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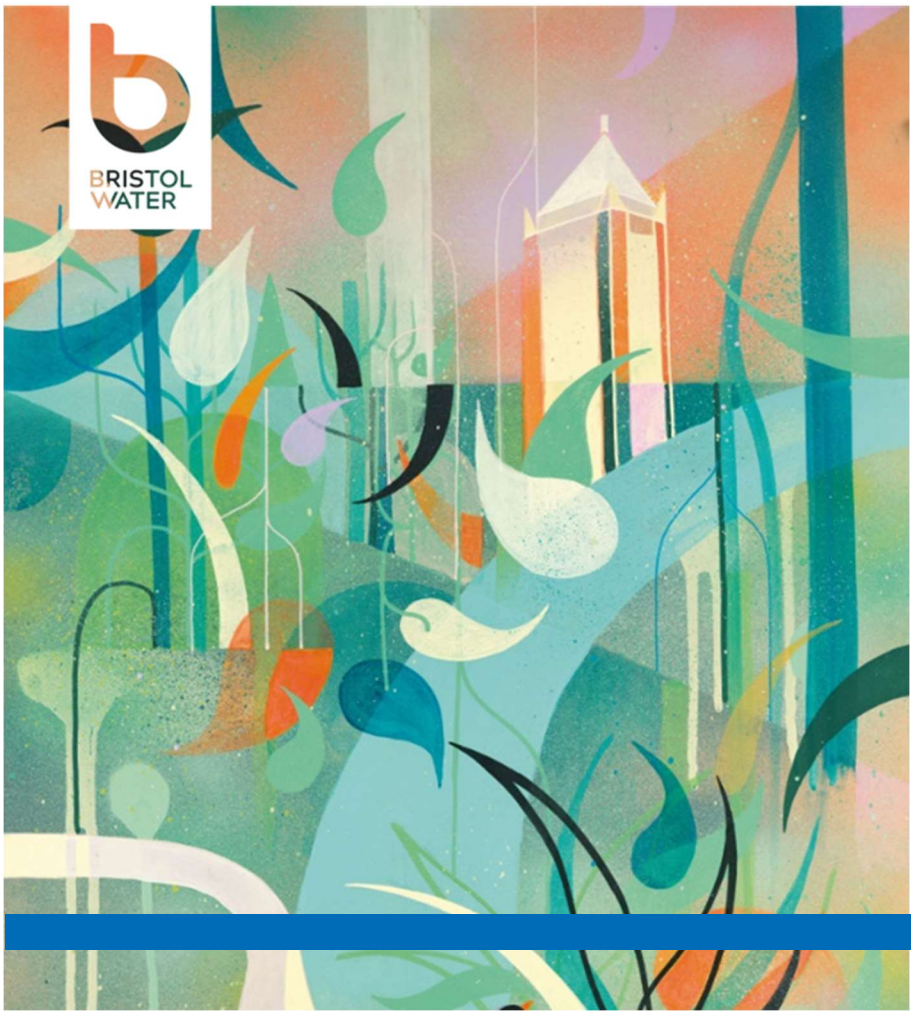

Bristol Water Draft Drought Plan 2021

HRA Stage 1 Screening Report

Final draft report for Bristol Water

Report for Bristol Water - 3500071535

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Non-Technical Summary

Water companies are required to prepare and maintain statutory Drought Plans every five years, and as part of this process, must ensure the Drought Plan meets the requirements of the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations").

Under Regulations 63 and 105, any plan or project which is likely to have a significant effect on a European site (either alone or in-combination with other plans or projects) and is not directly connected with, or necessary for the management of the site, must be subject to a Habitats Regulations Assessment (HRA) to determine the implications for the site in view of its conservation objectives. For the purposes of the HRA, a European site includes Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites, as well as any candidate or proposed sites.

Bristol Water has completed the first stage of the HRA process – screening - on its Draft Drought Plan 2021. The HRA screening stage identifies whether any measures included within the plan may have "Likely Significant Effects" on the integrity of any European site, either "alone" or "in combination" with other measures or other plans or projects.

A summary of the conclusions of HRA Stage 1 Screening is presented in **Table A**. This shows that likely significant effects of the Draft DP 2021 could not be ruled out upon the following European sites:

- North Somerset and Mendips Bats SAC
- Severn Estuary SAC
- Severn Estuary Ramsar site
- Mendip Limestone Grasslands SAC
- Somerset Levels and Moors SPA.

Appropriate Assessment is required for each supply option to conclude 'adverse effect' or 'no adverse effect' upon the European sites. The demand management measures will not have any Likely Significant Effects on any European sites.

In accordance with the Habitats Regulations, where Likely Significant Effects are identified, the HRA Stage 2 Appropriate Assessment process is required to assess in more detail whether the plan may adversely affect the integrity of any European site. Appropriate Assessment of the supply augmentation and drought permit measures is therefore required and will be carried out as part of the further development of the Bristol Water Drought Plan alongside further work on the environmental assessment of the supply augmentation and drought permit measures.

Table A: Summary of HRA Stage 1 Screening Conclusions

Drought Option	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?	Appropriate Assessment Required?
Demand Management Measures				
Appeals for restraint	No	No	No	No
Temporary Use Bans	No	No	No	No
Non-Essential Use Ban	No	No	No	No
Supply Augmentation Measures				
R24R Well	Yes	N/A	N/A	Yes
Drought Permits				
Blagdon Reservoir	Yes	N/A	N/A	Yes

Drought Option	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?	Appropriate Assessment Required?
Reduced Compensation Flow				
Cheddar Reservoir Reduced Prescribed Flow	Yes	N/A	N/A	Yes
Chew Valley Reservoir Reduced Compensation Flow	Yes	N/A	N/A	Yes
Changes to Minimum Residual Flow conditions set out in the P08R Abstraction Licence	Yes	N/A	N/A	Yes
Changes to Minimum Residual Flow conditions set out in the P05R abstraction licence	Yes	N/A	N/A	Yes
Extension to the licensed abstraction period for the River Axe source to support the refill of Cheddar reservoir	Yes	N/A	N/A	Yes

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1 INTRODUCTION

1.1 Background and Purpose of Report

Bristol Water published its current statutory Drought Plan (DP) in June 2018. Bristol Water is now in the process of developing an updated DP, in line with the requirements of the Drought Plan (England) Direction 2020 and to align with updated guidance including that provided in the Environment Agency's Drought Plan Guideline (DPG)[1]. The updated guidance specifies that a water company must ensure that its DP meets the requirements of the Conservation of Habitats and Species Regulations 2017. The DPG also includes an updated draft of the supplementary guidance on the environmental assessment for water company drought planning (published in July 2020).

The legislation transposing the European Union (EU) Habitats Directive (Council Directive 92/43/EEC) and Wild Bird Directive (Directive 2009/147/EC) has been changed as a consequence of the UK's departure from the European Union. This includes the Conservation of Habitat and Species Regulations 2017 (as amended) in England and Wales and the Conservation of Offshore Marine Habitats and Species Regulation 2017 (as amended). The changes have been made by the Conservation of the Habitat and Species (Amended) (EU Exit) Regulations 2019.

The requirement for a Habitats Regulations Assessment (HRA) is set out in the Conservation of Habitats and Species Regulations 2017 (hereafter referenced as "the Habitats Regulations"). Under Regulations 63 and 105, any plan or project which is likely to have a significant effect on a European site (either alone or in-combination with other plans or projects) and is not directly connected with, or necessary for the management of the site, must be subject to a HRA to determine the implications for the site in view of its conservation objectives.

1.1 Requirement for Habitats Regulations Assessment

The responsibility for undertaking the HRA lies with Bristol Water as the Plan making authority. HRA guidance for the appraisal of Plans[2] summarises the requirements for HRA under the Habitats Regulations:

- Regulation 63 states that the Plan making authority (in this case Bristol Water) shall adopt, or otherwise give effect to, the Plan only after having ascertained that it will not adversely affect the integrity of a European site, subject to Regulation 64 or 105 of the Habitats Regulations.

- Regulation 64 of the Habitats Regulations states:

1) *If the competent authority is satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), it may agree to the plan or project notwithstanding a negative assessment of the implications for the European site or the European offshore marine site (as the case may be).*
2) *Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred to in paragraph (1) must be either—*
   a) *reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or*
   b) *any other reasons which the competent authority, having due regard to the opinion of the European Commission, considers to be imperative reasons of overriding public interest.*

- Regulation 105 of the Habitats Regulations states:

(1) Where a land use plan—

[1] Environment Agency (2020) Water Company Drought Plan Guideline, December 2020.
[2] Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, January 2021 edition UK. DTA Publications Limited.

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in-combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of the site,

The plan-making authority for that plan must, before the plan is given effect, make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

(2) The plan-making authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority specifies.

(3) The plan-making authority must also, if it considers it appropriate, take the opinion of the general public, and if it does so, it must take such steps for that purpose as it considers appropriate.

(4) In the light of the conclusions of the assessment, and subject to regulation 107, the plan-making authority must give effect to the land use plan only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).

(5) A plan-making authority must provide such information as the appropriate authority may reasonably require for the purposes of the discharge by the appropriate authority of its obligations under this Chapter.

(6) This regulation does not apply in relation to a site which is—

(a) A European site by reason of regulation 8(1)(c), or

(b) A European offshore marine site by reason of regulation 18(c) of the Offshore Marine Conservation Regulations (site protected in accordance with Article 5(4) of the Habitats Directive).

Article 6 of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna) states:

6(3). Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in-combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

6(4). If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

If there are no alternative solutions and if, in exceptional circumstances, it is proposed that a Plan be adopted despite the fact that it may adversely affect the integrity of a European site, the HRA will need to address and explain the imperative reasons of Overriding Public Interest which the Plan making authority considers to be sufficient to outweigh the potentially adverse effects on the European site(s).

1.2 Approach to HRA

There are four stages of the HRA process:

1. Firstly, a screening process is undertaken to identify whether each drought management measure in Bristol Water's DP (either alone or in-combination with other plans or projects) is likely to have significant effects on European sites. This screening assessment does not consider any mitigation measures.
2. Where a significant effect is likely (noting the precautionary principle), an Appropriate Assessment will then need to be undertaken of the drought management measure to determine

whether it would adversely affect the integrity of any European site(s), either alone or in-combination with other plans and projects, including taking into account available mitigation measures.

3. Where adverse effects on site integrity are identified at the Appropriate Assessment stage, reasonable alternative options would be examined to avoid any adverse effects on the integrity of the European site.
4. This final stage only applies if no reasonable alternative options can be identified and comprises an assessment of compensatory measures where, having first demonstrated "Imperative Reasons of Overriding Public Interest", it is deemed that the Plan should proceed.

The HRA has been undertaken in accordance with currently available guidance[3][4][5][6][7] and has been based on a precautionary approach as required under the Habitats Regulations. It has followed the staged HRA approach, commencing with the Stage 1 screening of all the drought management measures contained within the DP.

The HRA Stage 1 assessment refers to the Likely Significant Effects (LSE) of an option on one or more European sites, including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) (also known as Natura 2000 sites) and Ramsar sites:

- SPAs are classified under the European Council Directive 'on the conservation of wild birds' (2009/147/EC; 'Birds Directive') for the protection of **wild birds and their habitats** (including particularly rare and vulnerable species listed in Annex 1 of the Birds Directive, and migratory species).
- SACs are designated under the Habitats Directive (92/43/EEC) and target particular **habitats** (Annex 1) **and/or species** (Annex II) identified as being of European importance.
- The Government also expects potential SPAs (pSPAs), candidate SACs (cSACs), compensation habitat and Ramsar sites to be included within the assessment.
- Ramsar sites support **internationally important wetland habitats** and are listed under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention, 1971).

