South East Strategic Reservoir Option

Preliminary Environmental Information Report

Appendix 5.1 - WFD screening and scoping report: part 1

Date: October 2025

Contents

Executive Summary 1

1 Introduction 7

2 Legislation and guidance 9

2.1 Water Environment Regulations 9

2.2 Water body status classification 10

2.3 Environmental standards 10

2.4 Guidance 11

3 Assessment methodology 12

3.1 Assessing deterioration 12

3.2 Overview of the assessment process 14

3.3 Establishing water body baseline conditions 17

3.4 Consultation and engagement 18

3.5 Assessment assumptions and limitations 19

4 Project description 21

4.1 Project location and site context 21

4.2 Project overview 21

4.3 Design parameters and assumptions 23

4.4 Embedded mitigation 23

5 Screening and baseline assessment 24

5.1 Overview 24

5.2 Impact sources, pathways and zone of influence 24

5.3 Screening of Project activities/components 25

5.4 Screening of WFD water bodies 30

5.5 Water body baseline 34

6 Scoping assessment – potential effects on current status 39

6.1 Overview 39

6.2 Identifying the potential mechanisms of impact 39

6.3 Identifying the potential Quality Elements affected 47

6.4 Summary of scoping results for Project activities and components 49

6.5 Anticipated magnitude of effects on current status 103

7 Scoping assessment – potential effects on future status 130

7.1 Overview 130

7.2 Potential effects on RNAGs 130

7.3 Potential effects on RBMP Programme of Measures (PoM) 135

7.4 Potential effects on A/HMWB Mitigation Measures 136
8 Requirements for impact assessment 137
8.1 Overview 137
8.2 Baseline characteristics of water bodies potentially affected 137
8.3 Determine and quantify the scale of potential WFD impacts 139
8.4 Design mitigation development 141
8.5 Construction mitigation development 141
8.6 Identification of wider enhancement opportunities 142
8.7 Impact assessment of the risk of deterioration 142
8.8 Ongoing consultation and engagement 142
9 Conclusions 143
References 146

List of tables

Table 1 System utilised to indicate magnitude of effect and the associated potential for change in status of the water body 13
Table 2 Scoping Opinion comments from PINS relevent for the WFD assessment 19
Table 3 Summary of relevant construction phase Project activities and screening results 26
Table 4 Summary of relevant operational phase Project activities and components, and screening results 29
Table 5 Summary of surface water bodies potentially imapcted by Project and screening outcomes. 31
Table 6 Screening of WFD Groundwater Bodies 33
Table 7 Overview of the current Cycle 3 status and status objectives for the surface (river) water bodies screened in for assessment 34
Table 8 Overview of the current Cycle 3 status and status objectives for the groundwater bodies screened in for assessment 35
Table 9 Summary of watercourses potentially impacted by the Project 36
Table 10 Summary of statutory site GWDTEs present within 10km of the Project's draft Order limits 37
Table 11 Construction phase: Project activities and components – potential mechanisms for impact 41
Table 12 Operational phase Project activities and components – potential mechanisms for impact 44
Table 13 WFD Quality Elements potentially affected by Project mechanisms of impact 48
Table 14 Construction phase Project activities and components – summary of scoping of mechanisms of impact for each surface water body and watercourse receptor 52
Table 15 Operation phase Project activites and components – summary of scoping of mechanisms of impact for each surface water body and watercourse receptor 84
Table 16 Construction phase Project activities and components – summary of scoping of mechanisms of impact for each groundwater body 101
Table 17 Operation phase Project activities and components – summary of scoping of mechanisms of impact for each groundwater body 102
Table 18 Construction phase – anticipated magnitude of potential effect on current status of surface water bodies 109
Table 19 Construction phase – anticipated magnitude of potential effect on current status of groundwater bodies 115

Table 20 Operational phase - anticipated magnitude of potential effect on current status of surface water bodies 123
Table 21 Operational phase – anticipated magnitude of potential effect on current status of groundwater bodies 129
Table 22 Summary of RNAGs potentially affected by the Project and scoped in for further assessment 131

List of Plates

Plate 1 Stages in the WFD Compliance Assessment process 14

Executive Summary

This document presents a Preliminary Water Framework Directive (WFD) compliance assessment for the proposed South-East Strategic Reservoir Option Project (hereby referred to as 'the Project').

The Project is of the scale that qualifies as a Nationally Significant Infrastructure Project under section 14(1)(m) and section 27 (Dams and reservoirs) of the Planning Act 2008 and will seek consent via a Development Consent Order.

The format of this assessment follows Planning Inspectorate advice on WFD for Nationally Significant Infrastructure Projects , which recommends that WFD compliance assessments comprise three stages:

- Stage 1: Screening assessment – determine what activities associated with the proposed Project require further consideration and what activities can be screened out for further consideration. Identify the zone of influence based on specific activities and/or characteristics of the proposed Project and screen in WFD water bodies that are within the zone of influence that require further consideration.
- Stage 2: Scoping assessment – an initial assessment to identify the risks from the proposed Project to receptors within the zone of influence. Identification of where an impact assessment is needed.
- Stage 3: Impact assessment – detailed assessment of the water bodies and activities carried forward from previous stages to determine WFD compliance or non-compliance.

This document comprises a 'Preliminary WFD compliance assessment', covering Stage 1 (Screening assessment) and Stage 2 (Scoping assessment), based on the latest design information and undertaken in parallel with the Preliminary Environmental Information Report for the Project. Stage 3 (Impact assessment) will be undertaken in parallel with the subsequent Environmental Statement.

This document provides background information on the Project and the legislative context and drivers together with a summary of the assessment scope, methodology, and key data sources used at this stage. The document should be read in conjunction with the Preliminary Environmental Information Report.

The key objectives of the Preliminary WFD (Screening and Scoping) compliance assessment at this stage are:

- Identify the relevant Project activities and components that have the potential to affect the water environment, together with the relevant parameters, assumptions, and embedded design mitigation and standard good practice measures currently integrated into the design and/or construction and operation activities at this stage. Provide justification for Project activities and components that are screened out of the assessment.
- Identify the relevant WFD water bodies and associated watercourses, water dependent habitats, and protected areas that may be affected by the Project activities and components and collate the latest available WFD baseline status classification

information for each. Provide justification for any WFD water bodies that are screened out of the assessment.
- Undertake a scoping assessment to identify the likely impact types / mechanisms and associated effects of the relevant Project activities and components on the current status and status objectives of the relevant water bodies (factoring in the current embedded design mitigation and standard good practice measures that will be applied to the Project).
- Identify any potential statutory non-compliance risks and whether further impact assessment is required. Summarise the nature of any further detailed baseline and impact assessments required, to be developed alongside the preparation of the ES.

The Project lies within the Thames River Basin District , which is covered by the Thames River Basin Management Plan. The main site is within the Gloucestershire and The Vale Management Catchment and the Ock Operational Catchment. The anticipated zone of influence of the Project includes the Thames (Evenlode to Thame) WFD water body and the downstream River Thames water bodies to the tidal limit at Teddington Weir. The downstream River Thames water bodies are within the South Chilterns and Lower Thames Operational Catchments, and the Thames and South Chilterns and Maidenhead and Sunbury Management Catchments.

The WFD Screening assessment has broken down the Project into a comprehensive list of 30 construction phase activities and components and 32 operational activities and components. The assessment has identified the potential impact source, pathways and zone of influence of each in relation to surface water and groundwater bodies and has screened in 27 construction phase and 23 operational phase project activities and components.

The assessment has identified 17 WFD surface water bodies and nine WFD groundwater bodies potentially impacted by the Project's construction and operational activities and components. Of these, 16 surface water bodies and two groundwater bodies have been screened in for scoping assessment. Additionally, the Project will create a new reservoir which is anticipated to be a new WFD lake water body once constructed. Guidance is currently awaited on the expected designation and classification methodology that will be used by the Environment Agency. The newly created reservoir has therefore also been screened in for scoping assessment. The newly created recreational lakes to the north of site will each have a surface area of less than 50 hectares and thus are not expected to be designated and classified as lake WFD water bodies. The water bodies screened in for scoping assessment are:

- Ock (to Cherbury Brook)
- Ock and tributaries (Land Brook confluence to Thames)
- Stutfield Brook (source to Ock)
- Childrey and Woodhill Brooks
- Childrey Brook and Norbrook at Common Barn
- Letcombe Brook
- Cow Common Brook and Portobello Ditch
- Frilford and Marcham Brook
- Sandford Brook (source to Ock)
- Ginge Brook and Mill Brook
- Moor Ditch and Ladygrove Ditch
- Thames (Evenlode to Thame)

- Thames Wallingford to Caversham
- Thames (Reading to Cookham)
- Thames (Cookham to Egham)
- Thames (Egham to Teddington)
- Vale of White Horse Chalk (groundwater body)
- Shrivenham Corallian (groundwater body
- Newly created reservoir

The assessment has also identified any relevant watercourses present within each of the surface water bodies that have the potential to be impacted by the Project. No Groundwater Dependent Terrestrial Ecosystems associated with the two screened in groundwater bodies are anticipated to be impacted by the Project.

The WFD Scoping assessment has then identified the potential mechanisms of impact of each of the screened in Project activities and components, and the WFD Quality Elements that have the potential to be affected by each. The Project activities and components and their mechanisms of impact on each of the WFD water bodies and watercourse receptors have then been scoped in on a case-by-case basis, based on the construction and design information and site baseline information available at this stage. The assessment has taken account of the embedded design mitigation and standard good practice measures set out within the draft Code of Construction Practice and the Draft commitments register appended to the Preliminary Environmental Information Report (Appendix 2.1: Draft Code of Construction Practice and 2.2: Draft commitments register respectively). These will be informed by ongoing design and assessment, and updated versions will be submitted alongside the ES as part of the Development Consent Order application.

The construction phase Project activities and components are anticipated to have only negligible effects on 12 of the screened in water bodies; including the Ock (to Cherbury Brook), Stutfield Brook (source to Ock), Childrey and Woodhill Brook, Letcombe Brook, Frilford and Marcham Brook, Ginge Brook and Mill Brook, Thames Wallingford to Caversham, Thames (Reading to Cookham), Thames (Cookham to Egham) and Thames (Egham to Teddington) surface water bodies and the Vale of White Horse Chalk and Shrivenham Corallian groundwater bodies.

The assessment has identified potential minor / localised adverse effects from the construction phase Project activities and components on one or more status elements of the six other existing surface water bodies that are screened in; including the Ock and tributaries (Land Brook confluence to Thames), Childrey Brook and Norbrook at Common Barn, Cow Common Brook and Portobello Ditch, Sandford Brook (source to Ock), Moor Ditch and Ladygrove Ditch, and Thames (Evenlode to Thames).

The potential for adverse effects from the construction phase has also been identified in relation to two of these water bodies; Childrey Brook and Norbrook at Common Barn and Cow Common Brook and Portobello Ditch. The scale and duration of construction activities within these two water body catchments are considerable and will involve the temporary loss of existing watercourses (both main river and ordinary watercourses) ahead of these being recreated and the flow diverted. This includes the lower reaches of Cow Common Brook, Landmead Ditch, Mere Dyke, and the East Hanney Ditch. However, changes in land use and the creation of new habitats proposed as part of the Project Priority Areas for Biodiversity (PABs) and Western and Eastern Watercourse Diversions within these water

bodies are anticipated to have beneficial effects that will also become live during the construction phase, once the new watercourse channels are connected and aquatic biota and riparian vegetation become established. The nuances of the adverse and beneficial effects that are anticipated to occur over the course of the construction phase, in relation to the phasing of the construction of the individual construction activities and components, will be assessed in detail for each of the relevant Quality Elements of the affected water bodies as part of Stage 3 impact assessment.

Post construction, the operational phase Project activities and components are anticipated to have negligible effects on nine of the screened in water bodies; including the Ock (to Cherbury Brook), Stutfield Brook (source to Ock), Frilford and Marcham Brook, Thames Wallingford to Caversham, Thames (Reading to Cookham), Thames (Cookham to Egham) and Thames (Egham to Teddington) surface water bodies and the Vale of White Horse Chalk and Shrivenham Corallian groundwater bodies.

The scoping assessment has identified a number of anticipated minor / localised adverse and/or minor / localised beneficial effects from the operational phase Project activities and components on one or more status elements of the other nine existing surface water bodies that are screened in; including the Ock and tributaries (Land Brook confluence to Thames), Childrey and Woodhill Brook, Childrey Brook and Norbrook at Common Barn, Letcombe Brook, Cow Common Brook and Portobello Ditch, Sandford Brook (source to Ock), Ginge Brook and Mill Brook, Moor Ditch and Ladygrove Ditch, and Thames (Evenlode to Thames). These minor / localised effects will be reported in the Stage 3 impact assessment that will support the Development Consent Order submission.

The potential for permanent adverse effects has also been identified on a precautionary basis, prior to detailed impact assessment, in relation to three of these water bodies: Childrey Brook and Norbrook at Common Barn, Cow Common Brook and Portobello Ditch, and the Thames (Evenlode to Thame). This includes potential adverse effects on the biological and hydromorphological status of the Childrey Brook and Norbrook at Common Barn and Cow Common Brook and Portobello Ditch water bodies, related to potential impacts on watercourse baseflows and hydromorphological conditions from a reduction in catchment area (as a result of the proposed reservoir footprint, canal, and watercourse diversions), groundwater drainage, and surface water / groundwater interactions along the diversion channels. In addition, a potential adverse effect on the biological status of the Thames (Evenlode to Thame) water body has been identified at this stage, related to the potential for fish (and potentially eel) impingement/entrainment (and potential mortality) relative to existing baseline conditions as a result of the reservoir operational abstraction regime. Whilst it is currently anticipated that it will be feasible for these potential adverse effects to be removed through the detailed impact assessment and the development of the design and additional mitigation measures, further work is required in consultation with the Environment Agency.

A number of the operational phase Project activities and components, and their associated mechanisms of impact, have the potential to affect the status of certain Quality Elements of the newly created reservoir. These include the operational abstraction and discharge regime, floating solar, and floating islands; which, based on a precautionary assessment and the information available at this preliminary stage, will provide some localised habitat benefits but will also cause localised shading of the water column and have the potential to influence water quality. However, the assessment of the anticipated effects on Quality Element status has not been undertaken at this stage, as it is currently unconfirmed if the reservoir will be designated and, if so, which Quality Elements will be included as

part of its status classification upon designation. The assessment will be undertaken at Stage 3 and will have regard to any relevant guidance received from the Environment Agency.

The scoping assessment has also considered the potential for the Project to prevent the future achievement of the status objectives of the WFD water bodies. The assessment has considered the relevant Project activities and components screened in for assessment and their potential effect on known existing pressures on water body status as well as on the implementation of any measures currently identified by the Environment Agency to support improvements in status; in relation to the latest available Environment Agency reasons for not achieving food status, River Basin Management Plan level Programme of Measures and water body level Artificial / Heavily Modified Water Body Mitigation Measures datasets. The assessment has identified the potential for the Project to have both minor / localised adverse and minor / localised beneficial effects on a number of Reasons for Not Achieving Good and Programme of Measures. Whilst individually these effects are not considered to be of a scale to prevent or result in the future achievement of status objectives, the relevant Reasons for Not Achieving Good and Programme of Measures have therefore been scoped in for further assessment and engagement with the Environment Agency at Stage 3. This includes beneficial effects due to changes in catchment land use from existing arable and pasture agricultural land use to new areas of neutral grassland, scrub, woodland, and wet woodland, together with the proposed new watercourse channels, ditches, and wetland scrape features as part of the Western and Eastern Watercourse Diversions.

The findings of this preliminary screening and scoping assessment will be reviewed and updated as necessary in parallel with the Environmental Statement at the Development Consent Order application stage of the Project, based on the forward design and mitigation development and ongoing engagement with the Environment Agency. In addition, further Stage 3 impact assessment will be undertaken for each of the relevant Project activities and components, impact mechanisms, and quality elements scoped in, where the potential for effects on WFD Quality Elements and water body status and status objectives has been identified at this stage.

The proposed scope of the Stage 3 impact assessment will include developing a detailed understanding of the baseline characteristics of the water bodies potentially affected, through a range of comprehensive baseline field surveys and monitoring. The potential impacts, mechanisms and effects that have been identified at this stage will then be determined and quantified via a combination of hydrological and hydraulic, water quality, and hydro-ecological modelling and assessments. Design and construction mitigation development will continue in parallel, driven by findings from surveys, monitoring, modelling, and assessments. Wider enhancement opportunities will also be developed to support the Project's requirement of delivering at least 10% Biodiversity Net Gain. The impact assessment will pull together the potential effects of each of the scoped in Project activities and components on the current status of each of the Quality Elements of the affected water bodies, together with any effects on the future attainment of status objectives, to confirm a WFD compliance outcome for each water body. This will be based on a detailed understanding of the baseline condition and sensitivity of the water bodies and relevant associated watercourse receptors, and will take into account the latest design development, assumptions and embedded mitigation measures. Where required, the impact assessment will identify the requirements and delivery mechanisms for any additional mitigation measures deemed required to further mitigate effects that would prevent compliance with WFD objectives.

Whilst this preliminary assessment highlights the potential for adverse effects, based on a precautionary approach, it is anticipated that these effects will be managed through the ongoing design and mitigation development and detailed impact assessments to ensure no residual risks of status deterioration and/or the prevention of status objectives and compliance with WFD objectives. Furthermore, the forward design of the proposed Western and Eastern Watercourse Diversions, as well as the various Project Priority Areas for Biodiversity, aims to provide improvements over baseline conditions, where practicable, in terms of enhanced hydromorphological form and processes, improved aquatic and riparian habitat quality and diversity, and reduced agricultural diffuse pollution pressures.

Regular consultation and engagement with relevant stakeholders, including the Environment Agency, Natural England and Local Authorities, will continue throughout the detailed impact assessment phase. Regulatory advice will be sought to support key design decisions, which will be robustly evidenced and documented.

1 Introduction

1.1.1 This report forms part of the evidence base for the Preliminary Environmental Information (PEI) Report prepared by Thames Water Utilities Ltd. (hereafter referred to as 'Thames Water' or the 'Applicant') for the proposed South East Strategic Reservoir Option (SESRO) Project (hereafter referred to as the 'Project'). The PEI Report has been prepared to inform Statutory Consultation, to enable interested parties to understand the likely significant effects of the Project.

1.1.2 The proposed Project is of a scale that qualifies as a Nationally Significant Infrastructure Project (NSIP) under section 14(1)(m) and section 27 (Dams and reservoirs) of the Planning Act 2008 and will be seeking consent via a Development Consent Order (DCO). The Project will deliver a long-term solution to secure a sustainable future water supply to the South East.

1.1.3 The Project is described in Chapter 2: Project description of the PEI Report. Although some Project components would have a defined design life, it is proposed that all elements would be subject to continued maintenance/replacement in line with the management of the reservoir as a whole. Therefore, the proposed operational phase Project components will form the permanent reservoir and associated infrastructure, and no operational activities or components are proposed that would require decommissioning or associated decommissioning plans. The DCO will not be consenting decommissioning and, as such, decommissioning is excluded from this WFD assessment.

1.1.4 This document presents a Preliminary (Screening and Scoping) Water Framework Directive (WFD) compliance assessment for the Project. The aims of the document are to provide:

- Background information on the Project and the legislative context and drivers informing the WFD compliance assessment
- A high-level baseline understanding of the relevant WFD water bodies that would be affected by the Project
- The methodology for, and outcomes of, the Screening and Scoping stages of the WFD compliance assessment undertaken at this stage

1.1.5 The key objectives of the Preliminary (Screening and Scoping) WFD compliance assessment are to:

- Identify the relevant Project activities and components that have the potential to affect the water environment, together with the relevant parameters and assumptions, and embedded design mitigation and standard good practice measures currently integrated into the design and/or construction and operation activities at this stage.
- Identify the relevant WFD water bodies that may be affected by the Project activities and components, and collate the latest available WFD baseline status classification information for each.
- Undertake a scoping assessment to identify the likely impact types and associated effects of the relevant Project activities and components on the current status and status objectives of the relevant water bodies (factoring in the current embedded design mitigation and standard good practice measures that will be applied to the Project).

- Identify any potential statutory non-compliance risks and whether further detailed impact assessment and/or additional mitigation development is required to be undertaken prior to the preparation of the Environmental Statement (ES).

1.1.6 This assessment should be read in conjunction with Chapter 2: Project description of the PEI Report, as well as other chapters and appendices of key relevance, namely:

- Chapter 5: Water environment – potential effects on the quality and quantity of surface and groundwaters, geomorphology and flood risk.
  - Appendix 5.2: Preliminary Hydrogeological Impact Assessment.
  - Appendix 5.3: Surface water monitoring data.
- Chapter 6: Aquatic ecology – potential effects on aquatic designated sites, habitats, protected and notable species, and invasive non-native species (INNS), which could be affected by changes to hydrology and hydrogeology.
  - Appendix 6.1: Macroinvertebrate, invasive species and depressed river mussel baseline surveys (2024).
- Chapter 10: Geology and soils – potential effects on sources of contamination and underlying geological and hydrogeological conditions, which could affect water quality.
  - Appendix 10.1: Desk study and preliminary contamination assessment.

1.1.7 This assessment should be read in conjunction with all PEI Report figures, in particular the following figures of key relevance:

- Figure 1.1: Location plan
- Figure 1.2: Draft Order limits
- Figure 2.1: Project overview
- Figure 2.2: Construction elements
- Figure 5.1: Surface water features
- Figure 5.2: WFD surface water bodies
- Figure 5.3: Surface water quality monitoring locations
- Figure 5.4: Surface water flow and level monitoring locations
- Figure 5.5: Aquifer designations
- Figure 5.6: WFD ground water bodies
- Figure 5.7: Hydrogeological study area and features
- Figure 5.8: Groundwater monitoring locations
- Figure 5.9: Catchment abstraction management strategy areas
- Figure 5.10: Existing risk of flooding from rivers and sea (fluvial)
- Figure 5.11: Existing risk of flooding from rivers and sea (pluvial)
- Figure 5.12: Groundwater flooding susceptibility
- Figure 6.2: Statutory designated sites (international)
- Figure 6.3: Statutory designated sites (national) and non-statutory designated sites
- Figure 10.2: Superficial geology
- Figure 10.3: Bedrock geology

2 Legislation and guidance

2.1 Water Environment Regulations

2.1.1 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended) (WER) transposes the European Parliament and the Council Water Framework Directive into English and Welsh law. The WER remain in force following the UK's exit from the European Union. The references in the WER to the Water Framework Directive refer to the version of the Directive that was in force at the time when the WER came into force (10 April 2017). The term "WFD" is used hereafter throughout the report in reference to the WER, not the EU Directive, in line with its use by the regulator within the relevant baseline datasets and guidance.

2.1.2 The legislation takes an integrated approach to the sustainable management of water by considering the interactions between surface water, groundwater and water-dependent ecosystems. Under the WFD, water bodies are the basic management units and are defined as a body of surface water (including transitional and coastal waters, rivers, and lakes) or a body of groundwater. These water bodies form part of a larger River Basin District (RBD), for which River Basin Management Plans (RBMPs) are developed to summarise baseline conditions, set environmental improvement objectives and include programmes of measures to achieve those objectives. These RBMPs are produced every six years in accordance with the river basin management planning cycle.

2.1.3 The WFD requires classification of the current condition of water bodies. This is referred to as their 'overall status'. The WFD also sets out a number of environmental objectives, intended to ensure that water bodies reach and/or maintain at least 'Good' overall status (see Section 2.2). These environmental objectives for surface water are:

- Prevent deterioration of the status of each body of surface water
- Protect, enhance and restore each body of surface water (other than an artificial or heavily modified water body (A/HMWB)) with the aim of achieving Good Ecological Status (GES) and Good surface water Chemical Status
- Protect and enhance each A/HMWB with the aim of achieving Good Ecological Potential (GEP) and Good surface water Chemical Status
- Aim progressively to reduce pollution from priority substances and aim to cease or phase out emissions, discharges and losses of priority hazardous substances.

