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Habitats Regulation Assessment of Thames Water Draft Drought Plan 2027

Report for Thames Water Utilities Ltd

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0.1	20/02/26	Original first draft issued to Thames Water	**Mark Spence, Andy Coe, Katie Moran**
1	30/03/26	Addressed comments from Thames Water. Final for Draft DP27 submission	**Katie Moran**

Executive Summary

Water companies are required to prepare and maintain statutory Drought Plans (DPs). A draft Drought Plan (DP) is required to be submitted to the Secretary of State before or on 31st March 2026 and as part of this process, each water company must ensure that its DP meets the requirements of the Habitats Regulations 2017, as amended.

Under Regulations 63 and 105, any plan or project which is likely to have a significant effect on a Habitats 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 Habitats site includes Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites.

Thames Water Utilities Ltd (Thames Water) has completed the first stage of the HRA process, screening, on its draft DP 2027 options list. The screening stage identified whether any drought options have the potential to cause a Likely Significant Effect (LSE) on the integrity of a Habitats site(s).

Due to uncertainties regarding the potential LSEs of the KEN_0006 on the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC, this drought option was taken through to Stage 2 Appropriate Assessment which concluded that there would be no adverse effects on site integrity from the implementation of the KEN_0006. No LSEs were identified for all other drought options in Thames Water's draft DP 2027, when considered alone on Habitats site(s).

In-combination effects were assessed between drought options of Thames Water's draft DP 2027, with its Water Resource Management Plan (WRMP)24, the Environment Agency's DPs, the Thames and Severn River Basin Management Plan, other water company WRMPs and DPs and other major infrastructure projects available at this time. No in-combination LSEs between drought options and with other plans and projects were identified on Habitat site(s).

A summary of the conclusions of the Stage 1 Screening and Stage 2 Appropriate Assessment is presented in **Table 1.**

Table 1: Summary of HRA Stage 1 Screening and Stage 2 Appropriate Assessment Conclusions.

Drought Option	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	Effect in-combination with other drought options?	Appropriate Assessment (AA) required?	Adverse effect on site integrity?
Demand Management					
Media/water efficiency campaign	No	No	No	No	N/A
Leakage reduction	No	No	No	No	N/A
Temporary use Ban	No	No	No	No	N/A
Drought Order to ban Non-Essential Use	No	No	No	No	N/A
Emergency Drought Order	No	No	No	No	N/A
Supply Side Options					
London WRZ					

Drought Option	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	Effect in-combination with other drought options?	Appropriate Assessment (AA) required?	Adverse effect on site integrity?
LON_0002	No	No	No	No	N/A
LON_0020	No	No	No	No	N/A
LON_0002	No	No	No	No	N/A
Reduction in lowest residual flow on the Lower Thames Control Diagram at LON_0027 from 300Ml/d to 200Ml/d	No	No	No	No	N/A
Earlier reduction in residual flow at LON_0027 on the Lower Thames Control Diagram	No	No	No	No	N/A
LON_0005	No	No	No	No	N/A
LON_0017	No	No	No	No	N/A
LON_0015	No	No	No	No	N/A
KEN_0006)	Yes	No	No	Yes	No
Drought permit/order					
London WRZ					
LON_0019 1	No	No	No	No	N/A
LON_0019 2	No	No	No	No	N/A
LON_0011 (200-100)	No	No	No	No	N/A
LON_0011 (200-0)	No	No	No	No	N/A
LON_0003	No	No	No	No	N/A
LON_0022	No	No	No	No	N/A
Increase in M2 annual licence	No	No	No	No	N/A
LON_0021	No	No	No	No	N/A
In extremis option					
LON_0008	No	No	No	No	N/A
SWOX Water Resource Zone					
SWOX_0002 1	No	No	No	No	N/A
SWOX_0002 2	No	No	No	No	N/A
SWOX_0009	No	No	No	No	N/A
SWOX_0010 1	No	No	No	No	N/A
SWOX_0010 2	No	No	No	No	N/A
SWOX_0006	No	No	No	No	N/A
SWOX_0001 1	No	No	No	No	N/A

Drought Option	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	Effect in-combination with other drought options?	Appropriate Assessment (AA) required?	Adverse effect on site integrity?
SWOX_0001 2	No	No	No	No	N/A
SWOX_0007	No	No	No	No	N/A
SWOX_0005	No	No	No	No	N/A
SWOX_0011	No	No	No	No	N/A
In extremis option					
SWOX_0004	No	No	No	No	N/A
SWOX_0003	No	No	No	No	N/A
SWOX_0012	No	No	No	No	N/A
Kennet Valley Water Resource Zone					
KEN_0003	No	No	No	No	N/A
KEN_0004	No	No	No	No	N/A
KEN_0005	No	No	No	No	N/A
KEN_0002	No	No	No	No	N/A
In extremis option					
KEN_0001	No	No	No	No	N/A
Guildford Water Resource Zone					
GUI_0001	No	No	No	No	N/A
GUI_0006	No	No	No	No	N/A
SWA Water Resource Zone					
SWA_0005	No	No	No	No	N/A
Henley Resource Zone					
HEN_0001/ HEN_0002	No	No	No	No	N/A

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1. Introduction

1.1 Background and Purpose of Report

Water companies in England and Wales are required to prepare and maintain Statutory Drought Plans (DPs) under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 and subsequently 2014, which set out the short operational steps a company will take before, during and after a drought.

Thames Water Utilities Ltd's (Thames Water) current Final DP 2022 covers the period 2022-2027. Thames Water has updated its DP 2027 to align with updated guidance including that provided in the Environment Agency's Drought Plan Guideline (DPG)[1], published in March 2025 (DPG2025), which specifies that a water company must ensure that its DP meets the requirements of The Conservation of Habitats and Species Regulations 2017, as amended. The DPG2025 also includes an updated draft of the supplementary guidance on the environmental assessment for water company drought planning (published in March 2025). The Drought Plan (England) Directions 2025 indicates that the planned submission date for all draft DPs will be before or on 31st March 2026 and final plans are anticipated to be published by April 2027. The DPG2025 refers to guidance relating to Habitats Regulations Assessment (HRA) that can be used which includes the UK Water Industry Research (UKWIR) report 'Strategic Environmental Assessment and Habitat Regulations Assessment - Guidance for Water Resources Management Plans and Drought Plans'[2]. The UKWIR report recommends that all DPs should be subject to the first stage of HRA, i.e. screening for Likely Significant Effects (LSEs).

The requirement for a HRA is established through Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and Flora (the Habitats Directive). Following the UK leaving the European Union (EU), the European Union (Withdrawal) Act 2018 (as amended[3]) retains existing EU law i.e. the Habitats and Birds Directives. The Directive is transposed into national legislation by The Conservation of Habitats and Species Regulations 2017, as amended, referred to as the Habitats Regulations[4]. It is this legislation, rather than the Directive, that now governs the HRA process within the UK. However, the amendments require that competent authorities continue to comply with and refer to all caselaw preceding 31 December 2020, unless or until modified by domestic appeals and legislation. Under Regulations 63 and 105, any plan or project which is likely to have a significant effect on a Habitats 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 an appropriate assessment to determine the implications for the site in view of its conservation objectives.

There have been material changes to the Thames Water DP HRA since 2022. Oxford Canal, LON_0008 ASR and LON_0006 have been removed as drought permit options. SWOX_0012, SWOX_0003, SWOX_0004, KEN_0001 and LON_0008 have been added as '*in extremis'* supply side options.

1.2 Requirement of Habitats Regulations Assessment

The responsibility for undertaking the HRA lies with Thames Water as the Plan making authority (competent authority).

HRA Guidance for the appraisal of Plans[5] summarises the Habitats Regulations. Regulation 63 states that the Plan making authority (in this case Thames Water) shall adopt, or otherwise give effect to, the Plan only after having ascertained that it will not adversely affect the integrity of a Habitats site, subject to Regulation 64 or 105 of the Habitats Regulations.

'Habitat sites' include the following:

[1] Environment Agency (2025) Water Company Drought Plan Guideline, March 2025.
[2] UKWIR (2021) Environmental Assessments for Water Resources Planning (21/WR/02/15).
[3] Amended by the European Union (Withdrawal Agreement) Act 2020.
[4] Amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulation 2019.
[5] Tyldesley, D. & Chapman, C. (2013) The Habitats Regulations Assessment Handbook, December 2025 edition UK. DTA Publications Limited. Subsequently withdrawn in January 2026 in response to Part 3 of the Planning and Infrastructure Act.

- existing Special Areas of Conservation SACs and Special Protected Areas (SPAs)
- new SACs and SPAs designated under these Regulations
- 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
- Ramsar sites - the national Ramsar site series means all the wetlands in the United Kingdom that have been designated under paragraph 1 of article 2 of the Ramsar Convention for inclusion in the list of wetlands of international importance referred to in that article[6]

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 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—

> *(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).

[6] Under Part 1, Schedule 5 of the Planning and Infrastructure Act 2025, Ramsar sites are to be added to the definition of 'marine areas' under Regulation 3 of the Conservation of Habitats and Species Regulations 2017. However, there is currently no Order for when Part 1 of Schedule 5 will be enacted. In the absence of this enactment, recent case law C.G. Fry & Son Limited v SoS confirmed that the NPPF (194 (b)) provided that Ramsar sites are to be protected as if they were a SAC or SPA under the Habitat Regulations. Ramsar sites are therefore included in this HRA report.

(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).

1.3 Approach to HRA

Independent best practice[7] encourages the use of a four-stage process to allow navigation of the tests described in the Habitats Regulations. This four-stage process consists of the following:

1. Firstly, a screening process is undertaken to identify whether each drought option in Thames Water's DP (either alone or in-combination with other plans or projects) is likely to have significant effects on Habitats sites.
2. Where a significant effect is likely (noting the precautionary principle), an Appropriate Assessment will then be undertaken of the drought option to determine whether this would adversely affect the integrity of the Habitats site(s), either alone or in-combination with other plans and projects, taking into account available mitigation measures.
3. Where significant adverse effects are identified at the Appropriate Assessment stage, alternative options would be examined to avoid any potential significant effects on the integrity of the Habitats site as Stage 3 of the HRA.
4. Stage 4 comprises an assessment of compensatory measures where, in the light of an assessment of 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[6][8][9][10] 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 options contained within the DP.

The assessment refers to the LSE of an option on one or more Habitats sites, including Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) (also known as National Site Network) 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), possible/ proposed SACs (pSACs), 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 Habitats sites, despite Ramsar designations being made at the international level.

The purpose of the screening stage is to determine whether any part of the plan in question (in this case the draft DP 2027) is likely to have a significant effect on any Habitats site. This is judged in terms of the implications of the plan

[7] Tyldesley, D. & Chapman, C. (2013). The Habitats Regulations Assessment Handbook, November 2021 edition UK. DTA Publications Limited. Subsequently withdrawn in January 2026 in response to Part 3 of the Planning and Infrastructure Act.
[8] Court of Justice for the European Union's ruling on People Over Wind and Sweetman ('Sweetman II') vs Coillte Teoranta, Case C-323/17.
[9] UK Government (2023). Habitats Regulations Assessments: Protecting a European Site.
[10] UK Government (2019). The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019.

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[11], 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 of that scheme.

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

This document reports the HRA Screening of Thames Water's draft DP 2027, i.e. Stage 1 as identified above. HRA Screening identifies whether the drought options contained within Thames Water's draft DP 2027 will have LSEs on Habitats sites and as such, determines the requirement for Appropriate Assessment.

In April 2018[12] 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 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, the implications have been taken into account as part of the HRA screening process in support of the draft DP 2027.

Thames Water have also undertaken a Strategic Environmental Assessment (SEA) of their draft DP 2027. The SEA has been undertaken in parallel with the HRA assessment and is reported separately.

1.4 Thames Water Supply System and Drought Planning

Thames Water is the UK's largest water and wastewater services provider, supplying 2.6 billion litres of drinking water each day and treating 4.7 billion litres of wastewater. The company manages public water supply and wastewater treatment across a vast region, serving 15.5 million people, which accounts for approximately 27% of the UK population[13]. In a dry year, Thames Water supplies around 2,000 Ml/d in the London WRZ, and 600 Ml/d across other WRZs[14]. Thames Water sources its water supply from both surface water and groundwater. Some 70% of Thames Water's water supply is derived from surface sources (largely from the upper and lower Thames and the River Lee) and the remainder is derived from groundwater abstraction[15]. However, as for most of South East England, during periods of prolonged low rainfall leading to a serious drought, water supply is largely sustained by groundwater abstraction, groundwater derived baseflow within rivers and available water stored in reservoirs.

Thames Water sets out how it will maintain planned levels of service in its Water Resources Management Plan (WRMP). The latest WRMP was published in 2024 (as WRMP24) and sets out a "twin-track" approach of demand management measures together with timely development of new water sources to ensure a positive supply/demand balance during prolonged dry weather[16]. The 2024 WRMP sets out the actions Thames Water will take to maintain its customer levels of service for water supply reliability, in particular planning for a Temporary Use Ban and/or a non-essential use ban on selected water use activities as well as measures to increase the amount of water that is available.

The Thames Water DP complements the WRMP24 and is focused on the actions that Thames Water will take during drought conditions when there are increased risks of temporary water use restrictions being required along with

[11] Annexes are contained within the relevant EC Directive.
[12] Court of Justice for the European Union's ruling on People Over Wind and Sweetman ('Sweetman II') vs Coillte Teoranta, Case C-323/17.
[13] Thames Water Utilities Limited (2024) Water Resources Management Plan 2024 Available at https://www.thameswater.co.uk/about-us/regulation/water-resources [Accessed February 2025]
[14] Thames Water Utilities Limited (2024) Draft Water Resources Management Plan 2024 Available at https://www.thameswater.co.uk/about-us/regulation/water-resources [Accessed February 2025]
[15] Thames Water Utilities Limited (2024) Water resources situation - January 2025 Available at https://www.thameswater.co.uk/about-us/performance/reservoir-levels-and-rainfall-figures [Accessed February 2025]
[16] Thames Water Utilities Limited (2024) Water Resources Management Plan 2024 - Section 1 – Introduction and Background Available at https://www.thameswater.co.uk/about-us/regulation/water-resources [Accessed February 2025)

implementing temporary measures to augment water supply availability in order to maintain essential water supplies to all customers. Thames Water's WRMP24 was approved by the Secretary of State in October 2024.

For water resource and drought planning purposes, the Thames Water supply area is divided into six water resources zones (WRZs) reflecting the different characteristics of the supply areas and associated risks associated with meeting demand within the Thames water area.

The largest of these zones is the London WRZ, which covers the Greater London area, followed by Swindon and Oxfordshire (SWOX). The water resources for London are largely based on abstraction from the River Thames (80%), which is stored in reservoirs, and the remainder from underground sources (aquifers) via boreholes. SWOX is supplied mainly from groundwater (60%), supported by river abstraction and a reservoir, sited near Oxford. The other zones to the west of London are Kennet Valley (this includes Reading and Newbury); Henley; Slough, Wycombe and Aylesbury (SWA) and Guildford. These latter four zones are largely reliant on groundwater abstraction although there are abstractions directly from local rivers, notably the River Kennet in Reading and the River Wey near Guildford. The Thames Water DP describes these WRZs from a drought perspective in the following sections

1.4.1 London and SWOX Water Resource Zones

The water resources for London and SWOX WRZs are derived from a combination of river abstraction, raw water reservoir storage and groundwater sources. For both zones, the critical element in the system is the level of reservoir storage, which in turn is dependent upon river flow, and during drought, this is primarily made up of the baseflow from the catchment's major aquifers and treated effluent discharges.

Through the Environment Agency's Restoring Sustainable Abstraction (RSA) programme, Thames Water has implemented measures to reduce abstraction from environmentally sensitive sources in the SWOX and London WRZs and further reductions are planned in the London WRZ.

1.4.2 Kennet Valley and Guildford Water Resource Zones

Although groundwater provides a major contribution in these zones, the critical drought elements are the surface water sources on the River Kennet and River Wey for Kennet Valley and Guildford zones, respectively. Consequently, the protocol for these zones consists of a trigger mechanism for implementing drought measures based on river flows receding to critical low levels.

Through the Environment Agency's RSA programme, Thames Water has implemented measures to reduce abstraction from environmentally sensitive sources in the Kennet Valley and Guildford WRZs with further reductions planned. Thames Water will continue to investigate any requirements for potential sustainability reductions in the supply area.

1.4.3 SWA and Henley Water Resource Zones

These two zones are entirely supplied by groundwater sources, which historically have remained robust during drought. That is to say, the critical point at which source outputs decline below their deployable output has never been reached. The approach in these zones, therefore, is to track groundwater levels in key regional observation boreholes as well as the linked performance of selected groundwater sources in relation to their deployable output. Stonor Park observation borehole has been chosen for tracking groundwater levels in the Chilterns and forms the basis for defining drought management guide levels for both the SWA and Henley zones.

Through the Environment Agency's RSA programme, Thames Water has implemented measures to reduce abstraction from environmentally sensitive sources in the SWA WRZ with further reductions planned. Thames Water will continue to investigate any requirement for potential sustainability reductions in the supply area.

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1.5 Thames Water Drought Planning Process

1.5.1 Overview and Timetable

Water companies in England and Wales are required to prepare and maintain Statutory DPs under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 and in accordance with the DP Regulations 2005 and the DP Direction 2025.

The Water Industry Act 1991 defines a DP 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 or drought permits'.

On 1 October 2010, Section 76 of the Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010. The Water Use (Temporary Bans) Order 2010 also commenced on 1 October 2010 and provides definitions and clarifications on these activities.

The DP Direction 2025 states that all water company draft DPs should be sent to the Secretary of State before or on 31st March 2026. Water companies must then publish their DP as directed by Defra.

Thames Water's current Final DP 2022 covers the period 2022-2027. Thames Water has published its draft DP 2027. The period encompassed by the draft DP 2027 is 2027 - 2032.

Only those drought options which are relevant to the period encompassed by the draft DP 2027 are considered in the SEA and HRA process. To this end, environmental effects of the draft DP 2027 options are considered within the context of the current licence operating conditions. Potential new sources (which Thames Water may bring online in the future), new drought options, or revisions to existing options which are only envisaged to become operational post 2032 have, therefore, been excluded from the SEA and HRA screening process. The same approach has also been taken with respect to in-combination plans, projects and programmes, in that only those that are likely to be effective in the period to 2032 were considered in the HRA and SEA. The HRA approach and methodology is discussed further in Section 2.

1.5.2 Thames Water Drought Options

The draft DP 2027 proposes a number of options which would make more water available for supply than is available under normal licensed conditions. Drought options include demand side options (e.g. water use restrictions), continued utilisation of existing licensed water sources within Thames Water's resource base (referred to as supply side options) and drought permits/orders.

1.5.2.1 Demand side options

Demand side options are designed to reduce the demand for water and the options available to Thames Water are consistent across all resource zones (see **Table 1-1**).

Table 1-1 Demand Side Options (all water resource zones).

