

Originator and date	Query
Fitzroy Park RA 20/03/13	Can we have more specific detail of exactly how much local data was integrated into the Atkins macro model for calculating the quantum? What local weighting did they integrate into to this new calculation?
Fitzroy Park RA 20/03/13	Prof Hughes said pathways plus a bit extra either side was assumed as hard landscaping. This is very vague. We need more detail.
Fitzroy Park RA 20/03/13	With regard to rainfall, Prof Hughes talked about using weather stats from around the country yet his colleague (sitting to the side) talked about a Met Office determination methodology. Which one is it?
Fitzroy Park RA 20/03/13	Atkins implied their computer software was far superior/sophisticated to Haycock's version? I cannot find in the report a definitive explanation of the key differences between them. Can this be provided?
Fitzroy Park RA 20/03/13	Who wrote 'Floods and Reservoir Safety – 3 <sup>rd</sup> Edition'?
H&HS 25/03/13	Percentage Run-off: Atkins has made two apparently reasonable simplifications. They have assumed that there is an even distribution of the path network across the Heath. However there appears to be less paths (and hence less compaction) on the higher Heath. Also, they have applied an average SPR value of 53% to all catchments, rather than use a specific lower SPR on the upper more permeable soils. Might these simplifications result in the calculated run-off into the upper more sensitive ponds being too high, leading to too much work on these ponds? Should the total run-off be adjusted to discharge less into the upper ponds and more into the lower ponds?
H&HS 25/03/13	Upstream Spills: The original Table 1-4, Pond Storage Capacity, [Table 5-7 is identical], states in column 3 <i>excludes spills from the upstream pond</i> . A revised Table was issued on 21.3.2013 with altered % storage figures in the last column. Column 3 heading now reads <i>including spills from the upstream pond</i> . Should the data in the 3rd column [Total PMF volume...] be altered to show

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	increased inflow?
H&HS 25/03/13	Section 4.6 indicates that inflow hydrographs were calculated for each pond's individual catchment. It is not clear if the following sections and tables include or exclude upstream spills. Please therefore confirm from Section 4.6 onwards, whether or not upstream spills have been included, and if not, please provide amended Tables including upstream spills where appropriate.
H&HS 25/03/13	<p>Flood Estimates Table 1-1, [Table 4-7 is identical]: This table compares Atkins maximum flows for different storms at every pond with Haycock's flows, which have been extracted from his Table 7, p.43. Are these two tables directly comparable? For example, Haycock states that <i>these flows will be attenuated by the lake chain and these values thus represent the boundary conditions of the lake model</i>. Please therefore clarify this aspect, particularly for upstream inflows and whether current attenuation has been allowed in this and other relevant tables.</p> <p>Quantified Risk Assessment: Atkins has confirmed in Appendix A of their Design Review Method Statement and separately that they will carry out a QRA of the current dam situation. When will this be carried out? We urge that it be as soon as the design flood has been agreed.</p>
H&HS 25/03/13	Precipitation / Design Rainfall Depths: Please explain how PMP and 1:10,000 rainfall depths and durations were calculated. Was 1:10,000 rainfall derived from PMP [or vice versa]?
H&HS 25/03/13	Are the PMP and 1:10,000 rainfall depths and durations proposed for design 235mm over 9.5 hours and c.141mm over 1.9 hours respectively? (If so, the PMP/1:10,000 ratio is presumably c. 1.67?). If not, please state.
H&HS 25/03/13	Haycock used 270mm and 135mm respectively, both over 4.4 hours. This presumably gives a much slacker PMP than Haycock, but a much more intense 1:10,000 storm, which may be the main