For ease of reference through the HRA process, these designations are collectively referred to as European sites, despite Ramsar designations being made at the international level. This terminology and references to Annexes of European Directives remain despite the UK's exit from the European Union.

The purpose of the HRA Stage 1 screening stage is to determine whether the Bristol Water DP is likely to have a significant effect on any European site. This is judged in terms of the implications of the plan for a site's conservation objectives, which relate to its 'qualifying features' (i.e. those Annex I habitats, Annex II species, and Annex I bird populations[8], or Ramsar criterion, for which it has been designated). Significantly, HRA is based on a rigorous application of the precautionary principle. Where uncertainty or doubt remains, an impact should be assumed, triggering the requirement for Appropriate Assessment.

The screening stage also has to conclude whether any in-combination effects would result from the concurrent implementation of two or more measures within the plan itself, or from implementation of any of the plan's measures in-combination with other plans and projects, for example neighbouring water companies' DPs or Water Resource Management Plans (WRMPs), and whether these would, in-combination, adversely affect the integrity of a European site.

[3] Tyldesley, D. & Chapman, C. (2013). The Habitats Regulations Assessment Handbook, January 2021 edition UK. DTA Publications Limited.
[4] Court of Justice for the European Union's ruling on People Over Wind and Sweetman ('Sweetman II') vs Coillte Teoranta, Case C-323/17.
[5] UK Government (2019). Guidance on the use of Habitats Regulations Assessment.
[6] UK Government (2019). Conservation of Habitats and Species Regulations (Amendment) (EU Exit).
[7] Natural England (2020). Guidance on how to use Natural England's Conservation Advice Packages in Environmental Assessments.
[8] Annexes are contained within the relevant EC Directive.

In April 2018[9] there was an important judgment in the Court of Justice of the European Union (CJEU) which ruled that Article 6(3) of the Habitats Directive (and therefore equivalent requirements in the national Habitats Regulations) must be interpreted as meaning that mitigation measures should be assessed within the framework of an Appropriate Assessment and that it is not permissible to take account of mitigation measures at the screening stage. Considering this judgement, mitigation measures are **not considered** as part of the HRA Stage 1 screening of the Draft DP 2021.

1.2 Bristol Water Supply Area and Drought Planning

In the event of severe drought, Bristol Water will need to implement a range of management measures to ensure the continued provision of essential water supplies to all of its customers. The Bristol Water Draft DP 2021 sets out the measures that the company will consider implementing in dealing with drought conditions, taking account of statutory legislation and regulatory requirements. The DP is prepared in line with the requirements of the Drought Plan (England) Direction 2020 and in compliance with the Water Industry Act 1991, as amended by the Water Act 2003 and the Flood and Water Management Act 2010. The updated DP takes account of the latest regulatory guidance for drought planning, industry best practice guidance and experiences across the water industry from recent drought events.

The Drought Plan (England) Direction 2020 contains the timeframe for submission of updated draft Drought Plans to the Secretary of State. For Bristol Water, this means that it must submit an updated draft DP before the 1st April 2021 which, once approved by the Secretary of State and published, will replace the existing Bristol Water DP published in June 2018.

1.2.1 Bristol Water Supply System

Bristol Water is a water only company that provides water supplies to 1.19 million people plus business customers in an area of approximately 2,400 square kilometres, centred on Bristol and the towns and villages within a 20-mile radius of the city. The water supply area stretches from Thornbury and Tetbury in the north, to Street and Glastonbury in the south, and from Weston-Super-Mare in the west to Frome in the east. Bristol Water relies on 68 water sources, including reservoirs, rivers, springs, wells and boreholes. Of the company's 14 raw water reservoirs, the largest is Chew Valley Reservoir, holding up to 20,460 million litres and providing around 40% of the water required to meet demand[10].

Water resources within the Bristol Water supply area alone are not sufficient to meet customer demand for water and therefore water supplies are also imported from neighbouring areas, in particular from the River Severn. This water is sourced via the Gloucester and Sharpness Canal to supply the largest northern treatment works. This source accounts for approximately 46% of Bristol Water's reliable water resources. Bristol Water has an agreement with the Canal & Rivers Trust (the owners of the abstraction licence) to receive water supplies from the Gloucester and Sharpness Canal, which is supplied by the River Severn and other local rivers, the Cam and the Frome. The volume of water available for abstraction from the River Severn is controlled by the Environment Agency according to the River Severn Regulation System operating rules. The Mendip Reservoirs and associated surface water abstractions account for approximately 42% of the available reliable water resource. The remaining 12% of reliable water resources for Bristol Water are derived from groundwater[11].

There is a significant degree of resilience and connectivity in both the raw water network and the treated water bulk transfer systems. This flexibility permits the sharing of resources and allows optimum use according to seasonable availability. As a result, the Bristol Water supply area is operated as a single water resource zone in which all sources are used conjunctively. Bristol Water's supply area is bounded by three other water companies (Thames Water, Wessex Water and Severn Trent Water). A number of water supply transfers are made between Bristol Water and these adjacent water companies.

[9] Court of Justice for the European Union's ruling on People Over Wind and Sweetman ('Sweetman II') vs Coillte Teoranta, Case C-323/17.

[10] Bristol Water (2019). Bristol Water Final Water Resources Management Plan 2019. Bristol Water, 1-215.

[11] Bristol Water (2019). Bristol Water Final Water Resources Management Plan 2019. Bristol Water, 1-215.

The geographical area under consideration for the Draft Drought Plan is shown in Error! Reference source not found., this spatial scope is defined by the Bristol Water supply area.

1.3 Bristol Water's Drought Planning Process

1.3.1 Overview and timetable

Under sections 39B and 39C of the Water Industry Act 1991 (as amended by the Water Act 2003 and the Flood and Water Management Act 2010), water companies are required to prepare and maintain statutory DPs. The DP sets out the operational steps a water company will take before, during and after a drought to maintain essential water supplies to customers. A DP is defined by the Water Industry Act 1991 (as amended) as '*a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders*[12] *or drought permits*[13]'.

Bristol Water is required to submit its draft DP 2021 to the Secretary of State in early 2021. The draft plan will be issued for public consultation along with the SEA Environmental Report, this HRA report and a WFD compliance assessment summary. Following feedback from the public consultation process, a Statement of Response will be published by Bristol Water setting out its responses to consultation feedback and any changes it proposes to make to the draft DP. The DP (and associated SEA, HRA and WFD compliance assessment) will be updated as appropriate and submitted to the Secretary of State for approval to publish it as a final plan. The Final DP is expected to be published by 2022, subject to approval by the Secretary of State. The updated plan will guide Bristol Water's response to any drought events that may arise in the period between 2022 and 2027.

Only those drought management measures which are relevant to the period encompassed by the DP are considered. In this regard, environmental effects of the potential DP measures are considered within the context of the company's existing abstraction licence conditions and operating arrangements. Additionally, only those relevant plans, projects and programmes that are likely to be effective in the period from 2022 to 2027 that may lead to in-combination effects with the DP will be considered. The DP is closely linked and integrated with the separate statutory process of developing a long-term WRMP (last published by Bristol Water in 2019).

1.3.2 Bristol Water's Drought Plan Measures

Bristol Water has identified DP triggers (Drought Management Zones) based on the combined storage in its major reservoirs. These triggers act as decision-points for implementation of defined drought management measures as reservoir storage is depleted in a drought event.

There are two broad categories of drought management measures:

- demand management measures
- supply augmentation measures.

1.3.2.1 Demand management measures

Demand management measures are designed to reduce the demand for water in a drought and are not site-specific but are invariably implemented across the entire water supply area (**Table 1-1**).

[12] An authorisation granted by the Secretary of State under Section 73 of the Water Resources Act (199) when there are drought conditions, which impose restrictions upon the use of water, and/or allows for abstraction/impoundment outside the schedule of existing licences on a temporary basis. A drought order can be applied for by the EA for environmental reasons and by a Water Undertaker for Public Water Supply reasons. A drought order lasts for 6 months but can be extended for a total of one year.
[13] An authorisation granted by the EA under drought conditions which allows for abstraction/impoundment outside the schedule of existing licences on a temporary basis (generally for 6 months, but can be extended up to a total of one year) under Schedule 8 of the Water Resources Act (1991) (as amended).

Table 1-1: Demand Management Measures

Demand Management Measure	Description
Appeals for restraint	This measure would help encourage customers to reduce their water usage via publicity campaigns and the media. The measure would be expected to reduce total household demand by around 1%.
Temporary Use Ban (TUB)	This measure to restrict certain non-essential water uses would be expected to reduce peak summer household demand by up to 9.5%. The restrictions in water use can include: • Cleaning a private leisure boat using a hosepipe • Cleaning a private motor vehicle using a hosepipe • Filling or maintaining an ornamental fountain • Cleaning walls, or windows, of domestic premises using a hosepipe • Cleaning paths or patios using a hosepipe • Cleaning other artificial outdoor surfaces using a hosepipe • Drawing water using a hosepipe, for domestic recreational use • Filling or maintaining a domestic swimming or paddling pool • Watering a garden using a hosepipe • Watering plants on domestic or non-commercial premises using a hosepipe • Filling or maintaining a domestic pond using a hosepipe
Non Essential Use Ban (NEUB)	This measure requires an application to the Secretary of State for a drought order to prohibit certain non-essential water uses. The measure would be expected to reduce non-household demand by up to 2% across the year. The restrictions in water use include: • Watering outdoor plants on commercial premises • Filling or maintaining a non-domestic swimming or paddling pool • Filling or maintaining a pond • Operating cisterns (in unoccupied premises) • Cleaning industrial plant (except where required for health and hygiene) • Suppressing dust (except where controlled by health and safety regulations) • Operating a mechanical vehicle-washer • Cleaning a window of a non-domestic building • Cleaning any vehicle, boat, aircraft or railway rolling stock • Cleaning non-domestic premises

1.3.2.2 Supply augmentation measures

Supply augmentation measures considered by Bristol Water include bringing disused, licensed water sources back into supply and applying for drought permits to temporarily vary the conditions of abstraction licences for specific water sources.

R24R and R24Ra (Well Head)

Bristol Water's R24R and R24Ra (Well Head) source (referred to as R24R Well hereafter) is an existing licensed water source that has not been in operation for approximately 20 years. In the event of a drought, it would require recommissioning before it could be used to supply water. The measure is expected to provide an additional 2.4 Ml/d of water supplies.

Some construction activities are required in order to bring R24R Well into operation, including the replacement of the pumps at R24R Well and the construction of a new pipeline to link the source to an existing water treatment works.

1.3.2.3 Drought Permits

Drought permits are drought management measures available to water companies which, if granted by the Environment Agency, can temporarily allow more flexibility to manage water resources and the effects of drought on public water supply and the environment. Drought permit measures previously considered by Bristol Water in its 2018 DP are identified in Error! Reference source not found..

Table 1-2: Drought Permit Measures included in 2018 DP and Draft DP 2021

Drought Permit	Description
Reduction in compensation flow release from Blagdon Reservoir	This permit would allow the compensation flow release from Blagdon Reservoir to be reduced from 8.64 Ml/d to 4.6Ml/d between 15th May and 30th November only. This will help to conserve water resources within Blagdon Reservoir.
Reduction in compensation flow release from Chew Valley Reservoir	This permit would allow the compensation flow release from Chew Valley Reservoir to be reduced from 14.32Ml/d to 7Ml/d between 1st May and 30th November, or from 6.82Ml/d to 3.4Ml/d (between 1st December to 30th April). This will help to conserve water resources within or refill Chew Valley Reservoir.
Reduction of prescribed flow at Cheddar Reservoir	This permit would allow a reduction to the prescribed flow into the Cheddar Yeo from 6.8Ml/d to 3.4Ml/d (between 1st December to 14th May) only. This will help to refill Cheddar Reservoir.

