
Technical stakeholder meeting – water resources

Venue: Crowne Plaza, Caversham Bridge, Richfield Avenue, Reading, RG1 8BD

Date: Tuesday 28th May 2019

Time: 10:00 – 15:00

The purpose of the meeting is to discuss the programme of works for physical testing to determine the net yield of the Severn Thames Transfer scheme

1. Welcome and introductions (Chris Lambert, Thames Water) Action

- 1.1. CL provided an introduction to the day; highlighted progress since the last Water Resources Forum and the programme for feedback on Thames Water's updated revised draft WRMP19 and Business Plan.
- 1.2. Thames Water has been awarded funding of £150m by Ofwat through the PR19 process to undertake studies on strategic supply options of which the Severn-Thames transfer (STT) is one. These studies will be undertaken in collaboration with partner organisations. The programme of further studies is held within Appendix XX of the updated revised draft WRMP19. Stakeholder engagement will continue regarding these schemes and the wider WRMP.
- 1.3. The focus of the meeting is to discuss the methodology for physical testing to enable calculation of net yield for the supported Severn Thames Transfer (sSTT), as part of the further work into this scheme.

2. Overview of the scheme (Chris Lambert, Thames Water)

- 2.1. CL presented an overview of the STT scheme and a summary of the water companies that are involved in undertaking further work either solo or in collaboration. For example, United Utilities would require new water sources in order to enable the sSTT scheme. Options to support Affinity Water and Southern Water are being investigated and Severn Trent Water is considering additional water to support the scheme further via the use of currently under-used licences and effluent reuse. Welsh Water is also considering options for transfer from the River Wye.
- 2.2. Water would be released for use during periods of drought in the South East.

2.3. There are a number of environmental aspects of the proposed scheme that will also be of particular interest and the Environment Agency is developing a scope of work to investigate these issues – as presented by David Preston.

3. New agenda item: Summary of the Environment Agency's scope of work in relation to environmental aspects of the proposed scheme (David Preston, Environment Agency)

3.1. DP described that the Environment Agency is keen to improve consistency of data and evidence used for this scheme and related water resources management in the West; aiming for commonality and a joined-up approach.

3.2. The Environment Agency would like to produce a baseline upon which all water companies can base their analysis. Developing a low flows model may be included in this work.

3.3. A draft framework to deliver greater ecological understanding has been produced. The aim is to enable better impact assessment and to identify opportunities for improving ecology where practicable. More dynamic regulation is also desirable.

3.4. There is a 4-year plan for ecological monitoring to support Habitats Regulations Assessment.

3.5. The group discussed a number of points:

3.5.1. MS asked whether the ecological impacts on the whole catchment of releases from Vyrnwy Reservoir would be reviewed; citing negative impacts of cold water on invertebrates during releases. MS also asked whether there was any investigation on Invasive Non-Native Species (INNS) being undertaken.

DP stated that there was a need to pool the existing knowledge of the catchment first and that additional ecological work would be carried out. Stakeholder sessions will be built into the programme of work moving forward.

3.5.2. JL asked whether the scope of work would include reviewing the HoF at Deerhurst.

DP explained that the ecology was one aspect of the programme. Understanding the ecology of the river, at local scales, is required first. Then the HoF may be reviewed.

3.5.3. JL queried the timetable for the work. DP said that decisions cannot be made without underpinning data/evidence.

3.5.4. A draft programme for the work is available. It has been shared with Water Resources West (WRW). The regional group is a good avenue to use in order to provide constructive feedback and to challenge and influence the programme moving forward (DP).

3.6. CL summarised the objectives of the meeting and confirmed (in response to questions from RH) that the sSTT scheme or another strategic supply option would be required from the 2030s onwards.

4. Approach to physical testing and associated challenges (Andy Ball, HR Wallingford)

- 4.1. AB reiterated the objectives of the day and introduced the current Severn Supply System for context.
- 4.2. The scale of the current system, relative to the proposed scheme, is a critical issue. The river system is large. The number of abstractors is similarly large and whilst data is available for the largest abstractors, the availability of data on the multiple smaller abstractors is poorer. The presence of protected areas, water quality issues and having two regulators creates further challenges for the assessment of the potential net yield of the scheme.

Further to this, the release from Vyrnwy Reservoir will be small, compared to previous releases in 1975. The relationship between discharge from Vyrnwy and abstraction downstream is dynamic - the amount released and the status of the river at the time will impact on the volume of water available for abstraction.

