

From: Peter West
Sent: Tuesday, 20 June 2017 9:55 a.m.
To: Peter Blackwood
Cc: Martin Butler; Mark Townsend
Subject: FW: Information Request; 9:24pm 19 June

Good morning Peter,
A response to the first part of Kyle's information request (*italics text is from Kyle's email below*):

My understanding of what actually occurred was a dam outflow instruction of 710 m³/s at 00:40 which was then increased to 780 m³/s at 09:50.
[Correct. These times and discharge values are confirmed by the email record].

Based on Scenario B Part 2 (as presented on 8 June) the optimised peak outflow would have been a constant 655 m³/s from 00:00 6 April with no subsequent increases. This would have required a lake level of 70.0 mRL prior to filling and a perfect inflow forecast (no factor of safety) to reach the maximum operating level of 76.2 mRL.

[Mostly correct: Scenario B Part 2 attempts to recreate the information available to the flood manager leading up to the decision at 00:40 6th April with only one change from what actually occurred: that the lake had been lowered to 70.0mRL. So the inflow forecast is as-estimated-at-the-time; – not perfectly-known or found-later. The 655m³/s value referred to is what the modelling tools would then have estimated as the optimum peak outflow. The archived report from this time shows that the optimisation tool estimated 685m³/s. Therefore 25m³/s contingency was effectively included in the 710m³/s dam discharge request. The magnitude of this contingency has been conserved in the subsequent modelling of this scenario (for example in the hydraulic results provided in response to the 2:06pm 16 June info request).

Correct that at this time (00:40 6th April) the expectation was that the estimated optimum peak outflow would be applied as a constant, actioned immediately, with no subsequent increases.

Correct about the tool's target level being 76.2mRL. Correct that no other safety factors are included in the modelling tool's estimate (other than the use of Max Operating Level as the tool's target instead of Max Flood Level) .

My understanding is that allowing for some contingency the likely attenuation flow decision would have been 680 m³/s at 00:40 which would have then been increased to 755 m³/s at 09:50 and that this is the basis for the flow and water level information that has been provided at the breach site.

[Correct. BOPRC estimates that, all other factors being conserved, the impact of a lake preparation level of 70.0mRL would have led to a discharge request at 00:40 6th April of 680m³/s instead of 710m³/s. Further analysis of the impact of this single change on the 09:50 6th April decision indicates a discharge request of 755m³/s at that time instead of 780m³/s. This is the basis for the hydraulic model results of water levels at the breach site provided 19 June in response to the 2:06pm 16 June request for information. For this scenario, the hydraulic model inflow hydrograph (at Te Teko) was scaled down by 30m³/s, proportionally over 400m³/s. (i.e. flows below 400m³/s unchanged; flows between 400m³/s and the peak discharge are scaled proportionally so that the peak discharge is 30m³/s less). It might be helpful to note (if not already noted) that hydraulic modelling is not available between the Dam and Te Teko – hence the scaling method].

Peter

From: Kyle Christensen [<mailto:kyle@christensenconsulting.co.nz>]

Sent: Monday, 19 June 2017 9:24 p.m.

To: Martin Butler

Cc: Frances Skilton; charlie.price@stantec.com; Michael Cullen; Mark Townsend; Peter West; Peter Blackwood

Subject: Re: Information Request

Hi Martin,

I wish to seek clarification relating to the alternative flow scenarios that are being run on the basis that a lake level of 70.0 mRL had been achieved prior to lake filling.

My understanding of what actually occurred was a dam outflow instruction of 710 m³/s at 00:40 which was then increased to 780 m³/s at 09:50.

Based on Scenario B Part 2 (as presented on 8 June) the optimised peak outflow would have been a constant 655 m³/s from 00:00 6 April with no subsequent increases. This would have required a lake level of 70.0 mRL prior to filling and a perfect inflow forecast (no factor of safety) to reach the maximum operating level of 76.2 mRL.

My understanding is that allowing for some contingency the likely attenuation flow decision would have been 680 m³/s at 00:40 which would have then been increased to 755 m³/s at 09:50 and that this is the basis for the flow and water level information that has been provided at the breach site.

Can you please confirm the above to be correct.

I also have one further question relating to the forecasting/dam management during the event -

The flood forecasts produced at 6am, 8am and 12pm on 5 April all predicted Matahina inflows of around 800 m³/s indicating a very significant flood (similar to 2004). Can you please comment on why approval to go to 70.0 mRL wasn't given earlier in the day. I have of course taken into account the lack of lake lowering that occurred between midnight and 11am on the 5th as well as between 6pm and 8:30pm.

Thanks and regards

Kyle Christensen

Rivers & Stormwater Engineer

m | 022 620 9047
e | kyle@christensenconsulting.co.nz
w | www.christensenconsulting.co.nz