

Appendix F

Environmental Assessments

1. Assessments of environmental impact arising from implementing drought permits and orders

In 2017/18 we commissioned full environmental assessment reports for the two sites we have identified for potential drought permit/order applications. The first focused on the river Blithe and River Trent, and relates to the river Blithe pumpback option. The second looks at the river Severn at Hampton Loade. We deem these reports to still be valid and can be provided upon request.

In addition, we have existing environmental monitoring plans in place which relate to our supply side options. These focus on the following locations:

- Blakedown (appendix F.1)
- Rising Brook (appendix F.2)
- River Mease (appendix F.3)
- River Stour (appendix F.4)
- Bourne Bilson Brook (appendix F.5)
- Bourne Pool Fotherley Brook (appendix F.6)
- Checkhill Bogs (appendix F.7)
- Kinver (appendix F.8)
- Leamonsley Brook (appendix F.9)
- Little Hay Brook (appendix F.10)
- Puxton Stourvale (appendix F.11)

These were also produced in 2018, and as there have been no fundamental changes, we deem these reports to also still be valid. They are provided as sub-appendices as detailed above.

1.1 Methodology

Our impact assessment method follows Defra¹ and Environment Agency² guidance.

In keeping with this guidance, we have identified and predicted the magnitude and significance of potential impacts of implementing a River Severn Works drought order compared with the effect of a natural drought (with normal rates of abstraction) on the existing environment. As a drought is possible at any time of the year, we considered the impacts for each season and the cumulative and in-combination effects, and clearly

¹ Defra (2015a) Drought plans: environmental assessment and monitoring. Guidance. Part of: How to write and publish a drought plan. www.gov.uk/guidance/drought-plans-environmental-assessment-and-monitoring [accessed 19 May 2016].

² Environment Agency (2016) Drought plan guideline extra information. Supplement to Environmental Assessment for Water Company Drought Plans. Environment Agency, May 2016.

differentiated between pre-mitigation and post-mitigation impacts. Where there are potential impacts on designated sites, we clearly identified these.

Our method considers impacts on receptors – that is, an organism, habitat or water use activity that may be affected by changes in water availability caused by implementing a drought order. Table 1 below summarises outcomes, which can be positive as well as negative. For water use activities, assessing the impact is more qualitative, being based on expert judgement.

Table 1 Impact significance as derived from magnitude of effect and receptor value

Magnitude of effect	Receptor value				
	International	National	Regional / County	District / Parish	Negligible
High Negative	Critical	Major	Major	Moderate	Negligible
Medium Negative	Major	Moderate	Moderate	Minor	Negligible
Low Negative	Moderate	Minor	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Low Positive	Negligible	Negligible	Negligible	Negligible	Negligible
Medium Positive	Critical	Major	Moderate	Minor	Negligible
High positive	Substantial	Major	Major	Moderate	Negligible

1.1.1 River Severn at the River Severn Works

To estimate impacts, our assessment adopted a source-pathway-receptor methodology, which aligns to the pressures, states and impacts used in the DPSIR (Drivers, Pressures, State, Impact and Response) framework adopted by the European Environment Agency (EEA) to support the implementation of the WFD. The risk pathways are as follows.

1.1.1.1 Sources (pressures)

The primary pressure is the River Severn Works drought order. A drought order would either allow up to 192MI/d to be abstracted when a 5% reduction would otherwise be imposed, or to increase abstraction to the maximum operational capacity of the River Severn Works.

Continued or increased abstraction during a time of drought may be considered the main pressure. However, reduced flow attributable to the River Severn Works abstraction may act with other existing stressors (which themselves may be further exacerbated by flow reduction) such as point and diffuse sources of organic pollution and nutrients from wastewater treatment works and agriculture, as well as morphological impacts (for example, channel modification) and smaller scale abstractions from other water users.

1.1.1.2 Pathways (states)

These are physical and chemical mechanisms by which the sources (pressures) affect the ecology of the River Severn and the Severn Estuary SAC downstream of the abstraction, including reduced flows and associated hydraulic and geomorphological changes, and effects on water quality.

1.1.1.3 Receptors (impacts)

These are the potential effects of the pressures through the pathways identified on the aquatic habitat, water quality, aquatic ecology, other river users and heritage features in the river reaches identified above.