In addition to the three drought permit options identified in **Table 1-2**, Bristol Water is considering three additional drought permit options in the Draft DP 2021:

- changes to the Minimum Residual Flow conditions set out in the P08R abstraction licence
- changes to the Minimum Residual Flow conditions set out in the P05R abstraction licence
- extension to the licensed abstraction period for the River Axe source to support the refill of Cheddar reservoir.

1.4 Purpose of this document

This document comprises the Stage 1 HRA Screening of the Bristol Water Draft DP 2021. The report consists of the following Sections:

Section 1 – Introduction (this Section)

Section 2 – Methodology

Section 3 – HRA Screening Findings for Drought Options

Section 4 – Conclusions and Recommendations

This document will be used as a basis for consultation with Natural England and the Environment Agency.

2 METHODOLOGY

2.1 Approach to HRA Screening

The objective of the HRA is to establish firstly whether any of the measures included in draft DP 2021 are likely to have a significant effect on European sites (alone or in-combination with other supply schemes in the plan, or with other plans and projects), and secondly, where a significant effect is likely, to determine through Appropriate Assessment, whether the plan would adversely affect the integrity of the European site(s).

This document only presents the HRA screening of the measures included in the draft DP 2021.

2.2 HRA Stages

Whilst only HRA Stage 1 Screening is included within this report, four stages of the HRA have been identified within the guidance[14] as already summarised in Section 1.2 and set out in more detail below:

Stage 1 – Screening

The first stage in the HRA is screening to determine whether any DP measure is likely to have a significant effect on any European site (either alone or in-combination with other plans and projects) and thus if a full HRA Stage 2 'Appropriate Assessment' would be required prior to inclusion in the Final DP.

For each of the seven DP measures listed above in **Section 1.3**, all European sites which could be impacted, including all SAC, SPA and Ramsar sites, were identified together with their qualifying and supporting features. Each DP measure has been screened for likely significant effects taking account of the qualifying designated habitats and species of conservation interest, and their supporting features, including hydrology, geomorphology, water quality, habitats etc.

In-combination assessments have also been carried out to establish the possibility of cumulative or synergistic impacts. The approach to in-combination assessments is described in **Section 2.5**.

The output of the screening stage is this HRA Stage 1 Screening Report which identifies if any of the DP measures require HRA Stage 2 Appropriate Assessment if it has been determined that they, either alone or in-combination with other plans or projects, are likely to have significant effects on European sites. This HRA Screening Report will be used as a basis for consultation with the regulatory authorities.

Stage 2 – Appropriate Assessment

Those DP measures identified during HRA Stage 1 Screening as being likely to have a significant effect on a European site (either alone or in-combination) will be subject to Stage 2 Appropriate Assessment. The Appropriate Assessment will consider the impacts of the DP measure against the conservation objectives of each relevant European Site to assess whether there will be any adverse effects on site integrity and site features, either alone or in combination with other plans and projects. This is judged in terms of the implications of the plan for a site's conservation objectives, which relate to its 'qualifying features' (i.e. those Annex I habitats, Annex II species, and Annex I bird populations for which it has been designated). The responsibility for undertaking the Appropriate Assessment lies with Bristol Water as the Plan making authority.

If no adverse effects are identified by the Appropriate Assessment (either alone, or in combination with other plans and projects), no further assessments are required in the HRA process. If adverse effects on European designated site integrity are identified, the assessment will progress to HRA Stage 3.

Further details about the methodology proposed for Appropriate Assessment is provided in **Section 4.2.**

[14] Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, December 2020 edition UK. DTA Publications Limited.

Stage 3 – Alternative Options Stage

Where significant adverse effects are identified at the Appropriate Assessment stage, reasonable alternative options must be examined to determine whether other measures could be adopted instead to achieve the DP objectives so as to avoid any potential damaging effects to the integrity of the European site. This could involve amending the DP measure to avoid adverse effects on a European site. If the review of reasonable alternative options concludes there are no other alternative options and the DP measure is still required to achieve the objectives of the DP, the assessment moves to Stage 4 of the HRA process.

Stage 4 – Assessment where adverse impacts remain

Stage 4 comprises an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed. IROPI will only be progressed if no alternative options are identified as part of HRA Stage 3.

HRA guidance[15] recommends that if there are no alternative options and if, in exceptional circumstances, it is proposed that a plan be adopted despite the fact that it may adversely affect the integrity of a European site, the HRA will need to address and explain the IROPI which the Plan making authority considers to be sufficient to outweigh the potentially adverse effects on the European site(s). The Secretary of State is responsible for determination of any Imperative Reasons of Overriding Public Interest case.

Where IROPI is confirmed, compensatory measures must be agreed and secured (including securing access to land to carry out the measures) in consultation with Natural England as the statutory advisor to the Secretary of State. The measures must meet a range of criteria set out in Habitats Regulations and in accompanying statutory guidance.

2.3 Identification of European Sites for Assessment

Geographic Information System (GIS) data were used to map the locations and boundaries of European sites within or adjacent to Bristol Water's water resource zone using publicly available data from Natural England. The European sites are shown in **Figure 2-1** along with the location of the R24R Well supply augmentation option and the three reservoir drought permit options in the Drought Plan.

The attributes of European sites, which contribute to and define their integrity, were considered with reference to Standard Data forms for SACs and SPAs and Information Sheets for Ramsar sites. An analysis of these information sources enabled the identification of European site qualifying features. Conservation objectives and site vulnerability assessments have been provided by Natural England. This information allows identification of qualifying features of each site which determine site integrity and the specific sensitivities of the site, as well as an analysis of how potential impacts of the drought management measures may affect site integrity. The assessment included consideration of designated mobile species (e.g. migratory fish, bats and birds) that are not confined to European site boundaries as well as functional habitat associated with, but outside the boundaries of, European sites. As a consequence, a DP measure might be located at some distance from a European site but may still lead to an adverse effect on a European site due to the inclusion of mobile species in the designation which may be impacted by the DP measure. Adverse effects on physical processes (e.g. air quality, water quality, river flows, groundwater levels) outside of European sites but which can also impact a European site are also considered in the assessment.

[15] Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, January 2021 edition UK. DTA Publications Limited.

Figure 2-1: European Sites within the Bristol Water supply area and location of Bristol Water Draft Drought Plan measures. **[THIS FIGURE HAS BEEN REDACTED FOR THE PUBLIC DOMAIN WEBSITE VERSION]**

2.4 Potential Impacts of Drought Plan Measures

The qualifying habitats and species of European sites are vulnerable to a wide range of impacts such as physical loss or damage of habitat, disturbance from noise, light, human presence, changes in hydrology (e.g. changes in water levels/flow, flooding), changes in water or air quality and biological disturbance (e.g. direct mortality, introduction of disease or non-native species). However, the drought management measures considered for inclusion in the Draft DP only have the potential to give rise to some of these impacts.

The demand management measures are unlikely to have any significant adverse effects on European sites as they relate to measures which will not result in any new development and will help to reduce the amount of water abstracted from the environment.

The supply augmentation measures and drought permits have the potential to impact upon European sites that are in proximity to, or hydrologically connected to, the water sources, or may impact mobile designated species. In determining the likelihood of significant effects on European sites from these measures, particular consideration has been given to the possible source-receptor pathways through which effects may be transmitted to features contributing to the integrity of the European site(s) (for example, groundwater or surface water catchments, atmospheric transmission, etc.). **Table 2.1** shows the type of impacts that the DP measures could have on European site qualifying features.

Table 2-1: Potential Impacts of Drought Plan Measures on European Sites

Broad categories of potential impacts on European sites	Examples of operations responsible for impacts (distance assumptions shown in italics)
Physical loss - Removal (including offsite effects, e.g. foraging habitat) - Smothering	Development of built infrastructure associated with scheme, e.g. pipelines, transport infrastructure, temporary weirs. *Physical loss is only likely to be significant where the boundary of the scheme extends within the boundary of the European site, or within an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European site is designated).*
Physical damage - Sedimentation / silting - Prevention of natural processes - Habitat degradation - Erosion - Fragmentation - Severance/barrier effect - Edge effects	Development of built infrastructure associated with scheme, e.g. temporary weirs. *Physical damage is only likely to be significant where the boundary of the scheme extends within or is directly adjacent to the boundary of the European site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European site is designated).*
Non-physical disturbance - Noise - Visual presence - Human presence - Light pollution	Noise from vehicular traffic during construction of scheme. *Noise from construction traffic is only likely to be significant where the transport route to and from the scheme is within 3-5km of the boundary of the European site.* Plant and personnel involved in construction and operation of schemes e.g. for maintenance, plus non-operational activities such as recreation associated with scheme e.g. reservoirs *These effects (noise, visual/human presence) are only likely to be significant where the boundary of the scheme extends within or is directly adjacent to the boundary of the European site, or within/adjacent to an offsite area of known foraging, roosting,*

Broad categories of potential impacts on European sites	Examples of operations responsible for impacts (distance assumptions shown in italics)
	breeding habitat (that supports species for which a European site is designated). Development of built infrastructure associated with scheme, which includes artificial lighting. *Effects from light pollution are only likely to be significant where the boundary of the scheme is within 500 m of the boundary of the European site. From a review of Environment Agency internal guidance on HRA and various websites it is considered that effects of vibration and noise and light are more likely to be significant if development is within 500 metres of a European site.*
Water table/availability - Drying - Flooding / storm water - Changes to surface water levels and flows - Changes in groundwater levels and flows - Changes to coastal water movement	Changes to water levels and flows due to water abstraction and storage. *These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the European site. However, these effects are dependent on hydrological continuity between the scheme and the European site, and sometimes, whether the scheme is up or down stream from the European site.*
Toxic contamination - Water pollution - Soil contamination - Air Pollution	Reduced dilution in downstream or receiving waterbodies due to changes in abstraction or reduced compensation flow. Air emissions associated with vehicular traffic during construction/operation of schemes. *This effect is only likely to be significant where the transport route to and from the scheme is within 100m of the boundary of the European site.*
Non-toxic contamination - Nutrient enrichment (e.g. of soils and water) - Algal blooms - Changes in salinity - Changes in thermal regime - Changes in turbidity - Changes in sedimentation/silting	Changes to water salinity, nutrient levels, turbidity, thermal regime due to water abstraction, storage, or inter-catchment transfers. *These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the European site. However, these effects are dependent on hydrological continuity between the scheme and the European site, and sometimes, whether the scheme is up or down stream from the European site.*
Biological disturbance - Direct mortality - Changes to habitat availability - Out-competition by non-native species - Selective extraction of species	Potential for changes to habitat availability, for example reductions in wetted width of rivers leading to desiccation of macrophyte beds due to changes in abstraction or reduced compensation flow. *This effect is only likely to be significant where the receiving water for the scheme is the European site or a tributary of the European site.*

Broad categories of potential impacts on European sites	Examples of operations responsible for impacts (distance assumptions shown in italics)
- Introduction of disease - Rapid population fluctuations - Natural succession	

HRA Stage 1 screening for Likely Significant Effects has been determined on a proximity basis, as well as consideration of any hydrological connectivity, including to any SPA functional habitat. Consideration has therefore been given to the relative locations of each drought management option sites and the European sites within the same surface and groundwater catchments to ensure that any connectivity over a longer distance than the 10km screening distance that might affect water-dependent sites was taken into account. For the Blagdon, Chew and Cheddar reservoir drought permits, this included reference to the hydrological assessments undertaken as part of the Environmental Assessment Reports (EARs) that identify the hydrological zone of influence during drought permit implementation. The available information on the hydrological influence of each DP measure is summarised in the next section in **Table 3.3**.

The operational phase impacts of each of the DP measures were reviewed and assessed. For the R24R Well supply augmentation measure, the associated construction activities have also been assessed. No other measures involve construction activities.