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	influence on dam design. Please explain why then so much difference from Haycock in depths and durations, and why the Atkins durations of 9.5 hours and 1.9 hours are so different
H&HS 25/0313	<p>Maximum Flood Estimates: Haycock used the approximate rapid assessment PMP/1:10,000 rainfall ratio of 2.0. From this he derived flood estimates at both Highgate No 1 and Hampstead No 1 which both had a PMF/1:10,000 ratio also of 2.0. These are shown in Tables 1-1 / 4-7, i.e. both his input rainfall and his outflow flood ratios on the bottom ponds are the same.</p> <p>In contrast, Atkins' more detailed calculations of rainfall inputs result in flows at both bottom dams with a PMF/1:10,000 ratio of 2.12 and 2.22 respectively, which are greater than Haycock's 2.0. Why are Atkins outflow ratios not both of the order of 1.67?</p>
H&HS 25/03/13	<p>Overtopping, and Dam Stability and Spillway Protection: Table 5-13 gives shows maximum depth of overtopping. Atkins Conclusions and Recommendations, p.45, state that <i>Reservoir routing resulted in generally lower overtopping depths than those predicted by Haycock</i>. Haycock's PMF overtopping depths are shown in his Tables 16 and 33. These show that Atkins statement is correct for all the Hampstead chain and for the Ladies Bathing dam. However, for the other 5 dams on the Highgate chain, Atkins overtopping PMF depths are all higher than Haycock's. How, therefore, is it that Atkins has these higher overtopping depths, bearing in mind that Atkins PMP (if this is 235mm) is only 87% of Haycock's, and is spread over a duration of over twice as long?</p>
Wilder Associates Strategic Landscape Architect 22/03/13	<p>The calculations for Stock Pond seemed to attribute the entire catchment north of Stock Pond to that pond alone and do not take into account any attenuation or holding back that the two Kenwood Ponds offer.</p> <p>Therefore, although we do not expect to carry out works on these ponds we still need Atkins to provide the attenuation capacity and take into account the effect of these ponds when assessing Stock Pond, otherwise the measures required at Stock Pond look disproportionate to the scale of the problem. This is fundamental to Atkins Problem Definition document.</p>

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<p>Brookfield Mansions 27/03/13</p>	<p>Although the primary objective of the work to be undertaken by City of London is to prevent dam failure whilst preserving the character and quality of Hampstead Heath, the secondary objective must be to lessen the quantity of surface water arising from overtopping, spillways and drains onto the Heath and subsequently into surrounding residential areas. While we welcome your assurance that the situation will not be made worse we would wish assurances that all flood waters are managed and controlled into the drainage and storm water systems in such a manner that it minimized any risk to life and property. The results from the investigation as shown in your report should be considered in conjunction with the capacity of the drains and sewers to cope with any water arising. All parties should be able to easily understand and to compare what the effect of future proposals may be with the existing situation, particularly where the residential areas affected by surface water from the Heath are likely to be affected.</p> <p>We understand that Dr. Hughes and CoL will liaise with Camden (as lead authority), TWA, EA and DEFRA and provide them with up to date information. We should like to know how and with whom this information will be shared.</p> <p>Clear information should be made available that will enable residents to assess their exposure to flood risk and insurers to determine the cost of the risk.</p> <p>Camden have said that they may have access to government funding if flooding is likely to occur in an event of 1:75 or less. TWA have a statutory obligation (I believe) to drain surface water arising from a 1:30 event. We should like confirmation in the light of the new calculations that anticipated volumes, speed and location of surface water arising from all events, including 1:30 and 1:75 events, be made available to statutory authorities.</p> <p>We should like consistent and reliable information made available on the size, location and connections of drains and sewers, both for surface, foul (combined sewers) and storm water.</p>

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	The figures given for the Hampstead chain indicate that the capacity of the Hampstead chain to cope with major events is better than that of the Highgate chain. A dry reservoir which will further mitigate downstream flooding is being considered to improve the capacity of the Hampstead chain. We wish to be assured that similar measures be considered for the Highgate chain.
Brookfield Mansions 27/03/13	Table Page 8: Why are the 1:100 peak flows for the Highgate chain the only ones that Atkins have estimated to be greater than Haycock?

Key

Fitzroy Park RA – Fitzroy Park Residents’ Association  
 H&HS – Heath and Hampstead Society