Measure	Description of Measure	Company Level of Service
Media /water efficiency campaign	Wide-scale media activity and advertising to encourage voluntary reduction in water usage	1
Leakage reduction	Increased leakage activity / Network pressure management	Not applicable
Temporary use ban	Temporary use ban	2

Measure	Description of Measure	Company Level of Service
Drought Order to ban Non-Essential Use	Application to Defra to grant Non Essential Use Bans, as part of DD11 Ordinary Drought Order application	3
Emergency Drought Order	Application to Defra to grant an Emergency Drought Order to authorise water supply via temporary rota cuts or standpipes	4

The above measures include a sub-set of Thames Water's baseline demand management (leakage reduction, metering and water efficiency) in the WRMP. During the course of a drought, leakage reduction and water efficiency can, to some extent, be enhanced.

1.5.2.2 Supply side options

Thames Water categorise the full range of supply side measures into the following:

- Optimisation of existing sources
- Strategic drought water resource schemes
- Bulk supplies
- Drought permits/orders
- Recommissioning of disused sources
- *In extremis* options / "More before Level 4" measures.

Supply side measures are measures available to Thames Water to introduce during the course of a drought to increase the amount of water available for supply. Supply side drought options that do not require drought permits/orders are listed in **Table 1-2**.

Table 1-2 Supply Side Drought Options (all sit in the London Water Resource Zone)

Option	Description	Trigger level	Indication of last use
LON_0013	The scheme is licensed for 275 Ml/d peak and 150 Ml/d average.	Drought Event Level 1	2022 and 2025 drought events (limited use to benefit water quality only)
LON_0020	There is an Operating Agreement governing use of the scheme. An agreement is in place with the EA whereby LON_0020 will be in supply no later than 50 days after the drought trigger is breached.	Drought Event Level 1 and naturalised LON_0027 flows below 3000 Ml/d for 1 days	N/A
LON_0002	16Ml/d average, 16 Ml/d peak – LON_0002 is a water treatment works (WTW) using a number of the LON_0013 boreholes. It is not restricted to use under the LON_0013 Operating Agreement but can be used under any conditions, although its use is primarily to meet peak demands and drought demands.	Drought Event Level 1 and naturalised LON_0027 flows below 3000 Ml/d for 10 days	2022 and 2025 drought events
Reduction in lowest residual flow on the	100 Ml/d - increased abstraction from the River Thames, reducing residual flow over LON_0027.	Agreed between the Environment Agency	N/A

Option	Description	Trigger level	Indication of last use
Lower Thames Control Diagram at LON_0027 from 300Ml/d to 200Ml/d		and Thames Water during potentially severe drought.	
Earlier reduction in residual flow at LON_0027 on the Lower Thames Control Diagram	The gain in abstraction capability would be equal to the difference in reduction agreed at each stage on the Lower Thames Control Diagram, for the period when that flow band is operable.	Agreed between the Environment Agency and Thames Water during potentially severe drought.	N/A
LON_0005	LON_0005 comprises a number of groundwater abstraction locations along the route of the Channel Tunnel Rail Link which can be used to meet demand for water in London as well as contributing to the management of groundwater level rises. The licence held allows for abstraction of 18 Ml/d average and 20.57 Ml/d peak.	Drought Event Level 1 and naturalised LON_0027 flows below 3000 Ml/d for 10 days	2022 drought event
LON_0017	LON_0017 is a groundwater source in East London which is run at low level of baseload output in order to keep groundwater levels suppressed to protect Stratford International Station. The option available during a drought is to increase the output from 5 Ml/d to 8 Ml/d in aggregate with Edmeston Close. The groundwater level management is not carried out by Thames and is de-watering.	Drought Event Level 1 and naturalised LON_0027 flows below 3000Ml/d for 10 days	N/A
LON_0015	LON_0015 is a groundwater source in East London which abstracts from the chalk aquifer. The licence allows for the abstraction of 4.5 Ml/d average, 4.5 Ml/d peak to meet peak demands and demand during drought conditions.	Drought Event Level 1 and naturalised LON_0027 flows below 3000 Ml/d for 10 days	N/A
KEN_0006	Untreated groundwater is discharged into the Kennet and Pang tributaries of the River Thames to increase the flow to London reservoir abstraction points. A benefit of some 123 Ml/d reducing to 66 Ml/d in a prolonged drought is provided by the scheme.	Level 2 on the Lower Thames Control Diagram	2022 drought event

1.5.2.3 *In Extremis* Supply Side Options

In extremis supply side management actions, also referred to as ‘more before level 4’ actions, may be considered during a drought to mitigate the need for Level 4 measures such as rota-cuts in an emergency situation. Thames Water is currently completing further consideration of such options to provide supply benefits to reduce the risk of reaching Level 4. Where sufficient information is available, these options have been included in the assessment. Some options are not well defined and therefore it is not possible to undertake an HRA assessment of these actions. Further work to define the feasibility and scope of these options is ongoing. In extremis options are presented in Table 1-3.

Table 1-3 *In extremis* 'more before 4' supply side options

Option	Description
Reduction of bulk supplies	The potential for reduction in provision of bulk supplies beyond what is already agreed with neighbouring companies would be explored and measures would be implemented if feasible and agreed with neighbouring companies. Any changes to bulk supplies in very severe scenarios would only be made in full agreement with the other water companies involved. In a severe drought it is important to retain the flexibility of allowing further discussions with other water companies to take into account the specific conditions of that drought and to use any operational flexibility that may be available at the time to help maintain customer supplies.
Alternative Sources of supply for non-potable use	Potential options to use dewatering discharges as a replacement for non-potable use would be explored. For example, quarry or excavation dewatering discharges could potentially be used to provide irrigation water for high value recreational uses where restrictions on use would have significant economic impact. We would also explore the setting up of non-potable water refill points for businesses on a community scale e.g. for councils for parks watering, this could potentially be provided through the re-use of treated STW effluent.

1.5.2.4 Supply Side Drought Permit/Order Options

Potential drought permit/order sites are identified in **Table 1-4**.

Table 1-4 Supply Side Drought Permit/Order Options.

Water Source	Potential Drought Permits/Orders
London Water Resource Zone	
LON_0019 1	0 - 6.64 Ml/d - relax the annual average licence rate so that for the 6 months of the drought order, 8Ml/d could be abstracted each day (1,470 Ml over 6 months).
LON_0019 2	10.64 Ml/d -relax the annual average licence rate and increase the peak licence rate so that for the 6 months of the drought order, 12 Ml/d could be abstracted each day (sequential to LON_0019 1).
LON_0011 1	100 – 200 Ml/d – depending on agreement with the Environment Agency and water availability.
LON_0011 2	0-200 Ml/d - depending on agreement with the Environment Agency and water availability.
LON_0003	2.8 Ml/d - increase in abstraction beyond existing licence limit.
LON_0022	6.0 Ml/d - increase in abstraction beyond existing licence limit.
Increase in M2 annual licence	Increase the annual maximum abstraction permitted under the M2 licence by up to 5 %. Abstractions would still be restricted when flows are medium to low (as per normal operations).
LON_0021	0 – 7Ml/d - increase in abstraction beyond existing licence limit (average rate per year of 7.6Ml/d).
Swindon Oxford Water Resource Zone	
SWOX_0002 1	6.3 Ml/d – re-establish abstraction from existing boreholes) revoked through sustainability reductions).
SWOX_0002 2	17Ml/d – an additional abstraction of up to 10.7Ml/d above the additional 6.3Ml/d from SWOX_0002 1.
SWOX_0009	5Ml/d increase in average licence limit.
SWOX_0010 1	6Ml/d - the drought permit would allow abstraction from the Great Oolite boreholes at a rate of 6 Ml/d
SWOX_0010 2	11.37Ml/d - the drought permit would allow abstraction from the Great Oolite boreholes at a rate of 11.37Ml/d when preceding flow (mean 5 days before) in the River Coln at SWOX_0003 is less than 68Ml/d (i.e. as per the terms of the now revoked 'summer' licence).
SWOX_0006	10 - 30Ml/d - additional abstraction direct from the river in addition to that allowed by the existing licence. Residual flow reduced to 47Ml/d from 77Ml/d

Water Source	Potential Drought Permits/Orders
SWOX_0001 1	Option would be to increase from the constrained level of 6 Ml/d peak and average to unconstrained abstraction of 13.1Ml/d peak and average. i.e. to go from 6 to 13.1Ml/d a gain of 7.1Ml/d.
SWOX_0001 2	Option would be to increase from 13.1 Ml/d to 20 Ml/d peak and average i.e. an increase of 6.9 Ml/d.
SWOX_0007	3.5Ml/d - continuation of abstraction from boreholes beyond licence conditions.
SWOX_0005	4.5Ml/d - resume historical abstraction to previous licence limit.
SWOX_0011	Abstract 3.5 Ml/d from the SWOX_0011 boreholes used in the now revoked licence.
Kennet Valley Water Resource Zone	
KEN_0003	12 – 30 Ml/d - bringing emergency abstraction licence online with output limited by groundwater resource available.
KEN_0004	7 Ml/d – removes flow constraint and allows the full amount of the KEN_0004 licence to be abstracted.
KEN_0005	2.8 - 4.1 Ml/d - increase in peak abstraction of existing licence from 8.2 Ml/d to 12.3 Ml/d.
KEN_0002	Variable, up to 20 Ml/d – manipulation of the KEN_0007 at extreme low flows (<173 Ml/d gauged at Theale) to allow abstraction from River Kennet at expense of flows to Holy Brook.
Guildford Water Resource Zone	
GUI_0001	6.8 Ml/d- extension of abstraction when flow constraint on the Law Brook is in force.
GUI_0006	5 Ml/d - increase the existing surface water abstraction from the River Wey
SWA Water Resource Zone	
SWA_0005	Increase from revised licence of 9.5 Ml/d up to old deployable output of 16.8 Ml/d (i.e. an option providing 7.3 Ml/d)
Henley Water Resource Zone	
HEN_0001 / HEN_0002	6Ml/d – aggregate abstraction from multiple sources.

In addition to the options in **Table 1-4**, we have included five new drought permit options to increase our resilience to future droughts. These include the GUI_0004/GUI_0002/GUI_0003 option, which involves the disaggregation of the existing abstraction licence which would allow an increase in peak yield by up to 9 Ml/d. The LON_0018 option involves the installation of additional treatment which would allow up to an additional 4 Ml/d and would maintain the peak licence for the duration of the drought permit. The LON_0001 option involves the removal of the flow constraint, allowing abstraction to continue at 36 Ml/d. The LON_0009 option comprises of a new abstraction into LON_0023.

EARs for these permit options are currently being developed and will be available to accompany our revised Drought Plan following consultation on the draft Drought Plan. They will not be included in the March 2026 draft submission as they have only recently been identified as requiring an EAR. A full list of Drought Permit options can be found in Appendix C of the main Drought Plan.

1.5.2.5 *In Extremis* Supply Side Drought Permit/Order Options

In extremis supply side management actions, also referred to as ‘more before level 4’ actions, may be considered during a drought to mitigate the need for Level 4 measures such as rota-cuts in an emergency situation. Thames Water is currently completing further consideration of such options to provide supply benefits to reduce the risk of reaching Level 4. Where sufficient information is available, these options have been included in the assessment. Some options are not well defined and therefore it is not possible to undertake an HRA assessment of these actions. Further work to define the feasibility and scope of these options is ongoing. In extremis options are presented in **Table 1-5**.

Table 1-5 *In extremis* 'more before 4' supply side options

Option	Description

SWOX_0004	The drought permit would require re-commissioning of existing boreholes. The abstraction licence at SWOX_0004 was revoked in 2007 and volumes transferred to SWOX_0007. The revoked SWOX_0004 abstraction consisted of 4 boreholes located 600m south of the village, approximately 700m away from the Mill Brook source and 600m away from Blewbury Pond. 5Ml/d- recommissioning of abstraction from boreholes (revoked 2007). Minor construction works would be required to bring this option online as a drought permit source. Operation would involve construction of a temporary water treatment plant; however, pipework would be within the existing site boundary. No significant construction impacts on the environment are anticipated.
KEN_0001	KEN_0001 (1) abstraction boreholes are located in Berkshire Downs Chalk WFD groundwater body. The option would see re-established abstraction from existing boreholes (previously revoked due to high nitrate concentrations) of up to 5Ml/day. There is currently NO treatment capability and therefore a temporary water treatment facility may be required.
LON_0008	In a very severe drought we would consider increasing abstraction from our boreholes at LON_0008 (by 6.64Ml/d). This would require the use of a Drought Permit and would also require additional treatment capacity to be installed on site.
SWOX_0012	Abstract 4 Ml/d from existing boreholes located 1 km away from the boreholes used in Thames Water's now revoked licence.
SWOX_0003	Up to 5Ml/d - Increase abstraction at the current boreholes by up to 5Ml/d. The arrangement for river flow augmentation would continue.

1.5.3 Consultation to date

To ensure that the stakeholder and regulatory engagement requirements have been met, Thames Water have continuously consulted with both the Environment Agency and Natural England in preparation of the previous DP updates, including the 2013, 2017 and 2022 DPs.

Annual reporting of the baseline monitoring results associated with the drought options have been submitted to the Environment Agency for review each year. Following review of the data collected, consultation with the Environment Agency about the monitoring programme was undertaken in spring 2014 and spring 2015, to ensure that sufficient monitoring to inform the baseline was undertaken collaboratively between the Environment Agency and Thames Water. In spring 2016, it was agreed with the Environment Agency that three years of continuous monitoring followed by appropriate intervals for ecological features was sufficient as a minimum to provide a robust baseline[17]. This approach was reviewed annually.

It should also be noted that in April 2018, Defra responded to Thames Water following their review of the Thames Water draft DP 2016, the representations received in response to the public consultation, the SoR, and the Environment Agency's advice to the Secretary of State. Following this review, Defra indicated that the Secretary of State required Thames Water to provide a high-level summary of the environmental impacts of Thames Water's drought actions in droughts worse than record ('severe droughts'). In response to this, Thames Water prepared an Environmental Assessment of Severe Droughts – Summary Report[18]. Implications for the HRA report following this assessment are addressed in the Severe Drought Report and Thames Water's Final DP 2017 and do not form part of this HRA report.

[17] Meeting between the Environment Agency, Thames Water and Cascade Consulting (12 April 2016)
[18] Thames Water Utilities Limited (2018) Environmental Assessment of Severe Droughts – Summary Report. *Prepared by Ricardo Energy & Environmen*t. August 2018

Consultation on the HRA continued throughout the preparation of DP 2022. The draft DP 2022 and HRA Screening Report were issued to Defra on 30 March 2021. Thames Water received approval to consult on the draft DP on 10 May 2021 and subsequently published the draft DP 2022 for public consultation on 7 June 2021 for a seven week period up to and including 30 July 2021. The statutory consultation bodies (Environment Agency, Natural England and Historic England), as well as the public and retailers, were invited to express their views on the draft DP 2022.

A Statement of Response was prepared and issued on 20 September 2021 which explains the changes Thames Water made to the Final DP 2022 (and accompanying documents, including the HRA) as a result of the consultation. Comments that were received through this consultation process, together with feedback from the specific consultation meetings / periods held over the course of the DP 2022 development and post-DP 2022 submission were taken into consideration in preparing the DP 2022 HRA.

1.5.4 Consultation for DP 2027

Consultation post-DP 2022 submission and during development of the draft DP 2027 held to date, and proposed consultation is listed in **Table 1-6**. Further consultation will also be undertaken, as required, at the time of any further applications for drought permit/orders.

Table 1-6 Stakeholder/regulatory engagement post-DP 2022 and during DP 2027 development

Date	Regulator/ Stakeholder	Type	Stakeholder of meeting/ correspondence
23/08/2022 – 14/12/2022	Environment Agency and Natural England	Teleconference	Discussion of the 2022 drought permit application process and developments, including revisions to the EARs and the specification of monitoring and mitigation.
22/02/2023 - ongoing	Environment Agency	Teleconference	Discussion of the DP2022 methodology and refocussing groundwater modelling and streamflow assessment to support hydro-ecology understanding for receptors assessment.
11/07/2024 and 16/07/2024 - ongoing	Environment Agency	Teleconference	Continued discussion of EAR methodology using SWOX_0002 1 as example.
06/05/2025 – 10/05/2025	Environment Agency, Natural England and Historic England	Formal 5-week consultation period	SEA Scoping Consultation comments provided to Thames Water.
Summer – Winter 2025	Environment Agency and Natural England	Teleconference	Discussion of the 2025 drought permit application process and developments, including revisions to several EARs (e.g. SWOX_0006, SWOX_0007), the specification of monitoring and mitigation and updates to the methodology.
TBC	Environment Agency and Natural England	Formal Consultation	Draft DP 2027 Consultation

Further consultation will also be undertaken, as required, at the time of any future applications for drought permits / orders.

1.5.5 Structure of report

The report is divided into the following sections: Section 2 Methodology, Section 3 HRA Screening of Drought Options, Section 4 HRA Screening Conclusions, Section 5 Stage 2 Appropriate Assessment, Section 6 Potential In-Combination Effects with other Plans and Projects and Section 7 Conclusions and Recommendations.

The HRA has also informed the production of the SEA of the DP.

2. Methodology

The objective of the HRA is to establish firstly whether schemes included in the final DP 2027 are likely to have a significant effect on Habitats 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 Habitats site(s).

HRA screening was therefore, completed for all of the drought options considered in the development of the draft DP 2027.

2.1 Review of Existing Abstraction Licences

Permission to abstract water, granted through licences issued by the Environment Agency and held and operated by Thames Water, was subject to a 'Review of Consents' in accordance with Regulation 63 of the Conservation of Habitats and Species Regulations 2010 (as amended) (referred to as the Habitats Regulations). It should be noted that these Habitats Regulations have now been superseded by the Conservation of Habitats and Species Regulations 2017, as amended. This Review of Consents was undertaken by the Environment Agency and included screening to determine LSEs on Habitats sites and Appropriate Assessment if LSEs were identified, to either affirm an abstraction licence or recommend action to amend the licence conditions. The Habitats sites were initially screened to identify all sites with water dependent habitat within Thames Water's supply area. Those sites that contained water dependent habitat were then reviewed to assess whether Thames Water abstractions were located within the same groundwater or surface water catchment and therefore, could have potential to affect the hydrogeological or hydrological regime of the sites. Any sites that were in the same catchment as a Thames Water licensed abstraction source were assessed in more detail to determine whether the abstraction would be likely to have a significant effect. The Environment Agency looked in more detail at the sensitivities of the Habitats site to water supply, and at the local hydrology. In addition, the Environment Agency was also able to use simple drawdown calculations to conclude that the impact would be insignificant. This was to ensure that the integrity of Habitats sites was not at risk from the impacts of abstraction. Information provided by the outcomes of the Review of Consents (released to Thames Water on 29 August 2008) was used to support the HRA screening of Thames Water's DP 2017[19]. This identified that none of the drought options included in the 2017 Final DP required an "Appropriate Assessment" for a Habitats Directive Habitats site.

It is acknowledged that this Review of Consents was concluded over a decade ago and, as the competent authority of the final DP 2022, Thames Water are required to consider the validity of the conclusions in light of more recent data or evidence, changes in Habitats site condition, and the impacts of climate change. Natural England requires that any abstraction which is not within the terms of the existing licence (including timings or duration of the abstraction) should be screened and assessed accordingly within the HRA.

Thames Water have reviewed the conclusions of screening assessments in light of current evidence, including any changes to Habitats site condition, where the HRA previously relied on Environment Agency's Review Of Consents.