2.5 Review of Potential In-combination Effects

An Appropriate Assessment is also required if '*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plan or projects*'.

The potential for in-combination, effects has considered the following:

1. Potential in-combination effects of the DP measures with Bristol Water's existing abstraction licences that operate within the zone of influence of the DP measure, and other abstraction and discharge consents where applicable.

2. Potential cumulative impacts with other Bristol Water DP measures.

3. Potential in-combination effects with other Bristol Water activities, plans and programmes, including the Water Resource Management Plan 2019.

4. Potential in-combination effects with other neighbouring water company activities, Drought Plans and Water Resource Management Plans, as well as any relevant Environment Agency and Canal & River Trust drought plans.

5. Potential in-combination effects with other relevant third party activities, programmes and plans (where these are likely to arise and be implemented over the 5-year lifetime of the Bristol Water Drought Plan). HRA guidance states "*It should be possible to identify the other plans or projects in a targeted way; not trawling for every conceivable plan or project, whilst identifying all the relevant ones. To be relevant to the in-combination effect, the residual effects of other plans or projects will need to either make the unlikely effects of the subject plan likely, or insignificant effects of the plan significant, or both.*"

National Policy Statements for Water, Wastewater and Renewable Energy Infrastructure were also reviewed as part of the cumulative assessment.

Demand management measures serve to reduce pressure on water resources and will have a positive influence on the environment by reducing the demand for water and reducing abstraction from water sources. Therefore, demand management measures have not been included in the in-combination assessment.

It is noted that there may be in-combination, site-specific issues which may not be foreseen, for example, other future development projects at, or in the vicinity of specific sites. Such future projects are difficult to define at the time of undertaking HRA Stage 1 Screening of the DP due to the uncertainty or timing of implementation. However, potential in-combination effects will be reviewed again at the time of implementing a DP measure which would identify any such projects.

3 HRA SCREENING FINDINGS

3.1 HRA Screening of Statutory Drought Plan

All of the DP measures have been screened and the assessment findings are presented in **Tables 3.1 - 3.6**. The tables show that all the supply augmentation and drought permit measures are assessed as being likely to have a significant effect on the qualifying features of at least one European site through indirect effects.

Table 3-1: Screening of R24R Well supply augmentation measure for impacts on European Sites

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
R24R Well	Mendip Woodlands SAC (1.5km)	**9180 Tilio-Acerion forests of slopes, screes and ravines** Mendip Woodlands in south-west England is a relatively extensive example of Tilio-Acerion forests on limestone. It is a cluster of three ash-dominated woods on Carboniferous limestone. A rich variety of other trees and shrubs are present, including elm *Ulmus* spp. and, locally, small-leaved lime *Tilia cordata*. At Ebbor Gorge elm rather than lime is mixed with ash *Fraxinus excelsior* in a steep-sided gorge; at both Rodney Stoke and Cheddar Wood lime and ash are found on rocky slopes with patches of deeper soil between the outcrops. Ferns characteristic of this woodland type, such as hart's-tongue *Phyllitis scolopendrium* and shield-ferns *Polystichum* spp., are common. The site is in the centre of the range of common dormouse *Muscardinus avellanarius* and holds a large population of this species.	Construction This measure would involve the construction of a new pumping station at the R24R Well site and the construction of a new 300mm diameter pipeline over a distance of 4.2km. The Mendip Woodlands SAC site is approximately 1.5km from the construction area. Direct or indirect construction effects are considered unlikely given the distance of the works to the site and intervening habitats. Operation The SAC qualifying features are not water dependent.	No	No	No
	North Somerset and Mendip Bats SAC (2.9km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates** The Cheddar complex and Wookey Hole areas support a wide range of semi-natural	Construction The SAC is approximately 2.9km from likely construction area but indirect construction effects are possible given the construction route lies within a Bat Consultation Zone for horseshoe bats, in	Yes	N/A	N/A

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		habitats including semi-natural dry grasslands. **9180 Tilio-Acerion forests of slopes, screes and ravines** The main block of *Tilio-Acerion* forest at Kings and Urchin's Wood has developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east. **1303 Lesser horseshoe bat** *Rhinolophus hipposideros* The limestone caves of the Mendips provide a range of important hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* and 1,304 greater horseshoe bat *Rhinolophus ferrumequinum*. **1304 Greater horseshoe bat** *Rhinolophus ferrumequinum* This site in south-west England is selected on the basis of the size of population represented (3% of the UK greater horseshoe bat *Rhinolophus ferrumequinum* population) and its good conservation of structure and function, having both maternity and hibernation sites. This site contains an exceptionally	respect of impacts to key offsite foraging habitat[16]. The construction of the pipeline could result in direct, temporary loss of key offsite foraging habitat and potentially sever commuting routes. The horseshoe bat species are potentially vulnerable to construction impacts associated with the pipeline element of the option. This relates to habitat fragmentation resulting from the removal of sections of linear features (hedgerows, ditches or woodland edges, for example) that bats use for navigation and commuting between roosting and foraging areas, and also temporary loss of foraging habitat during construction. Linear features are typically hedgerows, woodland and woodland edges. <u>Operation</u> Wetland habitat provides suitable foraging habitat for bats. The abstraction point lies on the edge of Zone B of a Bat Consultation Zone for horseshoe bats[16] in respect of impacts to key foraging habitat. Alterations to groundwater regime in extent or duration could alter the extent and quality of foraging habitat and have a likely			

[16] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.	significant effect on foraging success and survival. Further information is needed on whether the hydrological changes could affect the extent and quality of wetland habitats and the duration/time of year this would be effective in order to assess the potential effects on foraging success.			
	Mendip Limestone Grasslands SAC (6.8km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)** **T**his site comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips. **4030 European dry heaths** Occurs on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. **8310 Caves not open to the public**	<u>Construction</u> The site is approximately 6.8km from the likely construction area. There will be no direct effects and indirect construction effects on the grassland are very unlikely. Greater horseshoe bat species are potentially vulnerable to construction impacts. This relates to habitat fragmentation resulting from the removal of sections of linear features that bats use for navigation and commuting between roosting and foraging areas, and also loss of foraging habitat during construction. The pipeline route lies within zones A, B and C of a Bat Consultation Zone for horseshoe bat. Construction within this zone has potential to result in direct, temporary loss of key foraging habitat and potentially	Yes	N/A	N/A

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species **9180 *Tilio-Acerion* forests of slopes, screes and ravines** Tilio-Acerion ravine forests are woods of ash *Fraxinus excelsior,* wych elm *Ulmus glabra* and lime (mainly small-leaved lime *Tilia cordata* but more rarely large-leaved lime *T. platyphyllos*). It is found on calcareous substrates associated with coarse scree, cliffs, steep rocky slopes and ravines, where inaccessibility has reduced human impact. **1304 Greater horseshoe bat** The greater horseshoe bat is one of the largest bats in the UK. During the summer, they form maternity colonies, generally in large old buildings, and forage in pasture, edges of mixed deciduous woodland and hedgerows. In winter they depend on caves, abandoned mines and other underground sites for undisturbed hibernation. A system or series of sites is required. Summer and winter roosts are usually less than 20-30 km apart. The bats are vulnerable to the loss of insect food supplies due to insecticide use, changing	sever commuting routes, such as hedgerows, ditches/rhynes and impact on foraging success. <u>Operation</u> Owing to the distance of the abstraction from the SAC and lack of hydrological connectivity, direct operational impacts on habitats are probably unlikely but this is currently uncertain. Wetland habitats provide foraging habitat for bats. The abstraction has potential to alter wetland habitats and the food resource they provide for bats within a Bat Consultation Zone Band C for horseshoe bats. Further information is required on the hydrological effects of the scheme, regarding likely alterations to wetland habitats from abstraction.			

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		farming practices and the loss of broad-leaved tree-cover, and to the loss or disturbance of underground roost sites.				
	Somerset Levels and Moors SPA and Ramsar (12km)	**Article 4.1** **Over winter, the area supports:** Bewick's swan *Cygnus columbianus bewickii,* golden plover *Pluvialis apricaria.* **Article 4.2** **Over winter, the area supports:** shoveler *Anas clypeata,* seal *Anas crecca,* wigeon *Anas Penelope,* snipe *Gallinago gallinago*, lapwing *Vanellus vanellus*, pintail *Anas acuta*, gadwall *Anas strepera*, Bewick's swan *Cygnus columbianus bewickii*, and whimbrel *Numenius phaeopus*. **Ramsar Criterion 2** Supports 17 species of British Red Data Book invertebrates. **Ramsar Criterion 5** Assemblages of international importance – species with peak counts in winter: 97,155 waterfowl (5-year peak mean) **Ramsar Criterion 6**	Construction Distance from the site (12km) makes it unlikely that construction effects will have a significant direct effect on this site, although some of the interest features (including teal and shoveler) are known to roost on the Cheddar Reservoir but feed elsewhere on the Somerset Levels. Other migrant waders (e.g. golden plover, lapwing) are also known to use the reservoir as a feeding station when on passage. It is therefore possible that the construction of the new R24R Well pipeline may affect some of the SPA species when they are using the reservoir as the pipeline construction route is situated 600m from the Cheddar Reservoir at its nearest point. Further assessment is required on the potential disturbance impacts to offsite supporting habitat. Operation Site not hydrologically linked to the source or its tributaries / distributaries and therefore no LSE due to operation.	Yes	N/A	N/A

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Species/populations occurring at levels of international importance: tundra swan, *Cygnus columbianus bewickii* – 112 individuals, representing an average of 1.3% of the GB population (5-year peak mean)				
	Severn Estuary SAC, SPA, Ramsar (52km)	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets, comprising clean sands, muddy sands and muds. **1330 Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing	<u>Construction</u> Distance from the site (52km) makes it unlikely that construction effects will have a significant direct effect on this site. <u>Operation</u> Owing to the distance of the abstraction from the SAC direct operational impacts on habitats are probably unlikely but this is currently uncertain. The River Axe provides functionally link habitats for protected fish species. Further information is required on the hydrological effects of the scheme, regarding likely alterations to aquatic habitats from abstraction. Fisheries surveys reported the presence of migratory fish including Atlantic salmon, brown/sea trout and European eel. Atlantic salmon, sea trout and European eel are featured within the Severn Estuary SAC and/or Ramsar site designation. Therefore, there is a potential for hydrological impacts that could significantly affect the designated	Yes - SAC and Ramsar site No - SPA	N/A	N/A

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus* Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. **1099 River lamprey** *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters,	migratory fish species (i.e. quality of river habitat) affecting survival and spawning success. Further assessments and mitigation considerations are required.			

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax* Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall, greater white-fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1** Due to immense tidal range affecting both the physical environment and biological communities.				

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Criterion 3 Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5** Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8** The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded.				