2.1.4 The overall environmental objectives for groundwater bodies are:

- Prevent deterioration of the status of each body of groundwater
- Prevent or limit the input of pollutants into groundwater
- Protect, enhance and restore each body of groundwater, and ensure a balance between abstraction and recharge of groundwater, with the aim of achieving Good groundwater Chemical Status and Good groundwater Quantitative Status
- Reverse any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater.

2.1.5 The overall environmental objectives for protected areas are:

- For shellfish water protected areas, in addition to the objectives above for the surface water bodies in which they are located, the objectives are such objectives as are

necessary or desirable to improve or protect the shellfish water protected area in order to support shellfish life and growth and to contribute to the high quality of shellfish products suitable for human consumption as the appropriate authority may direct. For each protected area, other than a shellfish water protected area, the objective is to achieve compliance with any standards and objectives required by or under the assimilated law under which the area or body is protected.

2.1.6 All new activities and/or developments with the potential to adversely impact the water environment must comply with the requirements of the WFD. In England, the Environment Agency is the competent authority for implementing the WFD, although many objectives will be delivered in partnership with other relevant public bodies and private organisations (for example, local planning authorities, water companies, Rivers Trusts, large private landowners and developers). As part of its regulatory role and statutory consultee role on planning applications and environmental permitting (under the Environmental Permitting (England and Wales) Regulations 2016), the Environment Agency must consider whether proposals for new developments have the potential to influence WFD status by:

- Causing deterioration of a water body's current status or potential and/or
- Preventing attainment of Good status or potential for a water body

2.1.7 In determining whether a development is compliant or non-compliant with the WFD objectives for a water body, the Environment Agency must also consider the conservation objectives of any relevant WFD Protected Areas (areas within the water body catchments requiring special protection because of their sensitivity to pollution or due to their particular economic, social, or environmental importance; as defined by the WFD register of Protected Areas). The assessment of compliance for water-dependent Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites will be covered under the Habitats Regulations Assessment (HRA), which will be prepared as part of the DCO submission.

2.2 Water body status classification

2.2.1 Under the WFD, there is an overarching objective to achieve "Good" status for all waters. Surface water body status is classified on the basis of Ecological Status (or Ecological Potential for A/HMWBs) and Chemical Status, whilst groundwater body status is classified on the basis of Quantitative Status and Chemical Status. Details of how water body status classifications are derived are provided in Annex 1 (Appendix 5.1: WFD Screening and Scoping Report: Part 2 – Annexes).

2.3 Environmental standards

2.3.1 Under the WFD, a range of environmental standards and condition limits, Secretary of State (for England) and the Welsh Ministers (for Wales) (2015), are applied to help the classification of water body status, as detailed in Annex 1 (Appendix 5.1: WFD Screening and Scoping Report: Part 2 – Annexes), and the setting of WFD objectives via the RBMP process. For surface waters, these environmental standards define the range of environmental conditions that support "healthy" aquatic life. For instance, standards are set for the composition of biological communities, the physicochemical water quality parameters, the concentration of pollutants, and the level of flows in rivers (as described

above). For groundwaters, the environmental standards define the range of environmental conditions that support “healthy” groundwater volumes and quality.

2.3.2 These standards inform the Environment Agency on the implementation of the RBMP process, including classification of water bodies and the identification of measures required to support the achievement of the GES/GEP objectives, as well as underpinning efforts to protect the water environment by helping to regulate activities that could cause adverse impacts.

2.4 Guidance

2.4.1 Whilst there is no established methodology for assessing compliance with WFD legislation for river (fluvial) or groundwater bodies, the WFD Compliance Assessment is based upon expert judgement, established best practice and consultation with the Environment Agency. The assessment has been undertaken in accordance with a position statement on WFD compliance assessment from the Environment Agency (2016), and advisory guidance for WFD compliance assessment on NSIPs, provided by The Planning Inspectorate (PINS) (2024).

3 Assessment methodology

3.1 Assessing deterioration

Overview

3.1.1 As described in Section 2, to ensure compliance with the WFD, decision makers must consider whether proposals for new developments have the potential to cause a deterioration in water body status or potential, deterioration in element status, and/or prevent future attainment of status or potential objectives.

3.1.2 A ruling by the Court of Justice of the European Union (2013), known as the 'Bund Ruling', has provided clarification on how the WFD environmental objectives should be interpreted when assessing the effects of a project on a WFD water body. Specifically, these clarifications are:

- Deterioration of the status of the relevant body of surface water includes a fall by one class of any element of the 'Quality Elements' within the meaning of Annex V of the WFD even if the fall does not result in the fall of the status of the body of surface water as a whole.
- Consent for the development must not be granted by an authorising authority where a project may cause a deterioration in the status of a body of surface water or where it jeopardises the attainment of Good surface water status or of GEP and Good surface water Chemical Status by the date laid down in the Directive unless a derogation is granted.
- If the Quality Element is already in the lowest class, any deterioration of that element represents a deterioration of status within the meaning of WFD Article 4(1) (a) (i).

3.1.3 Although the ruling does not explicitly relate to groundwater bodies or the chemical status of water bodies, these have been assessed in the same manner to be consistent with the principles in the judgment.

3.1.4 Consequently, using a precautionary principle approach for this assessment, any fall in the classification of any element (quality or supporting), or any deterioration of an element already in its lowest class will trigger the requirement to review the need to develop Regulation 19 derogation documentation.

Magnitude of effect

3.1.5 In this WFD Compliance Assessment, effects arising from any Project activities or components have been categorised using a system to indicate the predicted magnitude of effect in terms of potential risk for change in WFD status of the water body. The assessment considers the potential risk for adverse and beneficial effects on status class. The categories used are summarised in Table 1.

3.1.6 The assessment applies a catchment-based approach by considering impacts on the WFD water bodies as designated within the RBMP as well as any non-designated Main River and/or ordinary watercourses present within the water body catchment areas. Where proposed Project activities and/or components have the potential to directly or indirectly affect a non-designated watercourses that flow into designated WFD water body, then the assessment considers the potential effect on the status class and objectives of the relevant

Quality Elements of the 'parent' WFD water body. This approach follows European Commission (2003) horizontal guidance, where non-WFD water bodies are protected and enhanced where required, not to compromise the achievement of objectives for water bodies to which they are directly or indirectly connected.

Table 1 System utilised to indicate magnitude of effect and the associated potential for change in status of the water body

Magnitude of effect	Potential for change in status of water body
Beneficial	Beneficial effect of a scale sufficient to potentially increase status class of the water body.
Minor / localised beneficial	Minor / localised beneficial effect resulting in a localised improvement but insufficient to increase status class of the water body.
Negligible	No measurable change to (or effect on) status class of the water body.
Minor / localised adverse	Minor /localised adverse effect when balanced against embedded mitigation but insufficient to cause a reduction in status class of the water body.
Adverse (uncertain)	An adverse effect sufficient to potentially cause a reduction in the status class of water body, despite embedded mitigation, taking a precautionary approach. The magnitude of the effect is uncertain at this stage. Additional detailed baseline and impact assessment is required to develop understanding and verify effect magnitude. Additional mitigation development, and the identification of residual effects, may be required.
Adverse (certain)	An adverse effect sufficient to deteriorate the status class of the water body, despite embedded mitigation. Non-compliance with WFD objectives. Additional mitigation and/or re-design is required. Preparation of Regulation 19 applicability assessment may be required in consultation with the Environment Agency.

Duration of effect

3.1.7 When assessing the Project effects on WFD Quality Elements, consideration needs to be made as to whether the effects are short-term and whether ecological, hydromorphological, and/or water quality conditions would recover in an acceptable timescale. Fluctuations in the condition of water bodies can sometimes occur due to short-duration activities, such as temporary construction works.

3.1.8 There is no definition in the WFD and available supporting guidance for a 'short period' or 'temporary' effects. A temporary effect does not necessarily amount to a deterioration in status, as determined in a recent High Court (2021) case for High Speed 2, where Ground 2 of the court challenge was concerned with the correct approach to temporary effects on WFD water bodies. The case highlighted that it is a matter of (expert) judgement as to whether the duration of an effect on the quality element amounts to a risk of deterioration in status. For the purposes of this assessment, therefore, temporary effects are not considered to have the potential to result in a deterioration of the status of a water body if the water body:

- Is only impacted for a short period and
- Is likely to recover without the need for any restoration measures within a short period.

3.1.9 It is recognised that this differs from the short-term and temporary timeframes used in the Environmental Impact Assessment (EIA), as detailed in Chapter 4: Approach to the environmental assessment. The timeframes for the WFD assessment are reflective of expert judgement around potential impacts, embedded mitigation and receptor sensitivity and consideration of likely deterioration in status over the course of the current RBMP cycle.

3.1.10 Any Project activities (regardless of whether temporary or not) that result in short-term impacts may still require environmental mitigation. Such activities/impacts and the associated environmental mitigation are covered within the wider EIA process for the Project as outlined in Chapter 4: Approach to the environmental assessment and Chapter 5: Water environment.

3.2 Overview of the assessment process

3.2.1 WFD Compliance Assessment is undertaken as an iterative, stepped process, which typically includes:

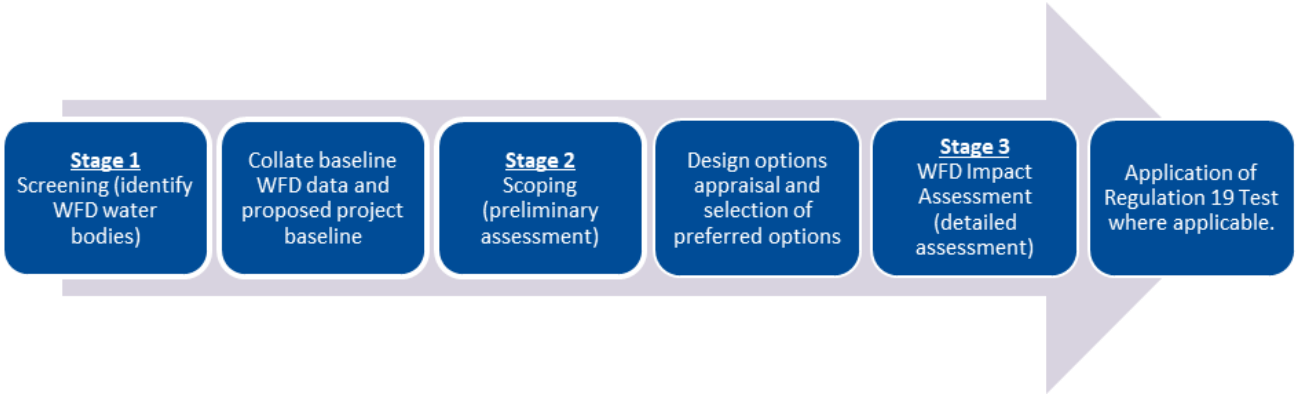
- Stage 1: Screening assessment.
- Stage 2: Scoping assessment.
- Stage 3: Detailed impact assessment (where required).
- Application of Regulation 19 (where required).

3.2.2 These stages are shown in Plate 1 and summarised in the following sections, in alignment with the PINS guidance (see Section 2.4 of this report).

3.2.3 At this preliminary stage, this assessment comprises Stage 1 and Stage 2 of the compliance assessment process.

3.2.4 Scoping and impact assessments feed back into the ongoing design development proactively, seeking to design out identified mechanisms of effects and/or design in additional embedded mitigation to support WFD compliance.

Plate 1 Stages in the WFD Compliance Assessment process



Stage 1: Screening

3.2.5 The primary objective of the screening assessment is to identify the relevant WFD water bodies that may be affected by the Project and to establish their baseline condition.

3.2.6 This stage identifies the construction and operational phase Project activities and components that have the potential to affect surface water and/or groundwater bodies, and that may impact the WFD status. This has included consideration of all relevant embedded design mitigation and standard good practice measures that will be applied to the Project.

3.2.7 The assessment then considered the potential impact pathways to surface water and groundwater, as well as the associated WFD water bodies, from each of the relevant Project components and activities. Where impact pathways have been considered possible, the potential zone of influence has been established based on the available baseline information and current design and assumptions information available at this stage.

3.2.8 Potential impacts may result from the activities required to construct the Project (e.g., temporary excavations and dewatering, watercourse crossings), or as a result of the Project's design (e.g., permanent watercourse diversions) and operation (e.g., the reservoir's abstraction and discharge regime). Project activities and components have been 'screened in' or 'screened out' based on the mechanisms of impact identified, taking into account the low-risk categories set out in the Environment Agency (2016) position statement 488_10. Justifications are provided for any Project activities and components.

3.2.9 Water bodies have been either 'screened in' or 'screened out' of further WFD compliance assessment by determining whether the Project construction and operation activities have the potential to lead to any non-temporary effects on the water body.

3.2.10 The baseline water body status classification information for each of the relevant 'screened in' water bodies has then been collated utilising the Catchment Data Explorer (CDE), Environment Agency (2025a) datasets and supporting Thames RBMP, Environment Agency (2022c) information. This includes the identification of:

- Water body overview data, including hydromorphological designation status and reason for designation.
- The current water body status classifications (2019 and 2022, Cycle 3), including the status classifications for all relevant Quality Elements.
- The latest water body status objectives for each water body and associated Quality Elements.
- The pressures currently identified as affecting the status of the water bodies (referred to as the 'Reasons for not achieving good (RNAG)' status).
- The latest RBMP programme of measures.
- WFD Protected Areas information.

3.2.11 In addition, the Environment Agency's HMWB Mitigation Measures data have been provided for the relevant HMWB screened into the assessment.

Stage 2: Scoping

3.2.12 The objective of the scoping assessment is to determine the likely effects of the Project on the WFD status elements and associated Quality Elements of the relevant surface water and groundwater bodies that have been screened for assessment. This has included the initial identification of the potential impact types of the relevant proposed activities and components screened in for assessment, which have been reviewed on a site-by-site basis based on their nature, size and location as well as the local baseline conditions and receptors.

3.2.13 The assessment has considered both beneficial and adverse potential impacts of the relevant Project activities and components. The associated potential effects on the WFD status elements of the relevant water bodies have then been identified and categorised using the risk-based method described in Sections 3.1.6-3.1.7 of this report and Table 1.

3.2.14 The scoping assessment has considered the potential effects of the Project on the current status of the water bodies and the future achievement of their status objectives. Accordingly, the assessment comprises two parts. Potential effects on the future achievement of water body status objectives have been considered by scoping the likely effects of the Project on the latest available RNAGs, 'Programme of measures' (PoM), and 'A/HMWB Mitigation Measure' datasets identified by the Environment Agency for the relevant water bodies. Here, the scoping assessment considered the potential for the Project to exacerbate existing pressures on water body status and/or to hinder the future implementation of catchment and water body-level measures identified to address existing pressures and support the achievement of status objectives.

3.2.15 This assessment stage has determined which of the status elements and associated Quality Elements of the water bodies that have been 'screened in' require further baseline and impact assessment. The assessment also provides a summary of the scope of the impact assessment required, which will be undertaken as part of the next ES stage of the Project.

Stage 3: Impact assessment

3.2.16 Where deemed required, the objective of the impact assessment is to establish the nature and anticipated magnitude of the effects of relevant Project activities and components on each of the WFD Quality Elements of the surface water and groundwater bodies affected by the Project. These effects are to be considered in terms of the potential for deterioration of current status and/or the prevention of achieving status objectives.

3.2.17 The approach to the impact assessment will be aligned with the PINS guidance (see Section 2.4 of this report) and include:

- A description of the Project and the activities and components scoped in for assessment
- A detailed baseline assessment of the characteristics and condition of the relevant water bodies, scoped in for assessment
- A description of the methods used to determine and quantify the impacts and associated magnitude of effects of the Project activities and components on the WFD Quality Elements of water
- An assessment of the risk of deterioration of the current status of the WFD Quality Elements of the relevant water bodies and the risk of prevention of future achievement of status objectives
- An explanation of any additional mitigation that is required (beyond the embedded design mitigation and standard good practice measures) and how its delivery is secured
- An explanation of any enhancements and/or positive contributions to water body and wider RBMP objectives that are proposed and how their delivery would be secured

3.2.18 The impact assessment will be undertaken as part of the next ES stage of the Project, subject to further outline design development and the outcomes of the ongoing baseline

surveys/monitoring and hydraulic (fluvial), groundwater and water quality modelling assessments.

3.3 Establishing water body baseline conditions

Desk study

3.3.1 As described in the previous sections, the WFD compliance assessment should describe the characteristics and current condition of each water body that is likely to be affected by the Project, including the current status classification information for each relevant Quality Element.

3.3.2 At this preliminary assessment (screening and scoping) stage, this has been established using desktop information, along with initial site visit walkovers. The desktop assessment has involved collating and reviewing the Environment Agency's latest available (RBMP Cycle 3, 2019 and 2022) water body status classification and status objectives datasets for the relevant WFD water bodies screened in for assessment. These data are considered to provide the current best estimate of water body status and the formal baseline against which the Environment Agency will assess compliance with the 'no deterioration' objective. In addition to the datasets taken from the Environment Agency's CDE website and Thames RBMP, as described in paragraph 3.2.10, a number of existing Environment Agency WFD monitoring baseline datasets have been collated and utilised to inform an understanding of the baseline condition of the water bodies affected by the Project. These include:

- Freshwater biological survey datasets for invertebrates, macrophytes and diatoms, including monitoring site locations, dates and results (taken from the Environment Agency (2025b) BIOSYS dataset
- Freshwater fish survey data collated from fisheries monitoring work, including monitoring site locations, dates and fish species count results (taken from the Environment Agency National Fish Populations Database (NFPD) on EFDE).
- Water quality monitoring datasets, including monitoring site locations, dates and results, Environment Agency (2025f)
- Hydrological data, including monitoring site locations, dates and results, Environment Agency (2025c)

3.3.3 In addition, the following openly available baseline datasets have also been used to further establish the nature and existing condition of the water bodies (and watercourses) that are affected by the Project:

- Ordnance Survey (OS) mapping.
- Google Satellite imagery.
- LiDAR data.
- DEFRA, Multi-Agency Geographic Information for the Countryside (MAGIC) Map, Natural England (2002).
- British Geological Survey (BGS) (2025), Geology Viewer.
- Environment Agency (2025e), Statutory Main Rivers Map / layer.
- Environment Agency (2025d), River Obstacles layer.
- 25 cm resolution aerial imagery

3.3.4 An initial desk-based exercise has been undertaken to identify all the watercourses present within the water bodies screened in as being potentially affected by the Project and provide

a provisional definition of the watercourse type to inform the level of baseline field survey required (see section below). This involved identifying all WFD river water bodies, Environment Agency Main Rivers, and wider ordinary watercourses, based on Ordnance Survey (OS) mapping, aerial imagery, and available Environment Agency and OS spatial datasets. LiDAR datasets have also been used to identify potential additional watercourse features that are not currently captured within the existing datasets.

3.3.5 Potential groundwater dependent terrestrial ecosystems (GWDTEs) have been identified based on statutory environmental designations and spring features have been identified from issues marked on the OS maps. Details of licensed and unlicensed groundwater abstraction have been sought from the Environment Agency and the relevant local authority. Further details regarding these baseline datasets are provided in Appendix 5.2: Preliminary Hydrogeological Impact Assessment.

Field surveys and monitoring

3.3.6 A suite of baseline field surveys and monitoring is being undertaken to establish detailed characteristics of the watercourses present within the vicinity of, and potentially impacted by, the Project. These are currently ongoing and will be used to inform the next iteration of this assessment, including the impact assessment, as part of the ES stage of the Project. The baseline surveys/monitoring of key relevance are summarised within Section 8.

Modelling

3.3.7 Modelling has been used to support design development and assessments to date. Development of the models is underway, including updates to reflect the latest design and calibrate with the latest survey data. The suite of models will support impact assessment at ES. Details of the modelling framework are provided in Section 8. Where appropriate, conclusions drawn from modelling undertaken in previous design phases have been considered in forming the expert judgement of the anticipated magnitude of effects on the current status as part of the scoping assessment in Section 6.5. Design development has been considerable within the Ock catchment, and as such, previous modelling conclusions are not considered appropriate to inform this assessment on the associated water bodies. Previous design phases modelling outputs on the River Thames from the Project abstraction and discharge regime have been considered within the scoping stage of this assessment.

3.4 Consultation and engagement

Scoping Opinion

3.4.1 PINS (on behalf of the Secretary of State) adopted the EIA Scoping Opinion on 08 October 2024, which included feedback from consultation bodies that it formally consulted. The EIA Scoping Opinion comments relevant to the water environment assessment are provided in Section 5.3 of Chapter 5: Water environment of the PEI Report. These comments, where relevant, have been used to inform the WFD assessment at this stage. PINS comments that are relevant to this assessment are detailed in Table 2.

Table 2 Scoping Opinion comments from PINS relevent for the WFD assessment

Stakeholder	Scoping comment	Applicant response
Planning Inspectorate	PINS 3.1.5 - Scoping Report paragraph 6.6.34 and Table 6-14 identifies potential pollution impacts from sedimentation on surface water quality, but potential impacts from erosion and accretion of sediment on hydrology, geomorphology, flood mitigation assets and the reservoir itself are not included. The ES should assess significant effects from erosion and accretion where they are likely to occur and describe and secure any relevant and appropriate mitigation measures.	A preliminary assessment of the potential effects from erosion and accretion has been undertaken as part of this Preliminary WFD Compliance Assessment and PEI Report. A more detailed assessment will be undertaken for the next ES stage of the Project.
Planning Inspectorate	PINS 3.1.6 - Scoping Report Table 6-14 identifies that potential impacts from watercourse crossings on fluvial geomorphology are scoped in. This impact should also be scoped in for hydrology.	A preliminary assessment of the effects from water crossings on hydrology has been undertaken as part of this Preliminary WFD Compliance Assessment and PEI Report. A more detailed assessment will be undertaken for the next ES stage of the Project.

On-going engagement

3.4.2 Ongoing technical engagement with key water environment stakeholders since EIA scoping is summarised in Section 5.3 of Chapter 5: Water environment of the PEI Report. This includes meetings, written correspondence and a Technical Liaison Group (TLG) attended by:

- Environment Agency (Member of: Flood Risk TLG, Surface Water and Aquatic Ecology TLG, Water Resources and Water Quality Modelling TLG and Geology and Hydrogeology TLG).
- Natural England (NE) (Member of: Surface Water and Aquatic Ecology TLG and Water Resources and Water Quality Modelling TLG).
- Oxfordshire County Council (Member of: Flood risk TLG and Geology and Hydrogeology TLG).
- South Oxfordshire District Council (Member of: Geology and Hydrogeology TLG).
- Vale of White Horse District Council (Member of: Geology and Hydrogeology TLG).

3.5 Assessment assumptions and limitations

3.5.1 For the assessment of construction impacts, where construction methods and sequencing are not available, current standard construction practices are assumed. For the assessment of operational impacts, the assessment is based on the design as it currently stands – aspects that are still evolving will be assessed in full within the impact assessment at the DCO application stage.

3.5.2 It has not yet been possible to survey and monitor all areas identified within the draft Order limits. Ongoing baseline surveying and monitoring will enhance understanding of current and future conditions within the study areas, and these will be incorporated into the impact assessment at the DCO application stage. Every effort has been made to ensure that the existing data used for the PEI Report presents an accurate interpretation of the water environmental baseline and the interaction between surface water and groundwater.