[19] Thames Water Utilities Limited (2018) Habitats Regulations Assessment of Thames Water's Revised Draft Drought Plan Screening Report (Final). Prepared by Cascade Consulting.

2.2 Identification of Habitats sites for Assessment

To provide an indication of those options more likely to have a significant effect on a Habitats site(s), those options that are within 10 km of a Habitats site were identified. Consideration was also given to the relative locations of options and Habitats sites within the same surface and groundwater catchments (where this information was available) to ensure that any connectivity over a longer distance that might affect water-dependent sites was taken into account. GIS data were used to map the locations and boundaries of Habitats sites within or adjacent to the Thames Water WRZs[20] using publicly avaiable data from Natural England. The attributes of Habitats 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[21].

The data sources that were considered include:

- Relevant citation documents;
- Conservation objectives (SACs and SPAs) and Supplementary Advice (where available) including the targets and attributes that inform favourable condition status;
- Site Improvement Plans (SACs and SPAs);
- Regulation 33 information for European Marine Sites;
- Favourable condition tables for Sites of Special Scientific Interest (SSSI);
- Article 12 (SPAs) and Article 17 (SACs) status reports;
- SSSI condition assessments;
- Common Standards Monitoring Guidance (where specific targets have been set and agreed by Natural England and Environment Agency);
- Habitat preferences for the qualifying species (e.g. nesting, foraging, commuting) and food preferences; and
- Physical characteristics of the habitats and environment influencing them.

A summary of the information provided by these documents is provided in **Appendix 1**. This information allows identification of those 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 options may affect site integrity.

[20] UKWIR/Environment Agency define a WRZ as: 'The largest possible zone in which all resources, including external transfers, can be shared, and hence, the zone in which all customers will experience the same risk of supply failure from a resource shortfall.'
[21] These were obtained from the Joint Nature Conservation Committee and Natural England websites (www.jncc.gov.uk and www.naturalengland.org.uk).

2.3 Potential Impacts of the Options Considered in the Drought Plan

The qualifying habitats and species of Habitats 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 schemes considered for inclusion in the draft DP 2027 only have the potential to give rise to some of these impacts.

The demand management schemes are unlikely to have any effects on Habitats sites as they comprise measures which will not result in any new development or water abstraction (repairing leakage and water efficiency measures) and which are largely implemented within urban areas. However, they have still been subject to the HRA screening process, the results of which are included in **Section 3**.

In determining the likelihood of significant effects on Habitats sites from the supply side drought options and drought permit/drought order drought options, particular consideration has been given to the possible source-receptor pathways through which effects may be transmitted from activities associated with DP options to features contributing to the integrity of the Habitats sites (e.g. groundwater or surface water catchments, air etc). **Table 2-1** shows the type of impacts drought options could have on Habitats site qualifying features.

Screening for LSEs has been determined on a proximity basis for many of the types of impacts, based on the proximity of the drought option location to each Habitats site. However, there are many uncertainties associated with using set distances as there are very few standards available as a guide to how far impacts will extend. Different types of impacts can occur over different distances, and the assumptions and distances used in this HRA and justification for them are shown in **Table 2-1**[22,23,24,25,26,27] below.

Table 2-1: Potential impacts of drought options on Habitats sites

Broad categories of potential impacts on Habitats sites, with examples	Examples of activities responsible for impacts *(example distance considerations in italics)*
Physical loss: • Removal Smothering	**Development of infrastructure associated with option**, e.g. new or temporary pipelines, transport infrastructure, temporary weirs. **Indirect effects from a reduction in flows** e.g. drying out of water-margin habitat. *Physical loss is likely to be significant where the boundary of the option extends within or is directly adjacent to the boundary of the Habitats site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats site is designated, or where natural processes link the option to the site, such as through hydrological connectivity downstream of an option, long shore drift along the coast, or the option impacts the linking habitat).*
Physical damage: • Sedimentation/silting • Prevention of natural processes • Habitat degradation • Erosion	**Construction activity leading to permanent and/or temporary damage of available habitat, sedimentation/siltation, fragmentation, etc.** *Physical damage is likely to be significant where the boundary of the option extends within or is directly adjacent to the boundary of the Habitats site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat that supports species for which a Habitats site is designated, or where natural processes link the option to the site, such as through hydrological connectivity downstream of an option or sediment*

[22] Taken from UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans) (21/WR/02/15).
[23] Environment Agency (2013) Bird Disturbance from Flood and Coastal Risk Management Construction Activities. Overarching Interpretive Summary Report. Prepared by Cascade Consulting and Institute of Estuarine and Coastal Studies.
[24] Cutts N, Hemingway K and Spencer J (2013) The Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning and Construction Projects. Produced by the Institute of Estuarine and Coastal Studies (IECS). Version 3.2.
[25] Waterbird Disturbance & Mitigation Toolkit. TIDE toolbox - TIDE tools (tide-toolbox.eu)
[26] British Standards Institute (BSI) (2009) BS5228 - Noise and Vibration Control on Construction and Open Sites. BSI, London.
[27] Institute of Lighting Professionals (2020) Guidance Notes for the Reduction of Obtrusive Light GN01/20.

Broad categories of potential impacts on Habitats sites, with examples	Examples of activities responsible for impacts *(example distance considerations in italics)*
• Fragmentation • Severance/barrier effect • Edge effects	*drift along the coast.*
Non-physical disturbance: • Noise • Visual presence • Human presence • Light pollution	**Noise from temporary construction or temporary pumping activities.** *Taking into consideration the noise level generated from general building activity (c. 122dB(A)) and considering the lowest noise level identified in appropriate guidance as likely to cause disturbance to estuarine bird species, it is concluded that noise impacts could be significant up to 1km from the boundary of the Habitats site.* **Noise from vehicular traffic during operation of an option.** *Noise from construction traffic is only likely to be significant where the transport route to and from the option is within 3-5km of the boundary of the Habitats site.* **Plant and personnel involved in in operation of the option.** *These effects (noise, visual/human presence) are only likely to be significant where the boundary of the option extends within or is adjacent to the boundary of the Habitats site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats site is designated).* **Options that might include artificial lighting**, *e.g. for security around a temporary pumping station.* *Effects from light pollution are more likely to be significant where the boundary of the option is within 500m of the boundary of the Habitats site.*
Water table/availability: • Drying • Flooding/stormwater • 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 increased water abstraction, reduced storage, or reduced flow releases from reservoirs to river systems. Potential for changes to habitat availability, for example reductions in wetted width of rivers leading to desiccation of macrophyte beds.** *These effects are only likely to be significant where the boundary of the option extends within the same ground or surface water catchment as the Habitats site. However, these effects are dependent on hydrological continuity between the option and the Habitats site, and sometimes whether the option is up or down stream from the Habitats 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 releases to river systems.** *These effects are only likely to be significant where the boundary of the option extends within the same ground or surface water catchment as the Habitats site. However, these effects are dependent on hydrological continuity between the option and the Habitats site, and sometimes whether the option is up or down stream from the Habitats site.* **Air emissions associated with plant and vehicular traffic during construction and operation of options.** *The effect of dust is only likely to be significant where site is within or in close proximity to the boundary of the Habitats site. Without mitigation, dust and dirt from*

Broad categories of potential impacts on Habitats sites, with examples	Examples of activities responsible for impacts *(example distance considerations in italics)*
	the construction site may be transported onto the public road network and then deposited/spread by vehicles on roads up to 500m from large sites, 200m from medium sites, and 50m from small sites as measured from the site exit. *Effects of road traffic emissions from the transport route to be taken by the project traffic are only likely to be significant where the protected site falls within 200 metres of the edge of a road affected.*
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 increased water abstraction, discharges, storage, or reduced compensation flow releases to river systems.** *These effects are only likely to be significant where the boundary of the option extends within the same ground or surface water catchment as the Habitats site. However, these effects are dependent on hydrological continuity between the option and the Habitats site, and sometimes whether the option is up or down stream from the Habitats site.*
Biological disturbance: • Direct mortality • Changes to habitat availability • Out-competition by non-native species • Selective extraction of species • Introduction of disease • Rapid population fluctuations • Natural succession	**Killing or injury due to construction activity.** *Likely to be a risk where the boundary of the option extends within or is directly adjacent to the boundary of the Habitats site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats site is designated).* **Creation of new pathway for spread of non-native invasive species.** *This effect is only likely to be significant where the option is situated within the Habitats site or an upstream tributary of the Habitats site, but also for inter-catchment water transfers.*

Construction phase and operational phase impacts were reviewed and assessed. Most of the drought permit/order options reviewed comprise a change to an existing abstraction licence, with little or no requirement for additional infrastructure, and as such, few of these options can be considered to have a 'construction' phase.

The HRA Screening process was undertaken using professional judgement taking into account potential extent, complexity, duration, frequency, reversibility and probability of impacts.

Where uncertainty remains after screening, and it cannot be concluded that a drought option is not likely to have significant effects on the qualifying features of a Habitats site, the drought option should be taken forward to Stage 2, which requires a full Appropriate Assessment of that option to be undertaken.

2.4 Drought Contingency Planning Environmental Assessments

EARs are being prepared for the drought permit/order sites identified in **Table 1-3**, to support Thames Water's DP 2027.

The aim of these studies is to produce environmental reports that have been agreed with the Environment Agency and Natural England such that in the event of a drought, they are readily available for updating based on the prevailing drought situation at that time. The environmental studies consider all potentially affected habitats and species including, but not limited to, SACs, SPAs and Ramsar features as well as any SSSI or species/habitats of principal importance for the conservation of biodiversity in England (identified in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41). The reports also include Environmental Monitoring Plan (EMP) recommendations for each drought permit/order site. These environmental studies, undertaken outside of an actual drought event, are intended to be used as the basis for the EAR to be prepared in support of a specific drought permit / order application, should the need arise.

The drought events of 2022 and 2025 led to the preparation of multiple drought permit applications, each requiring regular and ongoing consultation with the Environment Agency. The experience gained through these processes has directly shaped subsequent revisions to the EARs, resulting in more streamlined, clearly structured documents. The updated EARs now incorporate more robust impact assessments, alongside strengthened monitoring and mitigation packages that are better aligned with regulatory expectations and operational needs.

2.5 Review of Potential In-combination Effects

Article 6(3) of the Habitats Directive requires an Appropriate Assessment of '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'.

The review has therefore, considered the in-combination effects of the drought options in the Thames Water draft DP 2027 and the in-combination effects of the draft DP 2027 with a number of plans and projects that could have an impact on the Habitats sites identified within this HRA, as follows:

- Inter-option effects within Thames Water draft DP 2027
- Thames Water WRMP24
- Other water company WRMPs and DPs
- Thames River Basin Management Plan (RBMP) 2022
- Environment Agency Regional DPs
- Thames Water White Horse Reservoir SRO
- Thames Water Teddington Direct River Abstraction
- Environment Agency River Thames Scheme
- Environment Agency Oxford Flood Alleviation Scheme
- Other major planned infrastructure schemes.

The assessment has used all publicly available information. It should also be noted that the water companies are at different stages of updating their WRMPs and DPs and therefore further updates may be required to the HRA in-combination assessment at the time of application for any of the drought permits.

3. HRA Screening Drought Options

3.1 Potential Likely Significant Effects of Drought Options

The HRA of the draft DP 2027 screened all of the drought options in each of Thames Water's WRZs. A total of 50 options (5 demand side, 9 supply side, 30 supply side drought permit/order options and 6 in extremis option) were screened, with 29 of these options identified as being within 10 km of a Habitats site or where a source receptor pathway beyond 10 km could occur. This provided an indication of the schemes that may be likely to have a significant effect on a Habitats site(s). The HRA screening matrix for this assessment is presented in **Table 3-1, Table 3-2, Table 3-3**. Where source receptor pathways from the drought options to Habitats sites have not been identified, drought options have been excluded from the screening matrix presented in **Table 3-1, Table 3-2, Table 3-3**. This totals 13 options including the following: LON_0019 1 and 2, LON_0022, LON_0003, Increase in M2 annual licence, LON_0021, KEN_0004, KEN_0005, GUI_0001, LON_0020, SWOX_0004, LON_0008 and KEN_0001. As described in **Section 2**, an assessment of potential impacts on Habitats sites in proximity to the drought permit/order sites that were included in previous DPs was undertaken in consultation with Natural England.

In extremis supply side and drought permit options, also referred to as ‘more before level 4’ actions, may be considered during a drought to mitigate the need for Level 4 measures such as rota-cuts in an emergency situation. Five in extremis drought options have been included in Thames Water’s draft DP, while these continue to be developed, as assessment has been undertaken based on the information available.

These screening assessments identified and agreed those Habitats sites that may be impacted during drought permit/order implementation, and this information was used to inform the HRA in 2013 and the HRA for the final DP 2017 and final DP 2022. Effects in-combination with other drought options within Thames Water’s draft DP 2027 were assessed in the screening process and are documented in the matrix.

The tables show that the majority of the drought options within Thames Water’s draft DP 2027 are not considered likely to have significant adverse effects on the qualifying features of Habitats sites. The exception to this is the KEN_0006. The KEN_0006 is not a drought permit option but a well-established strategic scheme for the London WRZ owned by the Environment Agency. It is operated in accordance with an Environment Agency/Thames Water operating agreement and its use is triggered when London reservoir storage reaches the Level 2 on the Lower Thames Control Diagram.

Table 3-1 Screening of Demand Side Drought Options for Likely Significant Effects on Habitat sites.

Option	Likely Significant Effect and Potential for Alteration of Measure to Avoid Effects?	Further HRA Assessment Required?
Media /water efficiency campaign	None – media/water efficiency campaign includes increased water efficiency messages via increased customer communications. No impacts on Habitats 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 option sites that have the potential to impact Habitats sites due to reduced pressure on water resources and reduced abstraction at source.	No
Leakage reduction	None – it is envisaged that leakage detection and repair schemes will largely be undertaken primarily in urban areas. No impacts on Habitats 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 option sites that have the potential to impact Habitats sites due to reduced pressure on water resources and reduced abstraction at source.	No
Temporary use ban	None – a hose pipe ban, or any restrictions on consumer water use are demand management measures and as such, are not anticipated to have impacts on Habitats sites. It is acknowledged that decreased consumer demand will have a net positive effect in-combination with existing abstraction and/or drought option sites that have the potential to impact Habitats sites, due to reduced pressure on water resources and reduced abstraction at source.	No
Drought Order to ban 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 Habitats sites. It is acknowledged that decreased consumer demand will have a net positive effect in-combination with existing abstraction and/or drought option sites that have the potential to impact Habitats sites due to reduced pressure on water resources and reduced abstraction at source.	No
Emergency Drought Order	None – an emergency drought order includes extreme demand management measures and as such are not anticipated to have impacts on Habitats sites. It is acknowledged that decreased consumer demand will have a net positive effect in-combination with existing abstraction and/or drought option sites that have the potential to impact Habitats sites due to reduced pressure on water resources and reduced abstraction at source.	No

Table 3-2 Screening of Supply Side Drought Options for Likely Significant Effects on Habitat Sites

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
LON_0013	Epping Forest SAC (0.3km from the nearest borehole)	Construction There is no construction phase associated with this drought option. Operation Both Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths are water dependent qualifying features however, only Northern Atlantic wet heaths are groundwater dependent and sensitive to significant changes to water levels. LON_0013 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathway to Northern Atlantic wet heaths and associated water supply has been identified. Therefore, no LSEs are anticipated on Epping Forest SAC as a result of LON_0013 implementation.	No	No	No
	Lee Valley SPA and Ramsar (2 boreholes within the boundaries of the SPA and Ramsar site)	Construction There is no construction phase associated with this drought option. Operation Gadwall, northern shoveler, great bittern (qualifying feature of the SPA only), water milfoil and water boatman are all water dependent qualifying features. There are two boreholes located within the boundaries of the SPA and Ramsar site: Warwick reservoir west (23) and Forest road (40). Therefore, potential impact pathways have been identified if waterbodies associated with the Lee Valley SPA and Ramsar site are hydrologically connected to the groundwater within the chalk aquifer and are within the anticipated drawdown extent. LON_0013 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Lee Valley SPA and Ramsar site. In addition, the scheme is currently licensed and the licences would not be changed as part of drought plan implementation (i.e. operation of these options will be within existing licence limits with regards to timing and volumes).	No	No	No

[28] The distances given are to the nearest element of each scheme.
[29] Thames Water Utilities Ltd (2012). North London Artificial Recharge Scheme Licence Application. Environmental Report. 1 – 24.