Table 3-2: Screening of Demand Management Measures for Impacts on European Sites

Option	Description	Further HRA Assessment Required?
Appeals for restraint	None – appeals for constraint includes increased water efficiency messages via increased customer communications. No impacts on designated sites are anticipated, other than to acknowledge that decreased consumer demand will have a net positive effect in combination with existing abstraction and/or drought management measures that have the potential to impact European sites due to reduced pressure on water resources and reduced abstraction at source.	No
Temporary Use Bans	None – the restrictions on consumer water use are demand management measures and as such, are not anticipated to have impacts on European sites. It is acknowledged that decreased consumer demand will have a net positive effect in combination with existing abstraction and/or drought management measures that have the potential to impact European sites, due to reduced pressure on water resources and reduced abstraction at source.	No
Non-Essential Use	None – a non-essential use ban and its components are demand management measures and as such are not anticipated to have impacts on European sites. It is acknowledged that decreased consumer demand will have a net positive effect in combination with existing abstraction and/or drought management measures that have the potential to impact European sites due to reduced pressure on water resources and reduced abstraction at source.	No

Table 3-3: Screening of Pre-existing Drought Permits for Impacts on European Sites

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
Blagdon Reservoir Reduced Compensation Flow	North Somerset and Mendip Bats SAC (6.2km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates** The Cheddar complex and Wookey Hole areas support a wide range of semi-natural habitats including semi-natural dry grasslands. **9180 Tilio-Acerion forests of slopes, screes and ravines** The main block of *Tilio-Acerion* forest at Kings and Urchin's Wood has developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east. **1303 Lesser horseshoe bat** *Rhinolophus hipposideros* The limestone caves of the Mendips provide a range of important hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* and 1,304 greater horseshoe bat *Rhinolophus ferrumequinum*. **1304 Greater horseshoe bat** *Rhinolophus ferrumequinum* This site in south-west England is selected on the basis of the size of population represented (3% of the UK greater horseshoe bat *Rhinolophus ferrumequinum* population) and its good conservation of structure and	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> Wetland habitat provides suitable foraging habitat for bats. The SAC lies within Zone C of the Bat Consultation Zone and therefore, impacts are possible due to the importance of these zones for foraging bats. Alterations to the hydrological regime in extent or duration could alter the extent and quality of foraging habitat and have a likely significant effect on foraging success and survival. The hydrological assessment identified three impacted reaches of the Congresbury Yeo, from the Blagdon Reservoir compensation release point to the tidal limit at Woodspring Bay. Impacts reduce with distance downstream of the reservoir as the reduction in the compensation flow is ameliorated by additional flow inputs from the intervening catchment area and tributary inflows. The assessment for the EARs concludes a minor negative impact on	Yes	No	No

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		function, having both maternity and hibernation sites. This site contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.	wetland/rhyne/ditch habitat quality in the downstream reaches within the hydrological zone of Influence (ZoI) of the drought permit. Therefore, there are LSE on foraging habitat within the ZoI. Drought permits are 6 months duration, which is unlikely to alter the habitat and foraging resource and would only create an adverse effect if implemented in multiple years. Impacts of the drought permit on water levels in Blagdon Reservoir are assessed as minor beneficial, with water levels being held higher for longer. No likely significant effects on the wetland habitats of Blagdon Reservoir are anticipated.			
	Chew Valley Lake SPA (8km)	**Article 4.2** **Over winter, the area supports:** Shoveler *Anas clypeata*, 503 individuals representing up to 1.3% of the wintering North-western/Central Europe population (5 year peak mean)	Construction There is no construction phase associated with this drought permit. Operation The drought permit involves a reduction in the compensation flow release from Blagdon Reservoir. The Chew Valley Lake SPA, although relatively close, is within a	No	No	No

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
			different catchment with no hydrological connectivity.			
	Severn Estuary SAC, SPA, Ramsar (22km)	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets, comprising clean sands, muddy sands and muds. **1330 Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> The drought permit involves a reduction in the compensation flow release from Blagdon Reservoir to the Congresbury Yeo. There would be an associated impact on the flow/level regime in the Congresbury Yeo downstream of the Reservoir. The zone of hydrological influence includes 6km of the Congresbury Yeo from Blagdon Reservoir outfall to Iwood gauging station. The hydrological assessment identified that at Iwood gauging station low flow (Q95) was recorded as 17.0Ml/d and that a 4Ml/d reduction would be a loss of 24% of flow (to a value similar to Q99). In moderate and high flow periods, the hydrology impacts would be negligible.	Yes - SAC and Ramsar site No - SPA	N/A	N/A

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus* Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes.	Three hydrological impacted reaches have been identified within the River Yeo: • Reach 1: River Yeo from Blagdon Reservoir compensation release point to Rickford Stream. • Reach 2: River Yeo from Rickford Stream to EA gauging station at Iwood. • Reach 3: River Yeo from EA gauging station at Iwood to tidal limit at Woodspring Bay. Downstream of the Iwood gauging station, the Congresbury Yeo is level controlled and therefore any potential hydrology impacts during low flow periods would be restricted to potential minor changes in water velocity (wetted depth and wetted width are controlled by local in-river control structures), and this potential effect could extend downstream to the confluence with the Severn Estuary (12km downstream of Iwood gauging station). In the reach from Iwood to the Severn Estuary, the gradient is very low, the water level is managed, and the channel significantly modified by weirs, bridges and local bank engineering. Fisheries surveys completed in 2018[17] reported the presence of migratory fish			

[17] Bristol Water Plc (2019) Blagdon Reservoir Drought Permit Environmental Assessment. Report by Ricardo, October 2019.

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		1099 River lamprey *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters, estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax* Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall, greater white-fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1**	including brown/sea trout and European eel within reach 1, and brook/river lamprey within reach 2. Sea trout, eel and river lamprey are featured within the Severn Estuary SAC and/or Ramsar site designation. The 2019 EAR identified the significance of impact as major for brown/sea trout, and moderate for river/sea lamprey and European eel. Therefore, there is a potential for hydrological impacts that could significantly affect the designated migratory fish species (i.e. quality of river habitat) affecting survival and spawning success. Further assessments and mitigation considerations are required.			

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Due to immense tidal range affecting both the physical environment and biological communities. **Criterion 3** Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5** Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8** The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded.				

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
Chew Valley Reservoir Reduced Compensation Flow	North Somerset and Mendip Bats SAC (9km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates** The Cheddar complex and Wookey Hole areas support a wide range of semi-natural habitats including semi-natural dry grasslands. **9180 Tilio-Acerion forests of slopes, screes and ravines** The main block of *Tilio-Acerion* forest at Kings and Urchin's Wood has developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east. **1303 Lesser horseshoe bat** *Rhinolophus hipposideros* The limestone caves of the Mendips provide a range of important hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* and 1,304 greater horseshoe bat *Rhinolophus ferrumequinum*. **1304 Greater horseshoe bat** *Rhinolophus ferrumequinum* This site in south-west England is selected on the basis of the size of population represented (3% of the UK greater horseshoe bat *Rhinolophus ferrumequinum* population) and	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> Wetland habitat provides suitable foraging habitat for bats. Alterations to the hydrological regime in extent or duration could alter the extent and quality of foraging habitat and have a likely significant effect on foraging success and survival. The drought permit hydrological effects lie outside of the Bat Consultation Zone[18] and therefore, impacts are highly unlikely. The drought permit will result in water levels in Chew Valley Reservoir being maintained for longer than would have been the case in drought conditions without the drought permit in place. In operation, any effects on the interest features resulting from the drought permit would be beneficial.	No	No	No

[18] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018.

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		its good conservation of structure and function, having both maternity and hibernation sites. This site contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.				
	Chew Valley Lake SPA	**Article 4.2** **Over winter, the area supports:** shoveler *Anas clypeata*, 503 individuals representing up to 1.3% of the wintering North-western/Central Europe population (5 year peak mean)	Construction There is no construction phase associated with this drought permit. Operation The drought permit will result in water levels in Chew Valley Reservoir being maintained for longer than would have been the case in drought conditions without the drought permit in place. In operation, any effects on the interest features resulting from the drought permit would be beneficial.	No	No	No
	Severn Estuary	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent	Construction	Yes – SAC and	N/A	N/A

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
	SAC, SPA, Ramsar (20.2km)	mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets, comprising clean sands, muddy sands and muds. **1330 Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below	There is no construction phase associated with this drought permit. <u>Operation</u> The drought permit will result in water levels in Chew Valley Reservoir) being maintained for longer than would have been the case in drought conditions without the drought permit in place. The summer (May to November) and winter (December to April) the drought permit would result in a decrease in flow by approximately 50% in the River Chew, a tributary of the River Avon. Lower river flows could reduce habitat availability and migration connectivity. Lower river flows may increase the stranding of animals and increase the risk of predation in addition to impacting the water quality. Fish spawning sites can also be impacted from siltation and reduction in water quality, which could impact on future recruitment. As set out in the 2019 EAR[19], the hydrological zone of influence is delimited by the River Chew confluence with the River Avon (17km from Chew Valley Reservoir) at	Ramsar site No - SPA		

[19] Bristol Water Plc (2019) Chew Valley Reservoir Drought Permit Environmental Assessment – Appendix B. Report by Ricardo, October 2019.

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus* Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. **1099 River lamprey** *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters, estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax*	which point the reduction in flow is negligible due to the overwhelmingly large catchment area of the River Avon at this point. The 2019 EAR[20] identified that implementation of the drought permit would result in a major-moderate impact on flows in the River Chew. Three hydrological impacted reaches have been identified within the River Chew: • Reach 1: River Chew from Chew Valley Reservoir compensation release point to Winford Brook confluence. • Reach 2: River Chew from Winford Brook confluence to EA gauging station at Compton Dando. • Reach 3: River Chew from EA gauging station at Compton Dando to River Avon confluence. Fisheries surveys completed in 2018 reported the presence of migratory fish including brown/sea trout, Atlantic salmon, river lamprey and European eel some of which are featured within the Severn Estuary SAC and/or Ramsar site designation. The 2019 EAR identified the significance of impact as major for and			

[20] Bristol Water Plc (2019). Chew Valley Reservoir Drought Permit Environmental Assessment. Report by Ricardo, October 2019.

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall, greater white-fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1** Due to immense tidal range affecting both the physical environment and biological communities. **Criterion 3** Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*,	Atlantic salmon, and moderate for brown/sea trout, river/sea lamprey and European eel. Therefore, there is a potential for hydrological impacts that could significantly affect designated migratory fish species (i.e. quality of river habitat) affecting survival and spawning success. Further assessments and mitigation considerations are required.			

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5** Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8** The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded				
Cheddar Reservoir Reduced Prescribed Flow in Cheddar Yeo	Mendip Woodlands SAC (2km)	**9180 Tilio-Acerion forests of slopes, screes and ravines** Mendip Woodlands in south-west England is a relatively extensive example of Tilio-Acerion forests on limestone. It is a cluster of three ash-dominated woods on Carboniferous limestone. A rich variety of other trees and shrubs are present, including elm *Ulmus* spp. and, locally, small-leaved lime *Tilia cordata*. At Ebbor Gorge, elm rather than lime is mixed with ash *Fraxinus excelsior* in a steep-sided gorge; at both Rodney Stoke and Cheddar Wood lime and ash are found on rocky slopes	Construction There is no construction phase associated with this drought permit. Operation Features are not water dependant or water sensitive and the site will not be directly or indirectly affected by operation of the drought permit.	No	No	No

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		with patches of deeper soil between the outcrops. Ferns characteristic of this woodland type, such as hart's-tongue *Phyllitis scolopendrium* and shield-ferns *Polystichum* spp., are common. The site is in the centre of the range of common dormouse *Muscardinus avellanarius* and holds a large population of this species.				
	North Somerset and Mendip Bats SAC (2.5km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates** The Cheddar complex and Wookey Hole areas support a wide range of semi-natural habitats including semi-natural dry grasslands. **9180 Tilio-Acerion forests of slopes, screes and ravines** The main block of *Tilio-Acerion* forest at Kings and Urchin's Wood has developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east. **1303 Lesser horseshoe bat** *Rhinolophus hipposideros* The limestone caves of the Mendips provide a range of important hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* and 1,304 greater horseshoe bat *Rhinolophus ferrumequinum*.	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> Wetland habitat provides suitable foraging habitat for bats. Alterations to hydrological regime in extent or duration could alter the extent and quality of foraging habitat and have a likely significant effect on foraging success and survival The drought permit may impact river flows within Zone A and B of the Bat Consultation Zone and therefore, impacts are possible due to the importance of these zones for foraging bats. The drought permit would involve a 50% reduction in the prescribed flow discharged to the Cheddar Yeo (reduced to 3.4Ml/d) during the period 1 December to 14 May.	No	No	No