3.5.3 The findings presented in this chapter are preliminary and have not been derived from modelling outputs. Modelling is being developed, refined and calibrated and will be incorporated into the impact assessment at the DCO application stage.

3.5.4 The Programme of Measures information available in the Thames RBMP is high level and does not specify which water bodies are relevant for certain measures. Further consultation with the Environment Agency will therefore be undertaken to ascertain further details regarding the PoMs scoped in for assessment on a precautionary basis and, where available, this will be incorporated into the next iteration of the assessment at the DCO application stage.

4 Project description

4.1 Project location and site context

4.1.1 The draft Order limits of the Project are mainly within the Vale of White Horse District, with the exception of the far eastern extent on the eastern bank of the River Thames, which falls within the South Oxfordshire District. The Project is situated wholly within the County of Oxfordshire (see Figure 1.1: Location plan in the PEI Report) and the draft Order limits encompass an area of approximately 3,719ha (37km^2) (see Figure 1.2: Draft Order limits in the PEI Report).

4.1.2 The reservoir and associated infrastructure would mostly be situated within an area bounded by the River Ock to the north, the A34 and the village of Steventon to the east, the Great Western Main Line railway to the south and, the A338 and village of East Hanney to the west (the Core Project Area). The draft Order limits extend east of the A34 for the intake/outfall structure on the River Thames and to the north, south and west for habitat provision (see Figure 2.1: Project overview of the PEI Report).

4.1.3 There are also a number of isolated locations within the draft Order limits where supporting works are proposed to support the Project; these are on the A34 to the east of Harwell at Rowstock and extending approximately 5.5km west from the southern part of the draft Order limits along a corridor following the Great Western Main Line railway.

4.1.4 The area within the draft Order limits is generally flat agricultural land, sloping gently from approximately 65m Above Ordnance Datum (AOD, a term used to describe height above mean sea level), along the Great Western Main Line railway in the south, down to 54m AOD along the River Ock in the north, and back up to 57m AOD north of the A415 Marcham Road. The agricultural fields are interspersed with houses and farmsteads and bisected by hedgerows and ditches, with the occasional small woodland copse. There is a small industrial area in the south associated with Steventon Depot, and three existing operational solar farms, two located to the north of Hanney Road in the centre of the draft Order limits and one to the east of the A338 in the west of the draft Order limits. The nearest centres of population are Marcham to the north, Drayton to the east, Steventon to the south-east, and East Hanney to the south-west, and these are outside of the draft Order limits.

4.2 Project overview

4.2.1 The purpose of the Project would be to provide a strategic water resource to secure water supply for Thames Water, Affinity Water and Southern Water customers.

4.2.2 Key Project features are shown on Figure 2.1: Project overview of the PEI Report.

4.2.3 The Project comprises the following water infrastructure:

- Provision of a fully bunded raw (untreated) water storage reservoir with an operational capacity of 150 million cubic metres (Mm^3)
- A pumping station at the base of the proposed reservoir embankment on the north-east side of the reservoir

- The river tunnel to transfer flows between the pumping station and the River Thames via intake/outfall structures near Culham
- The reservoir tunnels to transfer flows between the reservoir and the pumping station
- Thames to Southern Transfer (T2ST) water treatment works (WTW)
- Sections of pipeline to facilitate transfers from the reservoir to Southern Water via T2ST and Farmoor, and infrastructure to allow connection to future transfer projects

4.2.4 The proposed non-water infrastructure includes:

- Main access road into the site from A415 Marcham Road
- Diversion of the existing Steventon to East Hanney Road
- Public access and parking
- Minor improvements to highways outside of the Core Project Area, including the A34 Marcham Interchange
- Two recreational lakes
- Recreational facilities, including a Recreational Lakes Centre, Water Sports Centre on the reservoir embankment, Nature Education Centre and active travel provision
- A network of Project Priority Areas for Biodiversity (PAB) to provide habitat creation, enhancement and species relocation
- Watercourse diversions to both the east and the west of the reservoir
- Provision for the Wilts & Berks Canal, this would be provided as a water channel to allow for future provision of operational features such as locks
- Additional floodplain conveyance on the east bank of the River Thames and adjacent to the diverted watercourses in the Ock catchment
- A groundwater drain encircling the reservoir
- Provision of renewable energy infrastructure including floating solar, solar on structures and hydro-electric turbines. In addition, potential for ground mounted solar is being considered (but for the purposes of the PEI-Report is assumed to be included) to replace three existing solar farms that would be lost as a result of the Project.
- Utility diversions, including the diversion of an existing 132kV overhead electricity cable, diversion of an existing gas main near Drayton Road and diversion of an existing gas main to the south of the reservoir embankment which would conflict with the proposed alignment of the Steventon to East Hanney Road diversion.
- Temporary rail sidings will also be required during construction, which will be removed upon completion. Some assets associated with the rail sidings may be adopted by Network rail for ongoing use and maintenance during operation. An embanked area will be retained to provide landscape and habitat creation

4.2.5 The Project would abstract, and store water taken from the River Thames via intake/outfall structures near Culham, and potentially from a future Severn to Thames Transfer (STT) project (see Section 2.3 Links to other water infrastructure projects in the PEI Report). Water would be abstracted from the River Thames during high flow periods via tunnels and a pumping station and be stored in the reservoir.

4.2.6 Water from the reservoir would then be released into the River Thames under gravity via the new tunnels and intake/outfall structure during periods of low water flows in the River Thames or during periods of high demand for abstraction further downstream, thereby providing additional resilience during drought conditions. The reservoir would also facilitate the transfer of water to Farmoor (via the Farmoor Transfer) and Southern Water (via the T2ST WTW) and provide the opportunity for a potential future transfer of potable water to the SWOX water resource zone.

4.2.7 Construction of the Project is expected to take place over three phases (early works, enabling works and main works). An early works phase would commence in 2027 subject to separate consents as required, with enabling works taking place after the DCO is granted (expected to be in 2028). The main works would commence from 2032 and is expected to be complete by 2043, taking approximately 12 years. The reservoir commissioning and filling would take place during the main works phase from 2039 to 2041. Water would be available for use from 2040.A detailed description of the Project is provided in Chapter 2: Project description of the PEI Report.

4.3 Design parameters and assumptions

4.3.1 The outline design for the Project is currently in development. This WFD screening and scoping assessment is therefore based on the latest available design information at this stage. This includes a set of parameters and assumptions for the design, construction and operation of the Project that were set in May 2025, particularly in terms of the maximum or minimum dimensions of Project elements (i.e. their limits of deviation (LOD) and the range of potential uses and locations). These parameters are summarised in Chapter 2: Project description of the PEI Report.

4.4 Embedded mitigation

4.4.1 The approach to mitigation is described in Section 4.6 in Chapter 4: Approach to the environmental assessment. This includes an explanation of the different categories of mitigation, as classified by IEMA (2016), how these have been factored into the preliminary assessment of effects reported in the PEI Report and this WFD preliminary (screening and scoping) assessment at this stage, and the anticipated approach to securing these measures.

4.4.2 The Preliminary WFD compliance assessment has taken account of the embedded design mitigation and standard good practice measures (such as monitoring and use of construction management plans) that have committed to by the Project – these are set out within the draft Code of Construction Practice and the Draft commitments register appended to the PEI Report (Appendix 2.1: Draft Code of Construction Practice and Appendix 2.2: Draft commitments register respectively). These will be informed by ongoing design and assessment, and updated versions will be submitted alongside the ES as part of the DCO application. Additional (secondary) environmental mitigation may be required as a result of the EIA, WFD assessment and/or HRA, and will be developed as these assessments and the current Project design progress.

4.4.3 The individual aspect Chapters 5 to 20 set out relevant embedded design mitigation and standard good practice measures that have been applied in considering likely significant effects, as well as additional mitigation that is being explored which may reduce significant adverse effects. Mitigation measures of particular relevance to the WFD assessment are identified in Chapter 5: Water Environment, Chapter 6: Aquatic ecology, and Chapter 7: Terrestrial ecology of the PEI Report.

5 Screening and baseline assessment

5.1 Overview

5.1.1 An initial screening assessment has been undertaken to identify the relevant Project activities and components that have the potential to comprise an impact source and pathway to the water environment and to determine which WFD water bodies could potentially be affected. An initial baseline assessment has then been undertaken to collate the latest available Environment Agency WFD baseline data for each of the water bodies screened in for assessment.

5.1.2 This section summarises the outcomes of the screening assessment and the baseline information for the relevant water bodies screened in. A more detailed record of the screening assessment is provided in Annex 3. The screening assessment is based on the currently available design information and assumptions for the Project and has assumed that relevant embedded design mitigation and standard good practice measures for the Project will be applied (as summarised in Section 4 of this report).

5.2 Impact sources, pathways and zone of influence

5.2.1 The screening assessment is based on a source-pathway-receptor model. For an impact on the water environment to exist, three components are required, specifically:

- An impact source (such as the release of pollutants or the loss or damage of riparian or in-channel habitats)
- A receptor that is sensitive to that impact (i.e. water bodies/watercourses and the biological Quality Elements that they support)
- A pathway by which the two are linked

5.2.2 The first step in applying the Source-Pathway-Receptor model is to identify the causes or 'sources' of potential impact. The sources have been identified through a review of the latest available design information for the Project, including the type and location of the various Project activities and components, their associated design parameters and assumptions, and proposed construction methodologies and timescales (where available at this stage). The assessment has considered both the construction and operation phases of the Project.

5.2.3 The next step is to undertake a review of the potential water environment receptors, including the relevant WFD water bodies and the various watercourses present within their catchment areas that have the potential to be affected. As described in Section 3.3 of this report, the presence and baseline character of the watercourses receptors have been identified mainly through desk study at this stage, together with site visit walkovers and initial findings from the ongoing baseline survey programme.

5.2.4 The last stage of the model is to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. This has been undertaken in the context of local conditions relative to water receptors within the study area, such as topography, geology, and the nature of the impact (e.g. proximity of works to a water body). This has included consideration of the likely zone of influence (ZoI) of the different impact sources

(e.g., considering the likely dispersal or dilution of potential flow or water quality impacts that propagate downstream).

5.2.5 This initial assessment is qualitative and has applied a precautionary approach, based on the information currently available regarding the existing site and the proposed Project activities and components. The impact pathways and ZoI will be assessed in more detail as part of the impact assessment stage, based on the findings of the relevant hydrological, hydraulic, groundwater and water quality modelling assessments.

5.3 Screening of Project activities/components

Construction phase (temporary works)

5.3.1 Construction of the Project is expected to take place over three phases (early works, enabling works and main works). This would be followed by commissioning and filling of the reservoir. The detailed sequencing of construction activities is still being developed. It is expected that the timeframes of the phases will overlap, such that some areas of the draft Order limits may be within different phases at any one time.

5.3.2 An early works phase would commence in 2027, consisting of ecological habitat creation or enhancement, and, where possible, the translocation of protected species. These would be undertaken prior to the Project being consented by the Secretary of State. During this period, licensing and secondary consents would also be sought where required.

5.3.3 The enabling works phase would commence after the DCO is granted (expected in 2028), which would involve the continuation of early works activities, as well as archaeological mitigation works, demolition, site clearance, utility diversions, access roads, and the establishment of the main compounds. The watercourse diversions would be undertaken in this phase, with both being diverted at the same time on the eastern and western sides of the reservoir location over a period of approximately two years. This phase would also include the establishment of a temporary rail siding and materials handling (RSMH) facility by 2032, as well as the provision of the East Hanney to Steventon Road Diversion early in the phase. This phase is expected to last approximately seven years, concluding in 2034.

5.3.4 The main works phase is scheduled to commence in 2032, starting with earthworks and construction activities associated with the reservoir embankments, the pumping station, the reservoir and river tunnels, the River Thames intake/outfall structure and T2ST WTW. The latter activities are expected to include construction of public and recreational facilities, and landscaping, which would continue after the reservoir commissioning and filing period. Completion of the main works phase is expected to be reached by 2043, taking approximately 12 years.

5.3.5 The reservoir commissioning and filling period would take place during the main works phase between 2039 and 2041. This would commence once the Construction Engineer has certified the reservoir embankment as safe to fill and would consist of filling the reservoir via abstraction from the River Thames and collection of rainwater to enable water to be available for use from the end of the first fill year (expected to be 2040).

5.3.6 Further details of the proposed construction programme and methods are provided in Section 2.5 of Chapter 2: Project description of the PEI Report.

5.3.7 As part of the screening assessment, a range of construction-phase Project activities have been identified that have the potential to impact surface waters and/or groundwater. A summary of the relevant construction phase activities and their screening results is provided in Table 3. A full breakdown of the screening of these construction phase activities, including the anticipated impact sources/pathways and ZoI of the Project activities and justifications for screening decisions, is provided in Annex 3 (Table 22). A description of each of the activity types is provided in Section 2.5 of Chapter 2: Project description of the PEI Report.

Table 3 Summary of relevant construction phase Project activities and screening results

Activity Type	Activity	Anticipated construction phase	Screening outcome
Construction of reservoir infrastructure	Construction of reservoir (borrow pit excavation), reservoir embankments and toe drain	Main works	In
	Construction of reservoir tunnel and river tunnel (Tunnelling)	Main works	In
	Construction of pumping station structure/shaft (below ground works)	Main works	In
	Construction of pumping station structure/shaft (above ground works)	Main works	In
	Construction of intake/outfall shaft (below ground works)	Main works	In
	Construction of intake/outfall structures (above ground and in-channel works)	Main works	In
Construction of new buildings	Construction of recreational buildings	Main works	In
	Construction of T2TS Water Treatment Works (WTW) buildings	Main works	Out
Construction of other infrastructure	Construction and decommissioning of Railway Sidings and Material Handling Facility	Main works	In
	Construction of noise bunds	Main works	In
	Construction of recreational lakes	Main works	In
	Construction of Integrated Constructed Wetland	Main works	In
	Priority Areas for Biodiversity creation	Multiple phases	In
	Construction of River Thames flood mitigation 'berm'	Main works	In

Activity Type	Activity	Anticipated construction phase	Screening outcome
	Construction of ground-mounted solar	Main works	In
Construction of new watercourses / ditches	Construction of watercourse realignments and diversions (including associated floodplain conveyance and compensation)	Enabling works	In
	Construction of Wilts & Berks Canal	Main works	In
Construction access / haul roads	Temporary watercourse crossings	Multiple phases	In
Construction of new permanent highways/ roads/ access tracks/ Public Rights of Way (PRoW)	Construction of new permanent watercourse crossings	Multiple phases	In
	Diversions for National Cycle Route 5, the Thames Path and other PRoW	Multiple phases	In
Construction compounds	Construction compounds	Multiple phases	In
Construction material storage	Stockpiling areas	Multiple phases	In
Construction of new utilities	Temporary utility connections	Multiple phases	In
	Construction of new utility connections, gas diversions, water mains diversions and pipelines	Multiple phases	In
Construction site drainage	Construction surface water drainage[1]	Multiple phases	In
	Construction foul drainage	Multiple phases	Out
	Construction highway/road drainage/runoff	Multiple phases	In
Construction lighting	Construction lighting	Multiple phases	Out
Demolition	Demolition of existing properties/infrastructure	Enabling works	In
Construction (general)	Accidental spillages/release of pollutants	Multiple phases	In

[1] Site-wide construction surface water drainage management, covering surface water drainage and associated water quality considerations of all construction activities, is considered within the Project activity 'construction surface water drainage'. Construction highway/road drainage and run-off is a separate Project activity.

Operational phase (permanent scheme)

5.3.8 The operational phase of the Project has the potential to impact the status of WFD water bodies due to the physical footprint of the reservoir and other permanent infrastructure, as well as the permanent diversion of watercourses around the perimeter of the reservoir and the additional realignment of sections of watercourses within the draft Order limits. Given the size of the Project, these components also have the potential to change flows and water quality in downstream watercourses by altering catchment areas, surface water and groundwater drainage patterns, flow routes, and flow and sediment dynamics.

5.3.9 In addition, the abstraction and discharge of water from and to the River Thames as part of the reservoir operation has the potential to impact the status of the Thames WFD water bodies downstream.

5.3.10 An initial reservoir commissioning and filling period is anticipated to occur between 2039 and 2041. This would commence once the Construction Engineer has certified the reservoir embankment as safe to fill and would consist of filling the reservoir via abstraction from the River Thames and the collection of rainwater, enabling water to be available for use from 2040. To fill the reservoir, water would flow from the River Thames towards the reservoir, passing through the intake screens and into the river tunnel. The river tunnel would transfer water to the pumping station and then to the reservoir tunnel via the intake pumps.

5.3.11 An operational abstraction and discharge regime will then be required for the reservoir and will be subject to controls through the DCO and/or the conditions of an environmental permit and abstraction license, the terms of which will be set by the Environment Agency. The permit would include conditions or limits on abstraction and discharge to prevent adverse effects on flows and water quality within the River Thames and downstream. The assessment has been based on the emerging design which would abstract up to 1000Ml/d at the intake/outfall structure, where the daily increase to reach this maximum would not exceed 300Ml/d. Abstraction would be limited to periods where the minimum river level flow for abstraction (also referred to as the 'hands off flow' level) would be at least 50% of the Q50 flow as measured at Culham and Kingston. The deployable output of the reservoir to the River Thames would be up to 321Ml/d, with a potential peak of 600Ml/d when discharges to WTWs and other locations are included (i.e. maximum draw to all destinations).

5.3.12 When no abstraction or discharge is required, the river tunnel would be emptied to prevent the water contained within the tunnel from degrading to a point where discharge to the river or the reservoir would have a water quality impact on either water body. A permanent system would be provided to pump the water contained within the river tunnel and Intake/Outfall shaft into the River Thames. Flow and water quality measurement facilities would be installed per the conditions of the environmental permit.

5.3.13 Further details of the proposed operation of the Project are provided in Section 2.6 of Chapter 2: Project description of the PEI Report.

5.3.14 The reservoir will likely form a new WFD lake water body once in operation. As such, the reservoir water body is considered within this assessment during the operational phase (see Section 5.4).

5.3.15 As part of the screening assessment, a range of operational phase Project activities and components have been identified that have the potential to impact surface waters and/or

groundwater. A summary of the relevant operational phase activities, components, and their screening results is provided in Table 4. A full breakdown of the screening of these operational phase activities, including the anticipated impact sources/pathways and ZOI of the Project activities and components and justifications for screening decisions, is provided in Annex 3 (Table 23). A description of each of the activity/component types is provided in Section 2.4 of Chapter 2: Project description of the PEI Report.

Table 4 Summary of relevant operational phase Project activities and components, and screening results

Activity / Component Type	Activity / Component	Screening outcome
Reservoir and reservoir infrastructure	Reservoir (footprint)	In
	Tunnels (River tunnel and Reservoir tunnel)	Out
	Intake/outfall structures (above ground)	In
	Intake/outfall shaft (below ground)	In
	Pumping station structures (above ground)	Out
	Pumping station structures/shaft (below ground)	Out
	Recreational Lakes (east and west) (catchment loss)	In
Reservoir operation	Abstraction regime	In
	Discharge regime	In
	Emergency drawdown test releases	In
Watercourse modifications	Watercourse diversions[2]	In
	Watercourse realignments	In
	Watercourse crossings - Bridges	In
	Watercourse crossings - Culverts	In
	River Thames flood mitigation berm	In
	Provision of Wilts & Berks Canal	In
Buildings / facilities	Recreational buildings	Out
	WTW building	Out
Utilities	New utility connections, diversions and pipelines (including T2ST pipeline)	Out
Renewable energy	Ground-mounted Solar (Solar Farm Reprovision)	In
	Floating Solar	In

[2] Associated floodplain conveyance and compensation are included as part of the watercourse diversions Project activity / component.

Activity / Component Type	Activity / Component	Screening outcome
	Hydropower	Out
Operational site drainage	Surface water drainage[3]	In
	Groundwater drainage	In
	Foul drainage including Integrated Constructed Wetland (ICW)	In
	Operational highway/road drainage/runoff	In
Highways / roads	New highway realignments/ diversions/ widening	In
Active Travel	New PRoW	In
Landscaping	Noise Bunds	Out
Lighting	Operational lighting	Out
Habitat creation	Project Priority Areas for Biodiversity (PAB)	In
	Floating islands	In

5.4 Screening of WFD water bodies

Surface water bodies

5.4.1 The proposed location of the Project lies within the Thames RBD, which is covered by the Thames RBMP, Environment Agency (2022c). The site falls within the 'Gloucestershire and the Vale' Management Catchment and the 'Ock' Operational Catchment.

5.4.2 However, the volume and quality of water in the River Thames may be altered due to abstraction to, and augmentation from, the reservoir. Accordingly, river water bodies comprising the sections of River Thames downstream of the Project intake/outfall structure need to be considered, as far as the tidal limit (at Teddington Weir). These River Thames water bodies fall within the 'Thames and Chilterns South' and 'Maidenhead and Sunbury' Management Catchments and 'Chilterns South' and 'Thames Lower' Operational Catchments, respectively.

5.4.3 The exact abstraction / discharge regime is subject to ongoing discussions with the Environment Agency. This assessment assumes an abstraction from the River Thames will only occur during high flows (above the Q50) and no new barriers to fish migration will be implemented on the River Thames; it is assumed that there will be no pathway for impacts on migratory species in any upstream River Thames water bodies beyond the Thames (Evenlode to Thame). Therefore, upstream water bodies on the Thames have been

[3] Site-wide operational surface water drainage management, covering surface water drainage and associated water quality considerations of all operational activities, is considered within the Project activity 'surface water drainage'. Operational highway/road drainage and run-off is a separate Project activity.

screened out of further assessment. The WFD water body downstream of Teddington has not been included in this assessment, as impacts associated with the abstraction and discharge regime are likely to be dissipated by this point. Given the number of existing abstractions which will continue to take place along the River Thames downstream of the reservoir, it is assumed that flows released by the Project will be re-abstracted before reaching the tidal limit at Teddington Weir.

5.4.4 In total, the Project has the potential to impact up to 17 WFD surface water bodies (rivers), which have been subject to a screening assessment. A summary of these water bodies and their screening results is presented in Table 5. A more detailed record of the screening assessment, including screening justifications, is provided in Annex 3 (Table 24). The locations of these water bodies relative to the draft Order limits are shown in Figure 5.2: WFD surface water bodies. The screening assessment has screened out one of the 17 river water bodies – 'Mill Brook and Bradfords Brook system, Wallingford' (GB106039023600) – on the basis that the water body is not directly impacted or hydraulically connected to any of the proposed construction phase or operational phase Project activities/components. The remaining 16 water bodies have been screened in and taken forward for scoping assessment.

5.4.5 No other existing surface water body types (including lakes, transitional, coastal, canals and surface water transfer channels) are impacted by the Project.

5.4.6 The reservoir is anticipated to be designated as an artificial lake WFD water body once constructed and has therefore been included in this assessment for the operational phase. The designation and classification of the reservoir will be confirmed with the Environment Agency in due course.

5.4.7 The two recreational lakes are not anticipated to be designated as WFD water bodies once constructed as they are proposed to each be less than 50 hectares in surface area.

Table 5 Summary of surface water bodies potentially imapcted by Project and screening outcomes.