- 4.3. A definition was provided for Net Yield and stakeholders were asked to comment: HR Wallingford to edit definition of net yield
- “The additional (net) amount of water (yield) which can be abstracted as a result of the releases. Net yield of the scheme depends on factors including:*
- *Reservoir release volume*
 - *Abstraction licence arrangements*
 - *Operation of the abstraction*
 - *Environmental/Water Quality*
 - *Other abstractions*
 - *Physical processes*
 - *Measurement/Assessment”*

It was suggested by CF that the factors described should be included in the definition using an asterisk.

PJ suggested that immediate weather activity should be included in the list of factors. The potential for adverse impacts, including flooding, was discussed at this point.

- 4.4. Each of the factors that may influence the net yield of the scheme were presented in turn. Comments were made on some of these:

- 4.4.1. Abstraction licence arrangements: It was noted that any change in HoF would impact this system. HT pointed out that HoF increases will be for new abstractions not necessarily for existing abstraction licences. JL asked whether the HoF was seasonal or longer term. HR Wallingford were not able to answer this during the meeting.

#Post meeting note: Information from the Environment Agency’s Severn Corridor Abstraction Licensing Strategy, February 2013 states that *“In the Severn Corridor CAMS we will manage this [support of Habitat’s Directive in the Severn Estuary] by ensuring that all new or upwardly varied surface water licences granted on the River Severn and its tributaries will have a local condition that is equal to or more restrictive than the HOF proposed for*

Deerhurst on the River Severn. This is a HOF of 1,800 Ml/d at Deerhurst Gauging station, and it is the flow that is equalled or exceeded for 90% of the time."

4.5. Other abstractions and physical processes:

AB described the variety of different abstractions that occur along the river. JL questioned whether the other abstractions were relevant.

AB agreed that if all other abstractions did not vary then it would not be relevant however, if they do vary in volume and over time, then it becomes relevant in order to calculate the net yield.

4.6. The focus of the rest of the day is on the other abstractions and physical processes. AB asked whether any other factors need to be included.

CF noted that all of the factors described were dynamic and as such make measurement challenging.

4.7. AB briefly described the previous testing that had been carried out in the 1970s by Severn Trent Water. Releases from Clywedog Reservoir were made in summer 1975. They released 1100Ml/d over a few days and had issues measuring the release. They had 17 monitoring stations downstream and had done quite a lot of work on groundwater. They estimated that at least 80% of the water they released made it downstream. It is important to learn from this experience, including significant uncertainties related to flow estimates.

4.8. AB explained that the programme of work for the physical testing and the associated analytical work is constrained by the wider timetable for WRMPs and regional plans and the gated investment approach proposed by Ofwat.

August 2021 is a key date for the provision of information from this project to inform the regional WRSE WRMP draft plan.

4.9. PJ noted that in the slide 19, on previous physical testing, the second part of the test had to be cancelled due to *"unfavourable weather conditions"* and theorised that this might have been due to the 1976 drought.

JL proposed that there might have been another reason for this but it was generally agreed that it would be worth finding out, if possible, why the test was cancelled.

HR Wallingford to try and find out why the second test was cancelled.

#Post meeting note: Tests were due in 1974 and 1975. It was the 1974 test that was cancelled due to unfavourable weather conditions. No further information is available.

4.10. The complexity of the system was discussed in relation to the need to provide water companies with enough information about the net yield of this scheme to enable decision-making. For example, other releases, in the Avon for example will interact with the releases made in this scheme/during physical testing. Such conjunctive use schemes are sensitive to even small changes and may need to be managed differently (CF).

4.11. AB presented the phased approach to the physical testing and each phase was discussed.

4.12. PJ asked whether the water availability at Vyrnwy and in the river historically can inform how often the scheme could be used. PS asked whether the R. Severn flow will be greater if UU is creating additional resources.

CL confirmed that Thames Water's expectation is that the scheme would be operated approximately once every two years on average.

- 4.13. KB suggested that releasing water from Vyrnwy in a pre-defined pattern and then using autocorrelation techniques to analyse the changes in flow downstream may enable the releases to be identified despite the impact of other factors that influence the flow. KB felt that because relative change in flow according to a pattern, rather than absolute values are required that this approach may be more effective than trying to identify a single small release and the accuracy of gauging equipment would be less significant.
- HR Wallingford will consider both an options-led approach and autocorrelation.

CF suggested that an options-led approach could be considered, rather than the evidence-led approach that had been put forward.

AB stated that KB's suggestion was similar to that taken in the 1970s but identifying the releases was still difficult and gauging station inaccuracies was an issue at that time. AB confirmed to PJ that known other inputs to the river will be considered.

HR Wallingford will consider both an options-led approach and autocorrelation.

- 4.14. MG asked about the data that has been collected in the past.