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		1304 Greater horseshoe bat *Rhinolophus ferrumequinum* This site in south-west England is selected on the basis of the size of population represented (3% of the UK greater horseshoe bat *Rhinolophus ferrumequinum* population) and its good conservation of structure and function, having both maternity and hibernation sites. This site contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.	This is predominantly during the hibernation season for bats. There would be an associated impact on the flow/level regime in the Cheddar Yeo downstream. The zone of hydrological influence includes 3km of the Cheddar Yeo from Cheddar Reservoir intake, with reducing scale of impact downstream to around Hythe where the effects would be largely ameliorated. Much of the Cheddar Yeo and the wider catchment is water level controlled, which is likely to negate any effects on wetland habitats and availability of food. The impacts are therefore assessed as unlikely to be significant.			
	Mendip Limestone Grasslands SAC (3.5km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)** **T**his site comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips. ***4030*** **European dry heaths**	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> The river flow impacts of the drought permit as described above for North Somerset and Mendips Bat SAC means there is no likely significant effect on this SAC.	No	No	No

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Occurs on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. ***8310* Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species ***9180 Tilio-Acerion* forests of slopes, screes and ravines** Tilio-Acerion ravine forests are woods of ash *Fraxinus excelsior,* wych elm *Ulmus glabra* and lime (mainly small-leaved lime *Tilia cordata* but more rarely large-leaved lime *T. platyphyllos*). It is found on calcareous substrates associated with coarse scree, cliffs, steep rocky slopes and ravines, where inaccessibility has reduced human impact. **1304 Greater horseshoe bat** The greater horseshoe bat is one of the largest bats in the UK. During the summer, they form maternity colonies, generally in large old buildings, and forage in pasture, edges of mixed deciduous woodland and hedgerows. In winter, they depend on caves,				

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		abandoned mines and other underground sites for undisturbed hibernation. A system or series of sites is required. Summer and winter roosts are usually less than 20-30 km apart. The bats are vulnerable to the loss of insect food supplies due to insecticide use, changing farming practices and the loss of broad-leaved tree-cover, and to the loss or disturbance of underground roost sites.				
	Severn Estuary SAC, SPA, Ramsar (16.2km)	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets, comprising clean sands, muddy sands and muds.	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> The drought permit would involve a 50% reduction in the prescribed flow discharged to the Cheddar Yeo (reduced to 3.4Ml/d) during the period 1 December to 14 May. There would be an associated impact on the flow regime in the Cheddar Yeo downstream. As set out in the 2019 EAR[21], the hydrological zone of influence is delimited by the downstream tidal limit at Brean Cross Sluice, where the influence of the drought permit becomes negligible, and includes the	Yes – Ramsar site No – SAC and SPA	N/A	N/A

[21] Bristol Water Plc (2019) Cheddar Ponds Drought Permit Environmental Assessment – Appendix B. Report by Ricardo, November 2019.

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus*	River Yeo and the River Axe for 19km from Cheddar Reservoir. Within the zone of influence, the magnitude of influence of the hydrological conditions of the downstream river diminishes with distance downstream, with a decreasing effect on the wetted width, wetted depth and flow velocity affecting in-channel habitat availability and quality. Downstream of Hythe, the river is level-controlled, although there may be the potential for some effects (water velocity) to extend downstream to the confluence of the Cheddar Yeo and the River Axe. The River Axe is a significantly larger, level-controlled river at its confluence with the Cheddar Yeo, where the hydrological zone of influence is considered to end. The Severn Estuary SAC, SPA and Ramsar is 14km downstream from this point. The 2019 EAR[22] identified that implementation of the drought permit would result in a major-moderate impact on flows in the River Yeo. Three impacted hydrological reaches have been identified within the zone of influence:			

[22] Bristol Water Plc (2019). Cheddar Ponds Drought Permit Environmental Assessment. Report by Ricardo, November 2019.

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. **1099 River lamprey** *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters, estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax* Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall, greater white-	• Reach 1: River Yeo from Cheddar Ponds intake to Hythe. • Reach 2: River Yeo from Hythe to the River Axe confluence. • Reach 3: River Axe from River Yeo confluence to tidal limit at Brean Cross Sluice (tidal lock). Fisheries surveys completed in 2018 reported the presence of migratory fish including brown/sea trout, Atlantic salmon and European eel, some of which are featured within the Severn Estuary Ramsar site designation. The 2019 EAR identified the significance of impact as major for brown/sea trout and Atlantic salmon (within reach 1), and minor for European eel. Therefore, there is a potential for hydrological impacts that could significantly affect some Ramsar designated migratory fish species (i.e. quality of river habitat) affecting survival and spawning success. Further assessments and mitigation considerations are required.			

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1** Due to immense tidal range affecting both the physical environment and biological communities. **Criterion 3** Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5** Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8**				

Option	European Site	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded				

Table 3-4: Screening of P08R drought permit for impacts on European Sites

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
P08R abstraction	Severn Estuary SAC, SPA, Ramsar (17km)	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and bays in the UK but also occur extensively	The nearest designated site is the Severn Estuary SPA, which lies 17km downstream of the P08R abstraction point. <u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> The operation of the P08R option is likely to lower water level and flow within the Ozleworth Brook from its source to the confluence with the River Little Avon, and	Yes – SAC and Ramsar site No - SPA	N/A	N/A

		along the open coast and in lagoonal inlets, comprising clean sands, muddy sands and muds. **1330 Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus* Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. **1099 River lamprey** *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters, estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial	then within the Little Avon to the tidal sluice (tidal limit) due to a reduction in groundwater contribution due to the increased abstraction. There is potential for hydrology impacts on water velocity, wetted depth and wetted width and this potential effect could extend downstream towards the confluence with the Severn Estuary (17km downstream). These hydrological impacts could affect the quality of habitat for some of the migratory fish species designated under the Severn Estuary SAC and/or Ramsar site and supporting habitat upstream effecting survival and spawning success. Further detail is required to fully assess the effects (Zone of Influence) downstream on designated aquatic migratory species (i.e. European eel, sea trout and river lamprey previously recorded within the Little Avon catchment). Overwintering birds are dependent on coastal marshes, tidal flats and open water. There will be no direct impacts to these habitats. Hydrological impacts will stop at the tidal reach and therefore, there will be no impacts to overwintering birds and therefore to the SPA. The SPA habitat qualifying features are intertidal and will not be affected.			

		obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax* Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall, greater white-fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1** Due to immense tidal range affecting both the physical environment and biological communities. **Criterion 3** Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5**			

		Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8** The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded				

Table 3-5: Screening of P05R Well drought permit for impacts on European Sites

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
P05R Well abstraction	North Somerset and Mendip Bats SAC (2.9km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates** The Cheddar complex and Wookey Hole areas support a wide range of semi-natural habitats including semi-natural dry grasslands. **9180 Tilio-Acerion forests of slopes, screes and ravines** The main block of *Tilio-Acerion* forest at Kings and Urchin's Wood has developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east.	Construction There is no construction phase associated with this drought permit. Operation The SAC is approximately 2.9km from the proposed point of abstraction, however habitats surrounding the SAC provide supporting habitat (functionally-linked). The abstraction point lies within Zone A of a Bat	Yes	N/A	N/A

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		1303 Lesser horseshoe bat *Rhinolophus hipposideros* The limestone caves of the Mendips provide a range of important hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* (and greater horseshoe bat *Rhinolophus ferrumequinum*. – see below). **1304 Greater horseshoe bat *Rhinolophus ferrumequinum*** This SAC in south-west England is selected on the basis of the size of population represented (3% of the UK greater horseshoe bat population) and its good conservation of structure and function, having both maternity and hibernation sites. This SAC contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.	Consultation Zone for horseshoe bats[23] but outside of the Juvenile Sustenance Zone. The abstraction has potential to alter wetland habitats within its vicinity that provide suitable foraging habitat for horseshoe bats. Tipulid larval development is favoured by damp conditions and provides a secondary prey source at times when their primary sources are less abundant. Therefore, any aquatic environments and/or marshes can provide a secondary prey source. Aquatic environments could also favour the production of caddis flies in certain months, such as May and late August / September when other food supplies may be erratic[24]. Therefore, alterations to the hydrological regime in extent or duration could alter the extent and quality of bat foraging habitat and have a likely significant effect on foraging success and survival. Further information on the likely hydrological effects of the drought permit is required, specifically likely alterations to wetland habitats from the increased abstraction.			

[23] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018.
[24] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018.

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
	Avon Gorge Woodland SAC (9.8km)	**9180 Tilio-Acerion forests of slopes, screes and ravines** On the limestone cliffs and screes of a large river gorge. Important for small-leaved lime *Tilia cordata* and rare whitebeams *Sorbus* spp. **6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites).** Festuco-Brometalia grasslands are found on thin, well-drained, lime-rich soils associated with chalk and limestone. They occur predominantly at low to moderate altitudes in England and support a large number of rare plants and noteworthy invertebrates.	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> Features are not water dependant or sensitive and the SAC will not be directly or indirectly affected by operation.	No	No	No
	Severn Estuary SAC, SPA, Ramsar (7.3km)	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets,	The Severn Estuary sites lie 7.3km downstream of the P05R Well abstraction point. Abstracted water would otherwise discharge into the River Kenn, then into the River Severn Estuary. <u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> Increased abstraction from P05R Well would impact on the flow/level regime downstream on the River Kenn.	Yes – Ramsar site No – SAC and SPA	N/A	N/A

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		comprising clean sands, muddy sands and muds. **1330 Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus* Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea	There is potential for hydrology impacts to water velocity, wetted depth and wetted width and this potential effect could extend downstream towards the confluence with the Severn Estuary (7.3km downstream). These hydrological impacts could affect the quality of the riverine habitat for the Ramsar designated migratory European eel in the River Kenn. Overwintering birds are dependent on coastal marshes, tidal flats and open water. There will be no direct impacts to these habitats. Hydrological impacts will stop at the tidal reach and therefore, there will be no impacts to overwintering birds. The habitat qualifying features are intertidal and will not be affected. There are therefore no identified impacts on the SPA and no likely significant effects on the SPA. No impacts to the SAC features are identified and no likely significant effects on the SAC.			

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. **1099 River lamprey** *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters, estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax* Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall, greater white-fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1**				

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?
		Due to immense tidal range affecting both the physical environment and biological communities. **Criterion 3** Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5** Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8** The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded				

Table 3-6: Screening of River Axe drought permit for impacts on European Sites

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
River Axe abstraction	North Somerset and Mendip Bats SAC (4.2km)	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates** The Cheddar complex and Wookey Hole areas support a wide range of semi-natural habitats including semi-natural dry grasslands. **9180 Tilio-Acerion forests of slopes, screes and ravines** The main block of *Tilio-Acerion* forest at Kings and Urchin's Wood has developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east. **1303 Lesser horseshoe bat *Rhinolophus hipposideros*** The limestone caves of the Mendips provide a range of important hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* (and greater horseshoe bat *Rhinolophus ferrumequinum*. – see below). **1304 Greater horseshoe bat *Rhinolophus ferrumequinum*** Construction There is no construction phase associated with this drought permit. Operation The SAC is approximately 6.2km from the proposed point of abstraction; however, habitats surrounding the SAC provide supporting habitat (functionally-linked land). The abstraction point lies on the edge of Zone B of a Bat Consultation Zone for horseshoe bats[25] in respect of impacts to key foraging habitat, but outside of the Juvenile Sustenance Zone. The abstraction has potential to alter wetland habitats within its vicinity, which provide suitable foraging habitat for horseshoe bats. Tipulid larval development is favoured by damp conditions and provides a secondary prey source at times when their primary sources are less abundant. Therefore, any aquatic environments and/or marshes can provide a secondary prey source. Aquatic environments could also favour the production of caddis flies in certain months, such as May and late	Yes	N/A	N/A

[25] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018.