Water body name	Water body ID	Water body type	Management Catchment	Operational Catchment	Screening outcome
Ock (to Cherbury Brook)	GB106039023400	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Ock and tributaries (Land Brook confluence to Thames)	GB106039023430	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Stutfield Brook (source to Ock)	GB106039023340	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Childrey and Woodhill Brooks	GB106039023370	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Childrey Brook and Norbrook at Common Barn	GB106039023380	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Letcombe Brook	GB106039023350	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In

Water body name	Water body ID	Water body type	Management Catchment	Operational Catchment	Screening outcome
Cow Common Brook and Portobello Ditch	GB106039023360	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Frilford and Marcham Brook	GB106039023420	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Sandford Brook (source to Ock)	GB106039023410	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Ginge Brook and Mill Brook	GB106039023660	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Moor Ditch and Ladygrove Ditch	GB106039023630	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Mill Brook and Bradfords Brook system, Wallingford	GB106039023600	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	Out
Thames (Evenlode to Thame)	GB106039023600	River (Not A/HMWB)	Gloucestershire and the Vale	Ock	In
Thames Wallingford to Caversham	GB106039030331	River (HMWB)	Thames and Chilterns South	Chilterns South	In
Thames (Reading to Cookham)	GB106039023233	River (HMWB)	Thames and Chilterns South	Chilterns South	In
Thames (Cookham to Egham)	GB106039023231	River (HMWB)	Maidenhead and Sunbury	Thames Lower	In
Thames (Egham to Teddington)	GB106039023232	River (HMWB)	Maidenhead and Sunbury’	Thames Lower	In
Newly created reservoir	Not yet designated	Lake (AWB)	Gloucestershire and the Vale	Ock	In

Groundwater bodies

5.4.8 The proposed location of the Project is within the ‘Thames’ Groundwater Management Catchment.

5.4.9 The majority of the proposed Project activities and components do not fall within the extent of any designated WFD groundwater bodies. However, the draft Order Limits for the Project partially encroach into two WFD groundwater bodies - Shrivenham Corallian (GB40602G60060) and Vale of White Horse Chalk (GB40601G601000).

5.4.10 The Shrivenham Corallian (GB40602G60060) groundwater body is located to the north of the footprint of the proposed reservoir and is associated with the Stanford Limestone Formation, Kingston Sandstone Formation, and a small section of Hazelbury Bryan Formation (Sandstone) bedrock geologies. The depth of the Corallian is around 40m below ground level within the footprint of the proposed reservoir.

5.4.11 The Vale of White Horse Chalk (GB40601G601000) groundwater body is located to the south of the footprint of the proposed reservoir and is associated with the West Melbury

Marly Chalk Formation and Upper Greensand Formation (Sandstone and Siltstone) bedrock geologies.

5.4.12 The majority of the study area is underlain by Ampthill and Kimmeridge Clay Formation (herein referred to as the Kimmeridge Clay) in the form of Mudstone. A thin strip of Lower Greensand Group sandstone crosses the location of the proposed reservoir from south-west to east. The Gault Mudstone Formation is also present across the southern study area. None of these bedrock aquifers are designated as WFD groundwater bodies.

5.4.13 Within the vicinity of the proposed reservoir, there is a superficial aquifer which underlies much of the site, associated with the Northmoor Sand and Gravel Member, the Summertown-Radley Sand and Gravel Member, the Wolvercote Sand and Gravel Member and Alluvium superficial deposits. This is designated as a Secondary A aquifer (defined as "permeable layers that can support local water supplies and may form an important source of base flow to rivers"). There is also a small, isolated area of Secondary (undifferentiated) aquifer to the east of the site. Neither of these superficial aquifers are designated as WFD groundwater bodies.

5.4.14 As described above in Sections 5.3.2 – 5.3.3, the Project has the potential to impact the River Thames water bodies located downstream of the site as far as the tidal limit (at Teddington Weir). The groundwater bodies that are hydraulically connected to these water bodies have therefore also been considered as part of the screening assessment.

5.4.15 In total, the Project therefore has the potential to interact with up to nine WFD groundwater bodies. These groundwater bodies and their screening results are presented in Table 6. A detailed record of the screening assessment, including screening decision justifications, is provided in Annex 3 (Table 25). The locations of these water bodies relative to the draft Order limits are shown in Figure 5.6: WFD groundwater bodies. The screening assessment has screened in the Shrivenham Corallian (GB40602G60060) and Vale of White Horse Chalk (GB40601G601000) on a precautionary basis. The remaining seven groundwater bodies have been screened out on the basis that there are no construction phase or operational phase Project activities/components proposed within the extent of the water bodies and there are no anticipated impact pathways to the water bodies due to the embedded mitigation included for the reservoir operational abstraction regime. Whilst the water bodies are hydraulically connected to the River Thames river water bodies that are within the predicted zone of influence for the proposed operational reservoir abstraction regime, the abstraction will be subject to the conditions of an environmental permit, the terms of which will be agreed upon with the Environment Agency. The permit would include conditions or limits on abstraction and discharge to prevent adverse effects on flows and water quality within the River Thames and downstream. This will include the abstraction being limited to periods where the minimum river level flow for abstraction (also referred to as the 'hands off flow' level) would be at least 50% of the Q50 flow as measured at Culham and Kingston. As such, based on the current design information, no impacts are anticipated on low flows within the River Thames.

Table 6 Screening of WFD Groundwater Bodies

Water body name	Water body ID	Management Catchment	Screening outcome
Vale of White Horse Chalk	GB40601G601000	Thames Groundwater	In
Shrivenham Corallian	GB40602G600600	Thames Groundwater	In

Water body name	Water body ID	Management Catchment	Screening outcome
Berkshire Downs Chalk	GB40601G600900	Thames Groundwater	Out
Chiltern Chalk Scarp	GB40601G604100	Thames Groundwater	Out
South-West Chilterns Chalk	GB40601G601100	Thames Groundwater	Out
Maidenhead Chalk	GB40601G602600	Thames Groundwater	Out
Twyford Tertiaries	GB40602G602700	Thames Groundwater	Out
Lower Thames Gravels	GB40603G000300	Thames Groundwater	Out
Chobham Bagshot Beds	GB40602G601400	Thames Groundwater	Out

5.5 Water body baseline

Water body status classifications and objectives

5.5.1 An overview of the Environment Agency's latest available Cycle 3 water body status classifications and objectives for the surface water (river) and groundwater bodies screened in for assessment is provided in Table 7 and Table 8, respectively. Full details of the water body status classifications, including associated WFD Protected Areas and the latest RNAG data, are provided in Annex 2.

Table 7 Overview of the current Cycle 3 status and status objectives for the surface (river) water bodies screened in for assessment

Water body name and ID	Hydro-morphological designation	Ecological Status / Potential (2022)	Chemical Status (2019)	Ecological Status / Potential objective	Chemical Status objective
Ock (to Cherbury Brook) (GB106039023400)	Not A/HMWB	Moderate	Fail	Good by 2027	Good by 2063
Ock and tributaries (Land Brook confluence to Thames) (GB106039023430)	Not A/HMWB	Poor	Fail	Moderate by 2025	Good by 2063
Stutfield Brook (source to Ock) (GB106039023340)	Not A/HMWB	Moderate	Fail	Good by 2027	Good by 2063
Childrey and Woodhill Brooks	Not A/HMWB	Moderate	Fail	Good by 2027	Good by 2063
Childrey Brook and Norbrook at Common Barn	Not A/HMWB	Poor	Fail	Good by 2027	Good by 2063
Letcombe Brook	Not A/HMWB	Poor	Fail	Good by 2039	Good by 2063

Water body name and ID	Hydro-morphological designation	Ecological Status / Potential (2022)	Chemical Status (2019)	Ecological Status / Potential objective	Chemical Status objective
Cow Common Brook and Portobello Ditch	Not A/HMWB	No Data (Poor in 2019)	Fail	Good by 2027	Good by 2063
Frilford and Marcham Brook	Not A/HMWB	Moderate	Fail	Moderate by 2015	Good by 2063
Sandford Brook (source to Ock)	Not A/HMWB	No Data (Poor in 2019)	Fail	Good by 2027	Good by 2063
Ginge Brook and Mill Brook	Not A/HMWB	Moderate	Fail	Moderate by 2015	Good by 2063
Moor Ditch and Ladygrove Ditch	Not A/HMWB	Poor	Fail	Moderate by 2015	Good by 2063
Thames (Evenlode to Thame)	Not A/HMWB	Poor	Fail	Moderate by 2015	Good by 2063
Thames Wallingford to Caversham	HMWB	Moderate	Fail	Moderate by 2015	Good by 2063
Thames (Reading to Cookham)	HMWB	Moderate	Fail	Moderate by 2015	Good by 2063
Thames (Cookham to Egham)	HMWB	Moderate	Fail	Moderate by 2015	Good by 2063
Thames (Egham to Teddington)	HMWB	Poor	Fail	Poor by 2015	Good by 2063

Table 8 Overview of the current Cycle 3 status and status objectives for the groundwater bodies screened in for assessment

Water body name and ID	Quantitative Status (2019)	Chemical Status (2019)	Quantitative Status objective	Chemical Status objective
Vale of White Horse Chalk (GB40601G601000)	Good	Poor	Good by 2015	Good by 2027
Shrivenham Corallian (GB40602G600600)	Good	Good	Good by 2015	Good by 2015

Watercourses

5.5.2 As described in Section 3.3, the screening assessment has included the identification of all the watercourse receptors that have the potential to be impacted within the WFD river water bodies screened in. These are summarised in relation to their parent WFD water

body catchment in Table 9. The location of these watercourses is shown in Figure 5.1: Surface water features.

Table 9 Summary of watercourses potentially impacted by the Project

WFD water body catchment	Watercourse name	Type
Ock (to Cherbury Brook) (GB106039023400)	River Ock (upper)	Main River
	Land Brook	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Ock and tributaries (Land Brook confluence to Thames) (GB106039023430)	River Ock (lower)	Main River
	Nor Brook	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Stutfield Brook (source to Ock) (GB106039023340)	Stutfield Brook	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Childrey and Woodhill Brooks (GB106039023370)	Childrey Brook (upper)	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Childrey Brook and Norbrook at Common Barn (GB106039023380)	Childrey Brook (lower)	Main River
	East Hanney Ditch	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Letcombe Brook (GB106039023350)	Letcombe Brook	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Cow Common Brook and Portobello Ditch (GB106039023360)	Cow Common Brook	Main River
	Portobello Ditch[4]	Main River
	Mere Dyke	Main River
	Landmead Ditch	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Frilford and Marcham Brook (GB106039023420)	Marcham Brook	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Sandford Brook (source to Ock) (GB106039023410)	Sandford Brook	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Ginge Brook and Mill Brook (GB106039023660)	Ginge Brook[5]	Main River
	Unnamed watercourses/ditches	Ordinary watercourse
Moor Ditch and Ladygrove Ditch (GB106039023630)	Ladygrove Ditch	Main River
	Unnamed watercourses/ditches	Ordinary watercourse

[4] Upstream end of watercourse also known locally as 'Pill Ditch'.
[5] Also known locally as Mill Brook and East Hendred Brook

WFD water body catchment	Watercourse name	Type
Thames (Evenlode to Thame) (GB106039030334);	River Thames	Main River
	Oday Ditch System	Main River
Thames Wallingford to Caversham (GB106039030331); Thames (Reading to Cookham) (GB106039023233); Thames (Cookham to Egham) (GB106039023231); Thames (Egham to Teddington) (GB106039023232)	River Thames	Main River

Groundwater-dependent terrestrial ecosystems (GWDTE)

5.5.3 As described in Section 3.3, the screening assessment has included the identification of any designated GWDTE receptors that have the potential to be impacted within the WFD groundwater bodies. These are summarised in relation to their parent WFD water body in Table 10. The locations of these GWDTE are shown in Figure 5.7: Hydrogeological study area and features.

5.5.4 Further details on these sites are provided in Appendix 5.2: Preliminary Hydrogeological Impact Assessment.

5.5.5 Two designated GWDTEs are present within 1km of the draft Order Limits - Barrow Farm Fen SSSI and Frilford Heath, Ponds & Fens SSSI. These are located 500 m and 200m north of the draft Order limits, respectively, and are therefore both hydraulically upgradient of the Project. Accordingly, no impacts are anticipated on these designated GWDTEs and they have been screened out for further assessment.

5.5.6 The Little Wittenham SSSI is located approximately 7km from the draft Order limits, thereby having minimal hydraulic connectivity with the Project. Whilst the site is located adjacent to the River Thames downstream of the Project, topographically the site is raised above the river and largely outside of the floodplain, and so will not be impacted by the proposed reservoir operational abstraction and discharge regimes. As a result, no impacts are expected within the designated GWDTEs, and they have been screened out for further assessment.

Table 10 Summary of statutory site GWDTEs present within 10km of the Project's draft Order limits

WFD groundwater body	Site name	Site type	Habitat type	Site location (centroid grid reference)
Vale of White Horse Chalk (GB40601G601000)*	Little Wittenham	Site of Special Scientific Interest (SSSI)	BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	Approximately 7km east of draft Order limits (SU57249305)

Shrivenham Corallian (GB40602G600600)	Barrow Farm Fen	SSSI	FEN, MARSH AND SWAMP - Lowland	Approximately 500m north of draft Order limits (SU46829750)
Shrivenham Corallian (GB40602G600600)	Frilford Heath, Ponds & Fens	SSSI	FEN, MARSH AND SWAMP - Lowland	Approximately 200m north of draft Order limits (SU43989846)

** The site falls partially within the extent of this WFD groundwater body. However, the northern portion of the site falls outside of any designated WFD groundwater bodies.*

6 Scoping assessment – potential effects on current status

6.1 Overview

6.1.1 A scoping assessment has been undertaken to identify potential risks of deterioration to the current status of WFD receptors from the Project. The assessment has identified the potential mechanisms of impact from the relevant Project activities and components screened in for assessment, and the WFD Quality Elements potentially affected by each. The mechanisms of impact on each of the WFD water bodies and watercourse receptors have then been scoped on a case-by-case basis, based on the construction and design information and site baseline information available at this stage. The following sections summarise the scoping results.

6.2 Identifying the potential mechanisms of impact

6.2.1 A comprehensive list of mechanisms of impact has been developed based on the construction and operational Project activities and components that have been screened in for assessment. These mechanisms of impact include:

- Direct loss or physical alteration of existing watercourse and/or associated riparian and aquatic habitats
- Creation of new watercourses and/or associated riparian and aquatic habitats
- Enhancement of existing watercourses, lake and/or associated riparian and aquatic habitats
- Shading of watercourses, lake and/or associated riparian and aquatic habitats
- Changes to river continuity and biological continuity leading to habitat severance or connection
- Changes in river lateral connectivity leading to increased or decreased floodplain connection
- Changes in watercourse flow volumes due to loss/reduction of catchment area or connection to the groundwater table
- Changes in watercourse flow volumes due to surface water abstraction or discharges and/or runoff
- Changes in watercourse flow volumes due to groundwater dewatering and/or discharges
- Changes in watercourse water quality due to surface water abstractions, discharges and/or runoff
- Changes in watercourse water quality due to groundwater discharges (e.g. from dewatering or groundwater drains)
- Changes in groundwater flows/levels leading to potential changes in groundwater-surface water interactions
- Changes in groundwater quality
- Spread of INNS
- Fish and eel entrainment
- Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures

6.2.2 The potential mechanisms of impact for the screened-in Project activities and components have been identified. Table 11 presents the construction phase, and Table 12 presents the operational phase mechanisms of impacts for each Project activity and component.

Table 11 Construction phase: Project activities and components – potential mechanisms for impact

Project activity/components	Direct loss or physical alterations	Creation of new watercourse and/or habitats	Enhancement of existing watercourse or lake	Shading	Changes to river continuity	Changes in river lateral connectivity	Changes in flow (catchment area or connection to groundwater)	Changes in flow (surface water abstraction or discharges and/or runoff)	Changes in flow (groundwater dewatering and/or discharges)	Changes in water quality (surface water abstractions discharges and/or runoff)[6]	Changes in water quality (groundwater discharges)	Changes in groundwater flows/levels	Changes in groundwater quality	Spread of INNS
Construction of reservoir (borrow pit excavation), reservoir embankments and toe drain	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✓
Construction of reservoir tunnel and river tunnel (Tunnelling)	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✗
Construction of pumping station structure/shaft (below ground works)	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✗
Construction of pumping station structures (above ground works)	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Construction of intake/outfall shaft (below-ground works)	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✗
Construction of intake/outfall structures (above ground and in-channel works)	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Construction of recreational buildings	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✓

[6] Water quality and flow volume impacts from surface water and sediment runoff are covered within the Project activity construction surface water drainage

Project activity/components	Direct loss or physical alterations	Creation of new watercourse and/or habitats	Enhancement of existing watercourse or lake	Shading	Changes to river continuity	Changes in river lateral connectivity	Changes in flow (catchment area or connection to groundwater)	Changes in flow (surface water abstraction or discharges and/or runoff)	Changes in flow (groundwater dewatering and/or discharges)	Changes in water quality (surface water abstractions discharges and/or runoff)[6]	Changes in water quality (groundwater discharges)	Changes in groundwater flows/levels	Changes in groundwater quality	Spread of INNS
Construction and decommissioning of Railway Sidings and Material Handling Facility	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Construction of noise bunds	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Construction of recreational lakes	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✓
Construction of Integrated Constructed Wetland	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Project Priority Areas for Biodiversity (PAB) creation	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓
Construction of River Thames flood mitigation 'berm'	✓	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓
Construction of ground-mounted solar	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓
Construction of watercourse realignments/diversions	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓
Construction of the Wilts & Berks Canal	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Temporary watercourse crossings	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓

Project activity/components	Direct loss or physical alterations	Creation of new watercourse and/or habitats	Enhancement of existing watercourse or lake	Shading	Changes to river continuity	Changes in river lateral connectivity	Changes in flow (catchment area or connection to groundwater)	Changes in flow (surface water abstraction or discharges and/or runoff)	Changes in flow (groundwater dewatering and/or discharges)	Changes in water quality (surface water abstractions discharges and/or runoff)[6]	Changes in water quality (groundwater discharges)	Changes in groundwater flows/levels	Changes in groundwater quality	Spread of INNS
Construction of permanent watercourse crossings	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓
Diversions for National Cycle Route 5, the Thames Path and other PRoW	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Construction compounds	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Stockpiling areas	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Temporary utility connections	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓
Construction of new utility connections, gas diversions, water mains diversions and pipelines	✓	✗	✗	✗	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓
Construction surface water drainage	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓
Construction highway/road drainage/runoff	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✗
Demolition of existing properties/infrastructure	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Accidental spillages/release of pollutants	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✗

Table 12 Operational phase Project activities and components – potential mechanisms for impact

Project activity / component	Direct loss or physical alterations	Creation of new watercourse and/or habitats	Enhancement of existing watercourse/lake	Shading	Changes to river continuity	Changes in river lateral connectivity	Changes in flow (catchment area or connection to groundwater)	Changes in flow (surface water abstraction or discharges and/or runoff)	Changes in flow (groundwater dewatering and/or discharges)	Changes in water quality (surface water abstractions, discharges and/or runoff)[7]	Changes in water quality (groundwater discharges)	Changes in groundwater flows/levels	Changes in groundwater quality	Spread of INNS	Fish and eel entrainment	Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures
Reservoir (footprint)	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓
Intake/outfall structures (above ground)	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Intake/outfall shaft (below ground)	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓	✓	✗	✗	✗
Recreational Lakes (east and west) (catchment loss)	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗
Abstraction regime	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✓	✗
Discharge regime	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗
Emergency Drawdown Test releases	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗

[7] Water quality and flow volumes impacts from surface water and sediment runoff are covered under Project activity surface water drainage.

Project activity / component	Direct loss or physical alterations	Creation of new watercourse and/or habitats	Enhancement of existing watercourse/lake	Shading	Changes to river continuity	Changes in river lateral connectivity	Changes in flow (catchment area or connection to groundwater)	Changes in flow (surface water abstraction or discharges and/or runoff)	Changes in flow (groundwater dewatering and/or discharges)	Changes in water quality (surface water abstractions, discharges and/or runoff)[7]	Changes in water quality (groundwater discharges)	Changes in groundwater flows/levels	Changes in groundwater quality	Spread of INNS	Fish and eel entrainment	Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures
Watercourse diversions	✓	✓	✓	✗	✓	✓	✓	✗s	✗	✗	✗	✗	✗	✓	✗	✗
Watercourse realignments	✗	✓	✓	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗
Watercourse crossings - Bridges	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Watercourse crossings - Culverts	✓	✗	✗	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
River Thames flood mitigation berm	✓	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗
Provision of the Wilts & Berks Canal	✗	✓	✓	✗	✗	✗	✓	✓	✗	✓	✗	✗	✗	✓	✗	✗
Ground-mounted Solar (Solar Farm Reprovision)	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗
Floating Solar	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Surface water drainage	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗

Project activity / component	Direct loss or physical alterations	Creation of new watercourse and/or habitats	Enhancement of existing watercourse/lake	Shading	Changes to river continuity	Changes in river lateral connectivity	Changes in flow (catchment area or connection to groundwater)	Changes in flow (surface water abstraction or discharges and/or runoff)	Changes in flow (groundwater dewatering and/or discharges)	Changes in water quality (surface water abstractions, discharges and/or runoff)[7]	Changes in water quality (groundwater discharges)	Changes in groundwater flows/levels	Changes in groundwater quality	Spread of INNS	Fish and eel entrainment	Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures
Groundwater drainage	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✗	✗	✗
Foul drainage (including Integrated constructed wetland)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Operational highway/road drainage/runoff	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗
New highway realignments/diversions /widening	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
New PRoW	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Project Priority Areas for Biodiversity (PAB)	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
Floating islands	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

6.3 Identifying the potential Quality Elements affected

6.3.1 The mechanisms of impact on the water environment receptors have the potential to impact different Quality Elements. Table 13 details the Quality Elements that have the potential to be impacted by each identified mechanism of impact.

6.3.2 A number of the operational phase Project activities and components and their associated mechanisms of impact have the potential to affect certain Quality Elements of the newly created reservoir (that is anticipated to be designated as a lake AWB under WFD). However, an assessment of the links between mechanisms of impact and Quality Elements has not been undertaken for the newly created reservoir at this stage, as it is currently unknown which Quality Elements will be included as part of the status classification of the water body, if it becomes designated under WFD. This is to be confirmed with the Environment Agency in due course.

Table 13 WFD Quality Elements potentially affected by Project mechanisms of impact

Mechanism of impact	Surface Water Quality Elements potentially affected					Groundwater Quality Elements potentially affected	
	Biological	Physio chemical	Specific pollutants	Hydro-morphological	Chemical	Quantitative	Chemical
Direct loss or physical alterations	✓	✓	×	✓	×	×	×
Creation of new watercourse	✓	✓	×	✓	×	×	×
Enhancement of existing watercourse or lake	✓	✓	×	✓	×	×	×
Shading	✓	✓	×	✓	×	×	×
Changes to river continuity and biological continuity	✓	×	×	✓	×	×	×
Changes in river lateral connectivity	✓	✓	×	✓	×	×	×
Changes in flow (catchment area or connection to groundwater)	✓	✓	✓	✓	✓	×	×
Changes in flow (surface water abstraction or discharges and/or runoff)	✓	✓	✓	✓	✓	×	×
Changes in flow (groundwater dewatering and/or discharges)	✓	✓	✓	✓	✓	×	×
Changes in water quality (surface water abstractions, discharges and/or runoff)	✓	✓	✓	×	✓	×	×
Changes in water quality (groundwater discharges)	✓	✓	✓	×	✓	×	×
Changes in groundwater flows/levels	✓	✓	✓	✓	✓	✓	×
Changes in groundwater quality	✓	✓	✓	×	✓	×	✓
Spread of INNS	✓	×	×	×	×	×	×
Fish and eel entrainment	✓	×	×	×	×	×	×
Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures	×	×	×	×	×	✓	×

6.4 Summary of scoping results for Project activities and components

6.4.1 A scoping assessment of each of the screened-in construction phase and operational Project activities and components has been undertaken to identify the potential mechanisms of impact of each on each of the relevant WFD water bodies. This has included identifying the relevant receptors that are anticipated to be impacted within each of the surface water bodies and groundwater bodies, respectively. The scoping assessment includes the operational impacts on the created reservoir that is anticipated to be designated as WFD AWF. A summary of the scoping results is provided in the sections below.