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Therefore, no LSEs are anticipated on the Lee Valley SPA and Ramsar site as a result of LON_0013 implementation.			
	Wormley-Hoddesdon Park Woods SAC (3.3km)	Construction There is no construction phase associated with this drought option. Operation No LSEs are anticipated from LON_0013 alone as the qualifying feature of the SAC is not water dependent (Sub-Atlantic and medio-European oak or oak-hornbeam forests).	No	No	No
LON_0002	Epping Forest SAC (0.3km from the nearest borehole)	Construction There is no construction phase associated with this drought option. Operations Both Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths are water dependent qualifying features however, only Northern Atlantic wet heaths are groundwater dependent and sensitive to significant changes to water levels. LON_0002 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathway to Northern Atlantic wet heaths and associated water supply has been identified. Therefore, no LSEs are anticipated on Epping Forest SAC as a result of LON_0002 implementation.	No	No	No
	Lee Valley SPA and Ramsar (0m nearest borehole within SPA)	Construction There is no construction phase associated with this drought option. Operation Gadwall, northern shoveler, great bittern (qualifying feature of the SPA only), water milfoil and water boatman are all water dependent qualifying features. Potential impact pathways from LON_0002 during operation have been identified if waterbodies associated with the Lee Valley SPA and Ramsar site are hydrologically connected to the groundwater within the chalk aquifer and are within the anticipated drawdown extent. LON_0002 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Lee Valley SPA and Ramsar site. In addition, the operation of this drought option would be in accordance with the existing abstraction licence.	No	No	No

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Therefore, no LSEs are anticipated on the Lee Valley SPA and Ramsar site as a result of LON_0002 implementation.			
Reduction in lowest residual flow on the LTCD from 300Ml/d to 200Ml/d	South West London Waterbodies SPA and Ramsar (operationally direct link)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> Both gadwall and northern shoveler are water dependent qualifying species of the South West London Waterbodies SPA and Ramsar site. The drought option would allow greater abstraction from the River Thames via the LON_0011 intakes, resulting in a reduction of the rate of drawdown in the Thames Valley storage reservoir system (including those reservoirs designated as part of the SPA and Ramsar). The abstraction point is approximately 4.8 km east at the closest point from the Habitats site. As the abstraction location is downstream of South West London Waterbodies SPA and Ramsar site, a reduction in flow within the River Thames will not impact on water levels within the Habitats site upstream. In addition, as water levels will remain the same in the LON_0011 during abstraction (aided by the presence of weirs), no impacts are anticipated on groundwater supply to waterbodies associated with the SPA and Ramsar sites. Alternatively, the reduction on the rate of drawdown in the Thames Valley storage reservoir may contribute to maintaining water levels in South West London Reservoirs over the winter, which could have a minor benefit on the overwintering bird population. However this is unlikely to be significant and has not been considered further. Potentially shorter duration of drawdown, or a less extensive drawdown than might have occurred without the drought option in the summer months is unlikely to significantly affect the sites' qualifying features. The operation of this drought option will also be within existing licensing limits with regards to timings and volumes. Therefore, no LSEs are anticipated during operation of the reduction in lowest residual flow on the LTCD drought option alone on the Southwest London Waterbodies SPA and Ramsar.	No	No	No
	Richmond Park SAC (3.5km from abstraction point)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> The qualifying feature of the SAC is stag beetle. Stag beetles are not water dependent, therefore, LSEs during operation of this option are not anticipated.	No	No	No

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
	Wimbledon Common SAC (5.4km from abstraction point)	Construction There is no construction phase associated with this drought option. Operation The qualifying features of Wimbledon Common SAC are Northern Atlantic wet heaths with *Erica tetralix,* European dry heaths and stag beetle. Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths are water dependent. However, the Habitats site is approximately 3.3km from the River Thames at its closest point and is located upstream of potentially impacted reaches. Therefore, no LSEs from the operation of this option are anticipated alone.	No	No	No
Earlier reduction in residual flow on the LTCD	South West London Waterbodies SPA, Ramsar (operationally direct link)	Construction There is no construction phase associated with this drought option. Operation Both gadwall and northern shoveler are water dependent qualifying species of the South West London Waterbodies SPA and Ramsar site. The drought option would allow greater flexibility in abstraction capability from the River Thames via the LON_0011 intakes, resulting in reduction of the rate of drawdown in the Thames Valley storage reservoir system (including those reservoirs designated as part of the SPA). The abstraction point is approximately 1.9 km north-west at the closest point from the Habitats site and Wraysbury No. 1 gravel pit is 0.2 km from the River Thames. Note that the Wraysbury Reservoir SSSI is in favourable condition. There is a potential impact pathway as the abstraction point is upstream of the Habitats sites and therefore, if water levels were reduced in the River Thames, this could impact on water supply within associated waterbodies if hydrologically connected via surface or groundwater. However, as the abstraction will not impact on water levels in the River Thames and only flow and velocity, no impact pathway has been identified. In addition, the reduction on the rate of drawdown is anticipated to contribute to maintaining water levels in South West London Reservoirs over the winter which will benefit overwintering birds. Potentially shorter duration of drawdown, or a less extensive drawdown than might have occurred without the drought option in the summer months is unlikely to significantly affect the sites' qualifying features. The operation of this drought option will also be within existing licensing limits with regards to timings and volumes. Therefore, no LSEs are anticipated from the operation of the earlier reduction in residual flow on the LTCD drought option alone on the Southwest London Waterbodies SPA and Ramsar.	No	No	No

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
	Windsor Forest and Great Park SAC (1km from the River Thames)	Construction There is no construction phase associated with this drought option. Operation The qualifying features of the SAC which include old acidophilous oak woods, Atlantic acidophilous beech forests and violet click beetle are not water dependant and therefore, LSEs during operation of the option alone are not anticipated.	No	No	No
	Burnham Beeches SAC (approximately 8.5km from abstraction point)	Construction There is no construction phase associated with this drought option. Operation The qualifying feature of this SAC is Atlantic acidophilous beech forests with Ilex. Atlantic acidophilous beech forests with Ilex are not classified as water dependent and therefore, no LSEs during the operation of the drought option alone are anticipated.	No	No	No
LON_0005	Epping Forest SAC (3.3km)	Construction There is no construction phase associated with this drought option. Operation Both Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths are water dependent qualifying features however, only Northern Atlantic wet heaths are groundwater dependent and sensitive to significant changes in water levels. LON_0005 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Epping Forest SAC. Therefore, no LSEs on Epping Forest SAC as a result of LON_0005 implementation have been identified.	No	No	No
	Lee Valley SPA and Ramsar (4.9km from the	Construction There is no construction phase associated with this drought option. Operation	No	No	No

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
	nearest borehole)	Gadwall, northern shoveler, great bittern (qualifying feature of the SPA only), water milfoil and water boatman are all water dependent qualifying features. LON_0005 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[30]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Lee Valley SPA and Ramsar site. The operation of this drought option would also be in accordance with the existing abstraction licence. The licence requires monitoring of groundwater quality to inform any risk of saline intrusion. No saline intrusion has been identified during operation of the abstraction. Therefore, no LSEs are anticipated from the operation of the LON_0005 drought option alone on the Lee Valley SPA and Ramsar site.			
LON_0017	Epping Forest SAC (3.5km)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> Both Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths are water dependent qualifying features however, only Northern Atlantic wet heaths are groundwater dependent and sensitive to inappropriate water levels. Therefore, there is a potential impact pathway to wet heaths if Epping Forest SAC is hydrologically connected the chalk aquifer abstracted from. Based on condition assessments of the underpinning Epping Forest SSSI, 8 out of 9 units that include heathland are in unfavourable condition, as a result of a lack of land management (bracken and bramble invasion, grazing recommended) and exposure to air pollution. The unfavourable condition of units within the Epping Forest SSSI have not been caused by changes in hydrological regime within the Habitats site. LON_0017 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Epping Forest SAC.	No	No	No

[30] Thames Water Utilities Ltd (2012). North London Artificial Recharge Scheme Licence Application. Environmental Report. 1 – 24.

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Therefore, no LSEs from the operation of LON_0017 on wet heaths present within the boundaries of Epping Forest SAC alone are anticipated.			
	Lee Valley SPA and Ramsar (4.8km)	Construction There is no construction phase associated with this drought option. Operational Gadwall, northern shoveler, great bittern (qualifying feature of the SPA only), water milfoil and water boatman are all water dependent qualifying features. LON_0017 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Lee Valley SPA and Ramsar site. The operation of this drought option would also be in accordance with the existing abstraction licence. Therefore, no LSEs are anticipated from the operation of the LON_0017 drought option alone on the Lee Valley SPA and Ramsar site.	No	No	No
LON_0015	Epping Forest SAC (4.75km)	Construction There is no construction phase associated with this drought option. Operation Both Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths are water dependent qualifying features however, only Northern Atlantic wet heaths are groundwater dependent and sensitive to inappropriate water levels. Therefore, there is a potential impact pathway if the wet heaths are hydrologically connected to the chalk aquifer. Based on condition assessments of the underpinning Epping Forest SSSI, 8 out of 9 units that include heathland are in unfavourable condition, as a result of a lack of land management (bracken and bramble invasion, grazing recommended) and exposure to air pollution. The unfavourable condition of units within the Epping Forest SSSI have not been caused by changes in hydrological regime within the Habitats site. LON_0015 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Epping Forest SAC.	No	No	No

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Therefore, no LSEs from the operation of LON_0015 on wet heaths present within the boundaries of Epping Forest SAC alone are anticipated.			
	Lee Valley SPA and Ramsar (4.7km)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> Gadwall, northern shoveler, great bittern (qualifying feature of the SPA only), water milfoil and water boatman are all water dependent qualifying features. LON_0015 boreholes abstract from a chalk-basal sands aquifer which is confined by clay-rich parts of the Lambeth Group and London Clay[29]. The top of the chalk is approximately 30 – 60m below surface level. Due to the depth and confined nature of the chalk aquifer, no impact pathways have been identified on qualifying habitats and species of the Lee Valley SPA and Ramsar site. The operation of this drought option would also be in accordance with the existing abstraction licence. Therefore, no LSEs are anticipated from the operation of the LON_0015 drought option alone on the Lee Valley SPA and Ramsar.	No	No	No
KEN_0006	River Lambourn SAC (discharge locations within the boundaries of the SAC)	<u>Construction</u> Minor pipeline connections/ repairs may be required. However, no LSEs from minor construction works are anticipated. <u>Operation</u> Seven borehole Wellfields associated with the KEN_0006 are located in the surrounding area to the River Lambourn SAC, with discharges within the River Lambourn SAC which abstract groundwater from unconfined chalk catchments of the Lambourn. All of the qualifying features of the River Lambourn SAC are water dependent and include water courses of plain to montane levels with *Ranunculus fluitantis,* brook lamprey *Lampetra planeri* and bullhead *Cottus gobio*. Therefore, potential impact pathways to qualifying features of the SAC include a reduction in water flow during operation, causing a deviation from 'naturalised' flow which could cause increased siltation, a reduction in wetted width of the channel and alterations to the biotope mosaic of the river. The underpinning SSSI is in unfavourable – recovering condition due to heavy modification of the watercourse and lack of bankside vegetation. However, flows are considered acceptable and characteristic of the river type (assessment conducted in 2019). Siltation and hydrological changes have been listed as pressures/ threats currently impacting on the condition of the River Lambourn SAC.	Yes	No (Subject to operating agreement)	No (Subject to operating agreement)

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Therefore, LSEs cannot be ruled out at this stage during the operation of KEN_0006 and a Stage 2 Appropriate Assessment is required. The conclusions of the Stage 2 Appropriate Assessment are in Section 5.3 of this report.			
	Kennet and Lambourn Floodplain SAC (3.1km from closest borehole, 2m from abstraction point.)	<u>Construction</u> Minor pipeline connections may be required as part of the construction phase of this drought option. However, no LSEs from minor construction works are anticipated. <u>Operation</u> Desmoulin's whorl snail is a water dependent qualifying feature of the Kennet and Lambourn Floodplain SAC. It is restricted to calcareous wetlands surrounding lakes, rivers or fens. The snail resides in habitats with high humidity, and therefore, maintenance of the local hydrological regime is vitally important for sustaining the population. Potential impact pathways have been identified, particularly in areas of the SAC located adjacent to the River Lambourn, due to the potential reduction in flow as a result of this drought option. This could reduce the wetted width of the channel, therefore, impacting on the availability of suitable habitats to support Desmoulin's whorl snail. During previous assessments, the potential LSEs on Thatcham Reedbeds SSSI which is an underpinning SSSI of the Kennet and Lambourn Floodplain SAC has been identified, which is largely in unfavourable – recovering condition; including unit 1 which is adjacent to the River Lambourn. In addition, Hunt's green which is lowland neutral grassland (unit 5 of the Kennet and Lambourn Floodplain SSSI which is currently in unfavourable – declining condition) and marshy grassland associated with unit 1 and 2 of Boxford Water Meadows SSSI (unit 1 is in favourable condition and unit 2 is in unfavourable – recovering condition) could be effected. Hydrological changes have been identified as a key threat to Desmoulin's whorl snail. Therefore, LSEs cannot be ruled out at this stage on the Kennet and Lambourn Floodplain SAC during operation of KEN_0006 and a Stage 2 Appropriate Assessment is required. The conclusions of the Stage 2 Appropriate Assessment are in Section 5.3 of this report.	Yes	No (Subject to operating agreement)	No (Subject to operating agreement)
	Hackpen Hill SAC (1.2 km from closest borehole)	<u>Construction</u> Minor pipeline connections may be required as part of the construction phase of this drought option. However, no LSEs from minor construction works are anticipated as sufficiently distanced from the Habitats site. <u>Operation</u> No water dependent qualifying features associated with Hackpen Hill SAC and therefore, no LSEs during operation are anticipated.	No	No	No

Option	Habitats site[28]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*

Table 3-3: Screening of Supply Side Drought Permit/Order Options for Likely Significant Effects on Habitat Sites

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
London Water Resource Zone					
LON_0011 1&2	South West London Waterbodies SPA, Ramsar (operationally direct link)	<u>Construction</u> The LON_0011 Drought Permit would involve some construction works associated with the back-pumping element of the scheme (temporary pipework to pump water over weirs with associated generators). The location of the backpumping element of the scheme would be approximately 3 km distance from the SAC/Ramsar. There will be no loss of qualifying habitat due to the scheme as the construction footprint does not impinge on any Habitats sites. Transport of materials and equipment during construction on site will require minimal general construction traffic. Transport will utilise the existing road network or the River Thames; the temporary increase in vehicle numbers required for the construction of the scheme is considered to be negligible. Therefore, no LSEs anticipated during construction. <u>Operation</u> Both gadwall and northern shoveler are water dependent qualifying species of the South West London Waterbodies SPA and Ramsar site. The drought option would allow greater abstraction from the River Thames via the LON_0011 intakes, resulting in a reduction of the rate of drawdown in the Thames Valley storage reservoir system (including those reservoirs designated as part of the SPA and Ramsar). The abstraction point is approximately 4.8 km east at the closest point from the Habitats site. As the abstraction location is downstream of South West London Waterbodies SPA and Ramsar site, a reduction in flow within the River Thames will not impact on water levels within the Habitats site upstream. In addition, as water levels will remain the same in the LON_0011 during abstraction, no effects are anticipated on groundwater supply to waterbodies associated with the SPA and Ramsar sites. Alternatively, this option has the potential for minor beneficial effects on the SPA and Ramsar by reducing the rate of reservoir drawdown than would be experienced without the option. However, this relationship has not be assessed further in the screening. The operation of this drought option will also be within existing licensing limits with regards to timings and volumes. Therefore, no LSEs are anticipated from the operation of the LON_0011 drought option alone on the South West London Waterbodies SPA, Ramsar.	No	No	No

[31] The distances given are to the nearest elements of each scheme.

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
	Richmond Park SAC (1.8km from abstraction point)	Construction The LON_0011 Drought Permit would involve some construction works associated with the back-pumping element of the scheme. This will not require landtake from within SAC boundaries. Backpumping would be required over LON_0025 (4.4km from the SAC), possibly LON_0027 (2km from the SAC). It would require installation of barges with fish friendly pumps and temporary pipework to get water over the weirs. There would also be a requirement to install a temporary power source to service the pumps. This could be done with mobile temporary generators and would require installation at agreed appropriate locations. The river reach between LON_0025 and LON_0027 is 1.2km from the SAC at its closest point. Considering the distances involved, no LSEs are not anticipated during construction. Operation The stage beetle is not water dependent and therefore, no LSEs from the drought option alone during operation are anticipated on Richmond Park SAC.	No	No	No
Swindon Oxford Water Resource Zone					
SWOX_0002 1	North Meadow and Clattinger Farm SAC (41m)	Construction There is no construction phase associated with this drought option. Operation Lowland hay meadows are classified as groundwater dependent habitats, therefore, there is a potential impact pathway due to a reduction in groundwater level during operation. However, the borehole is located on a highly productive, great oolite group aquifer and the SAC is located on clays that confine the underlying aquifer. Therefore, no hydrological connectivity has been identified between the Habitats site and SWOX_0002 1. No LSEs are anticipated from the operation of the SWOX_0002 1 drought option alone on the North Meadow and Clattinger Farm SAC.	No	No	No
SWOX_0002 2	North Meadow & Clattinger Farm SAC (41m)	Construction There is no construction phase associated with this drought option. Operation Lowland hay meadows are classified as groundwater dependent habitats, therefore there is a potential impact pathway due to a reduction in groundwater level during operation. However, the borehole is located on a highly productive, great oolite group aquifer and the SAC is located on clays that confine the underlying aquifer. Therefore, no hydrological connectivity has been identified between the Habitats site and SWOX_0002 2.	No	No	No

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		No LSEs are anticipated from the operation of the SWOX_0002 2 drought option alone on the North Meadow and Clattinger Farm SAC.			
SWOX_0009	North Meadow & Clattinger Farm SAC (883m)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> Lowland hay meadows are classified as groundwater dependent habitats, therefore there is a potential impact pathway due to a reduction in groundwater level during operation. Both the borehole and the Habitats site are located on rocks with essentially no groundwater due to clay confining the underlying aquifer. The bedrock at SWOX_0009 and the Habitats site consists of mudstone and therefore, has limited permeability. On that basis, no hydrological connectivity between the borehole and lowland hay meadows associated with the SAC is anticipated. It is likely that the water dependent feature is supported via surface water rather than groundwater supply. Therefore, no LSEs are anticipated from the operation of the SWOX_0009 drought option alone on the North Meadow and Clattinger Farm SAC.	No	No	No
SWOX_0010 (1) and (2)	North Meadow & Clattinger Farm SAC (886m)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> The scheme involves the increased abstraction from existing boreholes. Lowland hay meadows are classified as groundwater dependent habitats, therefore, there is a potential impact pathway due to a reduction in groundwater level during operation. Both the borehole and the Habitats site are located on rocks with essentially no groundwater due to clay confining the underlying aquifer. On that basis, no hydrological connectivity between the borehole and lowland hay meadows associated with the SAC is anticipated. It is likely that the water dependent feature is supported via surface water rather than groundwater supply. In addition, if borehole abstraction impacted on water levels in the River Thames, the SAC is located upstream of potentially impacted reaches. No LSEs are anticipated from the operation of the SWOX_0010 drought option alone on the North Meadow and Clattinger Farm SAC.	No	No	No
SWOX_0006 – Winter Permit	Oxford Meadows SAC (0m)	<u>Construction</u> Minor construction works may be required to bring the option online as a drought source. There will be no loss of qualifying habitat due to the scheme as the construction footprint will not impinge on any of the qualifying habitat.	No	No	No

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Transport of materials and equipment during construction on site will require minimal general construction traffic. Transport will utilise the existing road network. The temporary increase in vehicle numbers required for the construction of the scheme is considered to be negligible. Therefore, no LSEs from the construction phase are anticipated on the qualifying features of Oxford Meadows SAC. <u>Operation</u> Both lowland hay meadows and creeping marshwort *Apium repens* are water dependent qualifying features of Oxford Meadows SAC. A hydrological assessment for the scheme has identified that the River Thames will be subject to reductions in velocity, whilst the tributaries (including the Oxford watercourses) will be subject to a reduction in velocity and water level, due to lower flows. The lowland meadows are reliant on winter flooding. Although many parts of the site are not considered to be significantly hydrologically linked with the River Thames – water levels are primarily linked to groundwater levels. The proposed scheme will impact low flows between ~ May and December, and not flood flows overwinter. Therefore, no LSEs are anticipated from the operation of the SWOX_0006 drought option alone on the Oxford Meadows SAC.			
	Little Wittenham SAC (0m however, adjacent to potentially impacted reach of River Thames)	<u>Construction</u> Minor construction works may be required to bring the option online as a drought source. However, the location of the construction work would be >10km distance from the SAC. Therefore, no LSEs on the qualifying features of Little Wittenham SAC are anticipated during construction. <u>Operation</u> Great crested newts are water dependent qualifying features of Little Wittenham SAC. The site is currently in favourable condition and hydrological changes has not been identified as a threat or pressure that could prevent Little Wittenham SAC achieving favourable conservation status. The 2022 SWOX_0006 EAR identified that the Little Wittenham SAC is not likely to be fed by the River Thames, with springs and other surface sources almost certainly feeding into the site, thus the drought permit is not considered likely to impact on the permanence of the ponds within the SAC. No LSEs are anticipated from the operation of the SWOX_0006 drought option alone on the Little Wittenham SAC.	No	No	No
	Hartslock Wood SAC (7.6km however,	<u>Construction</u> Minor construction works may be required to bring the option online as a drought source. However, the location of the construction work would be >10km distance from the SAC. Therefore, no LSEs are anticipated on the qualifying features of Hartslock Wood SAC during construction.	No	No	No

