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Our ref: WX/2012/122351/11-L01
Your ref: W/12/01080/FUL
Date: 29 March 2019

Dear Mr Wilmott

EIA SUPPLEMENTARY REPORT 2019 - MELKSHAM CANAL LINK

Thank you for re-consulting the Environment Agency on the above planning application.

Hydromorphology & Geomorphology

We have reviewed the report entitled: 'Supplementary Report January 2019'.

Impact on flow and water level

Table 8 presents the results of analysis that indicates that lock operation under Q95 flow conditions will result in measurable changes to water level of approximately 8cm over 1km downstream of Challymead Bridge. In Section 2.5.4 the report states that such changes in water level with a rate of rise of 35mm/hour is "*very small compared to natural variation*". We disagree with this statement on two grounds:

- (a) Under Q95 conditions low flows are not naturally characterised by frequent sub-daily fluctuations in water level of this magnitude and
- (b) the significance of a change in water level lies not in its absolute magnitude but in its relative importance, especially when considering the potential impact on shallow fry habitat and gravels that may become disconnected or dry under such fluctuating water levels. In this context it should be noted that in Step 2 of the WFD assessment it states "*Downstream of Challymead Bridge is the most important section for spawning and fry habitat as it holds the largest area of clean potential spawning gravels and fry refuge areas.*"

The report states in Section 2.5.4 (and repeatedly within the WFD assessment) that the actual downstream impact on water levels downstream of Challymead Bridge will be significantly moderated by the hydraulic properties of the new weir and storage area between the two locks. A more detailed explanation is required of what is meant by this statement and it should be supported by evidence from modelling and/or the appropriate technical literature.

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Within 'Step 3' of the WFD statement the following statement is made with regard to the potential impact of the scheme on the hydrology (quantity and dynamics of flow) that is not supported by the clear evidence in Table 8 of measurable changes in water level over 1km downstream under low flow conditions. : "*Hydraulic modelling shows that the hydrological regime downstream of the new weir will not change from existing conditions, except for immediately downstream of the new structure, where there is likely to become localised change in flow dynamics caused by water flowing over the weir.*"

Dredging of River Avon

The construction risks associated with the Capital dredge are not adequately addressed and we disagree that 'no mitigation' is required to manage the potential risks to the environment associated with silt releases. Factors such as timing of the works and water quality monitoring triggers that protect the aquatic environment must be addressed.

The WFD assessment does not address the long-term risks and potential impacts of the acknowledged required maintenance dredging - specifically where would the arisings from such dredging be disposed of and what are the proposed methods of maintenance dredging?

New weir

Mitigation is being suggested for the construction of a new weir on the Avon through possible future weir removals on a tributary (Bydemill Brook). This is not an acceptable form of mitigation for the following reasons (a) the proposal to remove the weirs is speculative and lies outside the control of this project and (b) the Bydemill Brook is a separate water body and it is a fundamental principal of WFD that mitigation for impacts within a water body should be carried out within that water body.

Training Bank

The report does not provide the requested clarification that the dredging arisings from the Avon will be suitable for the construction of a training bank.

The training bank will create a backwater habitat that may provide environmental benefit, however it should also be expected to silt up and become vegetated by reeds (without maintenance) relatively quickly. This will result in a loss of channel capacity through the dredged reach relative to the baseline and therefore the flood risk assessment should reflect the potential loss of channel capacity.

If it is proposed to manage the backwater area behind the training bank to prevent siltation then this activity also needs to be assessed for its environmental impact.

Accordingly there remain significant areas of uncertainty over the long-term environmental impact of the scheme - relating to both its construction and operation / maintenance and therefore our objection remains until these points are satisfactorily addressed.

Hydrology

The report provides an assessment of the impact of the lock operation on the level and flow in the downstream reach, however it is difficult to interpret the results and conclusions as they are presented due to insufficient information on the modelling. We seek to understand how the lock operation from both locks would affect the level in this pound and therefore impact on flows over the weir and into the downstream reach.

For Melksham gate lock we are unclear how a level at approximately 12:10, that looks to be equivalent to the starting level, results in a lower flow. Why are flows and levels throughout the simulation higher than the start and end conditions?

We are unclear what the scenario includes for the River Avon bottom lock. The report states “*For the purposes of the modelling it is assumed that there is no back pumping from the river Avon at the River Avon Bottom lock. Back pumping would tend to reduce the impact of lock operation on water levels in the river Avon and conservatively this has been ignored. Back pumping simply recirculates the water and is not consumptive*”. Our understanding from previous reports is that the back pumping is the water taken from the river pound to refill the lock. So whilst it is non-consumptive on a daily basis there is an impact while the lock is being filled which will have an impact on the level in the ‘pound’ and hence flow over the weir. This is not what we would consider to be a conservative scenario. Clarification on this is needed.

On figure 4b, showing the levels and flows at locations downstream of the new weir - why are levels and flows increasing through the model scenario? There should be no net gain of water. Again the conversion between level and flow is inconsistent with identical levels having different flows.

Putting aside the questions around the modelling and looking at the model results, table 8 demonstrates a 4-8 cm change in level. This seems to be a significant change which, depending on the nature of the cross section, could particularly have a significant impact on wetted width. The conclusion that ‘*the change in water levels is negligible because of the large storage capacity of the river*’ is unsupported for the reach downstream of the new weir. We appreciate that the storage capacity of the ‘pound’ upstream of the new weir will dampen out the impacts of the pulses but these pulses are clearly demonstrated in the hydrographs presented.