6.4.2 A full breakdown of the scoping assessment results is provided in Annex 4. This includes details of the WFD Quality Elements potentially affected by each of the scoped-in Project activities and components, for each surface water body/watercourse and groundwater body.

Surface Water

6.4.3 A summary of the scoping of the Project activities and components and their potential mechanisms of impact for each of the surface water bodies and watercourse receptors is provided in Table 14 (construction phase) and Table 15 (operational phase).

6.4.4 The new reservoir is anticipated to become a WFD lake water body. The designation and classification guidance is under development by the Environment Agency. The water body designation and classification will be decided by the Environment Agency in due course. Whilst the water body designation and associated set of Quality Elements is yet to be confirmed, this preliminary assessment has highlighted the relevant operational Project components that have the potential to affect its status from the anticipated point of designation.

6.4.5 The reasoning for scoped out construction phase Project activities is detailed below.

6.4.6 Within the Ock (to Cherbury Brook), Stutfield Brook (source to Ock), Childrey and Woodhill Brooks and Letcombe Brook water bodies, there is a limited spatial and temporal extent of construction activities. Considering the limited construction planned within the water bodies and ‘standard good practice measures to reduce the impacts to surface and groundwater resources’ and the ‘Drainage Strategy to align with national and local planning policy and guidance' it was considered that there is a negligible risk of impact on the watercourses within these water bodies from the Project activity ‘accidental spillages/release of pollutants’. The Project activity is therefore scoped out for these water bodies and the associated watercourses, including Land Brook, River Ock (upper), Stutfield Brook, Childrey Brook (upper), Letcombe Brook, Marcham Brook, Ginge Brook, Moor Ditch (and their associated ordinary watercourse networks).

6.4.7 Within the Ock (to Cherbury Brook), Stutfield Brook (source to Ock), Childrey and Woodhill Brooks, Letcombe Brook, and Moor Ditch and Ladygrove Ditch water bodies, there is a limited spatial and temporal extent of construction activities. Considering the limited construction planned within the water bodies and the ‘standard good practice measures to reduce the impacts to surface and groundwater resources’ and the ‘Drainage Strategy to align with national and local planning policy and guidance' it was considered that there is a negligible risk of impact on the watercourses within these water bodies from the Project

activity ‘construction surface water drainage. The Project activity is therefore scoped out for these water bodies and the associated watercourses, including Land Brook River Ock (upper), Childrey Brook (upper), Letcombe Brook, Moor Ditch (and their associated ordinary watercourse networks).

6.4.8 ‘Standard good practice measures to reduce the impacts to surface and groundwater’ includes the use of directional drilling for utility and pipe crossings under main rivers, WFD water bodies and the Eastern Watercourse Diversion. Due to this mitigation, any impacts from the construction of new utility connections, gas diversions, water mains diversions and pipelines, and temporary utility connections will be localised and negligible at the water body scale. These Project activities have been scoped out for WFD, main river and the Eastern Watercourse Diversion, including the River Ock (lower), Childrey Brook (upper), Childrey Brook (lower), East Hanney Ditch, Cow Common Brook, Portobello Ditch, Landmead Ditch, Mere Dyke and Sandford Brook.

6.4.9 Construction of education centre buildings has the potential to impact the ordinary watercourse network within the Childrey Brook and Norbrook at the Common Barn water body under the Project activity ‘construction of recreational buildings’. Construction of the buildings has the potential to result in changes in flows and water quality due to dewatering, changes in groundwater levels and quality, and the spread of INNS. Considering ‘standard good practice measures to reduce the impacts to surface and groundwater resources’ and ‘standard good practice measures for controlling and treating of invasive and non-native species’, and that the construction will not have a direct impact on the watercourse, any impacts would be local and temporary. This has therefore been scoped out for the ordinary watercourse network within the Childrey Brook and Norbrook at the Common Barn water body.

6.4.10 The Project activity ‘demolition of existing properties/infrastructure’ has the potential to result in the spread of INNS.[8]. Considering the ‘standard good practice measures to reduce the impacts to surface and groundwater resources’ and ‘standard good practice measures for controlling and treating of invasive and non-native species’, all watercourses potentially impacted by this Project activity have been scoped out.

6.4.11 The reasoning for scoped out operational phase Project activities is detailed below.

6.4.12 Foul drainage (including integrated constructed wetland (ICW)) within the operation phase has the potential to impact watercourses via changes in watercourse water quality due to surface water discharges. It is assumed that operational foul drainage is to be connected to Abingdon or Drayton sewage treatment works (STW), except for the ICW, which will treat the foul water from the nature education centre and discharge into the Western Watercourse Diversion. Foul drainage has been scoped out where there is a connection to a STW. The associated discharges from the Drayton STW to Ginge Brook, and Abingdon STW to the River Thames[9] have been scoped out on the basis that these STW discharges are regulated by existing environmental permits.

[8] Note: Impacts from construction surface water drainage are covered under a separate Project activity/component

[9] Note: There are two existing outfalls from Abingdon STW, one of which is located on the River Thames near the location of the proposed reservoir abstraction intake will be. To remove any risk to the abstraction, the Abingdon STW outfall will be moved downstream of the proposed reservoir intake to a point where there will be no risk of backflow, whilst retaining the STW discharge into the Thames.

6.4.13 Ground-mounted solar (solar farm reprovision being considered) has been scoped out for the ordinary watercourse network within the Childrey and Woodhill Brook water body due to the setback nature outside of the riparian zone.

6.4.14 The operational impacts from the intake/outfall shaft (below ground) have been scoped out, as they are expected to have negligible impacts on local groundwater flows and levels that will have a negligible effect on the Thames (Evenlode to Thame) at the water body scale.

6.4.15 A proposed PRoW/active travel route is currently detailed within the Childrey Brook (lower) riparian zone. The route of the active travel has been agreed to be set outside the 10m riparian zone in future design updates and, as such, is scoped out.

6.4.16 Although the recreational lakes (east and west) (catchment loss) Project activity is within the Cow Common Brook water body catchment, the area drains into the Mere Dyke and then the lower River Ock. As such, this Project activity is scoped out for the Cow Common Brook watercourse but remains scoped in for the Mere Dyke with the impact assessment to determine the magnitude of effects on both the Mere Dyke and the Ock.

6.4.17 Operational surface water drainage has been scoped out for the River Thames and Oday ditch system watercourses due to the embedded mitigation 'operation stage surface water management', which includes surface water generated by specific design features that will be collected, treated, and discharged to receiving watercourses at a rate and volume that ensures there is no change to overall local water balance. This will be facilitated by a sustainable surface water management system. Due to this embedded mitigation, any effect on the River Thames downstream of the Project is anticipated to be negligible.

6.4.18 An active travel bridge is proposed over each of the East Hanney Ditch, Mere Dyke and Oday Ditch System. The three bridges have been scoped out as they will have a highly localised footprint only, resulting in short sections of riparian habitat alternation only.

Table 14 Construction phase Project activities and components – summary of scoping of mechanisms of impact for each surface water body and watercourse receptor

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Construction of reservoir (borrow pit excavation), reservoir embankments and toe drain	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (groundwater dewatering and/or discharges)	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
		Portobello Ditch	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges)	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	
		Landmead Ditch	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
Construction of reservoir tunnel and river tunnel (Tunnelling)	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (catchment area or connection to groundwater) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Mere Dyke	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	
		Ordinary watercourse network	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
	Thames (Evenlode to Thame)	River Thames	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Oday Ditch System	Changes in flow (catchment area or connection to groundwater) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (catchment area or connection to groundwater) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			discharges) Changes in groundwater flows/levels Changes in groundwater quality	
Construction of pumping station structure/shaft (below ground works)	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
Construction of pumping station structures (above ground works)	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Construction of intake/outfall shaft (below ground works)	Thames (Evenlode to Thame)	River Thames	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
Construction of intake/outfall structures (above ground and in-channel works)	Thames (Evenlode to Thame)	River Thames	Direct loss or physical alterations INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Construction of recreational buildings	Childrey Brook and Norbrook at Common Barn	Ordinary watercourse network	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Cow Common Brook and Portobello Ditch	Ordinary watercourse network	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
Construction and decommissioning of Railway Sidings and Material Handling Facility	Cow Common Brook and Portobello Ditch	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Construction of noise bunds	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Sandford Brook (source to Ock)	Sandford Brook	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Construction of recreational lakes	Cow Common Brook and Portobello Ditch	Ordinary watercourse network	Direct loss or physical alterations Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
Construction of Integrated Constructed Wetland	Childrey Brook and Norbrook at Common Barn	Ordinary watercourse / ditch network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Project Priority Areas for Biodiversity (PAB) creation	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Nor Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse / ditch network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse / ditch network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		East Hanney Ditch	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse / ditch network	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Letcombe Brook	Letcombe Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			abstractions, discharges and/or runoff) Spread of INNS	
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Portobello Ditch	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse / ditch network	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Frilford and Marcham Brook	Marcham Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Sandford Brook (source to Ock)	Sandford Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of invasive non-native species (INNS)	Scoped in for detailed impact assessment
		Ordinary watercourse / ditch network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Ginge Brook and Mill Brook	Ginge Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse / ditch network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
Construction of River Thames flood mitigation 'berm'	Thames (Evenlode to Thame)	River Thames	Direct loss or physical alterations Enhancement of existing watercourse or lake Changes in river lateral connectivity Spread of INNS	Scoped in for detailed impact assessment
Construction of ground-mounted solar	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
Construction of watercourse realignments and diversions	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (surface water abstraction or discharges and/or runoff)	Scoped in for detailed impact assessment
		East Hanney Ditch	Direct loss or physical alterations Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Portobello Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			abstractions, discharges and/or runoff) Spread of INNS	
		Landmead Ditch	Direct loss or physical alterations Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Direct loss or physical alterations Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
Construction of Wilts & Berks Canal	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Cow Common Brook	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Cow Common Brook and Portobello Ditch	Ordinary watercourse network	Direct loss or physical alterations Spread INNS	Scoped in for detailed impact assessment
Temporary watercourse crossings	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Portobello Ditch	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Landmead Ditch	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Direct loss or physical alterations Shading Changes to river continuity and biological	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	
		Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of s INNS	Scoped in for detailed impact assessment
Construction of permanent watercourse crossings	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Thames (Evenlode to Thame)	Oday Ditch system	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
Diversions for National Cycle Route 5, the Thames Path and other PRoW	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Construction compounds	Ock (to Cherbury Brook)	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Stutfield Brook (source to Ock)	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Childrey Brook and Norbrook at Common Barn	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Thames (Evenlode to Thame)	Oday Ditch system	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Stockpiling areas	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Portobello Ditch	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Landmead Ditch	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Ordinary watercourse network	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Direct loss or physical alterations Spread of INNS	Scoped in for detailed impact assessment
Temporary utility connections	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Direct loss or physical alterations Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Construction of new utility connections, gas diversions, water mains diversions and pipelines	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Stutfield Brook (source to Ock)	Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	
	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Portobello Ditch	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Landmead Ditch	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Mere Dyke	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped Out due to embedded design mitigation and / or standard good practice.

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
Construction surface water drainage	Ock (to Cherbury Brook)	River Ock (upper)	Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Land Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse / ditch network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment.

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		East Hanney Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment.
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Letcombe Brook	Letcombe Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Portobello Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment.
		Landmead Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Mere Dyke	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Moor Ditch and Ladygrove Ditch	Moor Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Thames (Evenlode to Thame)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Oday Ditch systems	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
Construction highway/road drainage/runoff	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Letcombe Brook	Letcombe Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Portobello Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Mere Dyke	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Ginge Brook and Mill Brook	Ginge Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Moor Ditch and Ladygrove Ditch	Moor Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Thames (Evenlode to Thame)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Oday Ditch systems	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Demolition of existing properties/infrastructure	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Spread of INNS	Scoped Out due to embedded design mitigation and / or standard good practice.
Accidental spillages / release of pollutants	Ock (to Cherbury Brook)	Land Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
		River Ock (upper)	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Stutfield Brook (source to Ock)	Stutfield Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Letcombe Brook	Letcombe Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Portobello Ditch	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Landmead Ditch	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Mere Dyke	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
	Frilford and Marcham Brook	Marcham Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
	Sandford Brook (source to Ock)	Sandford Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Ginge Brook and Mill Brook	Ginge Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
	Moor Ditch and Ladygrove Ditch	Moor Ditch	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped Out due to embedded design mitigation and / or standard good practice.
	Thames (Evenlode to Thame)	River Thames	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment
		Oday Ditch systems	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Scoped in for detailed impact assessment

Table 15 Operation phase Project activites and components – summary of scoping of mechanisms of impact for each surface water body and watercourse receptor

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Reservoir (footprint)	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Landmead Ditch	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
Intake/outfall shaft (below ground)	Thames (Evenlode to Thame)	River Thames	Changes in flow (catchment area or connection to groundwater)	Scoped out due to likely negligible impacts

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			Changes in groundwater flows/levels Changes in groundwater quality	
Intake/outfall structures (above ground)	Thames (Evenlode to Thame)	River Thames	Direct loss or physical alterations	Scoped in for detailed impact assessment
Recreational Lakes (east and west) (catchment loss)	Cow Common Brook and Portobello Ditch	Mere Dyke	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
Abstraction regime	Thames (Evenlode to Thame)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Spread of INNS Fish and eel entrainment	Scoped in for detailed impact assessment
	Thames Wallingford to Caversham	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Reading to Cookham)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Cookham to Egham)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Egham to Teddington)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Newly created reservoir	Newly created reservoir	Changes in water quality (surface water abstraction, discharges and/or runoff)	Scoped in for detailed impact assessment
Discharge regime	Thames (Evenlode to Thame)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames Wallingford to Caversham	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Reading to Cookham)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Cookham to Egham)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Egham to Teddington)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Newly created reservoir	Newly created reservoir	Changes in water quality (surface water abstraction, discharges and/or runoff)	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Emergency Drawdown Test releases	Thames (Evenlode to Thame)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames Wallingford to Caversham	River Thames	Spread of INNS	Scoped in for detailed impact assessment
	Thames (Reading to Cookham)	River Thames	Spread of INNS	Scoped in for detailed impact assessment
	Thames (Cookham to Egham)	River Thames	Spread of INNS	Scoped in for detailed impact assessment
	Thames (Egham to Teddington)	River Thames	Spread of INNS	Scoped in for detailed impact assessment
Watercourse diversions	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Creation of new watercourse Enhancement of existing watercourse or lake Changes to river continuity and biological continuity Changes in river lateral connectivity Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Portobello Ditch	Creation of new watercourse Enhancement of existing watercourse or lake Changes to river continuity and biological continuity Changes in river lateral connectivity Spread of INNS	Scoped in for detailed impact assessment
		Landmead Ditch	Changes in river lateral connectivity Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Changes in river lateral connectivity Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Creation of new watercourse Enhancement of existing watercourse or lake Changes to river continuity and biological continuity Changes in river lateral connectivity Changes in flow (catchment area or connection to groundwater) Spread of INNS	Scoped in for detailed impact assessment
Watercourse realignments	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Enhancement of existing watercourse or lake Changes in river lateral connectivity	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Ordinary watercourse network	Enhancement of existing watercourse or lake Changes in river lateral connectivity Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Enhancement of existing watercourse or lake Changes in river lateral connectivity	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Watercourse crossings - Culverts	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
	Moor Ditch and Ladygrove Ditch	Moor Ditch	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Thames (Evenlode to Thame)	Ordinary watercourse network	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Scoped in for detailed impact assessment
Watercourse crossings - Bridges	Childrey Brook and Norbrook at Common Barn	East Hanney Ditch	Direct loss or physical alterations Shading	Scoped out, single Active Travel bridge resulting in localised effects
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Direct loss or physical alterations Shading	Scoped in for detailed impact assessment
		Mere Dyke	Direct loss or physical alterations Shading	Scoped out, single Active Travel bridge resulting in localised effects
		Ordinary watercourse network	Direct loss or physical alterations Shading	Scoped in for detailed impact assessment
	Moor Ditch and Ladygrove Ditch	Moor Ditch	Direct loss or physical alterations Shading	Scoped in for detailed impact assessment
	Thames (Evenlode to Thame)	Oday Ditch system	Direct loss or physical alterations Shading	Scoped out, single Active Travel bridge resulting in localised effects
River Thames flood mitigation berm	Thames (Evenlode to Thame)	River Thames	Direct loss or physical alterations Changes in river lateral connectivity	Scoped in for detailed impact assessment
Provision of Wilts & Berks Canal	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (catchment area or connection to groundwater) Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			abstractions, discharges and/or runoff) Spread of INNS	
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
		Landmead Ditch	Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Creation of new watercourse Changes in flow (catchment area or connection to groundwater)	Scoped in for detailed impact assessment
Ground-mounted solar (solar farm reprovision)	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in groundwater quality	Scoped in for detailed impact assessment
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	No mechanism of impact	Scoped out as set back from the riparian zone

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Floating Solar	Newly created reservoir	Newly created reservoir	Shading Changes in water quality (surface water abstraction, discharges and/or runoff)	Scoped in for detailed impact assessment
Surface water drainage	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Portobello Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Landmead Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Mere Dyke	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped in for detailed impact assessment
	Thames (Evenlode to Thame)	River Thames	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped out due to likely negligible impacts
		Oday Ditch systems	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Scoped out due to likely negligible impacts

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
Groundwater drainage	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		East Hanney Ditch	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Portobello Ditch	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Landmead Ditch	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Mere Dyke	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality	Scoped in for detailed impact assessment
Foul drainage (including ICW)	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Mere Dyke	No potential mechanism of impact	Scoped out. Assumed foul drainage to Abingdon or Drayton STW.
		Ordinary watercourse network	No potential mechanism of impact	Scoped out. Assumed foul drainage to Abingdon or Drayton STW.
	Ginge Brook and Mill Brook	Ginge Brook	No potential mechanism of impact	Scoped out. Assumed foul drainage to Drayton STW

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
				discharged to Oday Ditch meets permit conditions.
	Thames (Evenlode to Thame)	River Thames	Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped out. Potential impacts of the ICW are likely to have sufficiently dissipated to not affect WFD quality element status, given the dilution and dispersion potential of the River Thames.
		Oday Ditch system	No potential mechanism of impact	Scoped out. Assumed foul drainage to Abingdon STW discharged to Thames meets permit conditions.
Operational highway/road drainage/runoff	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Portobello Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Mere Dyke	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
Highway realignments/diversions/widening	Moor Ditch and Ladygrove Ditch	Moor Ditch	Direct loss or physical alterations	Scoped in for detailed impact assessment
Public Rights of Way	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Direct loss or physical alterations	Scoped out as agreed to set back outside of the riparian zone in design updates
Project Priority Areas for Biodiversity (PAB)	Ock and tributaries (Land Brook confluence to Thames)	River Ock (lower)	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Nor Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
	Childrey and Woodhill Brooks	Childrey Brook (upper)	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Childrey Brook and Norbrook at Common Barn	Childrey Brook (lower)	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		East Hanney Ditch	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Letcombe Brook	Letcombe Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Cow Common Brook and Portobello Ditch	Cow Common Brook	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Portobello Ditch	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Mere Dyke	Creation of new watercourse Enhancement of existing watercourse or lake	Scoped in for detailed impact assessment

Project activity / component	Water body name	Watercourse	Potential mechanism of impact	Scoping outcome
			Changes in water quality (surface water abstractions, discharges and/or runoff)	
		Ordinary watercourse network	Creation of new watercourse Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Frilford and Marcham Brook	Marcham Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Sandford Brook (source to Ock)	Sandford Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
	Ginge Brook and Mill Brook	Ginge Brook	Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
		Ordinary watercourse network	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Scoped in for detailed impact assessment
Floating islands	Newly created reservoir	Newly created reservoir	Enhancement of existing watercourse / lake Shading	Scoped in for detailed impact assessment

Groundwater

6.4.19 A summary of the scoping of the Project activities and components and their potential mechanisms of impact for each of the groundwater bodies is provided in Table 16 (construction phase) and Table 17 (operational phase).

Table 16 Construction phase Project activities and components – summary of scoping of mechanisms of impact for each groundwater body

Project activity / components	Water body name	Potential mechanism of impact	Scoping outcome
Construction highway/road drainage/runoff	Vale of White Horse Chalk	Changes in groundwater quality	Scoped in for detailed impact assessment
Project Priority Areas for Biodiversity (PAB) creation	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment
Construction compounds	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment
Construction of ground-mounted solar	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment
Accidental spillages / release of pollutants	Vale of White Horse Chalk	Changes in groundwater quality	Scoped in for detailed impact assessment
	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment

Table 17 Operation phase Project activities and components – summary of scoping of mechanisms of impact for each groundwater body

Project activity / components	Water body name	Potential mechanism of impact	Scoping outcome
Reservoir (footprint)	Vale of White Horse Chalk	Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures	Scoped in for detailed impact assessment
	Shrivenham Corallian	Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures	Scoped in for detailed impact assessment
Operational highway/road drainage/runoff	Vale of White Horse Chalk	Changes in groundwater quality	Scoped in for detailed impact assessment
	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment
New highway realignments/ diversions/ widening	Vale of White Horse Chalk	Changes in groundwater quality	Scoped in for detailed impact assessment
	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment
Ground-mounted solar (solar farm reprovision)	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment
Project Priority Areas for Biodiversity (PAB)	Shrivenham Corallian	Changes in groundwater quality	Scoped in for detailed impact assessment

6.5 Anticipated magnitude of effects on current status

6.5.1 The scoping assessment has identified the potential mechanisms of impact relevant to each of the Project activities and components and WFD water bodies screened in for assessment, as well as the WFD Quality Elements potentially affected by each, which require further impact assessment as part of the next ES stage of the Project. The following sections detail a preliminary assessment of the anticipated magnitude of potential effects. The anticipated magnitude of effect is based on expert judgement and incorporates an understanding of the conclusions of the impact assessments undertaken during earlier design development stages of the Project, acknowledging the design changes that have occurred since those assessments took place. Design developments are significant within the Ock catchment, limiting reliance on previous impact assessment conclusions. For the Thames in relation to abstractions and discharges from the proposed Project, previous assessment conclusions remain valid as design changes are not considered likely to alter the previously completed modelling assessments.

6.5.2 An assessment of the anticipated magnitude of effect has not been undertaken for the newly created reservoir, which is anticipated to be a new lake WFD water body. Ongoing consultation and engagement with the Environment Agency will be undertaken to support the impact assessment of the Project's operation on the newly created reservoir.

6.5.3 Further impact assessments, as detailed in Section 8 of this report, will be undertaken for each of the water bodies, Project activities and components, and impact mechanisms scoped in. This will be reported on within the next iteration of the WFD Compliance Assessment report as part of the DCO application stage.

Construction

6.5.4 The construction programme is expected to take place over three phases (early works, enabling works and main works). The commissioning and filling of the reservoir would then follow this. Detailed sequencing of construction activities is being developed. It is expected that phases will overlap; for example, the diversion channel may be in operation while main works to the reservoir are still underway.

6.5.5 Early works would commence in 2027 before the DCO is granted, consisting of ecological habitat creation or enhancement and protected species translocation. Once DCO is granted (expected to be in 2028), continuation of early works and commencement of enabling works would occur. This would include site clearance, utility diversion, demolition, watercourse diversion, access road and establishment of main compounds, temporary rail sidings and materials handling facility. The main works would commence in 2032 and are expected to take approximately 12 years.