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
	adjacent to potentially impacted reach of River Thames)	<u>Operation</u> Qualifying features of the SAC are not water dependent and therefore, no LSEs have been identified from the SWOX_0006 drought option alone during operation.			
	Cothill Fen SAC (3.3km)	<u>Construction</u> Minor construction works may be required to bring the option online as a drought source as above, however this will be >5km away from the SAC. There is no pathway for the construction works to impact the SAC. Therefore, no LSEs during the construction phase of this scheme are anticipated on the qualifying features of the SAC. <u>Operation</u> The SAC is not in hydrological connectivity with the River Thames. The 2025 SWOX_0006 EAR confirms that Cothill Fen SAC is not within the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). Therefore, no LSEs are anticipated from the operation of the SWOX_0006 drought option on the Cothill Fen SAC alone.	No	No	No
SWOX_0001 1	Kennet and Lambourn Floodplain SAC (0km)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> The drought option involves additional abstraction from existing boreholes. The 2025 SWOX_0001 1 EAR confirms that the Kennet and Lambourn Floodplain SAC is not impacted by the scheme. Therefore, no LSEs of the SWOX_0001 1 drought option alone during operation are anticipated on the Kennet and Lambourn Floodplain SAC.	No	No	No
	Kennet Valley Alderwoods SAC (4.1km length)	<u>Construction</u> There is no construction phase associated with this drought option. <u>Operation</u> The Kennet Valley Alderwoods are not reliant on flows from the River Kennet and are therefore not within the hydrological Zone of Influence of the scheme. Therefore, no LSEs of the SWOX_0001 1 drought option alone during operation are anticipated on the Kennet and Lambourn Floodplain SAC.	No	No	No

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
SWOX_0001 2	Kennet and Lambourn Floodplain SAC (0km)	Construction There is no construction phase associated with this drought option. Operation The drought option involves additional abstraction from existing boreholes. The 2025 SWOX_0001 2 EAR confirms that the Kennet and Lambourn Floodplain SAC is not impacted by the scheme. Therefore, no LSEs of the SWOX_0001 2 drought option alone during operation are anticipated on the Kennet and Lambourn Floodplain SAC.	No	No	No
	Kennet Valley Alderwoods SAC (4.1km length)	Construction There is no construction phase associated with this drought option. Operation The Kennet Valley Alderwoods are not reliant on flows from the River Kennet and are therefore not within the hydrological Zone of Influence of the scheme. Therefore, no LSEs of the SWOX_0001 2 drought option alone during operation are anticipated on the Kennet and Lambourn Floodplain SAC.	No	No	No
SWOX_0007	Hartslock Wood SAC (0m)	Construction There is no construction phase associated with this drought option. Operation None of the qualifying features of Hartslock Wood SAC are classed as water dependent. Therefore, no LSEs are anticipated from the operation of the SWOX_0007 drought option alone on the Hartslock Wood SAC.	No	No	No
SWOX_0005	River Lambourn SAC (6.5km)	Construction There is no construction phase associated with this drought option. Operation The option will involve the abstraction of water from the Vale of White Horse chalk aquifer. The River Lambourn SAC is located in a different groundwater body (Berkshire Downs Chalk) and surface water catchment (River Lambourn). Therefore, there is no hydrological connectivity between the scheme and the SAC. Therefore, no LSEs are anticipated from the operation of the SWOX_0005 drought option alone on the River Lambourn SAC.	No	No	No

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
	Hackpen Hill SAC (0.6km)	Construction There is no construction phase associated with this drought option. Operation The qualifying features of the site are not water dependent and Hackpen Hill SAC is not located in the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). Therefore, no LSEs are anticipated from the operation of the SWOX_0005 drought option alone on the Hackpen Hill SAC.	No	No	No
SWOX_0011	Kennet and Lambourn Floodplain SAC (1.5km)	Construction There is no construction phase associated with this drought option. Operation The 2025 assessment EAR confirms that the SAC is not located in the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). Therefore, no LSEs are anticipated from the operation of the SWOX_0011 drought option alone on the Kennet and Lambourn Floodplain SAC.	No	No	No
SWOX_0012	Kennet and Lambourn Floodplain SAC (1.5km)	Construction There is no construction phase associated with this drought option. Operation The 2025 assessment EAR confirms that the SAC is not located in the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). Therefore, no LSEs are anticipated from the operation of the SWOX_0012 drought option alone on the Kennet and Lambourn Floodplain SAC.	No	No	No
Kennet Valley Water Resource Zone					
KEN_0003	Hartslock Wood SAC (10km)	Construction There is no construction phase associated with this drought option. Operation The 2026 KEN_0003 EAR confirms that Hartslock Wood SAC is not located within the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). In addition, qualifying features of the SAC are not classed as water dependent.	No	No	No

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
		Therefore, no LSEs are anticipated from the operation of the KEN_0003 drought option alone on the Hartslock Wood SAC.			
KEN_0002	Thames Basin Heaths SPA (4.7km)	Construction There is no construction phase associated with this drought option. Operation The scheme involves the redirection of water allowing more to be abstracted from the River Kennet and less being directed to Holy Brook. As the Habitats site is located upstream of the abstraction point and therefore, not reliant on water supply in Holy Brook, no impact pathway has been identified that could impact on supporting habitat of Dartford warbler, nightjar and woodlark. Therefore, no LSEs are anticipated from the operation of the KEN_0002 drought option alone are anticipated on the Thames Basin Heaths SPA.	No	No	No
Guildford Water Resource Zone					
GUI_0006	Thames Basin Heaths SPA (4km)	Construction There is no construction phase associated with this drought option. Operation The 2026 GUI_0006 EAR confirms that Thames Basin Heaths SPA is not located within the zone of influence of the scheme (i.e. the area over which the scheme could impact groundwater and surface water). Therefore, no LSEs are anticipated from the operation of the GUI_0006 drought option alone on the Thames Basin Heaths SPA.	No	No	No
	Thursley, Ash, Pirbright and Chobham SAC (8km)	Construction There is no construction phase associated with this drought option. Operation The 2026 GUI_0006 EAR confirms that Thursley, Ash, Pirbright and Chobham SAC is not located within the zone of influence of the scheme (i.e. the area over which the scheme could impact groundwater and surface water). Therefore, no LSEs are anticipated from the operation of the GUI_0006 drought option alone on the Thursley, Ash, Pirbright and Chobham SAC.	No	No	No
SWA Water Resource Zone					

Option	Habitats site[31]	Potential for effects on qualifying features?	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	*Effect in-combination with other drought options?*
SWA_0005	Chilterns Beechwoods SAC (8.7km)	Construction There is no construction phase associated with this drought option. Operation The 2026 SWA_0005 EAR confirms that Chilterns Beechwoods SAC is not within the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). In addition, no water dependent qualifying features are associated with the SAC. Therefore, no LSEs are anticipated from the operation of the SWA_0005 drought option alone on the Chilterns Beechwoods SAC.	No	No	No
	Burnham Beeches SAC (9.2km)	Construction There is no construction phase associated with this drought option. Operation The 2026 SWA_0005 EAR confirms that Burnham Beeches SAC is not located within the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). In addition, no water dependent qualifying features associated with the SAC. Therefore, no LSEs are anticipated from the operation of the SWA_0005 drought option alone.	No	No	No
Henley Water Resource Zone					
HEN_0001 / HEN_0002	Chilterns Beechwoods SAC (9.6km)	Construction There is no construction phase associated with this drought option. Operation The 2026 *HEN_0001* / HEN_0002 EAR confirms that Chilterns Beechwoods SAC is not within the zone of influence of the scheme (i.e. the area over which the scheme could affect groundwater and surface water). In addition, no water dependent qualifying features are associated with the SAC. Therefore, no LSEs are anticipated from the operation of the *HEN_0001* / HEN_0002 drought option alone on the Chilterns Beechwoods SAC.	No	No	No

4. HRA Screening Conclusions

The HRA Stage 1 Screening assessment concluded that KEN_0006 supply side option will be subject to a Stage 2 Appropriate Assessment. This is due to uncertainties regarding the potential LSEs of KEN_0006 on the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC. This assessment will identify if the option can meet the requirements of the integrity test, with the consideration of appropriate mitigation measures.

A summary of qualifying features of the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC being screened in for Stage 2 Appropriate Assessment, due to potential LSEs of the KEN_0006 is presented below in **Table 4-1**.

Table 4-1 Summary of the outcome of the HRA stage 1 screening assessment, indicating which qualifying features of the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC require a stage 2 Appropriate Assessment, due to potential likely significant effects of the KEN_0006.

Habitats site	Qualifying feature	Likely significant effect?
River Lambourn SAC	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Yes
	Brook lamprey	Yes
	Bullhead	Yes
Kennet and Lambourn Floodplain SAC	Desmoulin's whorl snail	Yes

5. Information to Inform Appropriate Assessment

5.1 Introduction

Regulation 63 of the Habitat Regulations states that competent authority (in this case Thames Water), before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which

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 that site,
c) must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives.

Screening has identified potential LSEs as a result of the implementation of the KEN_0006 on the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC. A Stage 2 HRA (Appropriate Assessment) is, therefore, required.

The Appropriate Assessment of the KEN_0006 considered the potentially damaging aspects of the operation, and the potential effects on the associated Habitats site's qualifying features and achievement of the conservation objectives.

The potential for adverse effects on the integrity of a Habitats site depends on the scale and magnitude of the action and its predicted impacts, taking into account the distribution of the qualifying features across (the baseline) the site in relation to the predicted impact and the location, timing and duration of the proposed activity and 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.

The conclusion of the Appropriate Assessment is known as the integrity test and requires the competent authority to ascertain whether the proposed scheme (either alone or in-combination with other plans or projects), will have no adverse effect on site integrity. The following definition of site integrity is provided by Defra: the integrity of the site is "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"[32].

The baseline conditions for the associated Habitats sites are presented in Section 5.2, and the Appropriate Assessment is provided in Section 5.3.

5.2 Baseline

5.2.1 River Lambourn SAC

The River Lambourn SAC is a lowland chalk river, approximately 0.27 km² and located in Berkshire and Marlborough Downs National Character Area[33]. The river is fed by a chalk aquifer of the north Wessex Downs. As the river is dominated by spring flow from the aquifer, flow is dependent on groundwater levels, which will naturally decline during the summer months. The upper reaches of the River Lambourn will dry up during spring flows, which are referred to as 'Winterbourne' reaches. Along the River Lambourn, multiple habitats are supported including reed swamp, tall fen and willow carr.

5.2.1.1 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Calitricho-Batrachion* vegetation

Water quantity and the resultant extent of inundation of macrophyte communities, plus the seasonal timing of changes in supply, are key factors influencing the development and stability of *Ranunculion fluitantis* and *Callitricho-Batrachion*

[32] Defra Circular 01/2005.
[33] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. River Lambourn Special Area of Conservation (SAC) Site Code: UK0030257. Natura 2000, 1 – 30.

vegetation[34]. The dynamic nature of riverine environments requires associated species to constantly adapt to fluctuations in flow regime and sediment load, leading to changes in fluvial processes and associated habitats. The optimum flow rate for *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation is between 0.3 and 0.5m/s[35]. High flow rates and flushes associated with increased rainfall in autumn are vitally important for *Ranunculaceae* species, as it removes excess sediment deposited during the summer, for the growing season. The growth of *Ranunculus penicillatus* subsp. *pseudofluitans* for example, has coincided with maximum flow in chalk streams[33]. In addition, *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation supports a diversity of community assemblages including diatoms, macroinvertebrates and fish. Therefore, deterioration of macrophytes will have a direct impact on associated species and the structure and function of the riverine system.

5.2.1.2 Brook lamprey *Lampetra planeri*

Brook lamprey are the smallest lamprey species present in Britain, growing to 13-15 cm once mature and are purely a freshwater species[36]. The ammocoete larvae occupy silt beds for up to 7 years and feed by filtering fine organic particles including diatoms and algae from the surrounding waterbody. Once metamorphosis occurs, adult brook lamprey migrate upstream to suitable spawning grounds to spawn when water temperatures reach 10-11°C, usually in March and April. The adult lamprey create oval depressions in spawning grounds consisting of clean stones and gravel present in flowing water to lay approximately 1,500 eggs per female[35]. Brook lamprey require gravel beds for spawning, silt beds for their larval stage, good water quality, low levels of abstraction and an absence of barriers between suitable gravel beds and silt beds to support different life stages[32].

5.2.1.3 Bullhead *Cottus gobio*

Bullhead is the only freshwater cottid found in the UK. It is a bottom-living fish that inhabits a variety of rivers, streams and stony lakes. It requires good water quality, a stony substrate free from excessive siltation, macrophyte beds and sufficient cover from overhanging vegetation or woody debris. Bullheads spawn from February to June; typically, once for females in upland streams and up to four times in warmer lowland streams[37]. Bullheads are susceptible to changes in oxygen saturation and temperature, with critical thermal limits of -4.2 and 27.7ºC[36].

5.2.1.4 Conservation Objectives

The Conservation Objectives for the River Lambourn SAC are outlined in 'European Site Conservation Objectives for River Lambourn Special area of Conservation Site Code: UK0030257'. They ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

5.2.1.5 Site Condition

The River Lambourn SAC is legally underpinned by the River Lambourn SSSI. Natural England's SSSI site condition assessment in 2019 recognised that:

- 100% of the SSSI is assessed to be in unfavourable – recovering condition.

5.2.2 Kennet and Lambourn Floodplain SAC

[34] Hatton-Ellis T.W and Grieve, N. (2003). Ecology of Watercourses Characterised by Ranunculion fluitantis and Callitricho-Batrachion Vegetation. Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough.
[35] Environment Agency (2004). Ranunculus in Chalk rivers: Phase 2. Science Report W1-042/TR.
[36] Maitland, P. S (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.
[37] Tomlinson, M. L and Perrow, M. R. (2003). Ecology of the Bullhead. Conserving Natura 2000 Rivers Ecology Series No. 4. English Nature, Peterborough, 1-19.

The Kennet and Lambourn Floodplain SAC is approximately 1.14 km² and flows through several river valleys including Lambourn and Kennet in the Berkshire and Marlborough Downs. The SAC consists of former water meadows, riverside fens, sedge beds and swamps[38].

5.2.2.1 Desmoulin's whort snail

Desmoulin's whorl snail is the largest Vertigo species, with a shell height of up to approximately 2.6 mm. The distribution of Desmoulin's whorl snail in the UK is mainly confined to the south east of England, stretching from east Dorset to north – west Norfolk[39]. The snail lives on reed grasses and sedges, such as reed sweet-grass (*Glyceria maxima*), and tussocks of greater pond-sedge (*Carex riparia*) and lesser pond-sedge (*C. acutiformis*), where it feeds on the microflora. In autumn, it may ascend taller reeds and scrub[37]. Desmoulin's whorl snail is considered a terrestrial gastropod but is associated with permanently wet habitats, including calcareous swamps, fens and marshes, and riparian margins. It lives on living and dead stems and leaves of tall plants and grazes on fungi, micro-algae and bacteria growing on marsh plants, and decaying higher plants. The hydrological regime associated with these environments is essential for this species to survive. The snail is dependent on the maintenance of high-water levels and standing water[40] and is susceptible to extreme fluctuations in groundwater levels, potentially inducing intolerable hydrological conditions.

5.2.2.2 Conservation Objectives

The Conservation Objectives for the Kennet and Lambourn SAC are outlined in 'European Site Conservation Objectives for River Lambourn Special area of Conservation Site Code: UK0030044'. They ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

5.2.2.3 Site Condition

The Kennet and Lambourn Floodplain SAC is legally underpinned by the Kennet and Lambourn Floodplain SSSI. Natural England's SSSI site condition assessment in 2019 recognised that:

- 68.39% of the SSSI is assessed to be in favourable condition;
- 16.01% unfavourable – declining;
- 14.5% unfavourable – recovering; and
- 1.1% unfavourable – no change.

5.3 Appropriate Assessment

5.3.1 Potential Adverse Effects

Using the Kennet Valley Groundwater Model, the following impact pathways were identified on the River Lambourn SAC[41]:

[38] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Kennet and Lambourn Floodplain Special Area of Conservation (SAC) Site code: UK0030044. 1 – 13.
[39] Kileen, I.J. (2003). Ecology of Desmoulin's Whorl Snail. Conserving Natura 2000 Rivers Ecology Series No.6. England Nature, Peterborough, 1-27.
[40] House, R.H., Thompson, R.J, & Acreman, M., (2016). Projecting impacts of climate change on hydrological conditions and biotic responses in a chalk valley riparian wetland. Journal of Hydrology. 534, 178-192.
[41] Environment Agency and Thames Water Utilities Ltd (2015). West Berkshire Groundwater Scheme Operating Strategy. 1 – 44.

- During pumping for augmentation, the source of the river would move approximately 0.5 km further downstream as a result of the operation of the KEN_0006.
- Following cessation of KEN_0006 pumping the drawdown in groundwater would cause a sustained reduction in flow within the River Lambourn[40].

Therefore, potential impact pathways to qualifying features of the SAC include a reduction in water flow during operation, causing a deviation from 'naturalised' flow which could cause a reduction in wetted width of the channel and alterations to the biotope mosaic of the river. The underpinning SSSI is in unfavourable – recovering condition due to heavy modification of the watercourse and lack of bankside vegetation. However, flows are considered acceptable and characteristic of the river type (assessment conducted in 2019)[42]. Hydrological changes have been listed as pressures/ threats currently impacting on the condition of the River Lambourn SAC[43].

The reduction in flow could impact on the ability of the SAC to comply with the following attributes and associated targets of water courses of plain to montane levels with *Ranunculus fluitantis*, brook lamprey and bullhead: to maintain or restore the extent and pattern of in-channel and riparian biotopes (habitat mosaic) to that characteristic of natural fluvial processes, maintain or restore the natural flow regime of the river (water course flow), maintain the natural sediment regime, maintain the natural nutrient regime and maintain the distribution and extent of supporting habitat[44].

Using the Kennet Valley Groundwater Model, the following impact pathway was identified on the Kennet and Lambourn Floodplain SAC[40]:

- The drawdown at the KEN_0006 Enborne wellfield would lower groundwater at the Thatcham Reedbeds component of the Kennet and Lambourn Floodplain SAC[40].

Potential impact pathways have been identified, particularly in areas of the SAC located adjacent to the River Lambourn due to the potential reduction in flow as a result of this drought option. This could reduce the wetted width of the channel, therefore, impacting on the availability of suitable habitats to support Desmoulin's whorl snail. Thatcham Reedbeds SSSI is largely in unfavourable – recovering condition, including unit 1 which is adjacent to the River Lambourn. In addition, Hunt's green which is lowland neutral grassland (unit 5 of the Kennet and Lambourn Floodplain SSSI which is currently in unfavourable – declining condition) and marshy grassland associated with unit 1 and 2 of Boxford Water Meadows SSSI (unit 1 is in favourable condition and unit 2 is in unfavourable – recovering condition) could be affected. Hydrological changes have been identified as a key threat to Desmoulin's whort snail[42].

In the absence of mitigation measures, the reduction in groundwater supply could impact on the ability of the SAC to comply with the following attributes and associated targets of Desmoulin's whort snail: to maintain the extent of supporting habitat, maintain the distribution and continuity of supporting habitat, maintain water quality and quantity to a standard which provides the necessary conditions for Desmoulin's whort snail, maintain appropriate soil/ground moisture and maintain the extent and patterning of in-channel and riparian habitats mosaic[44].