Until we receive satisfactory clarification on the above points we are unable to remove our objection relating to hydrology concerns. As we have said previously comments on this planning application will not affect our determination of an abstraction licence. Clear information will need to be presented when applying for an abstraction licence as to the impact of the proposed operation. At this point the submitted information would not fulfill this requirement.

Biodiversity

We would reiterate that protected species surveys will need to be repeated ahead of any groundwork due to the time lapse since the last ones were undertaken.

Fish Passage

With regard to fish passage and the impact of flow pulsing and water level change, our concerns remain. There is still insufficient information provided regarding a fish pass design to provide a meaningful response on this.

Flood Risk

The following is an extract from our previous letter dated 08 June 2018 (WX/2012/122351/10) with further comments added in red text to enable best understanding.

Under the Flood Risk section of our letter dated 12 May 2017 (appendix 1.2 ES addendum), we provided bold text comments for the benefit of the LPA and the applicant/agent as to what additional information was expected to satisfy our flood risk concerns. These concerns have not been fully addressed in the revised ES and amended drawings. We offer the following observations:

1. **Weir Crest Level** - Referring to point i) in our letter of 12 May 2017 – drawing WBCT/10/017 rev 7, WBCT-10-32 (appendix 4) and WBCT-10-033 (appendix 4) all show the concrete weir crest level to be 30.35m AOD and the crest level of the drop-in boards to be 30.60m AOD which will retain upstream water levels at that figure. A level of 30.60m AOD is also stated in table 2 (p.3-6). We recall that the modelling we have reviewed used a level of 30.35m AOD. If the weir crest level is to be 30.60m AOD, modelling will need to be re-run and re-reviewed by the Environment Agency using this crest level.

This concern now appears to have been addressed in section 2.2 of the Jan 2019 Supplementary Report, which shows (Table 1) no significant increase in flood levels in the River Avon with the new weir crest set at 30.60m AOD in the model. We would accept this point has now been addressed, and we would suggest that the design of the new weir and its crest level can be covered by appropriately worded planning condition(s).

In any case, approval of detailed design for the new weir will also require a Flood Risk Activity Permit(s) from us prior to any construction taking place, or associated temporary works, pursuant to any planning permission being granted.

2. **Culvert Blockage** - Regarding point iii) of our letter of 12 May 2017, the recent submissions still do not provide illustration of what land will be flooded in the event of blockage of the Berryfield Brook culvert (where the canal is proposed to cross over Berryfield Brook). There are properties/land in between Semington Road and Berryfield Brook which could be at an increased risk of flooding from culvert blockage. We need to see a graphic illustration (i.e. a map with illustrations) of what area is likely to be flooded for the different blockage scenarios which have been discussed in Appendix 3.2, page 7.

Whilst this matter has now been assessed in the FRA, the resultant findings are not yet acceptable to the Environment Agency. It is clear that the potential blockage of the aqueduct culvert could impact on a number of existing properties along Semington Road. This is shown in section 2.6, Figure 6. The comparison made in Figure 7 is not particularly relevant, as this is the Risk of Flooding from Surface Water map, not the Risk of Flooding from Rivers and Sea, which currently shows the same area as 'dry' under existing conditions without the aqueduct crossing. Although section 2.6 attempts to provide flood risk mitigation by suggesting that the canal edge will be lowered over the crossing to 36.85m AOD, the impact to upstream properties is still significantly increased, and the risk of culvert blockage under-estimated. The culvert proposed is only a 0.75m deep opening, and is set below the existing bed level of Semington Brook, immediately encouraging siltation in the structure, if constructed as shown. Experience with other canals elsewhere in Wessex suggests that regular inspection and clearance work is not high priority work for the canal operator, and we feel that the design needs to be reviewed and/or mitigation put forward to protect the affected properties from increased fluvial flood risk posed by this structure.

3. Training Bank

The new design element of the training bank will need to be included within a revised FRA to ensure no impact on flood levels and for this to be a realistic test this assessment should allow for significant vegetation (including trees) to become established on the right bank. In addition, it should be noted that Section 4.4 describes some aspirational future environmental enhancements to the training bank and Town Bridge reach, all of which would further impact the flood conveyance properties of the reach.

This concern now appears to have been addressed in section 2.2 of the Jan 2019 Supplementary Report, which shows (Table 2) no significant increase in flood levels in the River Avon with the training bank and vegetation now modelled. We would accept that this point has now been addressed in terms of flood risk, and we would suggest that the detail of the training bank, and future maintenance of any vegetative growth on it, are covered by appropriately worded planning condition(s). (This is notwithstanding the comments above in the section Hydromorphology & Geomorphology).

In any case, approval of detailed design for the new training bank and lock structures will also require Flood Risk Activity Permit(s) from us prior to any construction taking place, or associated temporary works, pursuant to planning permission being granted.

NOTE: The Environment Agency would not accept any liability for vegetation maintenance in the navigation channel and/or training bank and backwater channel, as we would expect this to fall to the navigation authority set up to look after the canal operations. These arrangements may be subject to future legal agreement between us and the navigation body/Trust.

Yours sincerely

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cc Paul Lenaerts - Wilts and Berks Canal Trust,
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