6.5.6 The anticipated magnitude of potential effects is provided in Table 18 and Table 19 (construction phase) for surface and groundwater bodies.

6.5.7 Six water bodies have the potential for minor/localised adverse effects on one or more Quality Elements during construction, including the Ock and tributaries (Land Brook confluence to Thames), Childrey Brook and Norbrook at Common Barn, Cow Common Brook, Sandford Brook (source to Ock), Moor Ditch and Ladygrove Ditch and Thames (Evenlode to Thame).

6.5.8 During the construction phase there is the potential for adverse effects on biology, physicochemical and hydromorphology Quality Elements of the Childrey Brook and Norbrook at Common Barn, and Cow Common Brook water bodies. The duration and scale of construction activities within the water bodies are considerable, with potential impacts relating to physical habitat, water quality, groundwater levels, and INNS. This includes the loss of existing watercourses (both main river and ordinary watercourses) as a result of the construction works. However, beneficial effects from the proposed land use changes and habitat creation as part of the Project PABs and Eastern and Western Watercourse Diversions are anticipated during the construction phase, once the new watercourse channels and riparian habitats are connected and become established. The nuances of both the adverse and beneficial effects over the course of construction phase, in relation to the phasing of construction works, will be assessed further as part of the Stage 3 impact assessment for all scoped in Project activities and components and Quality Elements.

6.5.9 Details on the anticipated magnitude of effect, for the construction phase, are provided for each water body within this section of the report. The anticipated magnitude of effect assumes implementation of embedded design mitigation and standard good practice, as described in Section 4.4 of this report. The key construction stage mitigation factored into the scoping stage includes:

- Design of temporary crossings during construction to maintain the function and integrity of watercourses
- Timings of construction works to reduce ecological impacts
- Standard good practice measures to reduce the impacts on surface and groundwater resources
- Standard good practice measures for managing ecology impacts
- Standard good practice measures for works within or adjacent to water bodies
- Construction stage surface water management
- Protection of riparian zone during construction
- Standard good practice measures to prevent soil pollution
- Measures to reduce impacts from land contamination during construction
- Standard good practice measures for road cleanliness
- Water quality monitoring and subsequent remedial activities where these are required
- Measures to reduce new watercourse crossings
- Standard good practice measures for controlling and treating of invasive and non-native species

Ock (to Cherbury Brook)

6.5.10 Construction activities have the potential to impact biological, physicochemical, hydromorphological, chemical and specific pollutants Quality Elements. Due to embedded design mitigation and standard good practice measures, as detailed in Section 4.4, the anticipated magnitude of the potential effect is considered to be negligible.

Ock and tributaries (Land Brook confluence to Thames)

6.5.11 Construction activities have the potential to impact biological, physicochemical, hydromorphological, chemical and specific pollutants Quality Elements. Due to embedded

design mitigation and standard good practice measures the anticipated magnitude of the potential effect is considered to be adverse, but minor/localised.

6.5.12 Land-use changes within the Ock and tributaries, as well as upstream water bodies, have the potential to reduce existing impacts on biological and physicochemical elements from agricultural land management. Land-use changes include a shift from existing arable and pasture agrarian land use to new areas of neutral grassland, scrub, woodland, and wet woodland, along with the proposed new watercourse channels, ditches, and wetland scrape features as part of the Western and Eastern Watercourse Diversions. Additionally, an area of existing agricultural land will be lost under the proposed reservoir's footprint, as well as that of other reservoir infrastructure, buildings, and ground-mounted solar facilities. These benefits will become live during the construction phase. The impact assessment will detail the nuances of both beneficial and negative impacts over the construction phase for all scoped Project activities and components and Quality Elements.

Stutfield Brook (source to Ock)

6.5.13 Construction activities have the potential to impact biological, physicochemical, hydromorphological, chemical and specific pollutants Quality Elements. Due to embedded design mitigation and standard good practice measures the anticipated magnitude of the potential effect is considered to be negligible.

Childrey and Woodhill Brooks

6.5.14 Construction activities have the potential to impact biological, physicochemical, hydromorphological, chemical and specific pollutants Quality Elements. Due to embedded design mitigation and standard good practice measures the anticipated magnitude of the potential effect is considered to be negligible. Land-use changes include a shift from existing arable and pasture land use to new areas of grassland, scrub, woodland and ground mounted solar, which is expected to become live during the construction phase.

Childrey Brook and Norbrook at Common Barn

6.5.15 Construction activities have the potential to adversely affect biological, physicochemical, and hydromorphological elements, and have minor/localised effects on chemical elements, as well as specific pollutants. A range of Project activities through enabling and main works result in these potential effects, including but not limited to the construction of reservoir (borrow pit excavation) and recreational lakes, the construction of the Western Watercourse Diversion, Project PABs and the construction of surface water management.

6.5.16 Project activities will result in a loss of watercourses within the catchment. An impact assessment is required to determine the hydromorphological and ecological contributions of these watercourses to the status of the Childrey Brook, and what further mitigation is necessary to mitigate their loss. The requirements for impact assessment are detailed in Section 8 of this report.

6.5.17 The scale and duration of construction activities within the water body pose the risk of potential adverse effects. Further development of the construction programme and Code of Construction Practice is required, alongside mitigation, during the impact assessment stage to reduce the potential adverse effects. Once the Western Watercourse Diversion is constructed and operational, much of the Project's ongoing construction activities and

components will no longer impact the water body due to the alteration of the hydrological catchment.

6.5.18 Land-use changes include a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, wetlands, and wet woodland, which is expected to become live during the construction phase, providing benefits to the water body. The impact assessment will detail the nuances of both beneficial and negative impacts over the construction phase for all scoped Project activities and components and Quality Elements.

Letcombe Brook

6.5.19 Construction activities have the potential to impact biological, physicochemical, hydromorphological, and chemical elements, as well as specific pollutants. Due to embedded design mitigation and standard good practice measures, the anticipated magnitude of the potential effect is considered to be negligible.

6.5.20 Land-use changes include a shift from existing arable land use to new areas of grassland, scrub and woodland which is expected to become live during the construction phase, providing benefits to the water body. The impact assessment will detail the nuances of both beneficial and negative impacts over the construction phase for all scoped Project activities and components and Quality Elements.

Cow Common Brook and Portobello Ditch

6.5.21 Construction activities have the potential to adversely affect biological, physicochemical, hydromorphological Quality Elements, and have minor/localised effects on chemical aspects, as well as specific pollutants Quality Elements. A range of Project activities covering a significant segment of the catchment result in these potential effects, including but not limited to the construction of reservoir (borrow pit excavation) and recreational lakes covering the direct loss of ordinary watercourses and part of the Landmead Ditch main river, construction of the watercourse diversions and realignments and construction surface water management.

6.5.22 The Western and Eastern Watercourse Diversions will be constructed in the dry, maintaining the functionality of the existing channels until the diversions are built. The diversions will be built from the north to the south, working in an upstream direction. As the constructed diversion channels intersect existing drainage ditches, they will be connected but remain offline from the main channel at the upstream end until a final connection is made and the existing channels are blocked, diverting flows into the newly created Western and Eastern Diversions.

6.5.23 The newly constructed diversions potentially pose a temporary deterioration in Quality Elements. Expert judgement anticipates that the recovery and establishment of the new diversions will restrict Quality Element deterioration to a temporary nature of less than 12 months. It is envisaged that within two growing seasons, the macrophyte and macroinvertebrate communities are likely to develop to a better state than existing due to the operational design providing greater habitat heterogeneity and improving natural hydromorphological form and processes. Selective riparian and marginal planting alongside ecological translocation would aid the establishment of the new channels. Macro-invertebrate translocation, as well as any rare/notable species if discovered, on site is recommended. Fish rescue and translocation would also be undertaken after the Eastern and Western Watercourse Diversion channels have been fully connected to the incoming

flows. These additional steps would aid recovery of these water bodies and help them move towards 'Good' ecological status quicker than if they were not undertaken.

6.5.24 The diversions will become live within the construction phase, alongside the associated land-use changes including a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, and wet woodland, along with the proposed new watercourse channels, ditches, and wetland scrape features, providing benefits to water body. The impact assessment will detail the nuances of both beneficial and negative impacts over the construction phase for all scoped Project activities and components and Quality Elements.

Frilford and Marcham Brook

6.5.25 Construction activities have the potential to impact biological, chemical, hydromorphological, chemical and specific pollutants elements. Due to embedded design mitigation and standard good practice measures, the anticipated magnitude of the potential effect is considered to be negligible.

Sandford Brook (source to Ock)

6.5.26 Construction activities have the potential to impact biological, physicochemical, hydromorphological, chemical and specific pollutants elements. Due to embedded design mitigation and standard good practice measures, the anticipated magnitude of the potential effect is considered minor and localised.

Ginge Brook and Mill Brook

6.5.27 Construction activities have the potential to impact biological, physicochemical, hydromorphological, chemical and specific pollutants elements. Due to embedded design mitigation and standard good practice measures, the anticipated magnitude of the potential effect is considered negligible.

Moor Ditch and Ladygrove Ditch

6.5.28 The anticipated potential magnitude of impact for the Moor Ditch and Ladygrove Ditch is considered to be minor/localised adverse during construction. The potential impact is upon biology, physicochemical, specific pollutants and chemical elements.

6.5.29 The mechanism of these potential impacts is from potential off-site highway works at the A34 Layby south of Milton Interchange, including embankment / cutting widening on the western side of the carriageway and a temporary construction access road from Didcot Road. The potential Project components and associated activities are likely to be scoped out at the ES stage, following further development of the design and Code of Construction Practice. Whilst the design of this aspect of the Project is further developed, the water body is scoped in for impact assessment on a precautionary basis.

6.5.30 The only impact pathway for the hydromorphology Quality Elements related to both construction highways/road and surface water drainage. Considering the mitigation of 'construction stage surface water management', the anticipated magnitude of impacts on hydromorphology Quality Elements is considered negligible.

Thames (Evenlode to Thame)

6.5.31 Potential local adverse effects are anticipated to be of minor magnitude from the construction of the new intake/outfall structure, shaft and associated tunnel. The magnitude is anticipated to be minor due to the local impacts and scale of the works in comparison to the water body, plus embedded design mitigation and standard good practice measures.

Thames water bodies between Thames (Evenlode to Thame) and Teddington Weir

6.5.32 On the Thames between the Thames (Evenload to Thame) and the tidal limit at Teddington Weir, the anticipated magnitude of impacts are consistent. The water bodies Thames Wallingford to Caversham, Thames (Reading to Cookham), Thames (Cookham to Egham), and Thames (Egham to Teddington) have a negligible anticipated magnitude of effect across the Quality Elements from construction activities as such no associated construction Project activities or components have been screened in.

Vale of White Horse Chalk and Shrivenham Corallian

6.5.33 Both groundwater bodies are expected to have a negligible magnitude of potential impacts during the construction phase due to embedded design mitigation and standard good practice measures.

Table 18 Construction phase – anticipated magnitude of potential effect on current status of surface water bodies

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
Ock (to Cherbury Brook)	Direct loss or physical alterations Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality Spread of INNS	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Ock and tributaries (Land Brook confluence to Thames)	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Minor/ localised adverse.	Minor/ localised adverse.	Minor/ localised adverse.	Minor/ localised adverse.	Minor/ localised adverse.

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
Stutfield Brook (source to Ock)	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Childrey and Woodhill Brooks	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in groundwater quality Spread of INNS					
Childrey Brook and Norbrook at Common Barn	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Adverse effect (uncertain)	Adverse effect (uncertain)	Minor/localised adverse.	Adverse effect (uncertain).	Minor/ localised adverse. Impact
Letcombe Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality Spread of INNS	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
Cow Common Brook and Portobello Ditch	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Adverse effect (uncertain)	Adverse effect (uncertain).	Minor/localised adverse	Adverse effect (uncertain).	Minor/ localised adverse.
Frilford and Marcham Brook	Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Sandford Brook (source to Ock)	Direct loss or physical alterations Shading Changes to river continuity and biological continuity	Minor/ localised adverse.	Minor/localised adverse.	Minor/localised adverse.	Minor/localised adverse.	Minor/ localised adverse.

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS					
Ginge Brook and Mill Brook	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Moor Ditch and Ladygrove Ditch	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality Spread of INNS	Minor/ localised adverse.	Minor/localised adverse.	Minor/localised adverse.	Negligible.	Minor/ localised adverse.

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
Thames (Evenlode to Thame)	Direct loss or physical alterations Changes to river continuity and biological continuity Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS	Minor/ localised adverse.	Minor/localised adverse.	Minor/localised adverse.	Minor/ localised adverse.	Minor/ localised adverse.
Thames Wallingford to Caversham	No potential mechanisms of impact.	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Thames (Reading to Cookham)	No potential mechanisms of impact.	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Thames (Cookham to Egham)	No potential mechanisms of impact.	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.
Thames (Egham to Teddington)	No potential mechanisms of impact.	Negligible.	Negligible.	Negligible.	Negligible.	Negligible.

Table 19 Construction phase – anticipated magnitude of potential effect on current status of groundwater bodies

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment	
		Quantitative	Chemical
Vale of White Horse Chalk	Changes in groundwater quality	Negligible.	Negligible.
Shrivenham Corallian	Changes in groundwater quality	Negligible.	Negligible.

Operation

6.5.34 The anticipated magnitude of potential effects is provided in Table 20 and Table 21 (operational phase) for surface and groundwater bodies.

6.5.35 During the operational phase, six water bodies have the potential for one or more Quality Elements to exhibit minor/localised beneficial effects. These include the Ock and tributaries (Land Brook confluence to Thames), Childrey and Woodhill Brooks, Childrey Brook and Norbrook at Common Barn, Letcombe Brook, Cow Common Brook and Ginge Brook. These beneficial effects are primarily due to changes in catchment land use from existing arable and pasture agricultural land use to new areas of neutral grassland, scrub, woodland, and wet woodland, together with the proposed new watercourse channels, ditches, and wetland scrape features as part of the Western and Eastern Watercourse Diversions.

6.5.36 Four water bodies have the potential for minor/localised adverse effects on one or more Quality Elements during operation, including the Ock and tributaries (Land Brook confluence to Thames), Sandford Brook (source to Ock), Moor Ditch and Ladygrove Ditch, Thames (Evenlode to Thame).

6.5.37 During the operational phase, the Childrey Brook and Norbrook at Common Barn, and Cow Common Brook water bodies have the potential for biological and hydromorphological Quality Elements to be adversely affected. The effects are driven by the risks associated with changes in hydrology and the potential for changes to the connectivity between surface water and groundwater. The design of the Western and Eastern Watercourse Diversion aims to enhance hydromorphology, water quality, and aquatic ecology by creating a sinuous channel within a floodplain that features a mosaic of diverse habitats, thereby restoring natural processes, creating habitat heterogeneity, and mitigating the loss of watercourse during the construction phase. The potential adverse effects require detailed impact assessment to confirm the magnitude of effects. The requirements for impact assessment are detailed in Section 8 of this report.

6.5.38 Details on the anticipated magnitude of effect, for the operational phase, are provided for each water body within this section of the report. The anticipated magnitude of effect assumes the implementation of embedded design mitigation and standard good practice measures as described in Section 4.4 of this report. The key operational stage mitigation factored in during the scoping stage includes:

- Manage water quality at the reservoir intake
- Measures to manage and protect water flows in watercourses
- Measures to manage Biochemical Oxygen Demand (BOD) concentrations
- Measures to offset any residual effects on water quality within the Ock Catchment
- Measures to reduce effects on aquatic ecology during operation
- Drainage strategy to align with national and local planning policy and guidance
- Maintain water quality in the reservoir
- Management of aquatic INNS
- Design of culverts to maintain function and integrity of watercourses
- Design and maintenance of reservoir infrastructure to minimise effects on aquatic ecology
- Operational stage surface water management plan
- Measures to manage groundwater levels and flow routes

- Measures to minimise INNS dispersal resulting from abstraction and discharge
- Battery Energy Storage System (BESS) outline emergency fire management system
- Measures to address the risks of increased temperatures, including prolonged periods of hot weather and drought

Ock (to Cherbury Brook)

6.5.39 On the Ock (to Cherbury Brook), there are no screened in operational Project activities or components.

Ock and tributaries (Land Brook confluence to Thames)

6.5.40 Within the operation, changes in flow volumes and water quality due to catchment loss in the Cow Common Brook and Portobello Ditch water body, as well as the Childrey Brook water body, have the potential to impact downstream water bodies, including the Ock and tributaries (Land Brook confluence to Thames). However, due to the size of the retained catchment supporting flow in the Ock and tributaries, it is anticipated that the effect will be negligible on hydromorphology and physicochemical Quality Elements. This is supported by the conclusions from WFD impact assessments undertaken at previous design stages.

6.5.41 Land-use changes within the Ock and tributaries, as well as upstream water bodies, have the potential to reduce existing impacts on biological and physicochemical Quality Elements from agricultural land management. Land-use changes include a shift from existing arable and pasture agrarian land use to new areas of neutral grassland, scrub, woodland, and wet woodland, along with the proposed new watercourse channels, ditches, and wetland scrape features as part of the Western and Eastern Watercourse Diversions. Additionally, an area of existing agricultural land will be lost under the proposed reservoir's footprint, as well as that of other reservoir infrastructure, buildings, and ground-mounted solar facilities.

6.5.42 The installation of the new box culvert will cause localised adverse effects via the loss of open channel. The river depth and width will be locally impacted, and the installation of the culvert will locally influence the connectivity with the channel's hyporheic zone. Embedded design mitigation and standard good practice measures ensure that sediment transport and ecological connectivity are maintained. As such, adverse operational effects on the hydromorphology are expected to be minor/localised.

6.5.43 The anticipated magnitude of effect on biology and physicochemical elements is considered to be minor/localised beneficial when the operational phase Project activities and component effects are considered in combination.

Stutfield Brook (source to Ock)

6.5.44 There are no operational phase Project activities or components screened in for this water body. Accordingly, no effects are anticipated on the water body during the operational phase.

Childrey and Woodhill Brooks

6.5.45 Operational land-use changes resulting from Project PABs have the potential to mitigate existing impacts on biological, physicochemical, and hydrological Quality Elements from

agricultural land management. Land-use changes include a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, and wet woodland. This is anticipated to have a minor/localised beneficial effect on biology, physicochemical and hydromorphology Quality Elements.

6.5.46 Considering the mitigation of 'operational stage surface water management plan' and 'BESS outline emergency fire management system', there is a negligible anticipated magnitude of impact on the current status of both specific pollutants and chemical Quality Elements.

Childrey Brook and Norbrook at Common Barn

6.5.47 Operational land-use changes resulting from Project PABs have the potential to mitigate existing impacts on biological, physicochemical, and hydrological elements from agricultural land management. Land-use changes include a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, and wet woodland. This is anticipated to have a minor/localised beneficial effect on physicochemical Quality Elements.

6.5.48 Operational effects of the reservoir, Wilts and Berks canal and Western Watercourse Diversion will result in a change in hydrology and hydromorphology to the Childrey Brook watercourses. An impact assessment is required, as detailed in Section 8 of this report, to confirm the magnitude of this effect. As a precautionary approach at this stage, the anticipated magnitude of the potential effect is considered to be adverse to biology and hydromorphology.

6.5.49 Considering the mitigation of 'operational stage surface water management plan' and 'BESS outline emergency fire management system', the Project is anticipated to have a negligible effect on the current status of both specific pollutants and chemical Quality Elements.

Letcombe Brook

6.5.50 Operational land-use changes resulting from Project PABs have the potential to mitigate existing impacts on biological, physicochemical, and hydrological Quality Elements from agricultural land management. Land-use changes include a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, and wet woodland. The anticipated magnitude of effect on biology, physicochemical and hydromorphology elements is considered to be minor/localised, beneficial.

6.5.51 Considering the mitigation of 'operational stage surface water management plan' the Project is anticipated to have a negligible effect on the current status of both specific pollutants and chemical Quality Elements.

Cow Common Brook and Portobello Ditch

6.5.52 The ICW discharges into the Cow Common Brook. The forward design of the ICW will be developed in consultation with the Environment Agency to comply with the relevant EQS for GES for the Cow Common Brook, including for the physicochemical water quality parameters, including phosphorous concentrations and BOD. It is expected to have a negligible magnitude of effects on physicochemical Quality Elements due to the design treatment standards of the ICW.

6.5.53 Operational land-use changes resulting from Project PABs have the potential to mitigate existing impacts on biological, physicochemical, and hydrological Quality Elements from agricultural land management. Land-use changes include a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, and wet woodland. The anticipated magnitude of effect on physicochemical Quality Elements is considered to be minor/localised, beneficial.

6.5.54 Enhancement and creation of habitats embedded as part of the Western and Eastern Watercourse Diversions and Cow Common Brook realignment will have a beneficial impact on Quality Elements at the water body scale. The design of the diversions aims to improve the hydromorphological form and processes from the baseline conditions to support improved biology and physicochemical Quality Elements.

6.5.55 Certain aspects of the diversions design are under development, including determining the existing surface water and groundwater connectivity and the potential impacts upon this from the groundwater drain. Additionally, further design development around tree planting, thermal regulation and the supply of large woody material is being progressed. Operational effects of the reservoir and the Wilts and Berks canal will result in a change in hydrology to the Cow Common Brook. An impact assessment is required, as detailed in Section 8 of this report, to confirm the magnitude of these effects and to assess them in combination at a water body scale. As a precautionary approach at this stage, the anticipated magnitude of the potential effect is considered to be adverse to biology and hydromorphology elements.

6.5.56 Considering the mitigation of 'operational stage surface water management plan', the Project is anticipated to have a negligible effect on the current status of both specific pollutants and chemical Quality Elements.

Frilford and Marcham Brook

6.5.57 Operational land-use changes resulting from Project PABs have the potential to mitigate existing impacts on biological, physicochemical, and hydrological elements from agricultural land management. However, due to the limited spatial scale of the proposed habitat creation works within this water body catchment, the anticipated magnitude of the potential effect is considered to be negligible.

Sandford Brook (source to Ock)

6.5.58 The installation of the new box culvert will cause a loss of open channel. The river depth and width will be locally impacted, and the installation of the culvert will locally influence the connectivity with the channel's hyporheic zone. Embedded design mitigation and standard good practice ensures that sediment transport and ecological connectivity are maintained. As such, the operational effects on the water body are anticipated to be minor/ localised adverse for hydromorphological Quality Elements and negligible for biology Quality Elements.

6.5.59 Considering the mitigation of 'operational stage surface water management plan', the Project is anticipated to have a negligible anticipated magnitude effect on the current status of physicochemical, specific pollutants and chemical Quality Elements.

Ginge Brook and Mill Brook

6.5.60 Operational land-use changes resulting from Project PABs have the potential to mitigate existing impacts on biological, physicochemical, and hydrological elements from agricultural land management. Land-use changes include a shift from existing arable and pasture land use to new areas of neutral grassland, scrub, woodland, and wet woodland. The anticipated magnitude of effect on physicochemical and hydromorphology elements is considered to be minor/localised beneficial. It is not expected to impact biological elements due to the proportion and location of the catchment impacted by beneficial land-use changes.

6.5.61 Considering the mitigation of 'operational stage surface water management plan', there is a negligible anticipated magnitude of effect on the current status of both specific pollutants and chemical Quality Elements.

Moor Ditch and Ladygrove Ditch

6.5.62 The anticipated potential magnitude of impact for the Moor Ditch and Ladygrove Ditch is considered to be minor/localised adverse during operation to hydromorphology Quality Elements and negligible for biology Quality Elements. This is due to the embedded design mitigation and standard good practice measures, plus anticipated localised spatial scale of physical works around the potential new highway realignments/diversions/widening that may impact watercourses within this catchment.

