Isthmus.

MEMO: PROPOSED WAITAHA ELECTRICITY PROJECT LANDSCAPE PEER REVIEW

Context

1. The project is run-of-river electricity generation entailing a low weir that will divert part of the Waitaha River flow through a 1.5km tunnel to a small hydro-electric power station. The section of river in which the flow will be reduced includes the 1km Morgan Gorge, a wild and barely accessible chasm. The valley downstream of the gorge, in which the power station is to be located, is modified. The intake structure, however, is in a natural landscape above the gorge – although located adjacent to the existing swing bridge.

Assessment

2. I carried out an external peer view (26 February 2014)[1] of the landscape assessment by Mr Bentley[2] for the previous concession application. As part of a re-consideration application in 2022 I was asked to review my earlier report and provide input to a design review process of the intake. I confirm my observations in my earlier report. I consider the design changes (Option 1 in the 2022 Westpower landscape report) are a meaningful improvement as described below.

Design review

3. In my previous review I noted the importance of designing the water intake area to minimise its effect on the natural landscape. I considered its acceptability would depend on minimising disturbance and a 'surgical' insertion of the structure into the landscape.

4. I took part in design workshops in 2022 with an expert consultant group to investigate options to achieve those outcomes. We (the expert consultant group) considered the following potential design approaches:

    - **Alternative intake locations**: Having re-looked at potential locations further upstream away from the gorge entrance, the current location is considered preferable because it is anchored by solid rock at a location where the river course is fixed. It also co-locates the intake adjacent to the existing swing bridge. Greater intervention would be required to secure an intake further upstream where the river course regularly changes in a gravel riverbed, and to pipe or construct a water race between the weir and penstock tunnel.
    - **Naturalistic weir forms**: We investigated design that would work with the natural pattern of gravel riverbed meeting the rock wall at the head of the gorge. On reflection, we considered that a clean, minimalist structure would have the least interruption to natural

[1] Lister, Gavin. Proposed Waitaha Hydro Scheme: Landscape and Urban Design External Review, 2014 (Appendix 9C of the AEE).
[2] Bentley, James. Waitaha Hydro Scheme: Natural Character, Landscape and Visual Amenity Effects, 2014 (Appendix 9B of the AEE.

patterns. A concrete weir sheathed in steel has therefore been designed to minimise cross-section. The steel sheathing will take on the natural tones of a rust patina. The minimalist form would represent a 'surgical' insertion. It will be at the location where the river condition changes from gravel bed to rock chute. It is also most consistent with the potential to reverse the works in the future.

- **Alternative access tunnel portal location**: We investigated locating the portal on a terrace on the north side of the river where existing vegetation would screen the portal. However, even though the portal itself might be screened, excavator access would still be required to the riverbed. We agreed the least impact is to co-locate the access tunnel portal in clean rock adjacent to the intake structure – where it provides access direct to the gravel riverbed. Instead we considered it preferable to focus on the size and form of the portal (see below).
- **Size and form of access portal:** The dimensions of the access tunnel portal have been halved to approximately 3m x 3m on the basis of using a smaller excavator with a detachable canopy. Investigations also indicated the rock is sufficiently competent to support a rough-hewn portal. A rough-hewn form will more in keeping with natural character. It will respond to the schistose planes of the rock. It will be a lighter touch.

Summary

5. I consider the proposed changes to the critical intake structures have been carefully designed and are meaningful and worthwhile improvements compared to the previous design. While the presence of electricity generation works will unavoidably have some adverse effects on intrinsic naturalness, the effects will be localised, and minimised through design. The structures will have a small footprint and a design that minimises their visual effects on the river's natural character.

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