5.3.2 Monitoring and Mitigation Measures

A series of monitoring and mitigation measures were developed by the EA and proposed in the KEN_0006 Operation document. The KEN_0006 was last operated in 2022, for a short period, and relevant monitoring and mitigation measures were implemented at the time. A licence for the scheme operation was also granted in 2024. It is assumed that the monitoring and mitigation provided within the KEN_0006 Operation document are sufficient to ensure no LSE's to the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC.

The following mitigation is included in the KEN_0006 Operation document, which is of relevance to Thames Water's Drought Plan implementation. To mitigate for the potential adverse effects of the KEN_0006, the Lambourn, Shefford and Winterbourne wellfields of the scheme should not be used in a second consecutive year or a subsequent drought to ensure that recovery of groundwater to 'natural' levels. The scheme could only be used for a second consecutive

[42] Natural England (2019). Condition of SSSI Units for Site River Lambourn SSSI. Designated Sites View.
[43] Natural England (2014). Site Improvement Plan River Lambourn and Kennet-Lambourn Floodplain. 1 – 16.
[44] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. River Lambourn Special Area of Conservation (SAC) Site Code: UK0030257. Natura 2000, 1 – 30.

year or during a subsequent drought if the following conditions were assessed and agreed with Thames Water, Natural England and the Environment Agency[45]:

- Recovery of the upper ephemeral reaches e.g the source of the River Lambourn has reached a portion of recovery (such as Lambourn village) for a period which allows ecology to recover (such as 6 months);
- Recovery of flow to near normal in the upper perennial reaches e.g. flows at East Shefford gauging station have recovered to near average for the time of year;
- Recovery of flows to near normal in the lower reaches e.g. flows at Shaw gauging station have recovered to near average for the time of year; and
- Recovery of groundwater levels to near normal[45].

Thames Water have also installed an offtake structure to ensure water levels are maintained within the Kennet and Lambourn Floodplain SAC. At Eddington Mill the River Kennet splits into several channels through historic sluices with a smaller channel ensuring flow to the SAC. Connectivity with the River Kennet will have to be maintained during the implementation of the drought option. This would require active maintenance and monitoring of the weir and structure that ensures flow in the SAC. During low flows this could include the monitoring of weir structures and the removal of debris to ensure flow is maintained within the SAC. Consultation with Natural England and the Environment Agency and walkovers will be required to establish the weirs and structures that are critical to maintenance of flow in the SAC. Where required, weirs may need to be modified to ensure that flow can be controlled into the SAC.

5.3.3 Integrity Test Conclusion

On the basis of the above agreed monitoring and mitigation measures during scheme operation, documented by the Environment Agency in the Operating Agreement, no adverse effects on the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC are anticipated.

[45] Environment Agency and Thames Water Utilities Ltd (2022). West Berkshire Groundwater Scheme Operating Strategy. 1 – 44.

6. Potential In-Combination Effects with Other Plans and Projects

6.1 Potential In-combination Effects of the Drought Plan

Most of Thames Water's drought options were identified as having no LSEs on Habitats sites. However, a number of drought options could be used at a similar time (inter-option effects), should they be required and therefore, an assessment has been completed to determine the potential for LSEs, as detailed in **Table 6-1**.

Table 6-1 Thames Water Drought Plan Options In-combination Effects.

Option	Habitats site	In-Combination With	Habitats site	Effect In-Combination?
SWOX_0001 1	Kennet and Lambourn Floodplain SAC	SWOX_0011	Kennet and Lambourn Floodplain SAC	**No** – The hydrological assessment completed as Appendix A of the 2025 SWOX_0012 EAR confirms that the Kennet and Lambourn Floodplain SAC is outside of the ZOI of the SWOX_0011 permit hydrological impacts. Therefore, there is no overlap of impacts to the SAC through the implementation of the SWOX_0011 or SWOX_0001 permit when operated in-combination, and no LSEs are anticipated.
SWOX_0001 2	Kennet and Lambourn Floodplain SAC	SWOX_0011 and/or SWOX_0012	Kennet and Lambourn Floodplain SAC	**No** – As above
SWOX_0006	Oxford Meadows SAC Hartslock Wood SAC Little Whittenham SAC Cothill Fen SAC	SWOX_0007	Hartslock Wood SAC	**No** – SWOX_0007 has a negligible hydrological impact to the River Thames, and therefore, there is no cumulative effect between the two permits operated in-combination.
KEN_0003	Hartslock Wood SAC	KEN_0006	River Lambourn SAC Kennet and Lambourn Floodplain SAC	**No** – no overlapping Habitats sites
KEN_0002	Hartslock Wood SAC	KEN_0006	River Lambourn SAC Kennet and Lambourn Floodplain SAC	**No** – no overlapping Habitats sites
KEN_0002	Hartslock Wood SAC	KEN_0003	Thames Basin Heath SPA	**No** – no overlapping Habitats sites
SWOX_0009	North Meadow and Clattinger Farm SAC	SWOX_0010	North Meadow and Clattinger Farm SAC	**No** – neither option is in hydrological connectivity with Habitats site, therefore no LSEs are anticipated.
Reduction in lowest residual flow on the LTCD from 300 Ml/d to 200 Ml/d	South West London Waterbodies SPA and Ramsar site Windsor Forest	LON_0011	South West London Waterbodies SPA and Ramsar site Richmond Park SAC	**No** – both options are downstream of the South West London Waterbodies SPA and Ramsar site, more than 4 km away and unlikely to impact on water levels in the River Thames.

Option	Habitats site	In-Combination With	Habitats site	Effect In-Combination?
	and Great Park SAC Burnham Beeches SAC			
Earlier Reduction in residual flow on the LTCD	South West London Waterbodies SPA and Ramsar site Windsor Forest and Great Park SAC Burnham Beeches SAC	LON_0011	South West London Waterbodies SPA and Ramsar site Richmond Park SAC	**No –** the options are approximately 19.1 km apart and 35.8 km via hydrological connectivity. As the LON_0011 is located downstream of South West London Waterbodies SPA and Ramsar and water levels are unlikely to be impacted, no LSEs are anticipated.
KEN_0006	River Lambourn SAC Kennet and Lambourn SAC Hackpen Hill SAC	SWOX_0005	River Lambourn SAC Hackpen Hill SAC	**No –** No water dependent qualifying features associated with Hackpen Hill SAC. SWOX_0005 is approximately 6.7 km away from the River Lambourn SAC and the source protection zone does not overlap with boreholes associated with KEN_0006. No LSEs are anticipated.
SWOX_0002 1	North Meadow and Clattinger Farm SAC	SWOX_0002 2	North Meadow and Clattinger Farm SAC	**No –** would not be operated at the same time.
SWOX_0002 1	North Meadow and Clattinger Farm SAC	SWOX_0009	North Meadow and Clattinger Farm SAC	**No –** due to mudstone and clay bedrock, North Meadow and Clattinger Farm SAC is unlikely to be hydrologically connected to the abstracted groundwater and, therefore, no in-combination effects anticipated.
SWOX_0002 2	North Meadow and Clattinger Farm SAC	SWOX_0009	North Meadow and Clattinger Farm SAC	**No –** due to mudstone and clay bedrock, North Meadow and Clattinger Farm SAC is unlikely to be hydrologically connected to the abstracted groundwater and, therefore, no in-combination effects anticipated.
SWOX_0010	North Meadow and Clattinger Farm SAC	SWOX_0002 1	North Meadow and Clattinger Farm SAC	**No –** due to the clay bedrock, North Meadow and Clattinger Farm SAC is unlikely to be hydrologically connected to the abstracted groundwater. In addition, potential impacts of the SWOX_0010 borehole on reaches of the River Thames are downstream of the SAC. No LSEs in-combination anticipated.
SWOX_0010	North Meadow and Clattinger Farm SAC	SWOX_0002 2	North Meadow and Clattinger Farm SAC	**No –** due to the clay bedrock, North Meadow and Clattinger Farm SAC is unlikely to be hydrologically connected to the abstracted groundwater. In addition, potential impacts of the SWOX_0010n borehole on reaches of the River Thames are downstream of the SAC. No LSEs in-combination anticipated.

Option	Habitats site	In-Combination With	Habitats site	Effect In-Combination?
SWOX_0006	Oxford Meadows SAC Hartslock Wood SAC Little Whittenham SAC Cothill Fen SAC	KEN_0003 Boreholes	Hartslock Wood SAC	**No –** no water dependent qualifying features associated with Hartslock Wood SAC.
SWOX_0007	Hartslock Wood SAC	KEN_0003	Hartslock Wood SAC	**No –** no water dependent qualifying features associated with Hartslock Wood SAC.
KEN_0006	River Lambourn SAC Kennet and Lambourn SAC	SWOX_0001 1	Kennet and Lambourn SAC	**No -** At the closest point the options are 9.5 km apart. The groundwater zone of influence of SWOX_0001 1 does not overlap with the groundwater zone of influence of the KEN_0006. Furthermore, both schemes have been determined to have a Negligible impact on the Kennet and Lambourn SAC in isolation, so therefore, there will be no cumulative impact associated within the schemes being operated in-combination, and therefore, no LSEs in-combination are anticipated.
KEN_0006	River Lambourn SAC Kennet and Lambourn SAC	SWOX_0001 2	Kennet and Lambourn SAC	**No -** At the closest point the options are 9.5 km apart. The groundwater zone of influence of SWOX_0001 2 does not overlap with the groundwater zone of influence of the KEN_0006. Furthermore, both schemes have been determined to have a Negligible impact on the Kennet and Lambourn SAC in isolation, so therefore there will be no cumulative impact associated within the schemes being operated in-combination, and therefore, no LSEs in-combination are anticipated.
SWOX_0001 1	Kennet and Lambourn SAC	SWOX_0001 2	Kennet and Lambourn SAC	**No –** would not be operated at the same time.
KEN_0002	Thames Basin Heaths SPA	GUI_0006	Thames Basin Heaths SPA Thursley, Ash, Pirbright and Chobham SAC	**No –** the options are approximately 37.5 km apart and the point where potential in-combination effects may occur on the River Thames is downstream of the Thames and Basin Heaths SPA.
SWA_0005	Chilterns Beechwoods SAC Burnham Beeches SAC	HEN_0001/ HEN_0002	Chilterns Beechwoods SAC	**No –** no water dependent qualifying features associated with Chilterns Beechwoods SAC.

Potential in-combination effects with other relevant plans and projects (as described in **Section 2.5**) have been reviewed and are summarised in the following sections.

6.2 Other Water Company Drought Plans

Assessment of the potential for cumulative impacts of supply side and drought permit/order options listed in neighbouring water companies' drought plans has been undertaken.

It should be noted that DPs for other companies/organisations are subject to review from the Environment Agency and Defra on the same timescales as Thames Water's DP revision. Thames Water has previously held discussions with neighbouring water companies in order to identify any drought options which may have the potential to cause in-combination effects, where necessary further discussions and, if necessary, more assessment work will be used to further improve understanding of potential in-combination effects. The information used to carry out these assessments is considered to be the most up to date information available at time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought options has been made in the intervening period, and that the assessment, therefore remains valid.

The assessments have been informed by the most recent information available on the neighbouring water company DPs. Where possible, the SEAs and the details presented in the drought option details tables often presented in the appendices of the respective water company DP have been taken into consideration, together with information gathered through Thames Water's ongoing consultation with other neighbouring water companies.

The following neighbouring watering company DPs were considered:

- Anglian Water (2022)
- Severn Trent (2022)
- Southern Water (2022)
- Wessex Water (2021)
- Bristol Water (2022)
- Essex and Suffolk Water (2022)
- South East Water (mid Kent) (2022)
- SES (2022)
- Affinity Water (2022)

6.2.1 Anglian Water

No cumulative impacts between drought options in Thames Water's DP 2027 with Anglian Water's Drought Plan (2022) have been identified.

6.2.2 Severn Trent

No cumulative effects between drought management measures in the Thames Water's DP 2027 and Severn Trent Water DP (2022) have been identified. The cross-border supplies between Severn Trent Water and Thames Water are minor in terms of drought planning.

6.2.3 Southern Water

No cumulative impacts between drought options in Thames Water's DP 2027 with Southern Water's Drought Plan (2022) have been identified.

6.2.4 Wessex Water

No cumulative impacts between drought options in Thames Water's DP 2027 with Wessex Water's Drought Plan (2021) have been identified.

6.2.5 Bristol Water

No cumulative impacts between drought options in Thames Water's DP 2027 with Bristol Water's Drought Plan (2022) have been identified.

6.2.6 Essex and Suffolk Water

Essex and Suffolk Water (ESW) obtain 16% of water supplied in their Essex water resource zone from Thames Water via a raw water bulk transfer from the Lee Valley reservoirs. This would be reduced in drought conditions depending on the respective demand management measures implemented by each company. ESW's Draft DP (2022) includes an option that would increase the Chigwell bulk transfers from Thames Water by agreement. The ESW Drought Plan assumes that Thames Water's own resource situation would be robust and that the spatial distribution of drought impact would not cover Thames Water's supply area, although this would not be the case in all drought situations. The agreement states that during an "unusual drought" Thames Water shall supply to ESW such quantities as shall represent "fair apportionment" of the water available and will therefore be dependent on Thames Water's own resource situation, the nature and spatial distribution of the drought, and demand in the Chigwell area. Therefore, the drought action would only be realistic in the event that a drought affecting ESW does not materially affect Thames Water, therefore, no cumulative impacts between drought options in Thames Water's DP 2027 with Essex and Suffolk Water Drought Plan (2022) have been identified.

6.2.7 South East Water (Mid Kent)

No cumulative impacts between drought options in Thames Water's DP 2027 with South East Drought Plan (2022) have been identified. At the time of writing South East Water had no drought options confirmed.

6.2.8 SES Water

SES have not included any temporary bulk transfers from other water companies, or third parties, in their Drought Plan 2022 and no permanent bulk transfers will be in operation for the lifetime of this iteration of the Drought Plan.

Cumulative impacts have been identified between the LON_0021 option and drought options in the SES Water Drought Plan. The SES Water Drought Plan (2022) includes a potential drought permit/order option which involves an increase in abstraction from three groups of groundwater abstraction sites (Hackbridge/Goatbridge group, Woodmansterne group and Kenley group). Given the proximity of these boreholes to the LON_0021 boreholes, there is the potential for cumulative effects, such as exacerbating the reduction in groundwater levels and associated effects, if the SES Water drought permits were to be implemented at the same time as the LON_0021 drought permit. In 2017, Thames Water conducted a study together with SES Water25 to understand the impact their individual groundwater abstractions were having on the Wandle Catchment. Borehole monitoring was carried out to assess how the different groundwater abstractions impact on levels in the Chalk aquifer when they are at their fully licensed rates. Results of the monitoring suggested that when operating the LON_0021 abstraction at its peak fully licensed abstraction of 15.5Ml/d (equivalent to the drought permit) groundwater drawdown of a depth of 0.1m would be experienced in the immediate vicinity of the abstraction. North of the abstraction, drawdown response varied with some boreholes not responding to the increased abstraction and others drawn down by 0.03-0.1m. There was no response to the increased abstraction south of LON_0021 in any of the boreholes. An assessment26 of the cumulative impacts of operating these two drought permits simultaneously has identified that together, the drought permits will exert a moderate impact on the River Wandle from Waddon Ponds to STW_0001 effluent ditch. The impact of the drought permits will be mitigated by the 90Ml/d discharge coming from the STW_0001 therefore, the impacted reach ends here. The hands-off- flow associated with the Hackbridge and Carshalton Arm augmentation scheme will also ensure that the River Wandle has enough flow in that section of the river to ensure that effluent discharge continues to flow downstream and does not back up the River Wandle. In an evolving drought situation, further discussions with SES Water will be required in order to understand the likelihood of the drought permits being operated at the same time. Alternative drought options may need to be reviewed in order to determine the appropriate approach according to the prevailing drought conditions. However, the LON_0021 option does not impact any Habitats sites, therefore, no in combination impacts to Habitat sites are anticipated.

The potential for cumulative impacts with other water company drought plans must be reviewed at the time of any potential future LON_0021 drought permit application, as they may have been revised in the interim.

6.2.9 Affinity Water

Affinity Water Drought Plan (2022) notes that there are currently four bulk import connections with Thames Water in their central region. It is Thames Water's responsibility to maintain minimum flows in the River Thames at LON_0027 and Affinity do not link their drought actions to surface water conditions. Potential cumulative effects have been identified for the River Lea. Thames Water abstract surface water at Lee Navigation at New Gauge (between Hertford and Ware). The abstraction rate from this source at the time of the implementation of the Affinity Water drought permits (if required) is therefore critical and there is potential for cumulative effects, however it is uncertain at this stage. However, the Affinity Water drought permits are lower in volumetric terms and result in indirect impacts as they are from groundwater. The HRA identified the following supply side options in Thames Water's DP 2027 overlap with the Lee Valley SPA and Ramsar site: LON_0013 (1km), LON_0015 (4.1km), LON_0017 (4.4km), LON_0002 (8.4km) and LON_0005 (9.6km). As these options relate to groundwater abstractions, there is potential for in combination effects with Affinity Water's THUN drought permit. However, Thames Water's schemes would abstract from a confined chalk aquifer approximately 30 – 60m below surface level and are overlayed with London Clay, whereas Affinity Water's THUN drought permit would abstract from chalk closer to surface level (3 – 7.4m below surface level). In addition, Thames Water options use existing licenses (they are not drought permits) and have been included in the baseline for the regional modelling conducted by Affinity Water for use in their EAR updates, where no in-combination effects were identified. Therefore, no cumulative impacts between drought options in Thames Water's DP 2027 with Affinity Water's Drought Plan (2022) have been identified at this stage.

6.3 Water Resource Management Plans

Assessment of the potential for cumulative effects with Thames Water's WRMP and neighbouring water companies' WRMPs has been undertaken.

It should be noted that all WRMPs are subject to review every five years. The information used to carry out these assessment is considered to be the most up to date information publicly available at time of writing (Periodic Review 2024 (PR24) WRMPs). Where possible, this is also informed through on-going discussions that Thames Water are holding with neighbouring water companies in order to identify any water resource options which may have the potential to cause cumulative impacts with their drought options. The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the WRMPs have been made in the intervening period, and that the assessment, therefore remains valid. For example, the PR29 WRMPs will be developed and issued during the period of Thames Water's DP.

The assessments have been informed by each Water Companies' WRMP and where possible SEAs.

The following WRMPs were considered:

- Thames Water (2024)
- Anglian Water (2024)
- Severn Trent (2024)
- Southern Water (2024)
- Wessex Water (2024)
- Bristol Water (2024)
- Essex and Suffolk Water (2024)
- South East Water (mid Kent) (2024)
- SES Water (2024)
- Affinity Water (2024)

All of Thames Water's neighbouring companies WRMPs include significant demand management components which will complement the Demand Side measures of Thames Water's DP. Improved water efficiency and leakage reduction across the country will give beneficial cumulative impacts in terms of lower energy use and carbon emissions from reduced pumping and treatment. These measures will also reduce the need to abstract new water resources, thereby ensuring ecological water requirements are maintained.