AB confirmed that there is a flood model but no low flows model. HR Wallingford has undertaken some water resources modelling in the past. The aim is to characterise the existing system rather than explicitly model it. The EA may develop a model as part of their work.

- 4.15. DW asked whether the yield of the reservoir under low flow conditions was known?

AB agreed that this was important but it is not currently within HR Wallingford's scope of work.

- 4.16. CF asked about the nature of the contractual arrangement and who would be responsible for deciding when a release should be made?

CL agreed that this was a critical point. It is currently uncertain.

- 4.17. JL and CF strongly support making test releases this year as it will help to support the experimental design moving forward.

AB agreed that test releases this year would be desirable but that permission to do this needs to be granted by the Environment Agency and Natural Resources Wales first. It is not clear if given the current regulation such releases can be made.

EA and NRW to confirm the process by which test releases can be made.

- 4.18. PJ asked whether other factors such as turbidity would be measured, not just flow.

AB confirmed that the plan is to measure other factors at the same time, although this may not be used by the HR Wallingford team directly but, may be useful for others.

- 4.19. Any other comments to be returned to Lesley Tait at Thames Water by the 7th June please.

Action for all

#Post meeting note: Comments were received from NE (verbal), PJ, KB and JL, and will be responded to by the 21st June. These comments will be published as an appendix of these minutes. This response will subsequently be published on Thames Water's website.

5. Activity during Summer 2019 (Mason Durant, HR Wallingford)

- 5.1. MD described the data management and problem refinement to be done over the summer 2019.
- 5.2. SC and HT queried the temporal extent of the gauged data presented as it should start at the beginning of the 20th century. It was also noted that there are discrepancies between the Environment Agency and NRFA data sets.

#Post meeting note: the data presented is sub-daily (15-minute timestep) and hence only goes back to the late 20th and early 21st century. A longer daily data record is available at several sites.

- 5.3. PJ asked whether there is any work on invertebrate monitoring and testing being undertaken.

MD said that it was anticipated that the Environment Agency would undertake this work. The scope of the HR Wallingford work does not extend to ecological impacts.

- 5.4. PS asked about data governance and associated sign-off processes.

MD confirmed that it is the intention of the project to agree a data management process with the Severn Working group and Water Resources West to ensure that the data used is QA'd appropriately and consistent between different sets of analyses.

- 5.5. CF noted that a much more intensive monitoring programme will be required (than simply measurements at the top and bottom of the river) in order to understand the losses.

MD stated that this was being addressed through the gap analysis for monitoring sites.

- 5.6. KB reiterated the need to consider autocorrelation as a method as it is likely to be very challenging to work out a precise volume. CF stated that he felt it would be difficult to use autocorrelation given the amount of regulation.

MD is sceptical that autocorrelation will enable the releases to be identified easily however, this method will be reviewed and considered.

HR Wallingford to review/consider use of autocorrelation methods

- 5.7. JL queried whether it is achievable for Affinity Water to be supplied using a pulse of water and suggested that Thames Water should store the water for use by Affinity (and Southern).

CL acknowledged this approach but highlighted that it assumes that Thames Water has spare existing reservoir capacity to store the water. Also, in its representation on Affinity Water's revised draft WRMP19 Ofwat has challenged Affinity's statement that it could not use the Severn Thames transfer without additional raw water storage and as such it is important that this project examines the validity of Ofwat's challenge.

AB added that a concern has been raised by the NRW fisheries expert at the EA/NRW/Thames that a continuous release of water may result in an unacceptable level of environmental damage.

- 5.8. PS queried the licence arrangement. In response, CL clarified that the Environment Agency deem a put-and-take licensing option to be unsuitable based on the existing

available evidence and requested that Thames Water need to assume high losses as a precautionary measure in order to protect the environment. CL asked DP to describe potential changes to HoF at Deerhurst.

- 5.9. DP stated that there is an intention to raise the HoF at Deerhurst from 1,800MI/d to 2,600MI/d. The decision to publicise this has been delayed by activities dealing with the continued dry weather. The current HoF at Deerhurst is not considered to be sufficiently precautionary for protection of the Severn Estuary SAC.

- 5.10. JL commented that such a change could have a significant impact on this scheme and asked for the data and analysis behind the decision to be published in advance so that stakeholders may comment before the final decision is taken.

DP explained that HoFs are reviewed regularly (every ~5 years) and that it is likely that the changes were suggested predominantly using expert judgement. Such changes are normally released via licence changes.

JL reiterated the need for the transparency in decision making and asked that the evidence behind the suggested change be provided.

DP agreed that transparency was important and agreed to look into the evidence behind the suggested change to the HoF but said that such a change needed to be included as a risk to the scheme.