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		This SAC in south-west England is selected on the basis of the size of population represented (3% of the UK greater horseshoe bat population) and its good conservation of structure and function, having both maternity and hibernation sites. This SAC contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species.	August / September when other food supplies may be erratic[26]. Therefore, alterations to the hydrological regime in extent or duration could alter the extent and quality of foraging habitat and have a likely significant effect on foraging success and survival. Further information on the likely hydrological effects of the drought permit is required, specifically likely alterations to wetland habitats from the increased abstraction.			
	Severn Estuary SAC, SPA, Ramsar (16km)	**1130 Estuaries** Habitat occurrence description not yet available. Comprises an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. **1140 Mudflats and sandflats not covered by seawater at low tide.** Habitat occurrence description not yet available. A major component of 1130 Estuaries and 1160 Large shallow inlets and	The Severn Estuary sites lie 16km downstream of the River Axe abstraction point. <u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> The drought permit involves an extension to the period of abstraction from the River Axe to include May and October. There	Yes – Ramsar site No – SAC and SPA	N/A	N/A

[26] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018.

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		bays in the UK but also occur extensively along the open coast and in lagoonal inlets, comprising clean sands, muddy sands and muds. **1330 Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) Habitat occurrence description not yet available. Forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented. **1110 Sandbanks which are slightly covered by sea water all the time** consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). **1170 Reefs** Rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. **1095 Sea lamprey** *Petromyzon marinus*	would be an impact on the flow/level regime downstream of the abstraction point in the River Axe in these two months. There is potential for hydrology impacts in water velocity, wetted depth and wetted width within the river, and this potential effect could extend downstream towards the confluence with the Severn Estuary (16km downstream). These hydrological impacts could affect the quality of the river habitat for Ramsar designated migratory European eel from the Severn Estuary and supporting habitat upstream effecting survival and spawning success. Further details are required on this drought permit to fully assess its effects (zone of Influence) downstream on migratory eel. Overwintering birds are dependent on coastal marshes, tidal flats and open water. There will be no direct impacts to these habitats. Hydrological impacts will stop at the tidal reach and therefore, there will be no impacts to overwintering birds. The habitat qualifying features are intertidal and will not be affected. There are therefore no identified impacts on the SPA and no likely significant effects on the SPA.			

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		Species occurrence description not yet available. It occurs in estuaries and easily accessible rivers and is anadromous. Sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. **1099 River lamprey** *Lampetra fluviatilis* Species occurrence description not yet available. Found in coastal waters, estuaries and accessible rivers. The species is normally anadromous, and pollution or artificial obstacles such as weirs or dams impede migration. **1103 Twaite shad** *Alosa fallax* Species occurrence description not yet available. This species returns from the sea to spawn in spring, usually between April and June. The habitat requirements of twaite shad are not fully understood but it is known to spawn in rivers in the England/Wale border that flow into the Severn Estuary. **Article 4.1** **Over winter the area supports:** Bewick's Swan *Cygnus columbianus bewickii*, **Article 4.2** Over winter the area supports approximately 84,300 of birds with gadwall,	No impacts to the SAC features are identified and no likely significant effects on the SAC.			

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		greater white-fronted goose, dunlin, common shelduck and common redshank present. **Criterion 1** Due to immense tidal range affecting both the physical environment and biological communities. **Criterion 3** Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4** Migratory fish Including salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla*. **Criterion 5** Assemblages of international importance – Species with peak counts in winter: 70919 waterfowl (5 year peak mean) **Criterion 6** Species/populations occurring at levels of international importance as listed in Article 4.2. **Criterion 8**				

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		The fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded				
	Mendip Woodlands SAC (2.9km)	**9180 Tilio-Acerion forests of slopes, screes and ravines –** Mendip Woodlands SAC in south-west England is a relatively extensive example of Tilio-Acerion forests on limestone. It is a cluster of three ash-dominated woods on Carboniferous limestone. A rich variety of other trees and shrubs are present, including elm *Ulmus* spp. and, locally, small-leaved lime *Tilia cordata*. At Ebbor Gorge, elm rather than lime is mixed with ash *Fraxinus excelsior* in a steep-sided gorge. At both Rodney Stoke and Cheddar Wood, lime and ash are found on rocky slopes with patches of deeper soil between the outcrops. Ferns characteristic of this woodland type, such as hart's-tongue *Phyllitis scolopendrium* and shield-ferns *Polystichum* spp., are common. The site is in the centre of the range of common dormouse *Muscardinus avellanarius* and holds a large population of this species.	Construction There is no construction phase associated with this drought permit. Operation Qualifying features are not water dependant or sensitive and the site will not be directly or indirectly affected by operation of the drought permit.	No	No	No
	Mendip Limestone	**6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)** This site comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips.	Construction There is no construction phase associated with this drought permit. Operation	Yes	N/A	N/A

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
	Grasslands SAC (2km)	**4030 European dry heaths** Occurs on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. **8310 Caves not open to the public** Natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species or support important populations of Annex II species **9180 *Tilio-Acerion* forests of slopes, screes and ravines** Tilio-Acerion ravine forests are woods of ash *Fraxinus excelsior,* wych elm *Ulmus glabra* and lime (mainly small-leaved lime *Tilia cordata* but more rarely large-leaved lime *T. platyphyllos*). It is found on calcareous substrates associated with coarse scree, cliffs, steep rocky slopes and ravines, where inaccessibility has reduced human impact. **1304 Greater horseshoe bat** The greater horseshoe bat is one of the largest bats in the UK. During the summer,	The assessment of likely significant effects is the same as for the North Somerset and Mendip Bats SAC. The increased abstraction period has the potential to alter wetland habitats and the food resource they provide for bats within a Bat Consultation Zone for horseshoe bats. Further information is required on the hydrological effects of the drought permit regarding likely alterations to wetland habitats from the increased abstraction period.			

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		they form maternity colonies, generally in large old buildings, and forage in pasture, edges of mixed deciduous woodland and hedgerows. In winter they depend on caves, abandoned mines and other underground sites for undisturbed hibernation. A system or series of sites is required. Summer and winter roosts are usually less than 20-30 km apart. The bats are vulnerable to the loss of insect food supplies due to insecticide use, changing farming practices and the loss of broad-leaved tree-cover, and to the loss or disturbance of underground roost sites.				
	Somerset levels SPA/Ramsar (6.5km)	**Article 4.1** Over winter, the area supports: Bewick's swan *Cygnus columbianus bewickii*, golden plover *Pluvialis apricaria*. **Article 4.2** Over winter the area supports: shoveler *Anas clypeata*, teal *Anas crecca*, wigeon *Anas Penelope*, snipe *Gallinago gallinago*, lapwing *Vanellus vanellus*, pintail *Anas acuta*, gadwall *Anas strepera*, golden plover, Bewick's swan, whimbrel *Numenius phaeopus*. **Ramsar Criterion 2** Supports 17 species of British Red Data Book invertebrates.	<u>Construction</u> There is no construction phase associated with this drought permit. <u>Operation</u> The site lies downstream of the Somerset Levels SPA/Ramsar and therefore will not be directly or indirectly affected by operation of the drought permit.	No	No	No

Option	European Site (and distance from proposed works)	Qualifying features	Potential for effects on qualifying features?	Is the scheme likely to have a significant negative effect on European Site(s) alone?	Likely significant effect in combination with existing consents?	Likely significant effect in combination with other drought options?
		Ramsar Criterion 5 Assemblages of international importance – species with peak counts in winter: 97,155 waterfowl (5-year peak mean) **Ramsar Criterion 6** Species/populations occurring at levels of international. Importance: Tundra swan, *Cygnus columbianus bewickii* – 112 individuals, representing an average of 1.3% of the GB population (5-year peak mean). Eurasian teal – 21,231 individuals, representing an average of 5.3% of the population (5 year peak mean). northern lapwing, *Vanellus vanellus* – 36,580 individuals, representing an average of 1% of the population (5 year peak mean).				

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Summary of HRA Screening Conclusions

Bristol Water has undertaken the first stage in the HRA process – screening - of its draft DP 2021. The HRA screening stage establishes whether the measures contained in the Plan may have likely significant effects on any European site.

A summary of the conclusions of HRA Stage 1 Screening is presented in **Table 4.1**. This shows that likely significant effects of the Draft DP 2021 could not be ruled out upon the following European sites:

- North Somerset and Mendips Bats SAC
- Severn Estuary SAC
- Severn Estuary Ramsar site
- Mendip Limestone Grasslands SAC
- Somerset Levels and Moors SPA.

On the basis of the screening results in **Table 4.1**, Appropriate Assessment of the DP is **required** in order to assess potential adverse effects on the integrity of the identified European sites in relation to all of the supply augmentation and drought permit measures**.** Recommendations are made in **Section 0** regarding the surveys, monitoring and mitigation measures to be discussed in order to undertake the Appropriate Assessments. As set out in the screening assessment in Section 3, the Appropriate Assessments will focus on certain designated migratory fish species and/or horseshoe bats, as applicable.

Table 4-1: Summary of HRA Stage 1 Screening Conclusions

Drought Option	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?	Appropriate Assessment Required?
Demand Management Measures				
Appeals for restraint	No	No	No	No
Temporary Use Bans	No	No	No	No
Non-Essential Use Ban	No	No	No	No
Supply Augmentation Measures				
R24R Well	Yes	N/A	N/A	Yes
Drought Permits				
Blagdon Reservoir Reduced Compensation Flow	Yes	N/A	N/A	Yes
Cheddar Reservoir Reduced Prescribed Flow	Yes	N/A	N/A	Yes
Chew Valley Reservoir Reduced Compensation Flow	Yes	N/A	N/A	Yes
Changes to Minimum Residual Flow conditions set out in the P08R Abstraction Licence	Yes	N/A	N/A	Yes

Drought Option	Likely significant effects (LSE) on European Site(s) alone?	If no LSE alone: Residual low-level effect requiring in-combination assessment with existing consents?	If no LSE alone: Residual low-level effect requiring in-combination assessment with other drought options?	Appropriate Assessment Required?
Changes to Minimum Residual Flow conditions set out in the P05R abstraction licence	Yes	N/A	N/A	Yes
Extension to the licensed abstraction period for the River Axe source to support the refill of Cheddar reservoir	Yes	N/A	N/A	Yes

4.2 Methodology for Appropriate Assessment

4.2.1 Guidance

The HRA Stage 2 Appropriate Assessment will be undertaken taking account of regulatory and best practice guidance, including (but not limited to):

- UK Government (2019). Guidance on the use of Habitat Regulations Assessment.
- UK Government (2019). Conservation of Habitats and Species Regulations (Amendment) (EU Exit).
- UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans.
- Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, January 2021 edition UK. DTA Publications Limited.
- Environment Agency (2020). Water Company Drought Plan Guideline, December 2020.

Guidance[27] states that the Habitats Regulations require the assessment of effects on a European site to be 'appropriate'. The guidance states that this is taken to be 'fit for purpose' and proportional to the scale of effects (not the scale of the project) and the risk of harm to the European site and its designated features. An Appropriate Assessment is not intended to be an assessment of all the environmental effects or all the potential effects of the drought plan measure on biodiversity; rather it is confined to determination of potentially significant effects on the designated features of the European site (alone or in combination with other plans and projects), taking account of the site conservation objectives.

Guidance[27] recommends the competent authority (in this case Bristol Water), discusses and agrees the scope of the Appropriate Assessment with the nature conservation body (Natural England). The HRA Stage 1 Screening Assessment has highlighted those aspects of the drought plan measure that are considered likely to affect European site features and associated conservation objectives and these will be the focus of the further analysis in the Appropriate Assessment.