6.3.1 Thames Water (2024)

A number of the DP demand side measures are fundamentally linked to the demand management schemes in the WRMP24, with the measures contained in each plan acting in-combination to provide a resilient water supply to customers in the Thames Water region and safeguard the provision of essential water supplies in drought conditions. While the implementation of demand side measures may exacerbate some of the potential adverse impacts of the demand management measures, for example in relation to vehicle movements their implementation in combination with demand management measures included in the WRMP should cause a beneficial cumulative impact on water resources (with indirect beneficial effects on environmental receptors such as biodiversity) because of improved water efficiency and reduced leakage.

In terms of geographic location, possible interactions with options included in Thames Water's Final WRMP24 as either operational or under construction in the timeframe of Thames Water's DP (to 2032) were identified as:

- The WRMP24 includes four drought permit options; GUI_0006, HEN_0002/HEN_0001, KEN_0005 and SWOX_0007. These options are all mutually exclusive with the DP, therefore, no cumulative effects are assessed.
- Cumulative effects may occur in catchments where the drought management plans are put in place in similar geographic locations to the WRMP measures, particularly if this occurs at a time before adequate supply side options have been introduced. WRMPs are required to be updated every five years by water companies. The cumulative effects assessments will be updated over time to reflect any changes to the WRMP.

6.3.2 Anglian Water (2024)

With particular focus on the Ruthamford South, South Essex and Central Essex WRZs which border Thames Water's region, there are no likely potential cumulative effects with Anglian Water's WRMP.

6.3.3 Severn Trent (2024)

There are no Thames Water DP options in close enough proximity to Severn Trent Waters region to result in any construction related cumulative effects. There is no hydrological link between the options in Thames Waters DP and Severn Trent's WRMP24. No cumulative effects are, therefore, likely to occur with Thames Water's DP.

6.3.4 Southern Water (2024)

Focussing on areas which border the Thames Water region it has been identified that there are no Thames Water DP options in close enough proximity to result in any cumulative effects.

6.3.5 Wessex Water (2024)

Wessex Water does not project a deficit until 2079 and as such the WRMP24 proposes no supply options that overlap with the DP. No cumulative effects are therefore likely to occur with Thames Water's DP.

6.3.6 Bristol Water (2024)

There are no Thames Water DP options in close enough proximity to the Bristol Water region to result in any construction related cumulative effects and there is no part of the Thames region in hydrological connectivity with the Bristol Water region. No cumulative effects are therefore likely to occur with Thames Water's DP.

6.3.7 Essex and Suffolk Water (2024)

The Essex and Suffolk Water WRMP includes no supply options, as all of the WRZs are projected to be in surplus over the plan period. No cumulative effects are, therefore, likely to occur with Thames Water's DP.

6.3.8 South East Water (mid Kent) (2024)

There are no Thames Water DP options in close enough proximity to the South East Water's WRMP24 options. No cumulative effects are considered likely to occur with Thames Water's DP.

6.3.9 SES Water (2024)

No options in the SES Water WRMP24 will become utilised during the DP operational period, as a result, no cumulative impacts were identified between the SES Water WRMP24 and the Thames Water DP.

6.3.10 Affinity Water (2024)

No cumulative impacts were identified between the Affinity Water WRMP24 and the Thames Water DP.

6.4 Environment Agency Thames Area Drought Plan

The potential for cumulative effects of Thames Water's DP 2027 with the Environment Agency's Thames area Drought Plan[46] has been assessed.

Part of the Environment Agency's role is to reduce the impact of drought on the natural environment by taking specific actions. The Environment Agency can apply for environmental drought orders if the environment is suffering serious damage because of abstraction during a drought. The plan says that the Environment Agency would work with stakeholders including water companies to identify where and when it would be necessary and its potential effects on any essential public supplies or infrastructure.

Environment Agency environmental drought order actions have the potential to have in-combination impacts with Thames Water's DP 2027. The Environment Agency can apply to the Secretary of State for environmental drought orders if the environment is suffering serious damage as the result of abstraction during a drought. Nevertheless, liaison is required with the Environment Agency to permit the operation of the DP schemes, and the Environment Agency also monitor the actions taken to ensure these are in accordance with any drought permits/orders.

Given that the Environment Agency drought actions will have a positive effect on river flows and lake levels and, therefore, the natural environment and ecology, there will be **no cumulative impacts** between it and the Thames Water drought plan options. However, due to the uncertainties of potential locations, this should be considered further at the time of any potential application for drought permits/orders by Thames Water or the Environment Agency.

6.5 Thames River Basin Management Plan

Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in the River Basin Management Plans has been undertaken.

The updated Thames RBMP[47], published in October 2022, describes the planned steps to implement the measures required to achieve the environmental objectives of the Water Framework Directive (WFD). It provides the framework for protecting and enhancing the water environment.

The information used to carry out these assessments is considered to be the most up to date information available at the time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to the River Basin Management Plans have been made in the intervening period, and that the assessment, therefore, remains valid.

[46] Environment Agency (2025) Thames are drought plan, 20 March 2025. Version 2025.1.0
[47] Environment Agency (2022) Thames river basin district river basin management plan: updated 2022. Available at: https://www.gov.uk/guidance/thames-river-basin-district-river-basin-management-plan-updated-2022 [Accessed February 2026)

The RBMP and DP contain similar objectives around the protection, sustainable management and use of the water environment in terms of quality and quantity. As a result, interaction between both plans is considered likely, particularly on the water environment and water dependant habitats. SEA was undertaken on the second cycle of RBMPs and not updated during the third RBMP cycle. The SEA of the Thames RBMP determined that the plan was likely to have significant positive effects on the environment, particularly in respect of biodiversity, water, population and human health and that any local negative effects would expect to be mitigated during implementation. Therefore, there will be **no cumulative impacts** between the Thames RBMP and the Thames Water drought plan options. The Environment Agency is carrying out SEA for the fourth cycle as there is potential for more significant changes to the measures. This will be reviewed during future drought plan cycles for potential cumulative effects. The HRA[48] of the Thames RBMP concluded that the risk of significant in-combination effects on Habitats sites with other plans is considered to be low.

6.6 Cumulative effects with any identified relevant projects

There are a number of infrastructure priorities identified in regional and local planning documents in addition to national programmes. These include the improvement of existing infrastructure by extension, redevelopment or increasing existing capacity. With regard to other projects that may result in a cumulative effect with the Thames Water DP 2027, those considered to be **relevant at the strategic level** comprise large scale high profile infrastructure schemes and particularly those that may affect water flows or groundwater levels, these projects comprise:

- LON_0027 Direct River Abstraction (TDRA)
- White Horse Reservoir SRO (previously known as South East Strategic Reservoir Option – SESRO)
- River Thames Scheme (reducing flood risk from Datchet to Teddington)
- Oxford Flood Alleviation Scheme
- High Speed Two Rail Network (HS2)

6.6.1 The LON_0027 Direct River Abstraction (TDRS) project

The TDRA Strategic Resource Option (SRO) is a key component of Thames Water's long-term strategy to secure London's water supply. It was selected as a part of the SRO London Effluent Reuse by the Regulators' Alliance for Progressing Infrastructure Development (RAPID). It is designed to enhance drought resilience, ensuring reliable service for customers and supporting the millions of people who live, work, and visit the city. The scheme is intended to meet the forecast demand of 13 million people across the Thames Water region by 2050, including 10 million in London[49].

Construction is scheduled to begin in 2029, with full operation expected by 2033. During operation, water will be abstracted from the River Thames upstream of LON_0027 and transferred via a new connecting pipeline into an existing underground tunnel, delivering supplies to Thames Water's reservoirs for treatment into drinking water. To maintain river levels and protect the environment, the abstracted water will be replaced with highly treated recycled water from STW_0004 in Isleworth. This recycled water will be conveyed through a new underground pipeline to an outfall structure upstream of LON_0027, ensuring both additional supply resilience and the safeguarding of river ecology.

Only construction-phase activities are relevant to the cumulative effects assessment, as the operation of the scheme will not coincide with the DP. All construction works associated with both the scheme and the drought options are expected to follow established best practice, and therefore no significant cumulative effects are anticipated.

6.6.2 White Horse Reservoir SRO (previously known as South East Strategic Reservoir Option – SESRO)

[48] Environment Agency (2022) River basin management plan for the Thames River Basin District: Habitats Regulations Assessment, September 2022. Available at https://assets.publishing.service.gov.uk/media/635248048fa8f554cca7b226/Thames_river_basin_management_plan_2022_HRA.pdf [Accessed February 2026]
[49] Thames Water (2025) Teddington Direct River Abstraction (TDRA) Available at https://thames-sro.co.uk/projects/tdra/ [Accessed December 2025]

This SRO involves the construction and operation of a new reservoir near Abingdon in Oxfordshire, designed to help secure water supplies for around 15 million people across the South East. The reservoir would play a critical role in addressing anticipated water shortages. It would be filled with water from the River Thames during the winter months, when flows are higher and resources more plentiful. When river levels fall or demand increases, water would be released from the reservoir back into the Thames for re-abstraction downstream.

The proposed reservoir would provide direct supply to local customers, as well as homes and businesses across London and the wider South East. It would also support customers served by Affinity Water and Southern Water, strengthening resilience across the region[50].

Construction of the reservoir is not anticipated to start until 2032 and will not overlap with the DP, therefore no cumulative effects are anticipated.

6.6.3 The River Thames Scheme (reducing flood risk from Datchet to Teddington)

The River Thames Scheme (RTS) is a significant green and blue infrastructure development that will comprise a range of new features, including a new flood channel to reduce flood risk whilst providing habitat for wildlife and new recreational opportunities. Construction of the scheme is anticipated to take place between winter 2026 to 2032, with the flood channel being operational from 2030, meaning both periods overlap with the DP. There is potential for cumulative effects with the RTS and LON_0011 drought permit option.

The Southwest London Water bodies SPA and Ramsar are present within the study area for the River Thames Scheme. The scheme has been subject to a full HRA which is not publicly available. The HRA concluded that the scheme will not adversely affect the integrity of the site subject to appropriate mitigation being put in place. If it is not possible to find sufficient mitigation for the effects of diversion channels on Southwest London Waterbodies SPA, a case for IROPI will be prepared. Further HRAs will also be undertaken on individual component parts arising from the Scheme. It is noted that a loss of habitat in the Thorpe Hay Meadow SSSI is also likely and mitigation and/or compensation measures need to be developed.

The SPA and Ramsar are also within the zone of influence of the LON_0011 drought option. However, no LSEs are anticipated from the construction phase with minor construction work being mitigated by best practice construction methods, or operational phase with a reduced rate of drawdown being potentially beneficial.

The RTS PEIR identified potential significant negative effects during construction on the River Thames – Cookham to Egham water body and during construction and operation in the River Thames – Egham to Teddington water body. The LON_0011 drought permit requires construction to enable back pumping at several weirs which may coincide with the construction of the RTS. As a result, there is potential for cumulative effects as a result of exacerbated contamination risk to the water bodies, however, it is assumed good industry practice will be applied during construction, therefore significant cumulative effects are not anticipated. During operation, the introduction of augmented from the RTS has the potential for reduced flow and creation of a depleted reach with may result in impacts to river habitats and aquatic receptors. No secondary mitigation has been proposed by the RTS at this stage and further modelling is being undertaken to develop these. The PEIR identified that precise mitigation to reduce negative effects on gadwall and shoveler will be determined by the HRA but might include measures such as seasonal restrictions; buffers; habitat enhancement; construction noise barriers/screens; timed sheet piling; restricted lighting; avoidance of direct impacts. Operation of the LON_0011 drought permit assumes management actions to maintain levels will be carried out by the Environment Agency, however, a precautionary approach has been applied and significant cumulative effects on the water environment between the RTS and the LON_0011 drought permit cannot be ruled out at this stage. This will be reviewed during any future drought permit applications.

6.6.4 Oxford Flood Alleviation Scheme

The Environment Agency is working in partnership on a major new scheme to reduce flood risk in Oxford. The Oxford Flood Alleviation Scheme will create a new stream with a wetland wildlife corridor to reduce flood risk in the city and

[50] Thames Water (2025) South East Strategic Reservoir Option (SESRO) Available at https://thames-sro.co.uk/projects/sesro/ [Accessed December 2025]

surrounding areas. The scheme will be approximately 5km long and is designed to reduce flood risk around the River Thames through diverting flood water across the undeveloped flood plain away from properties. The same amount of water that enters the scheme will return to the River Thames at Kennington.

The Oxford Meadows SAC and Cothill Fen SAC are within 10km of the proposed Oxford Flood Alleviation Scheme[51]. Oxford Meadows SAC is upstream of the proposed scheme, whilst Cothill Fen SAC is approximately 4.7km south west, however, no HRA or environmental assessment is available for the scheme yet.

Construction is expected to begin in late 2026 and continue for up to five years, overlapping with the duration of the DP. The scheme's study area also coincides with the impacted reaches of the SWOX_0006 drought permit option.

Modelling undertaken to support the planning application for the flood alleviation scheme identified negligible changes in groundwater levels and no significant alterations to surface water levels in the Seacourt Stream or in adjacent streams and ditches. The SWOX_0006 EAR identified moderate and uncertain risks to river habitats across the affected reaches. The drought permit option would also include over pumping from the River Thames into selected distributaries to maintain minimum flows, with implementation requiring only minor construction works such as temporary electric and submersible pumps. The SWOX_0006 drought option construction works were assessed to have no LSEs on either Habitats site due to distance. Cothill Fen SAC is not within the operational zone of influence, and the option will not impact flood flows over winter which the Oxford Meadows SAC is reliant on.

Construction of the flood alleviation scheme carries the potential for accidental pollution of local watercourses, including the Seacourt, Bulstake and Hinksey Streams. However, the application of best practice pollution prevention and construction management measures throughout all works would minimise such risks. As a result, significant cumulative effects are not anticipated. Likewise, no LSEs on the Oxford Meadows SAC are expected, either alone or in combination, for the scheme or the drought permit option.

Therefore, no likely significant in-combination effects between the Oxford Flood Alleviation Scheme and Thames Water's draft DP 2027 are currently envisaged, however this will be kept under review as more details of the Oxford Flood Alleviation Scheme become available.

6.6.5 High Speed Two Rail Network (HS2)

HS2 (High Speed Two) is a major UK rail infrastructure project designed to create a new high-speed railway linking London with Birmingham, with original plans to extend further north to Manchester and Leeds now cancelled. Originally set to complete in 2033, the project programme is currently being reset with no new completion date formally agreed. Construction activities are anticipated to continue throughout this period and will overlap with the DP.

The construction of HS2 has the potential to contribute to cumulative impacts when considered alongside drought options in the DP, particularly where activities overlap spatially or temporally within shared catchments or water bodies. These risks include changes to water quality, increased sedimentation, disturbance to hydrological regimes, and potential effects on dependent habitats and species. However, any construction associated with the drought options is anticipated to be minor, with the nearest spatial proximity of HS2 to a drought option being 7km, and both HS2 and the drought options will ensure robust coordination, follow best practice and adhere to regulatory requirements, therefore significant cumulative effects are unlikely.

[51] Environment Agency (2017) Oxford Flood Alleviation Scheme: design consultation. Accessed at: https://www.gov.uk/government/consultations/oxford-flood-alleviation-scheme-design-consultation

7. Conclusions and Recommendations

Thames Water has completed the first stage of the HRA process, screening, on its draft DP 2027 options list. The screening stage identified whether any drought options have the potential to cause a Likely Significant Effect (LSE) on the integrity of a Habitats site(s).

Due to uncertainties regarding the potential LSEs of the KEN_0006 on the River Lambourn SAC and the Kennet and Lambourn Floodplain SAC and the requirement for mitigation measures, this drought option was taken through to Stage 2 Appropriate Assessment. With consideration of a hydrometric monitoring programme and appropriate mitigation measures (previously agreed between the Environment Agency and Thames Water), no adverse effects on site integrity are anticipated from the implementation of the KEN_0006. No LSEs were identified for all other drought options in Thames Water's draft DP 2027, when considered alone on Habitats site(s).

In-combination effects were assessed between drought options of Thames Water's draft DP 2027, with its Water Resource Management Plan (WRMP)24, the Environment Agency's DPs, the Thames River Basin Management Plan, other water company WRMPs and DPs and other major infrastructure projects available at this time. No in-combination LSEs between drought options and with other plans and projects were identified on Habitat site(s).

A summary of the conclusions of the Stage 1 Screening and Stage 2 Appropriate Assessment is presented in **Table 7-1**

Table 7-1 Summary of HRA Screening Conclusions.