- 5.11. JL suggested that a similar level of work should be done for ecology in the Severn as has been previously undertaken in the Thames.

CL agreed and stated that the Environment Agency's proposed programme of work to review ecology in the Severn should address this.

JL requested that there was transparency in the work that would be carried out. He noted positively that the Severn losses work had become very transparent but that the change to the Deerhurst HoF may have more of an impact and is not as transparent.

DP confirmed that the ecology work would be transparent and that the Severn modelling group and Water Resources West were good forums to engage.

- 5.12. MD returned to the presentation. In an average year, there is water left in Vyrnwy Reservoir which means that there might be scope to do test releases later in the year.

JL asked whether it might be possible to use Clywedog Reservoir for test releases instead/as well.

MD agreed and that this is in discussion with the Environment Agency / Natural Resources Wales.

- 5.13. MS commented that there had been no mention of achieving WFD objectives and that this should be made explicitly.

DP to review evidence behind change to HoF at Deerhurst and share with this stakeholder group.

HR Wallingford to agree this aspect of the work with Thames Water

6. Activity during Autumn/ Winter 2019 (Andy Ball, HR Wallingford)

- 6.1. AB described the approach during autumn and winter 2019. There were no questions from the stakeholders.

7. Summary of key points

- 7.1. AB summarised the key points and actions that had been raised during the meeting and asked stakeholders for any other views.
- 7.2. PJ suggested that a review of similar schemes in the UK or abroad might be useful. HR Wallingford to review similar schemes
- Examples suggested include:
- Welsh Dee
 - River Test
 - River Itchen augmentation scheme
 - Essex and Suffolk Water
 - Fisheries issues downstream of Kielder.
 - Murray Darling basin – Australia
- 7.3. CL confirmed that the slides from the meeting and the minutes will be made available to all. CL asked that any other comments be passed to Lesley Tait by the 7th June.

8. Summing up and general discussion (Chris Lambert, Thames Water)

- 8.1. CL thanked everyone for coming and for the discussions and contributions that had been made throughout the day.

Regional groups will now be responsible for creating regional WRMPs. It is anticipated that there will be other forums to engage with planning through the relevant regional groups.

The next key date is Ofwat's draft determination of the company's Business Plan, 18 July 2019.

Thames Water intend to continue to run the quarterly Water Resources Forum and associated technical stakeholder meetings to continue to brief interested stakeholders on work relevant to the future water resources strategy.

- 8.2. MG gave a summary of the WRSE work programme. Simulation modelling work, including multi-sector work and sustainability reductions work will continue into next summer. Investment stages of the analysis will begin later on in 2020 and into 2021.
- 8.3. JL said that the plans presented today on the Severn losses work sounds really good and asked whether anything similar would be done for the Thames?
- CL confirmed that losses in the Thames would be revisited and this would be shared as part of the ongoing stakeholder engagement process on the WRMP19 strategic water supply options for the South East region.
- 8.4. RH asked whether there is a WR model for the Severn and whether this will be linked with the model for the Thames.
- DP said that there is a desire to develop a model of the Severn but that this is not a top priority at this time.

CL said that there is very little in the way of modelling of the Severn downstream of Bewdley.

CL stated that WRSE is looking at ways of developing “umbrella” simulation models for the South East region which will bring different models together for different company areas without losing too much detail.

Attendees

Colin Fenn (CF – Hydrologic)
Dan Wykeham (DW - Southern Water)
David Preston (DP - Environment Agency)
David Groom (DG - Stroud Valleys Canal Company)
Helen Tidridge (HT - Natural Resources Wales)
John Lawson (JL - Group Against Reservoir Development, GARD)
Kane Horton (KH - Canal and River Trust)
Kay Lacey (KL - CCG/River Pang Flood Forum)
Ken Burgin (KB - Cotswold Canal Trust, CCT)
Martin Salter (MS - Angling Trust)
Meyrick Gough (MG – WRSE)
Neil Edwards (NE - RWE Npower)
Nick Honeyball (NH - Affinity Water)
Pat Spain (PS - Hafren Dyfrdwy)
Paul Jennings (PJ - River Chess Association)
Richard Harding (RH - Council for Protection of Rural England, CPRE)
Sarah Clark (SC - Severn Trent Water)
Wendy Kilmurray (WK - Mott McDonald)

Thames Water

Chris Lambert (CL)
Peter Blair (PB)

HR Wallingford

Andy Ball (AB)
Eleanor Hall (EH)
Mason Durant (MD)

Minutes also circulated to Patric Bulmer (Bristol Water) and Derek Stork (GARD)