For each receptor, we have assessed the potential for effects from the proposed drought order operations. Where we identified a significant moderate (or higher) impact, we consider appropriate mitigation measures.

For most receptors, we have predicted only negligible or minor negative impacts. The continual improvement in water quality in the River Severn over the last two decades has reduced the sensitivity of certain receptors to low flow events and in general, monitoring data show that river ecology recovers fairly rapidly after droughts. Whilst we also predict in-combination impacts with downstream abstractions to be negligible, we cannot entirely rule out some in-combination effects on the Severn Estuary, particularly associated with the Gloucester and Sharpness Canal abstraction.

As mentioned in chapter 3, we consider this drought permit to potentially have moderate environmental impacts.

1.1.2 River Blithe and River Trent pump back

We have calculated impacts for two scenarios according to the current conditions of the River Trent pump back (A – 9MI/d; B – 17MI/d) as compared with the lowest daily flow of 15.5MI/d recorded during the 1976 drought. Below, we summarise the impacts on water quality and ecological receptors. It should be noted that we consider all impacts to be negative, unless otherwise stated.

1.1.2.1 Impacts on physicochemistry

The physical environment and water quality are not classed as receptors, but instead as processes that will affect receptors.

We anticipate little impact on hydraulics in the reach of the River Trent affected by the drought permit abstraction, with the possible exception of reductions in velocity. Hydraulic changes in the lowest reach of the River Blithe between the intake and the confluence with the River Trent, are greatest when pump back flows are reduced to 9MI/d (scenario A), but do not exceed 20% of the lowest daily flow and would be over a very short reach.

We expect little increase in sedimentation, and the daily period when the River Blithe abstraction is stopped to facilitate fish movement will have a small flushing effect, so sediment will be subjected to frequent disturbance and redistribution.

We consider water quality impacts to be negligible for the River Trent, and for the River Blithe most water quality elements are negligible.

1.1.2.2 Impacts on fish

Our habitat analysis indicated that the drought permit would cause impacts to spawning and adult habitat for several fish species. However, the River Blithe downstream of the site is a relatively homogenous reach and suitable spawning habitat is absent in this section. Therefore, we consider adverse impacts to fish habitat associated with the drought permit to be negligible.

The drought permit has the potential to reduce fish passage at the pump back weir due to a reduction in the frequency and magnitude of flows through the fish pass.

We predict the impacts in the River Trent to be negligible.

1.1.2.3 Impacts on other ecological receptors

We predict impacts on macroinvertebrates in the River Blithe to be of minor significance for habitat loss and water quality, and negligible significance for flow modification and sedimentation. This acknowledges some unknowns in the indirect impact of increased phosphate loading, but also that impacts will be very localised and recovery will be relatively rapid. We predict no significant impacts in the River Trent.

Based on the knowledge of otters' feeding behaviour and the predicted magnitude of habitat changes under reduced flow, we consider that implementation of the drought permit is likely to have negligible or low impact on otters.

1.1.2.4 Impacts on invasive non-native species

A pump back water transfer scheme could potentially transport zebra mussel from the River Trent to the lowest reach of the River Blithe, which would have a minor negative impact on the river as its effect would be localised. The mussel is prevented from actively moving further upstream due to the presence of the fish pass. There may also be a minor negative impact of Himalayan balsam and the New Zealand mud snail. We consider other impacts negligible. It is, however, important to emphasise the degree of uncertainty in these predictions. There is also an absence of available information on several high impact species that may be present, and therefore as a precautionary approach we class their impacts as unknown and consider them in our monitoring proposals and as part of our WINEP investigations into INNS.

1.1.2.5 Impacts on socio-economic receptors

We consider impacts on recreational boating to be negligible. Impacts on industrial and commercial use, in the form of irrigation water abstraction, are negligible. Impact on anglers and fishing is negligible for the Rivers Blithe and Trent but is predicted to be low for Blithfield Reservoir.

1.1.2.6 Impact to water quality and ecological receptors

As mentioned in chapter 3, we consider this drought permit to potentially have minor environmental impacts.

1.1.3 Transfer of potable water to Blithfield Reservoir

As part of the review of the River Blithe pump back drought permit we used the same techniques to assess the impact of the potable water transfer to Blithfield Reservoir. This scheme is independent of the drought permit and therefore not conditional on its operation, but some of the same receptors are involved.

