used by the experts in arriving at their opinions are:
  - a Roper-Lindsay *et al.* (2018)<sup>5</sup> – we agree this is an appropriate methodology for determining the ecological impact of this project
  - b Harding *et al.* (2009)<sup>6</sup> – we agree the method outlined in this document is appropriate for measuring stream compaction for this project.

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<sup>4</sup> Roper-Lindsay *et al.* (2018) *Ecological Impact Assessment (EclA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems* (2<sup>nd</sup> ed)

<sup>5</sup> Roper-Lindsay *et al.* (2018) *Ecological Impact Assessment (EclA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems* (2<sup>nd</sup> ed)

<sup>6</sup> Harding, J.S., Clapcott, J.E., Quinn, J.M., Hayes, J.W., Joy, M.K., Storey, R.G., Greig, H.S., Hay, J., James, T., Beech, M.A. and others (2009) *Stream Habitat Assessment Protocols for Wadeable Rivers and Streams of New Zealand*. School of Biological Sciences, University of Canterbury, Christchurch, New Zealand. 133 p. [<https://envirolink.govt.nz/assets/Envirolink/Stream20Habitat20Assessment20Protocols.pdf>]

- c Clapcott *et al.* (2011)<sup>7</sup> – we agree the ‘*Sediment Assessment Method 2 (SAM-2) – In-stream visual estimate of % sediment cover*’ method outlined in these guidelines is appropriate for measuring fine sediment deposition for this project.

#### **4 Issues which the witnesses agree upon**

##### **4.1 The witnesses agree the following:**

- a The overall existing aquatic ecology values of the Pinehaven Stream are “moderate”;
- b The adverse effects of the project construction on aquatic ecology can be reduced to a “minor adverse effects” level with the recommended avoidance and mitigation actions outlined in the proposed GWRC consent conditions;
- c The adverse effects of the project on aquatic ecology post-construction, will be “less than minor” to “nil effects”. The project has the potential to have positive effects on the aquatic ecology of Pinehaven Stream;
- d The best construction methodology from the perspective of reducing impacts on aquatic ecology has been selected, given the space constraints of the project area that preclude . The piped diversion methodology involves working predominantly from a dry stream bed, significantly reducing entrainment of suspended sediments in the stream. This is a significant improvement on the originally proposed construction methodology that included machinery operating in the wetted, flowing stream in some locations;
- e The recommended avoidance and mitigation actions, which have been included in the proposed GWRC consent conditions will minimise adverse impacts and provide for potential permanent positive effects on the aquatic ecology of Pinehaven Stream.
- f We have agreed to some minor changes to the wording of the proposed GWRC consent conditions:

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<sup>7</sup> Clapcott, J.E., Young, R.G., Harding, J.S., Matthaei, C.D., Quinn, J.M. & Death, R.G. (2011) *Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values*. Cawthron Institute, Nelson, New Zealand. [[http://www.cawthron.org.nz/media\\_new/publications/pdf/2014\\_01/SAM\\_FINAL\\_LOW.pdf](http://www.cawthron.org.nz/media_new/publications/pdf/2014_01/SAM_FINAL_LOW.pdf)]

- i Condition 12 b) – Remove the text reference to the electric fishing machine model, “(EFM400)” as it is overly restrictive to require a particular machine to be used for fish relocation work.
  - ii Condition 12 e) – Replace “immediately downstream” with “upstream or downstream” to give the ecologist(s) doing the fish relocation work more discretion as to the best location for releasing fish in the context of the overall Project area and stage of the Project at the time.
  - iii Condition 12 f) – Change wording to “Fish transfer in closed, cool containers that are kept in the shade at all times, and consider aeration during particularly warm weather”
  - iv Condition 56, para 2 – Replace “a fish movement barrier” with “the stages’ piped diversion dam” as no fish movement barriers will be installed with the piped diversion method. This terminology is a remnant from the now abandoned construction method that involved tracking in the flowing stream bed.
- g With respect to GWRC consent condition 53 relating to stream bed compaction, Evan suggested a change to what is considered “undue compaction”. In the applicants’ proposed consent conditions, undue compaction was defined as “a shift in compaction rating from 1 (loose, easily moved substrate) or 2 (mostly loose) to 4 (tightly compacted)”. This has now been altered slightly such that undue compaction is now “defined as an increase in compaction rating of two categories (e.g. from 1 to 3 or 4, or from 2 to 4” in the draft GWRC consent. Alex is in agreement with this change.

## **5 Issues which the witnesses do not agree upon**

- 5.1 The witnesses consider that all issues have been resolved through the s92 process, such that there are currently no issues we do not agree upon.

Date: 16 July 2020

Signed

A handwritten signature in blue ink, appearing to read 'A James', with a stylized flourish at the end.

Dr Alex James

A handwritten signature in black ink, appearing to read 'E Harrison', with a long horizontal flourish extending to the right.

Dr Evan Harrison