Drought Option	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	Effect in-combination with other drought options?	Appropriate Assessment (AA) required?	Adverse effect on site integrity?
Demand Management					
Media/water efficiency campaign	No	No	No	No	N/A
Leakage reduction	No	No	No	No	N/A
Temporary use Ban	No	No	No	No	N/A
Drought Order to ban Non-Essential Use	No	No	No	No	N/A
Emergency Drought Order	No	No	No	No	N/A
Supply Side Options					
London WRZ					
North London Artificial Recharge Scheme	No	No	No	No	N/A
LON_0020	No	No	No	No	N/A
LON_0002	No	No	No	No	N/A
Reduction in lowest residual flow on the Lower Thames Control Diagram at LON_0027 from 300Ml/d to 200Ml/d	No	No	No	No	N/A
Earlier reduction in residual flow at LON_0027 on the Lower Thames Control Diagram	No	No	No	No	N/A
LON_0005	No	No	No	No	N/A
LON_0017	No	No	No	No	N/A
LON_0015	No	No	No	No	N/A
KEN_0006	Yes	No	No	Yes	No

Drought Option	Is scheme likely to have a significant effect on Habitats site(s) alone?	Effect in-combination with existing consents?	Effect in-combination with other drought options?	Appropriate Assessment (AA) required?	Adverse effect on site integrity?
Drought permit/order					
London WRZ					
LON_0019 1	No	No	No	No	N/A
LON_0019 2	No	No	No	No	N/A
LON_0011 1	No	No	No	No	N/A
LON_0011 2	No	No	No	No	N/A
LON_0003	No	No	No	No	N/A
LON_0022	No	No	No	No	N/A
Increase in M2 annual licence	No	No	No	No	N/A
LON_0021	No	No	No	No	N/A
In extremis option					
LON_0008	No	No	No	No	N/A
SWOX Water Resource Zone					
SWOX_0002 1	No	No	No	No	N/A
SWOX_0002 2	No	No	No	No	N/A
SWOX_0009	No	No	No	No	N/A
SWOX_0010 1	No	No	No	No	N/A
SWOX_0010 2	No	No	No	No	N/A
SWOX_0006	No	No	No	No	N/A
SWOX_0001 1	No	No	No	No	N/A
SWOX_0001 2	No	No	No	No	N/A
SWOX_0007	No	No	No	No	N/A
SWOX_0005	No	No	No	No	N/A
SWOX_0011	No	No	No	No	N/A
SWOX_0012	No	No	No	No	N/A
In extremis option					
SWOX_0004	No	No	No	No	N/A
SWOX_0003	No	No	No	No	N/A
SWOX_0012	No	No	No	No	N/A
Kennet Valley Water Resource Zone					
KEN_0003	No	No	No	No	N/A
KEN_0004	No	No	No	No	N/A
KEN_0005	No	No	No	No	N/A
KEN_0002	No	No	No	No	N/A
In extremis option					
KEN_0001	No	No	No	No	N/A
Guildford Water Resource Zone					
GUI_0001	No	No	No	No	N/A
GUI_0006	No	No	No	No	N/A
SWA Water Resource Zone					
SWA_0005	No	No	No	No	N/A
Henley Resource Zone					
HEN_0001/HEN_0002	No	No	No	No	N/A

Appendices

Appendix A: Habitats Sites Summaries

Table A-1: Summaries of Habitats Sites within the Thames Water region

Site Name	Reason for Designation	Site Vulnerability
Burnham Beeches SAC (UK0030034)	**H9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)** Burnham Beeches is an example of Atlantic acidophilous beech forests in central southern England. It is an extensive area of former beech wood-pasture with many old pollards and associated beech *Fagus sylvatica* and oak *Quercus* spp. high forest. Surveys have shown that it is one of the richest sites for saproxylic invertebrates in the UK, including 14 Red Data Book species. It also retains nationally important epiphytic communities, including the moss *Zygodon forsteri.*	The site is subject to threats and pressures from; Problematic native species Outdoor sports and leisure activities, recreational activities Changes in biotic conditions Air pollution, air-borne pollutants Other ecosystem modifications
Chilterns Beechwoods SAC (UK0012724)	**H9130 Asperulo-Fagetum beech forests ('Beech forests on neutral to rich soils')** The Chilterns Beechwoods represent a very extensive tract of *Asperulo-Fagetum* beech forests in the centre of the habitat's UK range. The woodland is an important part of a grassland-scrub-woodland mosaic. A distinctive feature in the woodland flora is the occurrence of the rare coralroot *Cardamine bulbifera.* **H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)** This habitat is typically located on thin, well-drained, lime-rich soils associated with chalk and limestone. The grassland at Chilterns Beechwoods SAC includes species such as sheep's fescue *Festuca ovina*, quaking grass *Briza media* and wild thyme *Thymus praecox*. **S1083 Stag beetle *Lucanus cervus*** Stag beetles are the largest terrestrial beetle present in the UK, growing up to 7cm, and have a south-eastern distribution in the UK. Larvae develop in decaying timber, therefore, forests provide an essential functioning role in maintaining this species abundance.	This site is subject to threats and pressures from; Invasive non-native species Problematic native species Interspecific floral relations Forest and Plantation management & use
Cothill Fen SAC (UK0012889)	**H7230 Alkaline fens** One of the largest surviving examples of alkaline fen vegetation in central England, a region where fen vegetation is rare. The M13 *Schoenus nigricans – Juncus subnodulosus* vegetation found here occurs under a wide range of hydrological conditions, with frequent bottle sedge *Carex rostrata*, grass-of-Parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris* and marsh helleborine *Epipactis palustris*.	This site is subject to threats and pressures from; Pollution to groundwater (point sources and diffuse sources) Human induced changes in hydraulic conditions

Site Name	Reason for Designation	Site Vulnerability
	H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) Alluvial forests consists of woods dominated by alder *Alnus glutinosa* and willow *Salix* spp. on flood plains that typically occur on moderately base-rich, eutrophic soils subject to periodic inundation.	
Epping Forest SAC (UK0012720)	**H9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)** Epping Forest represents Atlantic acidophilous beech forests in the north-eastern part of the habitat's UK range. Although the epiphytes at this site have declined, largely as a result of air pollution, it remains important for a range of rare species, including the moss *Zygodon forsteri*. The long history of pollarding, and resultant large number of veteran trees, ensures that the site is also rich in fungi and dead-wood invertebrates. **S1083 Stag beetle *Lucanus cervus*** Epping Forest is a large woodland area in which records of stag beetle *Lucanus cervus* are widespread and frequent; the site straddles the Essex and east London population centres. Epping Forest is a very important site for fauna associated with decaying timber, and supports many Red Data Book and Nationally Scarce invertebrate species. **H4010 Northern Atlantic wet heaths with *Erica tetralix*** At Epping Forest the wet heaths consist of M16 *Erica tetralix* – *Sphagnum compactum* wet heath. **H4030 European dry heaths** At Epping Forest the European dry heaths comprises of H1 *Calluna vulgaris* – *Festuca ovina* heathland.	Qualifying features of Epping Forest are currently subject to threats and pressures as a result of: Human induced changes in hydraulic conditions Grazing Outdoor sports and leisure activities, recreational activities Air pollution, air-borne pollutants Changes in biotic conditions
Hackpen Hill SAC (UK0030162)	**1654 Early gentian *Gentianella anglica*** Hackpen Hill is an extensive area of unimproved chalk grassland in the Downs. The site has a variety of aspect and gradients, with the grassland dominated by red fescue *Festuca rubra* and upright brome *Bromus erectus*. The herb flora includes a significant population of early gentian *Gentianella anglica*. **6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)** (* important orchid sites). At Hackpen Hill SAC extensive areas of species-rich, agriculturally unimproved chalk grassland are present that support a diverse range of plants including orchids such as frog orchid *Coeloglossum viride* and fragrant orchid *Gymnadenia conopsea*.	No current issues affecting the qualifying feature(s) of the Habitats site have been identified.

Site Name	Reason for Designation	Site Vulnerability
Hartslock Wood SAC (UK0030164)	**H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)** Hosts the priority habitat type "orchid rich sites". The steep slopes of this site on the chalk of the Chilterns comprise a mosaic of chalk grassland, chalk scrub and broadleaved woodland. The site supports one of only three UK populations of monkey orchid *Orchis simia*, a nationally rare Red Data Book species. **H91J0 *Taxus baccata woods of the British Isles*** This site lies on a steep slope above the River Thames. Recent storms and landslips have resulted in a diverse age-structure for the yew population. Open patches show a rich flora including local species such as southern wood-rush *Luzula forsteri*, wood barley *Hordelymus europaeus* and narrow-lipped helleborine *Epipactis leptochila*.	The grasslands are subject to pressures from; Air pollution, air-borne pollutants
Kennet and Lambourn Floodplain SAC (UK0030044)	**1016 Desmoulin`s whorl snail *Vertigo moulinsiana*** - The cluster of sites selected in the Kennet and Lambourn valleys supports one of the most extensive known populations of Desmoulin's whorl snail *Vertigo moulinsiana* in the UK and is one of two sites representing the species in the south-western part of its range in the important chalk stream habitat. Integrity of the population is being maintained by taking measures, including habitat creation, to safeguard populations. The habitat occupied at this site differs from the Fenland sites in East Anglia in that it is predominantly reed sweet-grass *Glyceria maxima* swamp or tall sedges at the river margins, in ditches and in depressions in wet meadows.	This site is subject to threats and pressures from; Modification of cultivation practices Human induced changes in hydraulic conditions Pollution to groundwater (point sources and diffuse sources
Lee Valley SPA (UK9012111)	**A021 Great bittern *Botaurus stellaris* (Non-breeding)** This site supports nationally important numbers of this Annex 1 species during the winter months The reed-bed habitat is vital to the species, providing them with feeding areas and locations to hide. The majority of bittern are found in the Turnford and Cheshunt Pits site while Amwell Quarry and Rye Meads also support the species. Walthamstow Reservoirs also occasionally supports bittern. **A051 Gadwall *Anas strepera strepera* (Non-breeding)** The site supports internationally important numbers of gadwall during the wintering period and Gadwall favour gravel pits and reservoirs during the winter period where they feed on seeds, leaves and stems of water plants. Each of the supporting SSSIs support gadwall in numbers which are sufficient to qualify them as being of national importance. **A056 Northern shoveler *Anas clypeata* Non-breeding)** The site supports internationally important numbers of shoveler during the winter period, and Shoveler are found throughout the site and in winter they frequent shallow water areas on marshes, flooded pasture, reservoirs and lakes with plentiful, marginal reeds or emergent vegetation.	Threats and pressures affecting the Lee Valley SPA include: Human induced changes in hydraulic conditions Pollution to groundwater (point sources and diffuse sources) Outdoor sports and leisure activities, recreational activities Biocenotic evolution, succession Marine and Freshwater Aquaculture

Site Name	Reason for Designation	Site Vulnerability
Lee Valley Ramsar (UK11034)	**Gadwall (wintering) *Anas strepera strepera*** Species/ populations occurring at levels of international importance. Peak counts in winter in north-west Europe of 445 individuals representing an average of 2.6% of the British population (5 year peak mean 1998/9 – 2002/3). **Northern shoveler (wintering) *Anas clypeata*** Species/ populations occurring at levels of international importance. Peak counts in winter in north-west and central Europe of 287 individuals representing an average of 1.9% of the British population (5 year peak mean 1998/9 – 2002/3). **Whorled water-milfoil *Myriophyllum verticillatum*** It is an aquatic perennial that colonises slow flowing, calcareous waterbodies including lakes, streams, canals and ditches[52]. In the UK, the plans distribution is concentrated in eastern and southern England with no records in Scotland and <10 records in Wales. **Water boatman *Micronecta minutissima*** Water boatman (*M. minutissima*) is a nationally rare aquatic invertebrate in the UK and currently the species is listed as of least concern in the IUCN Red List of Threatened Species. It is part of the lesser water boatman family (Corixidae). There are few records of this species in the UK, with most individuals observed in southern England and East Anglia.	See Lee Valley SPA site improvement plan information above.
Little Wittenham SAC (UK0030184)	**S1166 Great crested newt *Triturus cristatus*** One of the best-studied great crested newt sites in the UK, Little Wittenham comprises two main ponds set in a predominantly woodland context (broad-leaved and conifer woodland is present). There are also areas of grassland, with sheep grazing and arable bordering the woodland to the south and west. The River Thames is just to the north of the site, and a hill fort to the south. Large numbers of great crested newts *Triturus cristatus* have been recorded in the two main ponds, and research has revealed that they range several hundred metres into the woodland blocks.	The site is subject to threats and pressures from; Invasive non-native species
North Meadow and Clattinger Farm SAC (UK0016372)	**H6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)** This site represents an exceptional survival of the traditional pattern of management for hay meadows with unique vegetation communities. The site also contains a very high proportion of fritillary *Fritillaria meleagris* (>90% of the surviving UK population), a rare species highly characteristic of damp lowland meadows.	The site is subject to threats and pressures from; Grazing Outdoor sports and leisure activities, recreational activities Pollution to groundwater (point sources and diffuse sources) Human induced changes in hydraulic conditions Other ecosystem modifications

[52] English Nature (2000). EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Areas (SPA). South West London Waterbodies, Classification citation, pg 1.

Site Name	Reason for Designation	Site Vulnerability
Oxford Meadows SAC (UK0012845)	**H6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)** Together with North Meadow and Clattinger Farm, also in southern England, Oxford Meadows represents **lowland hay meadows** in the Thames Valley centre of distribution. The site includes vegetation communities that are perhaps unique in the world in reflecting the influence of long-term grazing and hay-cutting on **lowland hay meadows**. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function. **S1614 Creeping Marshwort *Apium repens*** Oxford Meadows is selected because Port Meadow is the larger of only two known sites in the UK for creeping marshwort *Apium repens*.	The site is subject to threats and pressure from; Invasive non-native species Pollution to surface waters (limnic & terrestrial, marine & brackish) Fire and fire suppression
Richmond Park SAC (UK0030082)	**S1083 Stag beetle *Lucanus cervus*** Richmond Park has a large number of ancient trees with decaying timber. It is at the heart of the south London centre of distribution for stag beetle and is a site of national importance for the conservation of the fauna of invertebrates associated with the decaying timber of ancient trees.	No key threats or pressure have been identified for Richmond Park SAC and associated qualifying features.
River Lambourn SAC (UK0030257)	**H3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation** The Lambourn is an example of a lowland river in a chalk catchmentin central southern England.chalk In its upper reaches, the River Lambourn it is a winterbourne, drying through the summer months. It is one of the least-modified rivers of this type, with a characteristic flora dominated by pond water-crowfoot *Ranunculus peltatus*. In the downstream perennial sections *R. peltatus* is replaced by stream water-crowfoot *R. penicillatus* var. *pseudofluitans*. **S1163 Bullhead Cottus gobio** The Lambourn represents bullhead populations inhabiting chalk streams in central southern England. Good water quality, coarse sediments and extensive beds of submerged plants again provide excellent habitat for the species. **S1096 Brook lamprey *Lampetra planeri*** The River Lambourn provides good habitat conditions for Brook lamprey which include gravel beds for spawning, silt beds for ammocoetes, good water quality and low abstraction rates.	The River Lambourn is considered to have one of the least modified catchments in southern England and has one of the lowest levels of abstraction. The site is subject to the following threats and pressures: siltation, water pollution, invasive non-native species, hydrological changes, inland flood defence works and inappropriate cutting/ mowing.
South West London Waterbodies SPA (UK9012171)	**A051 Gadwall *Anas strepera* (wintering)** The birds present at South West London Waterbodies SPA during the winter have either derived from UK breeding populations or have migrated from breeding grounds present in colder climates; including Fennoscandia, central and eastern Europe and western Russia. The	Threats and pressures effecting gadwall and northern shoveler at South West London Waterbodies SPA include public access/ disturbance, changes in species distributions, invasive non-native species, natural changes to site conditions, fish stocking and inappropriate weed control.

Site Name	Reason for Designation	Site Vulnerability
	Habitats sites support an estimated 2.4% of the north-west European population of gadwall (based on 5-year peak mean 1993/94 – 1997/98. **A056 Northern shoveler *Anas clypeata* (wintering)** The birds that occupy South West London Waterbodies SPA and Ramsar site during the winter have either derived from UK breeding populations or have migrated from breeding grounds present in colder climates. They typically arrive in September and remain in the UK until March – early April and are often sighted in pairs or small groups. The Habitats sites support an estimated 2.1% of the north-west/ central European population of Northern shoveler (based on 5-year peak mean 1993/94 – 1997/98)[52].	
South West London Waterbodies, Ramsar (UK11065)	**Gadwall *Anas strepera* (wintering)** Supports species/ populations occurring at levels of international importance including gadwall which in north-west Europe supports 487 individuals, representing an average of 2.8% of the British population (5 year peak mean 1998/9 – 2002/3). **Northern shoveler *Anas clypeata* (wintering)** Supports species/ populations occurring at levels of international importance including northern shoveler which in north-west and central Europe supports 397 individuals, representing an average of 2.6% of the British population (5 year peak mean 1998/9 – 2002/3).	See site improvement plan information regarding South West London Waterbodies SPA for information on relevant threats and pressures.
Thames Basin Heaths SPA (UK9012141)	A composite site of open heathland habitats that is located across the counties of Surrey, Hampshire and Berkshire in southern England. **A302 Dartford warbler *Sylvia undata* (breeding)** During the breeding season the SPA regularly supports 27.8% of the British population of Dartford warblers which is an Annex I species. **A224 Nightjar *Caprimulgus europaeus* (breeding)** During the breeding season the SPA regularly supports 7.8% of the British population of nightjars which is an Annex I species. **A246 Woodlark *Lullula arborea* (breeding)** During the breeding season the SPA regularly supports 9.9% of the British population of woodlark which is an Annex I species.	Threats and pressures effecting qualifying species of the SPA include public access/ disturbance, undergrazing, lack of or inappropriate forestry and woodland management, inappropriate scrub control, wildfire/ arson, air pollution (nitrogen deposition), unknowns regarding location, extent and condition of species, military activities and habitat fragmentation. The mosaic of habitats which form the internationally important lowland heathland are dependent on active heathland management. Lack of grazing and other traditional management practices therefore pose a threat. Development pressure on neighbouring land and the cumulative and indirect effects of neighbouring developments also pose a potential long-term problem. At present the Ministry of Defence land is used principally for firing ranges and military exercises (predominantly on foot). A significant proportion of the site is local

Site Name	Reason for Designation	Site Vulnerability
		authority-owned land. The local authority land is often designated as Public Open Space and is heavily used for informal recreation.
Thursley, Ash, Pirbright and Chobham SAC (UK0012793)	**H4010 Northern Atlantic wet heaths with *Erica tetralix*** The site is representative of National Vegetation Classification type M16 *Erica tetralix – Spahgnum compactum* wet heath which supports a number of rare plants including brown beak-sedge *Rhynchospora fusca*, marsh clubmoss *Lycopodiella inundata* and marsh gentian *Gentianella pneumonanthe*. **H4030 European dry heaths** The site is representative of the National Vegetation Classification type H2 *Calluna vulgaris – Ulex* minor dry heathland. Supports a number of rare species including European nightjar, Dartford warbler, sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*). **H7150 Depressions on peat substrates of the *Rhynchosporion*** The peat within the SAC forms part of a mosaic associated with the valley mire and wet heath and supports a range of species including white beaked-sedge *Rhynchospora alba,* bog asphodel *Narthecium ossifragum* and early marsh-orchid *Dactylorhiza incarnata.*	Threats and pressures effecting qualifying habitats of the site include undergrazing, lack of or inappropriate forestry and woodland management, hydrological changes, invasive non-native species, wildfire/ arson, air pollution (nitrogen deposition), military activities and habitat fragmentation. Insufficient grazing or other traditional practices, including bracken control and scrub clearance, is a serious potential threat, as is lowering of water tables as a result of water abstraction or other reasons which could cause loss or damage to wet heath and mire communities. A Memorandum of Understanding exists between Natural England and the Ministry of Defence through which the impact of military activities is regulated.
Windsor Forest and Great Park SAC (UK0012586)	**9190 Old acidophilous oak woods with *Quercus robur* on sandy plains** Windsor represents **old acidophilous oak woods** in the south-eastern part of its UK range. It has the largest number of veteran oaks *Quercus* spp. in Britain (and probably in Europe), a consequence of its management as wood-pasture. It is of importance for its range and diversity of saproxylic invertebrates, including many rare species (e.g. the beetle *Lacon querceus*), some known in the UK only from this site, and has recently been recognised as having rich fungal assemblages. Windsor Forest and Great Park has been identified as of potential international importance for its saproxylic invertebrate fauna by the Council of Europe. **1079 Violet click beetle *Limoniscus violaceus*** Violet click beetle was first recorded at Windsor Forest in 1937. The site is thought to support the largest of the known populations of this species in the UK. There is a large population of ancient trees on the site, which, combined with the historical continuity of woodland cover, has resulted in Windsor Forest being listed as the most important site in the UK for fauna associated with decaying timber on ancient trees. The site was also identified as of potential international importance for its saproxylic invertebrate fauna by the Council of Europe. **9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*).**	The qualifying features of the site are subject to the following threats: Invasive non-native species Air pollution, air-borne pollutants Interspecific floral relations Forest and Plantation management & use

Site Name	Reason for Designation	Site Vulnerability
	Comprises beech *Fagus sylvatica* forests with holly *Ilex*, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood-pasture systems, in which pollarding of beech and oak *Quercus* spp. was common. This is known to prolong the life of these trees.	
Wormley-Hoddesdonpark Woods SAC (UK0013696)	**H9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli** Large stands of almost pure hornbeam *Carpinus betulus* (former coppice), with sessile oak *Quercus petraea* standards.	The site is subject to the following threats: Other human intrusions and disturbances Invasive non-native species Problematic native species Interspecific floral relations Air pollution, air-borne pollutants

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