The assessment concluded that water transfer from the potable water network may potentially have a negative impact on phosphate concentrations as we routinely dose supplies with phosphate for plumbo-solvency control, to reduce the risk of lead entering customers' taps from lead supply pipes. This may potentially temporarily raise phosphate concentrations such that they align with a lower WFD classification. However, the time required for the transfer to move phosphate concentration into the Bad category far exceeds the time over which the transfer would operate (as it only operates during winter months). The impact on phosphate concentration, and therefore WFD classification, of this option is negligible. The overall impact significance is predicted to be at worst (if the transfer is operated longer than planned) moderate negative for Blithfield Reservoir, in view of its SSSI status, and minor negative for the River Blithe, as it has a lower receptor value than the reservoir. As we mentioned in chapter 4, we are continuing to work with the Environment Agency to better understand any potential environmental impact associated with this option.

1.2 Statutory Designated Sites

We have considered the environmental effects of this plan on designated sites, to which the following legislation applies:

- Conservation of Habitats and Species Regulations 2010 – Habitats Directive
- Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000)

- Habitats Regulations Assessment (HRA) and Strategic Environmental Assessment Directive (SEA)
- Water Framework Directive, River Basin management Plans and UK Biodiversity Action Plan
- Other protected areas under international agreements such as Ramsar sites and non-statutory sites, such as local wildlife sites and reserves.

The sensitivity of sites to abstraction has been assessed during the Restoration of Sustainable Abstraction Programme (RSA) in conjunction with the Environment Agency and continues to be assessed as part of the EA Sustainable Catchments programme. We have assessed the impacts of increasing abstractions within existing licenced quantities to inform our drought management decision making, where this includes flexing abstractions within our published deployable output and abstraction licences.

1.3 Habitats Regulations Assessment

The EU Habitats Directive, which seeks to safeguard Europe’s natural heritage, was transposed into UK law by the Habitats Regulations 1994. The Regulations require a Habitats Regulations Assessment (HRA) to be undertaken to determine whether plans are likely to have a significant effect on European Sites, including Special Areas for Conservation (SACs), candidate SACS (cSACs), Special Protection Areas (SPAs) and Ramsar sites (Wetlands of international importance). The Company has carried out the following HRA in fulfilment of its Habitats Regulations obligations.

1.4 Strategic Environmental Assessment

European Directive 2001/42/EC, otherwise known as the Strategic Environmental Assessment or SEA Directive, requires the “assessment of the effects of certain plans and programmes on the environment”. Information and guidance on to how to comply with the Directive was published by the Office of the Deputy Prime Minister (ODPM), in its 2005 publication A Practical Guide to the Strategic Environmental Assessment. A subsequent UKWIR report², adapted the ODPM guidance for the water industry.

The decision-making process set out in the UKWIR report to determine whether plans require an SEA is presented in the form of a decision tree, which is reproduced below.

Water companies, as responsible authorities, must determine if their drought plans fall within the scope of the SEA Directive. The Company has followed the UKWIR guidance, the decision tree, and the Environment Agency’s drought planning guideline to arrive at an informed decision in this regard. The conclusions from applying the process are summarised below.

- The response to questions 1 and 2 is “yes”, as South Staffs Water is clearly an ‘authority’ within the meaning of the Directive, and the drought plan is a statutory requirement.
- In response to question 3, although the drought plan is prepared for water management, it does not set a framework for future development consent of projects in Annexes I and II to the EIA Directive (Art. 3.2(a))
- Question 4 asks whether the plan, in view of its likely effect on sites, requires an assessment under Article 6 or 7 of the Habitats Directive (Art. 3.2(b)). This question has been addressed in our environmental assessment and in Section 7.4 above and the Company has concluded, with the endorsement of Natural England, that no assessment is needed.
- Question 6 seeks to determine whether the plan sets the framework for future development consent of projects (not just projects in Annexes to the EIA Directive) (Art. 3.4). The drought plan for the Cambridge region drought plan does not set the framework for future development consent, and the answer is therefore “no” to this question.

Having followed published guidance it is the Company’s conclusion that a Strategic Environmental Assessment (SEA) is not required in respect of this drought plan.