6.5.63 Considering the embedded mitigation of 'operational stage surface water management plan', there is a negligible anticipated magnitude of impact on the current status of both specific pollutants and chemical Quality Elements.

Thames (Evenlode to Thame)

6.5.64 The installation of a new intake and outfall structure, as well as a flood mitigation berm, will result in a direct change of riparian, bank, and marginal features, which will locally affect the diversity and quality of hydromorphology Quality Elements. The significance of this loss is anticipated to be a minor and localised adverse effect.

6.5.65 Previous WFD impact assessment assessed impacts on hydrology, water levels and water quality (ammoniacal nitrogen, nitrite, nitrate, total phosphorus, silicate, BOD, dissolved oxygen, suspended solids and algae). Inputs of algae to the river were derived from a PROTECH reservoir model, temperature inputs were based on a Computational Fluid Dynamics (CFD) reservoir model, and inputs of other chemicals were output from the Intermediate Reservoir Water Quality model.

6.5.66 The operational abstraction required to maintain the reservoir is anticipated to have negligible impacts on the highest flows, which are considered to be the most significant hydromorphological flows. The abstraction regime is also unlikely to significantly affect in-channel habitat condition or the in-channel and marginal wetland communities that may benefit from the current inundation regime, due to the embedded design mitigation 'measure to manage and protect water flows in watercourses'. Therefore, it is anticipated that there will be a negligible effect on hydromorphology and biological Quality Elements as a result of the abstractions changes to flow volumes.

6.5.67 The abstraction poses a risk to fish impingement/entrainment at the intake screens. The embedded design mitigation includes a 2 mm mesh screen with automated cleaning and

no abstractions below Q50, which will assist in minimising effects. Further studies will be completed to understand the level of risk the operational abstraction may have on fish populations on the River Thames, which will inform the design of additional mitigation measures. Ongoing consultation and engagement with the Environment Agency, on-going baseline surveys, and design development is required alongside impact assessment to confirm the magnitude of this impact. As a precautionary approach at scoping stage, the anticipated magnitude of effect on Biology has been assessed as adverse.

6.5.68 The operational discharge from the reservoir will result in larger summer flows relative to the baseline (and associated increases in both level and velocity during those periods, assuming no amendment to existing level-control operations), and a reduction in the frequency of low-flow and drought-year hydrology within the system. On balance, it is anticipated that a reduction in drought and very low flow conditions in the River Thames (and improved resilience to climate change in the future), mediated by the reservoir releases, is likely to be beneficial for most of the River Thames biological Quality Elements, as concluded by previous design development stages WFD impact assessments. In addition, the change in flow as a result of the SESRO discharge is anticipated to improve resilience to climate change in the future.

6.5.69 Whilst it is understood that, generally, the impact of droughts on fish can have both positive and negative effects. Overall, it is anticipated that the discharge regime from reservoir is likely to result in negligible effects on fish status.

6.5.70 Overall physicochemical elements are expected to improve as a result of the discharge of water from the reservoir during operation. Although water quality modelling indicates a potential for some minor decline in BOD and ammonia. However this will be negligible and there will be no changes in in physicochemical Quality Elements from a WFD perspective.

6.5.71 Specific pollutants and priority substances are expected to break down over time within the reservoir or be retained within it. Therefore, there is expected to be an overall reduction in pollutants in the discharge versus the abstracted water. If levels of pollutants are particularly high during abstraction, increasing levels in the reservoir above what is normal in the Thames, there could be an increase in the concentrations of pollutants during discharge. However, the dilution of the reservoir discharges within the River Thames is anticipated to result in a negligible effect on specific pollutants and priority substances Quality Elements through this process.

6.5.72 Based on the above, the anticipated magnitude of impacts is minor/localised adverse effects on physicochemical, hydromorphology, specific pollutants and chemical Quality Elements, and adverse effect on biology Quality Elements from the Project.

Thames water bodies between the Thames (Evenlode to Thame) and Teddington Weir

6.5.73 The anticipated magnitude of effects for the Thames Wallingford to Caversham, Thames (Reading to Cookham), Thames (Cookham to Egham), and Thames (Egham to Teddington) are summarised below.

6.5.74 Modelling of the River Thames has indicated that physicochemical elements would improve as a result of the discharge of water from the reservoir during times when it operates, although there is the potential for some minor increases in BOD and ammonia concentrations. However, no deterioration in class was noted and within a short distance downstream all impacts from the operational phase of the reservoir become negligible, particularly in the lower reaches of the River Thames. As such, changes are deemed to be

minor and are anticipated to have a negligible magnitude of effect on the physicochemical Quality Elements of the Thames water bodies.

6.5.75 Specific pollutants and priority substances are expected to break down over time within the water column in the reservoir or be retained within it. Therefore, there is expected to be an overall reduction in the concentrations of pollutants in the discharge water versus the abstracted water. If levels of pollutants are particularly high during abstraction, increasing levels in the reservoir above what is normal in the River Thames, there could potentially be an increase in the concentrations of pollutants during discharge. However, the dilution of the reservoir discharges within the River Thames is anticipated to result in a negligible effect on specific pollutants and priority substances elements through this process.

6.5.76 The operational discharge from the reservoir will result in larger summer flows relative to the baseline (and associated increases in both level and velocity during those periods, assuming no amendment to existing level-control operations), and a reduction in the frequency of low-flow and drought-year hydrology within the system. It will also offset the impacts of climate change on increasing the frequency and severity of low flows on the Thames. On balance, it is anticipated that a reduction in drought and very low flow conditions in the River Thames, mediated by the reservoir releases, is likely to be beneficial for most of the River Thames biological Quality Elements.

6.5.77 It is understood that generally, mitigating the impact of droughts and low flows has a positive effect on biological Quality Elements. However, not all effects of drought and low flows are adverse for all species all of the time. Overall, a reduction in drought and very low flow conditions in the River Thames, mediated by the reservoir releases, is anticipated to have a negligible magnitude of impacts on Fish Quality Elements for the River Thames. Although the change in flow as a result of the reservoir operational discharges is anticipated to improve resilience to climate change in the future.

6.5.78 While the abstraction regime would reduce the higher flows, the proportional change in flows is small, and flows would remain within the range that is considered normal for the River Thames. As a result, the geomorphological functions performed by higher flows will remain.

6.5.79 The overall anticipated magnitude of effect on hydromorphology and biology Quality Elements is negligible at a water body scale.

Vale of White Horse Chalk and Shrivenham Corallian

6.5.80 The operational phase Project activities and components are anticipated to have a negligible effect on the two groundwater bodies screened in for assessment, due to the embedded design mitigation and standard good practice measures to reduce impacts to groundwater quality.

6.5.81 Potential changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures from the presence of the newly created reservoir are also considered to have a negligible effect on the WFD groundwater bodies, as detailed in Appendix 5.2: Preliminary Hydrogeological Impact Assessment.

Table 20 Operational phase - anticipated magnitude of potential effect on current status of surface water bodies

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
Ock (to Cherbury Brook)	No screening in operational Project activities or components.	NA	NA	NA	NA	NA
Ock and tributaries (Land Brook confluence to Thames)	Direct loss or physical alterations Shading Enhancement of existing watercourse or lake Changes to river continuity and biological continuity Changes in river lateral connectivity Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (catchment area or connection to groundwater) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in groundwater quality Spread of INNS	Minor/ localised beneficial.	Minor/localised beneficial.	Negligible.	Minor/localised adverse.	Negligible
Stutfield Brook (source to Ock)	No potential mechanisms of impact.	Negligible.	Negligible.	Negligible.	Negligible.	Negligible
Childrey and Woodhill Brooks	Direct loss or physical alterations Changes to river continuity and biological continuity Enhancement of existing watercourse or lake	Minor/ localised beneficial.	Minor/ localised beneficial.	Negligible.	Minor/localised beneficial.	Negligible

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS					
Childrey Brook and Norbrook at Common Barn	Direct loss or physical alterations Creation of new watercourse Enhancement of existing watercourse or lake Shading Changes to river continuity and biological continuity Changes in river lateral connectivity Changes in flow (catchment area or connection to groundwater) Changes in flow (surface water abstraction or discharges and/or runoff)	Adverse (uncertain)	Minor/localised beneficial.	Negligible.	Adverse (uncertain).	Negligible

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS					
Letcombe Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Minor/ localised beneficial.	Minor/localised beneficial.	Negligible.	Minor/localised beneficial.	Negligible
Cow Common Brook and Portobello Ditch	Direct loss or physical alterations Creation of new watercourse Enhancement of existing watercourse or lake Shading Changes to river continuity and biological continuity Changes in river lateral connectivity Changes in flow (catchment area or connection to groundwater)	Adverse (uncertain)	Minor/localised beneficial.	Negligible.	Adverse (uncertain).	Negligible

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in flow (groundwater dewatering and/or discharges) Changes in water quality (surface water abstractions, discharges and/or runoff) Changes in water quality (groundwater discharges) Changes in groundwater flows/levels Changes in groundwater quality Spread of INNS					
Frilford and Marcham Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Negligible. -	Negligible.	Negligible.	Negligible.	Negligible
Sandford Brook (source to Ock)	Direct loss or physical alterations Enhancement of existing watercourse or lake Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Negligible.	Negligible.	Negligible.	Minor/localised adverse.	Negligible

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff)					
Ginge Brook and Mill Brook	Enhancement of existing watercourse or lake Changes in water quality (surface water abstractions, discharges and/or runoff)	Negligible.	Minor/localised beneficial.	Negligible.	Minor/localised beneficial.	Negligible
Moor Ditch and Ladygrove Ditch	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity	Negligible.	Negligible.	Negligible.	Minor/localised adverse.	Negligible
Thames (Evenlode to Thame)	Direct loss or physical alterations Shading Changes to river continuity and biological continuity Changes in river lateral connectivity Changes in flow (catchment area or connection to groundwater) Changes in flow (surface water abstraction or discharges and/or runoff)	Adverse (uncertain)	Minor/localised adverse.	Minor/localised adverse.	Minor/localised adverse.	Minor/ localised adverse.

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS					
Thames Wallingford to Caversham	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Negligible.	Negligible.	Negligible.	Negligible.	Negligible
Thames (Reading to Cookham)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Negligible.	Negligible.	Negligible.	Negligible.	Negligible
Thames (Cookham to Egham)	Changes in flow (surface water abstraction or discharges and/or runoff) Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS	Negligible.	Negligible.	Negligible.	Negligible.	Negligible
Thames (Egham to Teddington)	Changes in flow (surface water abstraction or discharges and/or runoff)	Negligible.	Negligible.	Negligible.	Negligible.	Negligible

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment				
		Biological	Physicochemical	Specific pollutants	Hydromorphological	Chemical
	Changes in water quality (surface water abstractions, discharges and/or runoff) Spread of INNS					

Table 21 Operational phase – anticipated magnitude of potential effect on current status of groundwater bodies

WFD water body	Summary of potential mechanisms of impacts	Magnitude of potential effect and detail required for Stage 3 Impact Assessment	
		Quantitative	Chemical
Vale of White Horse Chalk	Changes in groundwater quality Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures	Negligible.	Negligible.
Shrivenham Corallian	Changes in groundwater quality Changes in regional groundwater flow direction and cross-aquifer leakage due to altered stresses/pressures	Negligible.	Negligible.

7 Scoping assessment – potential effects on future status

7.1 Overview

7.1.1 A scoping assessment has been undertaken to identify the potential risks of the Project preventing the future achievement of the status objectives of the WFD receptors. The assessment has considered the relevant Project activities and components screened in for assessment and their potential effect on known existing pressures on water body status as well as on the implementation of any measures currently identified by the Environment Agency to support improvements in status. The following sections summarise the results of the scoping assessment, in relation to the latest available Environment Agency RNAGs, RBMP level PoMs and water body level A/HMWB Mitigation Measures datasets.

7.2 Potential effects on RNAGs

7.2.1 The Environment Agency's RNAG dataset identifies the key pressures and activities that are currently considered to be limiting the status of each of the Quality Elements that are not currently achieving their 'Good' status objective for each WFD water body. Each RNAG is linked to a 'Surface Water Management Issue' (SWMI), which have been identified via the catchment management planning process. These comprise the main issues that are deemed to limit the uses and potential benefits of managing the water environment in the river basin district in a sustainable way.

7.2.2 The scoping assessment has therefore reviewed the RNAG data for the screened in water bodies to determine if the Project has the potential to worsen or reduce these existing pressures on status.

7.2.3 A summary of the latest Cycle 3 RNAGs for each of the water bodies screened in for assessment is provided in Annex 2. Full details of the RNAGs considered as part of the scoping assessment, and their scoping outcomes and justifications, are provided in Annex 5 (Table 52).

7.2.4 In total, 23 RNAGs have been scoped in for further assessment across six of the WFD surface water bodies impacted by the Project. These are summarised in Table 22. A summary of these is provided in the following sections.

Table 22 Summary of RNAGs potentially affected by the Project and scoped in for further assessment

WFD water body	Status element	Category	Activity	SWMI
Childrey and Woodhill Brooks (GB106039023370)	Phosphate	Agriculture and rural land management	Poor nutrient management	Diffuse source
	Invertebrates	Agriculture and rural land management	Poor nutrient management	Diffuse source
	Macrophytes and Phytobenthos Combined	Agriculture and rural land management	Poor nutrient management	Diffuse source
Childrey Brook and Norbrook at Common Barn (GB106039023380)	Phosphate	Agriculture and rural land management	Poor Livestock Management	Diffuse source
	Macrophytes and Phytobenthos Combined	Agriculture and rural land management	Poor Livestock Management	Diffuse source
	Macrophytes and Phytobenthos Combined	Agriculture and rural land management	Land use - arable	Physical modification
Cow Common Brook and Portobello Ditch (GB106039023360)	Dissolved oxygen	No sector responsible	Drought	Natural
	Dissolved oxygen	Agriculture and rural land management	Poor nutrient management	Diffuse source
	Phosphate	Agriculture and rural land management	Poor nutrient management	Diffuse source
	Phosphate	Agriculture and rural land management	Poor Livestock Management	Diffuse source
	Phosphate	Urban and transport	Sewage discharge (continuous)	Point source
	Macrophytes and Phytobenthos Combined	Agriculture and rural land management	Poor nutrient management	Diffuse source
	Macrophytes and	Agriculture and rural land management	Poor Livestock Management	Diffuse source

WFD water body	Status element	Category	Activity	SWMI
	Phytobenthos Combined			
	Macrophytes and Phytobenthos Combined	Urban and transport	Sewage discharge (continuous)	Point source
	Invertebrates	No sector responsible	Natural conditions - other	Natural
	Invertebrates	Agriculture and rural land management	Land use - arable	Physical modification
Ock and tributaries (Land Brook confluence to Thames) (GB106039023430)	Phosphate	Agriculture and rural land management	Poor nutrient management	Diffuse source
	Phosphate	Agriculture and rural land management	Poor Livestock Management	Diffuse source
	Phosphate	Water Industry	Sewage discharge (continuous)	Point source
	Phosphate	Water Industry	Sewage discharge (intermittent)	Point source
	Fish	Agriculture and rural land management	Barriers - ecological discontinuity	Physical modification
Thames (Evenlode to Thame) (GB106039030334)	Invertebrates	No sector responsible	North American signal crayfish	INNS
Thames (Egham to Teddington) (GB106039023232)	Temperature	No sector responsible	Low Flow (not drought)	Flow

Childrey and Woodhill Brooks

7.2.5 Three RNAGs have been scoped in for further assessment for the Childrey and Woodhill Brooks water body. These relate to agricultural and rural land management practices, associated with poor nutrient management, which are currently limiting the water body's Phosphate, Invertebrate, and Macrophytes and Phytobenthos Combined status.

7.2.6 The Project will result in a permanent change of land use in some areas of the water body catchment area. This will include a change from existing areas of arable and pasture agricultural land use to new areas of woodland and grassland habitats. This is anticipated

to have a minor / localised beneficial effect on these RNAGs relating to diffuse pollution from agricultural land.

Childrey Brook and Norbrook at Common Barn

7.2.7 Three RNAGs have been scoped in for further assessment for the Childrey Brook and Norbrook at Common Barn water body. These relate to agricultural and rural land management practices, associated with poor livestock management and physical modifications for arable land use, which are currently limiting the water body's Phosphate and Macrophytes and Phytobenthos Combined status.

7.2.8 The Project will result in a permanent change of land use in a significant portion of the water body catchment area. This will include a change from existing areas of arable and pasture agricultural land use to new areas of neutral grassland, scrub, woodland, and wet woodland habitats, together with the new watercourse channels, ditches and wetland scrape features proposed as part of the Western Watercourse Diversion. This is anticipated to have a minor / localised beneficial effect on these RNAGs relating to diffuse pollution from agricultural land.

Cow Common Brook and Portobello Ditch

7.2.9 Ten RNAGs have been scoped in for further assessment for the Cow Common Brook and Portobello Ditch water body. These relate to:

- agricultural and rural land management practices, associated with poor livestock and nutrient management and physical modifications for arable land use, which are currently limiting the water body's Dissolved Oxygen, Phosphate, Macrophytes and Phytobenthos Combined, and Invertebrate status
- point source sewage discharges, which are also currently impacting the water body's Phosphate and Macrophytes and Phytobenthos Combined status
- natural conditions affecting the water body's Invertebrate status
- natural low flow pressures from drought, which are deemed to be affecting the water body's Dissolved Oxygen status

7.2.10 The Project will result in a permanent change of land use in a significant portion of the water body catchment area. This will include a change from existing areas of arable and pasture agricultural land use to new areas of neutral grassland, scrub, woodland, and wet woodland habitats, together with the new watercourse channels, ditches and wetland scrape features proposed as part of the Western and Eastern Watercourse Diversions. In addition, a large area of existing agricultural land will be lost under the footprint of the proposed reservoir and other reservoir infrastructure and buildings. This is anticipated to have a minor / localised beneficial effect on the RNAGs relating to agricultural land management.

7.2.11 The Project will introduce operational foul drainage discharges from the Nature Education Centre and other buildings proposed in the south-west corner of the site to the Cow Common Brook, via a new ICW. This therefore has the potential to have a minor / localised adverse effect on the RNAGs relating to point source sewage discharges. However, the forward design of the ICW will be developed in consultation with the Environment Agency to comply with the relevant EQS for GES for the Cow Common Brook, including for the physicochemical water quality parameters including phosphorous concentrations and BOD. Detailed baseline monitoring, water quality assessment, and design development

and is ongoing for this Project component and will inform further assessment at ES stage (as described further in Section 8).

7.2.12 The Project will result in permanent reduction in catchment area and potential reductions in baseflow associated with the footprint of the reservoir and recreational lakes and the potential for changes to the connectivity between surface water and groundwater. This therefore has the potential to have a minor / localised adverse effect on the RNAGs relating to natural drought pressures on dissolved oxygen concentrations in the watercourse. However, the Project will also result in the creation of a new diverted watercourse channel around the reservoir that will have a more naturalised morphology, riparian structure, and lateral connectivity with the floodplain. As such, this may help to reduce the natural condition pressures on Invertebrate status. Detailed baseline monitoring, hydrological, fluvial and groundwater modelling, and design development is ongoing and will inform further assessment at ES stage (as described further in Section 8).

Ock and tributaries (Land Brook confluence to Thames)

7.2.13 Five RNAGs have been scoped in for further assessment for the Ock and tributaries (Land Brook confluence to Thames) water body. These include those relating to agriculture and rural land management practices and point source sewage discharges from water industry, which is currently impacting the water body's Phosphate status. In addition, a RNAG relating to physical modification pressures on the water body's Fish status (barriers to ecological continuity) has been scoped in.

7.2.14 The Project is expected to have a permanent minor/localised beneficial effect on the RNAGs relating to agricultural land management, as it will result in some changes of land use directly within the water body catchment area as well as the Childrey and Cow Common Brook catchment upstream. This will include a change from existing arable and pasture agricultural land use to new areas of grassland and woodland habitat creation directly within the water body catchment.

7.2.15 The Project has the potential to have a minor/localised adverse effect on the RNAG relating to barriers to fish passage, due to the proposed new culvert associated with the main access road crossing. Embedded design mitigation will ensure that ecological connectivity will be maintained. However, detailed baseline surveys and design development is ongoing in relation to this potential effect and will inform further assessment at ES stage (as described further in Section 8).

Thames (Evenlode to Thame)

7.2.16 One RNAG has been scoped in for further assessment for the Thames (Evenlode to Thames) water body. This relates to the water body's Invertebrates status currently not achieving Good status due to the presence of INNS in the water body.

7.2.17 The Project has the potential to have an adverse effect on this RNAG due to the risk of further spread of INNS as a result of the operational reservoir abstraction and discharge regime. Detailed baseline surveys and design development is ongoing in relation to this potential effect and will inform further assessment at ES stage (as described further in Section 8).

Thames (Egham to Teddington)

7.2.18 One RNAG has been scoped in for further assessment for the Thames (Egham to Teddington) water body. This relates to non-drought related low flow pressures, which are currently limiting the water body's Temperature status.

7.2.19 The operational discharge regime from the reservoir will result in larger summer flows and a reduction in the frequency of low flows within the water body relative to the baseline (and associated increases in both level and velocity during those periods, assuming no amendment to existing level-control operations). Accordingly, the operational discharges may have the potential to indirectly reduce low flow pressures on water temperatures within the water body. Detailed hydrological assessment, fluvial and water quality modelling, and design development is ongoing for this Project component and will inform further assessment at ES stage (as described further in Section 8)

7.3 Potential effects on RBMP Programme of Measures (PoM)

7.3.1 The Thames RBMP contains a summary of the programmes of measures (PoM) which the Environment Agency have identified as being needed to achieve the environmental objectives in the RBD. This focuses on the main mechanisms, programmes, and strategic initiatives to protect and improve the water environment. The PoM include the on-the-ground actions (for example, improving a sewage treatment works) and the mechanisms (tools and approaches) to ensure the actions are delivered (for example, environmental permit conditions regulating the discharge of sewage effluent and the associated water industry price review process to fund the improvements). These mechanisms include 'basic' measures (for example, action required by legislation) and 'supplementary' measures (which can be regulatory or voluntary initiatives such as codes of practice). The plan sets out the measures that are already confirmed and suggests additional measures that are likely to be required but are not yet confirmed.

7.3.2 The scoping assessment has therefore reviewed the available PoM information for the Thames RBD to determine if the Project has the potential to support or prevent the future implementation of any of the measures.

7.3.3 Full details of the PoM considered as part of the scoping assessment, and their scoping outcomes and justifications, are provided in Annex 5 (Table 53).

7.3.4 In total, 22 of the 89 measures have been scoped in for further assessment and further consultation with the Environment Agency. The majority of the measures do not include details of the specific water bodies that they relate to and additional information is required to support further assessment.

7.3.5 There is the potential for the Project to support the local delivery of 18 of the 22 measures scoped in, which in turn has the potential to contribute towards the future achievement of the status objectives of the water bodies screened in.

7.3.6 One of the measures scoped in relates to partnership work to develop a shared strategy and various measures to control the INNS, Floating Pennywort. This measure has been scoped in for further assessment as there is potential for various Project activities and components to have a localised adverse impact on the spread of INNS, as outlined in Section 6 of this report). Baseline surveys, construction mitigation and design development and is ongoing and will inform further assessment at ES stage (see Section 8).

7.3.7 Two of the measures scoped in relate to seeking to improve fish passage at Environment Agency assets. These measures have been scoped in for further assessment on a precautionary basis as there is the potential for the Project to introduce new barriers to fish passage associated with new watercourse crossing culverts proposed on the River Ock and Sanford Brook. Embedded design measures are anticipated to minimise any impacts. However, baseline surveys, design development, and Environment Agency engagement is ongoing for these Project components and will inform further assessment at ES stage (see Section 8).

