

Our Ref: 121701/2220/SES/JWNM

Your Ref:

11<sup>th</sup> July 2012

Mr M Lee  
Wilts and Berks Canal Trust  
6 The Paddock  
Corston  
Bath  
BA2 9AB

Dear Mr Lee

**Melksham Link – Flood Risk Supplementary information  
Hydraulic Modelling**

Further to your instructions we have undertaken a final hydraulic analysis of the proposed Melksham Link Waterway Design as included in your Engineering Design Report of 14 May 2012.

This analysis updates the assumptions and results as included in our Black & Veatch report “*Wilts & Berks Canal Melksham Rivers Route Supplementary Hydraulic Modelling Report (Melksham Gate Options) November 2010*” (the ‘November 2010 report’).

The changes from the November 2010 report are summarised below:

November 2010 Proposal	Final Proposal (14 May 2012)
Construct new weir at Challymead to retain water levels through the town. Retained water level through the town 31.20m	Construct new weir at Challymead to retain water levels through the town. Retained water level through the town approximately 30.6m (based on a new weir crest level of 30.35m)
Melksham Gate: Retain main weir structure, but remove existing gate and replace with a new lock and adjacent weir.	Melksham Gate: Retain main weir structure and sluice gate. Construct new lock on the south (left bank) with a potential hydropower facility

The new weir proposed at Challymead was shown in the 2010 report at a proposed crest level that had no impact on flood levels when compared with the existing situation. In the final proposals the weir crest has been further lowered to 30.35m, and so no impact on flood levels is expected.

The new proposals at Melksham gate retain the existing situation (retaining the existing weir and sluice gate) whilst building a new lock parallel to Melksham gate to provide for the navigation. When compared with the existing situation the new proposals would have no hydraulic impact.

The final arrangement has been included in a new hydraulic model run to confirm the assessment above. As expected there is no measurable impact on flood levels on the River Avon for all flows above about 25 m<sup>3</sup>/s when compared with the existing situation. A flow of 25 m<sup>3</sup>/s is less than one third of the median annual flood.

The flood levels at Melksham Gate are summarised below for a number of flows (for direct comparison with Table 1 in the November 2010 report).

Flood Event (Return Period)	Existing Water Levels mAOD		New Final Proposal Water Levels Upstream of Structure mAOD	Difference in Water Level Upstream of the Gate Between Final Proposal and Existing (mm)
	Downstream of Gate	Upstream of Gate		
1 in 2 year	33.46	33.60	33.60	0
1 in 5 year	33.76	33.94	33.94	0
1 in 10 year	33.94	34.14	34.14	0
1 in 25 year	34.18	34.41	34.41	0
1 in 50 year	34.36	34.63	34.63	0
1 in 100 year	34.57	34.86	34.86	0

The analysis has not assessed the small hydraulic impact of the proposed dredging which will tend to increase the hydraulic capacity of the River Avon through Melksham and correspondingly reduce flood risk slightly. The benefits are however expected to be modest. Equally there may be some additional flow capacity associated with the paddles on the lock and potentially the proposed hydropower facility. However the flood risk impact will be negligible.

It will be necessary to ensure that the capacity of the River Avon through Melksham is retained and siltation upstream of the new weir at Challymead and any siltation in the vicinity of the new lock addressed. However this will be necessary for the navigation as well, so this will help ensure the hydraulic capacity is retained.

Should you have any questions on the above or wish to discuss any of the items further, please do not hesitate to contact us.

Yours sincerely



Jack Mason  
Principal Engineer  
Black & Veatch Ltd