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Waikanae North Development – FTAA-2603-1194, Response to Fast Track Panel on Flooding Risk Associated with a breach failure of the Outlet Flow Control Structure

Paragraph 5 of the Panels Minute 15 raises issues of concern relating to possible downstream flooding risk due to the potential 200,000m³ of flood water stored upstream of the flow control structure.

Although the maximum storage depth is low, typically 1 – 1.5m, and the maximum depth of water at the flow control structure in a burst scenario would be less than 3m, an erosion event of the earth embankment connecting the flow control structure to the adjacent natural land forms could create a potential flood hazard downstream of the flow control structure.

We recommend that the following conditions of consent (with appropriate editing to facilitate consistency with the other consent conditions) be included in the draft conditions of consent.

1. At least 20 working days prior to commissioning the flow-control structure, the Consent Holder shall provide the Consent Authority with a breach assessment for the flow-control structure shown on [approved plan reference].
2. The assessment shall be prepared by a suitably qualified and experienced Chartered Professional Engineer, or other person accepted by the Consent Authority as having demonstrated expertise in breach assessment and unsteady hydraulic flood modelling.
3. The assessment shall be undertaken generally in accordance with the dam-break flood hazard assessment methodology in the New Zealand Society on Large Dams *Dam Safety Guidelines*, current at the time of assessment, and shall include, as a minimum:
 - (a) confirmation of the impoundment geometry, maximum operating water level, stage–storage relationship, and the dimensions and levels of the culverts, concrete weir, earth embankments and adjoining ground;
 - (b) identification and assessment of credible erosion and breach failure scenarios for the earth embankments, including a conservative scenario in which erosion bypasses or compromises the culvert/weir structure where physically credible;
 - (c) breach parameters and sensitivity testing, including final breach geometry and breach-development time;
 - (d) assessment of both:
 - i. a full-storage, normal-inflow (“sunny-day”) failure scenario; and
 - ii. a failure during a flood-inflow event (“rainy-day”) scenario;
 - (e) unsteady routing of the breach outflow through the downstream environment to the point at which the incremental effects of the breach are negligible;
 - (f) maps and tabulated results identifying the incremental inundation extent, maximum flood depth, velocity, depth–velocity product, arrival time, time to peak, and duration of inundation at all identified downstream dwellings, buildings, roads, crossings, infrastructure, watercourses and other sensitive receptors; and
 - (g) identification of practicable measures to avoid, remedy, or mitigate any identified adverse effects of a breach.

4. If the assessment identifies adverse downstream effects requiring mitigation, the Consent Holder shall, within [20] working days of providing the assessment, submit a Breach Risk Mitigation Plan to the Consent Authority for certification. The plan shall identify the measures to be implemented, performance standards, responsibilities, implementation timeframes, and any monitoring, inspection, maintenance, warning, or emergency-response procedures.
5. The Consent Holder shall implement the certified Breach Risk Mitigation Plan in accordance with its certified timeframes. The twin box culvert flow control structure shall not be commissioned until the required measures have been implemented, unless otherwise certified in writing by the Consent Authority.

We trust this clarifies this matter for the panel.



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