7.3.8 One measure scoped in relates to National Highways Strategic Road Investment Strategy measures to mitigate impacts from road run-off. This measure has been scoped in for further assessment as there is the potential for localised adverse impacts on water quality from construction phase and operational phase highway traffic. The embedded design measures (including the integration of Sustainable Drainage Systems (SuDS)) to align with national and local planning policy and guidance) are anticipated to minimise any impacts. However, Construction mitigation and highway drainage design development and is ongoing and will inform further assessment at ES stage (see Section 8).

7.4 Potential effects on A/HMWB Mitigation Measures

7.4.1 As described in Annex 1, A/HMWB are classified in part according to an assessment of mitigation measures, which defines GEP in water bodies where all applicable mitigation is in place, and Moderate ecological potential in water bodies where some or all relevant mitigation is missing.

7.4.2 As outlined in Section 5.3 (Table 4) of this report, four of the River Thames surface water bodies screened in for assessment are designated as HMWBs and are therefore subject to the Mitigation Measure Assessment as part of their Ecological Potential classification. At present, all four water bodies are failing to achieve their GEP objective, in part, due to one or more mitigation measures not being in place.

7.4.3 The scoping assessment has therefore reviewed the outstanding mitigation measures for the four HMWBs screened in to determine if the Project has the potential to prevent the future implementation of the measures.

7.4.4 Full details of the HMWB Mitigation Measures considered as part of the scoping assessment, and their scoping outcomes and justifications, are provided in Annex 5 (Table 54). The Project is not anticipated to inhibit or prevent the future implementation of any of the HMWB Mitigation Measures currently identified for the water bodies screened in for assessment. Accordingly, no measures are scoped in for further assessment at this stage.

8 Requirements for impact assessment

8.1 Overview

8.1.1 The impact assessment is a detailed assessment of the water bodies and Project activities and components carried forward from the WFD Screening and Scoping assessment. It should be set within the context of the appropriate RBMPs and should include:

- The baseline characteristics of the water bodies affected.
- The methods used to determine and quantify the scale of WFD impacts.
- An assessment of the risk of deterioration, where Regulation 19 may apply if the proposed development may risk deterioration in status or prevent the achievement of WFD objectives.
- An explanation of any mitigation required and how it is secured.
- An explanation of any enhancements and/or positive contributions to the RBMP objectives proposed, and how they would be secured.
- Where a derogation is required, information to justify the case for derogation.
- Identification of any areas of non-compliance.

8.1.2 The Scoping assessment has identified that the Project has the potential to affect the current status and status objectives of WFD water bodies due to Project activities and components and impact mechanisms outlined in Section 6 and Section 7. Accordingly, the scoped in water bodies, Project activities and components, and impact mechanisms will be carried over for further impact assessment (Stage 3), in line with national infrastructure guidance from The Planning Inspectorate (2024).

8.1.3 A series of detailed assessments (including baseline field surveys/monitoring and modelling) is ongoing and required to support the subsequent detailed impact assessment stage. These are outlined in the sections below.

8.1.4 As previously noted, the findings of the scoping and impact assessments will also be fed back into the ongoing design development proactively, to design out the identified impact mechanisms where possible, informing the further development of mitigation, and/or designing in additional mitigation where required to address any residual risks of WFD compliance.

8.2 Baseline characteristics of water bodies potentially affected

8.2.1 To determine the baseline characteristics of the water bodies affected, a range of surveys and monitoring is being undertaken.

8.2.2 Geomorphology surveys will establish the baseline geomorphological condition of receptor watercourses within the draft Order limits. This will inform a detailed assessment of impacts on hydromorphological Quality Element receptors.

8.2.3 Baseline fluvial geomorphological surveys are being undertaken to provide data to inform an understanding of the geomorphological diversity, functionality, and sensitivity of the watercourses. This baseline understanding will, in turn, inform the receptor sensitivity for the watercourses with regard to their geomorphological / hydromorphological condition, as well as their potential to support biological Quality Elements (in conjunction with baseline

aquatic ecology surveys). The surveys comprise observational walkover surveys of pre-defined sections of each watercourse (including a 2 m riparian corridor from the bank top), recording specific physical characteristics on a standardised proforma to enable assessment of the presence, type and extent of fluvial geomorphological features and processes. In addition, surveys will record the presence and location of key existing physical modification pressures affecting the baseline hydromorphological condition of the watercourse.

8.2.4 Two types of fluvial geomorphological surveys are being undertaken, depending on the nature of the watercourse surveyed, which are Reconnaissance surveys or Detailed surveys. The extents of the Reconnaissance and Detailed fluvial geomorphology surveys have been identified by an initial desktop exercise, which has identified and provisionally categorised all of the watercourses present within the study area. Reconnaissance fluvial geomorphological surveys will be undertaken on all ordinary watercourses throughout the survey area which do not comprise a main WFD river water body extent. Detailed fluvial geomorphological surveys will be undertaken on all Environment Agency-defined Main Rivers and all watercourses (Main Rivers or ordinary watercourses) within a WFD river water body extent. Each survey type will involve the definition of distinct geomorphological reaches and an associated reach-level characterisation of the baseline hydromorphological condition of the watercourse along the survey extent. In addition, the detailed survey will involve the capture of detailed spatial data within reach, including meso-scale mapping of key fluvial geomorphological features and processes as well as key physical modifications.

8.2.5 Water quality sampling will establish pre-construction, baseline water quality results, against which subsequent analyses will be compared. Similarly, hydrometric monitoring will establish flow characteristics within receptor watercourses. This will provide a baseline against which subsequent analyses can be compared.

8.2.6 The programme of hydrometric and water quality monitoring is ongoing, targeted at the watercourses potentially impacted by the Project within the River Ock and River Thames catchments. This includes the following types of surveys/monitoring, further details of which are provided in Chapter 5: Water environment of the PEI Report:

- Surface water hydrometric monitoring (watercourse flow and water level).
- Surface water quality monitoring (physicochemical and chemical).
- Hydrogeology surveys (including ground investigations).
- Groundwater level and water quality monitoring.
- Watercourse topographical surveys.

8.2.7 A suite of aquatic ecology sampling, including invertebrate sampling, electro-fishing surveys, and macrophyte surveys, will establish detailed baseline conditions for each Quality Element receptor. Data from this sampling will permit detailed analysis of potential impacts on each receptor, as well as provide a pre-construction baseline record.

8.2.8 The programme of baseline aquatic ecology surveys is on-going, targeted at the watercourses potentially impacted by the Project within the River Ock and River Thames catchments. This includes the following types of surveys, further details of which are provided in Chapter 6: Aquatic ecology of the PEI Report:

- Reconnaissance surveys
- Fish habitat surveys
- Electro-fishing surveys
- Macroinvertebrate surveys

- Diatom surveys
- Phytoplankton surveys
- Zooplankton surveys
- Specialist depressed river mussel surveys
- Bespoke invasive species surveys
- Multi-purpose environmental DNA (eDNA) surveys

8.3 Determine and quantify the scale of potential WFD impacts

Hydrological and hydraulic modelling

8.3.1 A seven-step modelling approach is used for assessing hydrological and water quality effects and considered a robust framework for testing and developing operational and design scenarios to support impact assessment. Each step represents an individual component of the overall hydrological system, which gradually develops an integrated model of complex hydrological processes within the modelled area. The modelling approach is detailed below:

- Step 1: A PyWR water resource mass balance model will be used to simulate the operation of SESRO, specifically when it abstracts from and releases to the River Thames, as well as the flow volumes associated with these abstraction and release dynamics. Daily abstraction and daily release timeseries extracted from the water resource mass balance model will be applied across the other models.
- Step 2: Rainfall runoff modelling will be used to generate hydrological inflows across the entire Thames catchment for use in later modelling steps.
- Step 3: Hydrodynamic and water quality modelling from Lechlade-on-Thames to Teddington Weir at the tidal boundary. Model simulation provides baseline and operational information on flow and water quality within the River Thames, taking into account river structures, flow, and water quality inputs from water and wastewater treatment works, as well as water company abstractions.
- Step 4: The reservoir CFD model will simulate vertical temperature profiles within the reservoir. The modelling is required to understand reservoir mixing and produce temperature outputs that can drive additional modelling. The CFD model itself requires timeseries data from the PyWR model for mass balance, river temperatures from the River Thames 1D InfoWorks ICM model and stochastic climate datasets. The CFD model also requires additional climate datasets including air temperature, wind speed and wind direction.
- Step 5: The PROTECH Algal Reservoir model is a reservoir model simulating algal concentrations and nutrient concentrations within the reservoir. This is to assess the potential change in algal concentrations from water abstracted from the River Thames after residence time within the reservoir, and to simulate the water being reintroduced to the River Thames from reservoir releases. The PROTECH model requires input timeseries from the PyWR model, river nutrients from the River Thames 1D InfoWorks ICM model, temperature profiles from the CFD model and stochastic climate datasets.
- Step 6: The IRWQ model is the final reservoir model in the sequence, to be run. The IRWQ model is a reservoir model that simulates the water quality determinands aligned to the River Thames 1D InfoWorks ICM model. This is to assess the potential change in the quality of water abstracted from the River Thames after residence time within the

reservoir and simulate the water being reintroduced back to the River Thames from reservoir releases. This IRWQ model enables all river water quality determinands not captured by the CFD and PROTECH modelling to be simulated.

- Step 7: The final step in the modelling framework is to re-run the River Thames 1D InfoWorks ICM model with the additional release timeseries into the River Thames from SESRO. The timing and release volumes will be taken from the PyWR model, whilst the water quality associated with the reservoir release series are the output from the suite of reservoir models. Thames Water's abstraction sequences are also replaced with timeseries from the PyWR that reflected higher abs0074raction rates, which utilised SESRO releases.

8.3.2 Additional standalone models are required for detailed WFD impact assessment and to support the ES. These are detailed in the following sections.

Hydraulic modelling

8.3.3 Hydraulic modelling is assessed via two fluvial hydraulic models used to model flood risk separately for the River Ock catchment and for the River Thames catchment. Both hydraulic models are 1D-2D linked, Flood Modeller Pro (FMP)-TUFLOW models. Model outputs will provide a means of evaluating, in detail, the performance of the proposed river channel diversions and flood mitigation areas under a range of low and high-flow scenarios. Design and model development will be drawn upon to support the impact assessment on hydromorphology of certain Project activities and components.

Detailed Water balance analysis

8.3.4 Water balance assessments will support the WFD assessment by quantifying the movement and availability of water within receptor water bodies, including inputs (e.g. rainfall), outputs (e.g. evapotranspiration, runoff), and human influences (e.g. abstraction and discharges). This will identify pressures on water resources, assess whether flows and groundwater levels are sufficient to support ecological receptors, and determine if water bodies are at risk of failing to meet WFD objectives.

8.3.5 Operational changes to flows will be assessed for compliance with the Environmental Flow Indicators as part of the impact assessment for three WFD water bodies: the Cow Common Brook and Portobello Ditch, Childrey Brook and Norbrook at Common Barn, and Ock and tributaries (Land Brook confluence to Thames).

Groundwater Modelling

8.3.6 Groundwater modelling will form a critical component of the detailed WFD assessment, providing predictive information on groundwater impacts from the Project activities and components, as well as informing effects on surface water and groundwater connectivity. The model will support both design development as well as impact assessment.

Highways England Water Risk Assessment Tool (HEWRAT)

8.3.7 HEWRAT is a risk assessment tool designed to evaluate the impacts of road runoff on the water quality of local receptors and assess pollution risks from routine runoff (e.g., heavy metals and hydrocarbons), accidental spillages, and the efficacy of proposed mitigation measures (such as swales, ponds, and SuDS). The HEWRAT assessment is a necessary

component of the detailed WFD assessment because it quantifies pollution risks from highways, thereby signposting any deterioration in water quality, and demonstrates the impact of potential mitigation measures to eliminate those risks.

Hydro-ecological Impacts

8.3.8 Assessment of the hydro-ecological impacts will be undertaken. This will bring together the understanding of both the detailed baseline characteristics of the water bodies and watercourses from baseline survey and monitoring, and the quantified scale of impacts upon hydromorphology and water quality, and assess the impacts these will have on each of the biological Quality Elements via expert judgement.

8.3.9 A detailed risk assessment on the risk of INNS presence and potential spread will be undertaken and included as an annex of the Aquatic Ecology chapter at ES.

8.4 Design mitigation development

8.4.1 Design Mitigation development will ensure that potential adverse impacts on WFD receptors are identified and addressed at an early stage in the design process. A proactive approach will be adopted, whereby impacts are either 'designed out' or reduced as far as practicable within design, safety, and budget constraints. This approach will be both collaborative and iterative, with input from multiple disciplines to refine design elements.

8.4.2 The impact assessment will detail the mitigation required to ensure no risk of deterioration and explain, with a prediction of its likely effectiveness and an assessment of any residual effects. The impact assessment will also detail the mechanisms to be put in place to secure the implementation of the required mitigation.

8.4.3 As detailed by The Planning Inspectorate (2024) within the Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive, avoidance of deterioration will be sought through design development.

8.5 Construction mitigation development

8.5.1 Construction mitigation development will form a critical element of the detailed WFD assessment due to the scale of SESRO and the timescales over which its construction will take place. Therefore, although the construction will be temporary, it has the potential to pose risks to the WFD status of receptor water bodies. The WFD assessment phase will therefore incorporate a collaborative approach with multiple disciplines to ensure that construction proposals, methodologies and phasing are WFD-compliant. This will include identifying potential impacts and inputting construction methods to reduce or eliminate impacts as far as practicable. A Code of Construction Practice will be developed to support the ES and mitigate potential construction impacts, including:

- Construction Environmental Management Plan
- Construction Traffic Management Plan
- Construction and Logistics Management Plan
- Floodplain Management Plan
- Materials Management and Handling Plan

8.6 Identification of wider enhancement opportunities

8.6.1 The Project is committed to delivering voluntary 10% biodiversity net gain (BNG) for area habitats, linear watercourses and hedgerows (as detailed in Chapter 2: Project description of the PEI Report). To support the BNG objective, enhancement of watercourses will be delivered within the order limits to improve one or more of the following: distinctiveness, condition and encroachment. The location and form of enhancement will be determined through baseline surveys and design development for ES.

8.6.2 It is noted that WFD mitigation can contribute to BNG 'no net loss', but net gain must be delivered from qualifying enhancements.

8.7 Impact assessment of the risk of deterioration

8.7.1 The impact assessment will pull together the scoped-in potential effects on current condition, scoped-in effects on future condition, alongside the quantified scale of potential impacts, baseline characteristics, design development and mitigation development to confirm a WFD compliance outcome. Whilst this assessment highlights potential effects, it is considered that compliance is likely to be achieved through the progression of the impact assessment and associated ongoing design and mitigation development, and the Project will deliver a positive environmental legacy.

8.8 Ongoing consultation and engagement

8.8.1 Regular consultation and engagement with relevant stakeholders, including the Environment Agency, Natural England and Local Authorities, will continue throughout the detailed assessment phase. Regulator advice will be sought to support key design decisions, which will be robustly evidenced and documented.

9 Conclusions

9.1.1 This WFD Screening and Scoping Assessment has identified the WFD surface water and groundwater bodies (and associated watercourse receptors) and Quality Elements that have the potential to be affected by the Project during both the construction and operational phases.

9.1.2 The screening stage has considered all activities and components of the Project against the Environment Agency CDE datasets and supporting Thames RBMP information, including the latest available Cycle 3 (2019 and 2022) water body status classifications and relevant protected area designations.

9.1.3 This stage has screened in those Project activities and components with plausible impact pathways to WFD water bodies and status elements. In total, 27 construction phase and 23 operation phase Project activities and components have been identified as having the potential to impact on WFD receptors and have therefore been screened in for further assessment.

9.1.4 A total of 18 WFD surface water bodies have been considered as part of this screening assessment, of which 17 are deemed to potentially be impacted by the Project activities and components. These 17 surface water bodies have been screened in for further assessment. One of the 17 screened-in water bodies comprises the newly created reservoir, which will be a new WFD lake water body once operational (designation to be decided and confirmed by the Environment Agency in due course). Similarly, a total of nine groundwater bodies have been considered as part of the screening assessment, of which two have been screened in for further assessment. No GWDTEs associated with the two screened in groundwater bodies are anticipated to be impacted by the Project.

9.1.5 The screening assessment included the identification of all the watercourse receptors that have the potential to be impacted within the WFD river water bodies screened in. The scoping assessment has then identified the potential mechanisms of impact of each of the screened in Project activities and components, and the WFD Quality Elements that have the potential to be affected by each. The Project activities and components and their mechanisms of impact on each of the WFD water bodies and watercourse receptors have then been scoped on a case-by-case basis, based on the construction and design information and site baseline information available at this stage. The assessment has identified and taken account of the embedded design mitigation and standard good practice measures and commitments set out within the construction and design information at this stage of the Project.

9.1.6 From the 27 construction phase and 23 operation phase Project activities and components included in the scoping assessment, a total of 306 Project activities and components were scoped across all fluvial watercourses. These included 186 Project activities and components during construction and 120 during operation. 256 construction phase Project activities and components were scoped in for impact assessment and 50 were scoped out. 150 operational phase Project activities and components were scoped in for impact assessment, and 36 were scoped out.

9.1.7 For the groundwater bodies, a total of 14 Project activities and components were scoped across all water bodies, six during construction and eight during operation. All Project activities and components were scoped in for impact assessment.

9.1.8 For the newly created reservoir, which is anticipated to be designated as a WFD lake water body once operational (to be decided and confirmed by the Environment Agency in due course), four operation phase Project activities / components were scoped in.

9.1.9 A scoping assessment has been undertaken to identify the potential risks of the Project preventing the future achievement of the status objectives of the WFD receptors. The assessment has considered the relevant Project activities and components screened in for assessment and their potential effect on known existing pressures on water body status as well as on the implementation of any measures currently identified by the Environment Agency to support improvements in status. The following sections summarise the results of the scoping assessment, in relation to the latest available Environment Agency RNAGs, RBMP level PoM and water body level A/HMWB Mitigation Measures datasets.

9.1.10 In total, 23 RNAGs have been scoped in for further assessment across six of the WFD surface water bodies impacted by the Project.

9.1.11 In total, 22 of the 98 PoM have been scoped in for further assessment and further consultation with the Environment Agency. There is the potential for the Project to support the local delivery of 18 of the 22 measures scoped in, which in turn has the potential to contribute towards the future achievement of the status objectives of the water bodies screened in.

9.1.12 The scoping assessment has reviewed the outstanding mitigation measures for the four HMWBs screened in to determine if the Project has the potential to prevent the future implementation of the measures.

9.1.13 The Project is not anticipated to inhibit or prevent the future implementation of any of the HMWB Mitigation Measures currently identified for the water bodies screened in for assessment. Accordingly, no measures are scoped in for impact assessment at this stage.

9.1.14 The scoping assessment has identified that the Project has the potential to affect the current status and status objectives of WFD water bodies due to Project activities and components and impact mechanisms. Accordingly, the scoped in water bodies, Project activities and components, and impact mechanisms will be carried over for further impact assessment (Stage 3), in line with national infrastructure guidance from The Planning Inspectorate (2024).

9.1.15 The impact assessment of the water bodies and Project activities and components carried forward from the WFD screening and scoping assessment is required to support the DCO submission. It will be set within the context of the appropriate RBMP and will include:

- The baseline characteristics of the water bodies affected.
- The methods used to determine and quantify the scale of WFD impacts.
- An assessment of the risk of deterioration, where Regulation 19 may apply if the proposed development may risk deterioration in status or prevent the achievement of WFD objectives.
- An explanation of any mitigation required and how it is secured.
- An explanation of any enhancements and/or positive contributions to the RBMP objectives proposed, and how they would be secured.
- Where a derogation is required, information to justify the case for derogation.
- Identification of any areas of non-compliance.

9.1.16 As previously noted, the findings of the scoping and impact assessments will also be fed back into the ongoing design development proactively, to design out the identified impact mechanisms where possible, informing the further development of mitigation, and/or designing in additional mitigation where required to address any residual risks of WFD compliance.

9.1.17 Through impact assessment and design development, the Project aims to leave a positive legacy on the local environment whilst delivering nationally critical infrastructure.

References

British Geological Survey (2025). Geology Viewer. Accessed August 2025. BGS Geology Viewer - British Geological Survey

Court of Justice of the European Union (2013). Case C-461/13: Request for a preliminary ruling from the Bundesverwaltungsgericht (Germany) lodged on 22 August 2013 — Bund für Umwelt und Naturschutz Deutschland e.V. v Bundesrepublik Deutschland. Accessed August 2025. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62013CN0461

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. Accessed August 2025. https://eur-lex.europa.eu/eli/dir/2000/60/oj/eng

Directive 2013/39/EU of the European Parliament and of the Council of 12 August amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy. Accessed August 2025. https://eur-lex.europa.eu/eli/dir/2013/39/oj/eng

Environment Agency (2016). Position Statement 488_10: Protecting and improving the water environment. Water Framework Directive compliance of physical works in rivers.

Environment Agency (2022a). Rules for assessing surface water body ecological status and potential: Method statement for 2022 update of the river basin management plans

Environment Agency (2022b). Groundwater chemical status assessment (classification) and trend assessment: Method statement for 2022 update of the river basin management plans

Environment Agency (2022c). Thames river basin district river basin management plan: updated 2022. Accessed August 2025. https://www.gov.uk/guidance/thames-river-basin-district-river-basin-management-plan-updated-2022

Environment Agency (2025a). Catchment Data Explorer. Accessed August 2025. https://environment.data.gov.uk/catchment-planning/

Environment Agency (2025b). Ecology and Fish Data Explorer. Accessed August 2025. https://environment.data.gov.uk/ecology/explorer/

Environment Agency (2025c). Hydrology Data Explorer. Accessed August 2025. https://environment.data.gov.uk/hydrology/explore

Environment Agency (2025d). River Obstacles. Accessed August 2025. https://www.data.gov.uk/dataset/0df09ef3-9220-438a-8112-6879b3a51ac5/river-obstacles

Environment Agency (2025e). Statutory Main River Map. Accessed August 2025. https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386

Environment Agency (2025f). Water Quality Archive. Accessed August 2025. Open WIMS data. Accessed August 2025. https://environment.data.gov.uk/water-quality/view/landing

European Commission (2003). Common Implementation Strategy for the Water Framework Directive: Guidance Document No 2 Identification of Water Bodies. Accessed August 2025. https://circabc.europa.eu/sd/a/655e3e31-3b5d-4053-be19-15bd22b15ba9/Guidance%20No%202%20-%20Identification%20of%20water%20bodies.pdf

High Court (2021). R(on the application of Misbourne Environmental Protection Ltd) v Environment Agency [2021] EWHC 3094 (Admin). Accessed August 2025. https://www.bailii.org/ew/cases/EWHC/Admin/2021/3094.html

IEMA (2016). Environmental Impact Assessment Guide to: Delivering Quality Development. Accessed January 2025. https://www.isepglobal.org/webinars/eia-shaping-and-delivering-quality-development/

Natural England (2002). Multi-Agency Geographic Information for the Countryside (MAGiC) Map. Accessed August 2025. https://magic.defra.gov.uk/MagicMap.html

Secretary of State (for England) and the Welsh Ministers (for Wales) (2015). The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Available online: https://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksiod_20151623_en_003.pdf

The Environmental Permitting (England and Wales) Regulations 2016. Accessed August 2025. https://www.legislation.gov.uk/uksi/2016/1154/contents

The Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. Accessed August 2025. https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Accessed August 2025. https://www.legislation.gov.uk/uksi/2017/407/contents.

It's everyone's water