

## Turitea - water quality - caucusing

This document is a report of caucusing between John Male and Chris Taylor (Mr Taylor only up to item 2(d))(GHD, for Palmerston North City Council), and Andrew Watson and Graham Levy (Beca, for Mighty River Power) on 12 June 2009 in Christchurch. However, because Mr Taylor was not present for much of the caucusing, ~~and Mr Watson's involvement related to Mr Taylor's work, neither Mr Watson nor Mr Taylor have signed this document.~~ *has not AN*

Note that GHD staff are attending the caucusing to canvass issues to assist the Board, but given that full information exchange has not occurred (being information requested by MRP from PNCC, and Andrew Watson's final brief of rebuttal evidence), this report is caveated on that basis. A copy of Mr Watson's rebuttal ("draft 3") was provided to GHD at the caucusing meeting.

Item	Issue	Points of agreement	Points of disagreement	Comments
1	Sediment load to water catchment:			
a	<ul style="list-style-type: none"> <li>Existing</li> </ul>	Estimating sediment yield is fraught with difficulty, and differences reflect different methods. Order of magnitude is agreed. Change is most important.	GHD: Historical sediment loads may have varied especially prior to the implementation of the Reserve management plan.	
b	<ul style="list-style-type: none"> <li>During construction (general)</li> </ul>		<p>Significant difference in prediction, both used USLE method.</p> <p>Beca assessment uses USLE for the whole catchment, but with the construction areas calculated separately.</p> <p>GHD assessment uses USLE for the development areas only, otherwise GHD used the NIWA database.</p>	<p>Slope, length and treatment assumptions are likely reason for difference.</p> <p>GHD: Differences in USLE inputs account for some of the difference particularly slope and length aspects.</p> <p>This will apply to GHD calculations for the development sites and also to assumptions made by Beca's for calculations across the subcatchments</p>

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c <ul style="list-style-type: none"> <li>• During construction (slips/failures/wave)</li> </ul>	<p>"Wave" risk minimised if no ponds. Preference to use spreaders to avoid concentration of flow.</p> <p>Slips unlikely to result in significant accumulation of further sediment load downstream.</p>		<p>GHD concern is what sediment is collected on the way down – pond breach associated. This may be best described as the snowball / avalanche effect where debris combining sediment and vegetation accumulates as a pathway is created by the movement down the slope</p>
d <ul style="list-style-type: none"> <li>• During construction (stream erosion)</li> </ul>	<p>OK if the risk of increased energy is minimised by spreading the discharge.</p>	<p>GHD seek higher level of control than GWRC, e.g. double silt fences. Use the "belt and braces" approach.</p> <p>Given that spoil is to be exported, no ponds are to be constructed and that flow dispersion and sediment filtering is to be used the main issue for GHD is the standards of construction and that will need to be defined in the detailed plans yet to be developed by the applicant. This is largely a performance standard and diligence rather than a design standard and relates to things like the length of time a surface is exposed or the type and cleaning of traps.</p>	
e <ul style="list-style-type: none"> <li>• Sediment deposition in reservoir</li> </ul>	<p>Volumetrically it appears to be less than a minor risk</p>		<p>GHD: Historically there may have been higher sediment runoff rates which could have impacted bathymetry of reservoir and availability of nutrients for release</p>
f <ul style="list-style-type: none"> <li>• During operations</li> </ul>	<p>Sediment unlikely to be a problem if runoff is distributed and controlled as proposed.</p>		