The Appropriate Assessment is confined to assessing the potential adverse effects on the European site qualifying features and site integrity. The scope and nature of Appropriate Assessment will vary

[27] Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, January 2021 edition UK. DTA Publications Limited

considerably from case to case. It is therefore important to agree with Natural England the scope of the Appropriate Assessment and the information and timescale required to undertake it.

4.2.2 Objectives

The objective of the Appropriate Assessment is to determine if there will be adverse effects on site integrity, and is dependent on the site-specific details, including the condition status and conservation objectives of the site. The potential for adverse effects on site integrity depends on the scale and magnitude of the impact on designated features taking into account:

- the distribution of the designated features across the site in relation to the predicted impact and the location, timing and duration of the proposed drought plan measure
- the level of understanding of the effect, such as whether it has been recorded before and, based on current ecological knowledge, whether it can be expected to operate at the site in question. Where this information is not available, professional judgement has been used, and it is noted that in some cases, there may not be sufficient information to undertake the assessment.

Assessment of significance is based on the available information, using professional judgement and regulatory and/or best practice guidelines where appropriate.

The Appropriate Assessment reports will be set out in sufficient detail for it to be transparent and understandable. It will set out what effects the drought plan measures are likely to cause on the relevant interest features (alone and, where applicable, in-combination with other plans or projects), referring to relevant background evidence and other information on which ecological judgements rely. Guidance[28] states that the size or complexity of the Appropriate Assessment report will not necessarily reflect the scale of the plan or project, but rather the complexity of potential effects. The length of the Appropriate Assessment report may not reflect the complexity of ecological judgements made to arrive at the necessary conclusions. Very complex ecological analysis and judgements may be expressed succinctly, with detailed supporting analyses contained in Appendices or clearly referenced separate documents.

4.2.3 Mitigation Measures

The Appropriate Assessment also considers any potential mitigation measures to determine whether they can reduce the likelihood, nature, scale, and duration of the effect to a lower level. The Appropriate Assessment seeks mitigation measures that are capable of implementation and will reduce the impact to the lowest level possible. These measures can include both avoidance and reduction measures, with the former being the preferred option.

Mitigation measures to be considered for the Bristol Water DP will relate to the relevant designated migratory fish species (European eel, sea trout and river lamprey) and horseshoe bats. **Table 4-2** provides further details regarding qualifying features to consider and potential mitigation measures required for each drought plan measure. A general mitigation strategy may also be included with regards to each supply option in order to preclude likely significant effect. The strategy would include season and/or timing restrictions in relation to the qualifying feature life cycle.

[28] Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, January 2021 edition UK. DTA Publications Limited

Table 4-2: Summary of potential mitigation measures and monitoring to consider through Appropriate Assessment.

Drought Management Measure	European site	Qualifying feature (significant effect considered summarised in italic)	Potential Mitigation Measures	Potential Monitoring Measures
R24R Well	North Somerset and Mendip Bats SAC	Greater and lesser horseshoe bat. *Through construction and operation, the option has the potential to significantly effect foraging, commuting and roosting activity through direct and indirect impacts.*	Proportionate bat survey programme to identify bat roosting features, foraging and commuting habitat opportunities. Consultation with the Local Planning Authority and/or Natural England as per guidance[29]. Avoid / reduce / compensate for habitat loss and/or degradation. Develop and implement bat mitigation strategy to mitigate for disturbance (e.g. noise, light, dust).	Bat activity monitoring following construction and/or implementation of the drought option.
	Severn Estuary SAC and Ramsar site	European eel, Atlantic salmon and sea trout *Through operation, the option has the potential to significantly effect fish migration and quality of habitat necessary for their life cycle.*	Fish obstruction assessment, including a walkover if deemed necessary. Timing restriction on use of the drought plan to avoid migration activity.	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the conditions identified. This might include temporary oxygenation measures.

[29] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018

			Use of temporary fish / eel passes. Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions. Protection of 'spate flows'*	Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring.
	Mendip Limestone Grassland SAC	Greater horseshoe bat. *Through construction and operation, the option has the potential to significantly effect foraging, commuting and roosting activity through direct and indirect impacts.*	Proportionate bat survey programme to identify bat roosting features, foraging and commuting habitat opportunities. Consultation with the Local Planning Authority and/or Natural England as per guidance[30]. Avoid / reduce / compensate for habitat loss and/or degradation. Develop and implement bat mitigation strategy to mitigate for disturbance (e.g. noise, light, dust).	Bat activity monitoring following construction and/or implementation of the drought option.
	Somerset Levels and Moors SPA	Waterbird assemblage and habitat supporting: Bewick's swan (Non-breeding), Eurasian teal (Non-breeding), European golden plover (Non-breeding), Northern lapwing (Non-breeding) as well as shoveler,	Assess the potential significant effect of the construction upon waterbird activity.	Unlikely to be required.

[30] North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018

		teal, wigeon, snipe, pintail, gadwall and whimbrel. *Through construction the option has the potential to significantly affect SPA features*	Best practice construction methods to be implemented.	
Blagdon Reservoir Reduced Compensation Flow	North Somerset and Mendip Bats SAC	Greater and lesser horseshoe bat *Through operation, the option has the potential to significantly effect foraging activity through indirect impacts upon wetland habitat.*	Assess the potential significant effect upon foraging habitat (wetland).	Bat activity monitoring following implementation of the drought option.
	Severn Estuary SAC and Ramsar site	River and sea lamprey, European eel and sea trout *Through operation, the option has the potential to significantly effect fish migration and quality of habitat necessary for their life cycle.*	Fish obstruction assessment, including a walkover if deemed necessary. Timing restriction on use of the drought plan to avoid migration activity. Use of temporary fish / eel passes. Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions. Protection of 'spate flows'*	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the conditions identified. This might include temporary oxygenation measures. Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring.
Cheddar Reservoir Reduced Prescribed Flow	Severn Estuary Ramsar	European eel, Atlantic salmon and sea trout *Through operation, the option has the potential to significantly effect fish migration and quality of habitat necessary for their life cycle.*	Fish obstruction assessment, including a walkover if deemed necessary. Use of temporary fish / eel passes.	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the

			Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions.	conditions identified. This might include temporary oxygenation measures. Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring.
Chew Valley Reservoir Reduced Compensation Flow	Severn Estuary SAC and Ramsar site	River lamprey, Atlantic salmon, European eel and sea trout *Through operation, the option has the potential to significantly effect fish migration and quality of habitat necessary for their life cycle.*	Fish obstruction assessment, including a walkover if deemed necessary. Use of temporary fish / eel passes. Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions. Protection of 'spate flows'*	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the conditions identified. This might include temporary oxygenation measures. Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring.
Changes to Minimum Residual Flow conditions set out in the P08R Abstraction Licence	Severn Estuary SAC and Ramsar site	River lamprey, European eel and sea trout *Through operation, the option has the potential to significantly effect fish migration and quality of habitat necessary for their life cycle.*	Fish obstruction assessment, including a walkover if deemed necessary. Use of temporary fish / eel passes. Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions.	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the conditions identified. This might include temporary oxygenation measures. Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring

			Protection of 'spate flows'*	
Changes to Minimum Residual Flow conditions set out in the P05R abstraction licence	North Somerset and Mendip Bats SAC	Greater and lesser horseshoe bat *Through operation, the option has the potential to significantly effect foraging activity through indirect impacts upon wetland habitat.*	Assess the potential significant effect upon foraging habitat (wetland).	Bat activity monitoring following implementation of the drought option.
	Severn Estuary Ramsar	European eel *Through operation, the option has the potential to significantly effect fish migration and quality of habitat necessary for their life cycle.*	Fish obstruction assessment, including a walkover if deemed necessary. Use of temporary fish / eel passes. Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions. Protection of 'spate flows'*	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the conditions identified. This might include temporary oxygenation measures. Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring
Extension to the licensed abstraction period for the River Axe source to support the refill of Cheddar reservoir	North Somerset and Mendip Bats SAC	Greater and lesser horseshoe bat *Through operation, the option has the potential to significantly effect foraging activity through indirect impacts upon wetland habitat.*	Assess the potential significant effect upon foraging habitat (wetland).	Bat activity monitoring following implementation of the drought option.
	Mendip Limestone Grassland SAC	Greater horseshoe bat *Through operation, the option has the potential to significantly effect foraging activity through indirect impacts upon wetland habitat.*	Assess the potential significant effect upon foraging habitat (wetland).	Bat activity monitoring following implementation of the drought option.

	Severn Estuary Ramsar	European eel and sea trout	Fish obstruction assessment, including a walkover if deemed necessary. Use of temporary fish / eel passes. Temporary reduction or cessation of the terms of the Drought permit where water quality monitoring and/or fish distress monitoring indicate a sharp deterioration in aquatic conditions. Protection of 'spate flows'*	Fish distress monitoring with triggers and response plan: regular visual observations carried out on key stretches of rivers to detect signs of large-scale fish distress and agree appropriate mitigation with the Environment Agency specific to the conditions identified. This might include temporary oxygenation measures. Water quality monitoring: measures dissolved oxygen, pH, turbidity, conductivity and temperature using calibrated handheld equipment. Obstruction monitoring

* Protection of 'spate flows'*: Temporary increases in river flows following periods of rain can be important to flush sediment/pollutants from the system or promote fish passage. Where possible, the terms of the drought order/permit could be temporarily reduced/suspended so that these spate flows are preferentially allowed to pass through the system. This decision would need to be taken in dialogue with the Environment Agency to take account of the prevailing conditions and considering the merits of encouraging fish migration during a drought.

4.2.4 Integrity Test

The integrity test is the conclusion of the Appropriate Assessment and requires the competent authority (in this case Bristol Water) to confirm whether the drought plan measures (either alone or in-combination with other plans or projects) will not have a significant adverse effect on site integrity. The following definition of site integrity is provided by Defra: "*the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the level of populations of the species for which it was classified*"[31].

From the evidence and assessments undertaken, a statement will be made as to whether it can be ascertained that the Drought Plan alone, or in-combination with other plans or projects, will not adversely affect the integrity of a European site.

4.2.5 Monitoring

Details of any potential monitoring to be considered are described within **Table 4-2**. Monitoring could be recommended either for the purposes of validating the findings of the Appropriate Assessment, or 'early warning' monitoring which would enable any actions to be stopped, paused, reduced in scale or altered should an adverse effect be recorded when a drought plan measure is being implemented.

4.2.6 Limitations

The approach to the Appropriate Assessment should be as rigorous as can reasonably be undertaken, although it is accepted that there may be gaps in information which could affect the assessment process. A brief resume of any limitations associated with undertaking the Appropriate Assessment will, therefore, be discussed. The integrity test will take into account the precautionary principle which requires the competent authority to demonstrate that the plan, either alone or in combination with other plans and projects, will not have an adverse effect on site integrity, before it may proceed. If there is insufficient information to demonstrate no adverse effect, then the plan or project should not go ahead (or will need to progress to HRA Stages 3 and 4).

4.2.7 Consultation

The Appropriate Assessment report will be issued to Natural England and the Environment Agency for comment and consultation on the findings. The report can also be used for wider stakeholder consultation, as appropriate.

4.2.8 Inclusion of measures in the Drought Plan

The findings of Appropriate Assessment will inform revision and selection of the measures to be included in Bristol Water's Final Drought Plan. Where an Appropriate Assessment of a drought plan measure concludes that adverse effects on site integrity cannot be ruled out, the measure should only be included in the Final Drought Plan if no reasonable alternative options can be identified to meet the Drought Plan's objectives and subject to the confirmation of IROPI and securing agreed compensatory measures.

4.3 Next Steps

Bristol Water will discuss the findings of the Stage 1 HRA screening with Natural England and the Environment Agency as part of its consultation on the Draft Drought Plan 2021 during spring 2021 and agree the timescales for agreeing the scope of the Appropriate Assessments and their subsequent completion as part of the development of the Final Drought Plan.

[31] Defra Circular 01/2005.

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