# East Anglia TWO Offshore Windfarm

# Appendix 20.4

## Water Framework Directive Compliance Assessment

### Environmental Statement
### Volume 3

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# Glossary of Acronyms

| | |
|---|---|
| A/HMWB | Artificial or Heavily Modified Water Body |
| CoCP | Code of Construction Practice |
| CDA | Critical Drainage Area |
| CIA | Cumulative Impact Assessment |
| CIRIA | Construction Industry Research and Information Association |
| DCLG | Department for Communities and Local Government |
| DCO | Development Consent Order |
| Defra | Department for Environment, Food & Rural Affairs |
| DMRB | Design Manual for Roads and Bridges |
| EA | Environment Agency |
| EC | European Commission |
| EIA | Environmental Impact Assessment |
| FRA | Flood Risk Assessment |
| FWMA | Flood and Water Management Act |
| GEP | Good Ecological Potential |
| GES | Good Ecological Status |
| HDD | Horizontal Directional Drilling |
| LFRMS | Local Flood Risk Management Strategy |
| NPPF | National Planning Policy Framework |
| NPPG | National Planning Practice Guidance |
| NPS | National Policy Statement |
| PFRA | Preliminary Flood Risk Assessment |
| PPG | Planning Practice Guidance |
| RBD | River Basin District |
| RBMP | River Basin Management Plan |
| SAC | Special Area of Conservation |
| SPA | Special Protection Area |
| SPZ | Source Protection Zone |
| SSSI | Site of Special Scientific Interest |
| SuDS | Sustainable Drainage System |
| WFD | Water Framework Directive |

# Glossary of Terminology

| | |
|---|---|
| Applicant | East Anglia TWO Limited. |
| Cable sealing end compound | A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation. |
| Cable sealing end (with circuit breaker) compound | A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation. |
| Construction consolidation sites | Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure. |
| Development area | The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order). |
| East Anglia TWO project | The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure. |
| East Anglia TWO windfarm site | The offshore area within which wind turbines and offshore platforms will be located. |
| European site | Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas. |
| Evidence Plan Process | A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA. |
| Horizontal directional drilling (HDD) | A method of cable installation where the cable is drilled beneath a feature without the need for trenching. |
| Jointing bay | Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts. |
| Landfall | The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables. |
| Link boxes | Underground chambers within the onshore cable route housing electrical earthing links. |
| Mitigation areas | Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts. |
| National electricity grid | The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission |
| National Grid infrastructure | A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets. |
| National Grid overhead line realignment works | Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid. |

| | |
|---|---|
| National Grid overhead line realignment works area | The proposed area for National Grid overhead line realignment works. |
| National Grid substation | The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order. |
| National Grid substation location | The proposed location of the National Grid substation. |
| Natura 2000 site | A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive. |
| Onshore cable corridor | The corridor within which the onshore cable route will be located |
| Onshore cable route | This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas. |
| Onshore cables | The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables. |
| Onshore development area | The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located. |
| Onshore infrastructure | The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid. |
| Onshore preparation works | Activities to be undertaken prior to formal commencement of onshore construction such as pre–planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations. |
| Onshore substation | The East Anglia TWO substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure. |
| Onshore substation location | The proposed location of the onshore substation for the proposed East Anglia TWO project. |
| Transition Bay | Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables. |

# 20.4 Water Framework Directive Compliance Assessment

## 20.1 Introduction

1. This assessment aims to determine whether the construction and operation of the onshore infrastructure associated with the proposed East Anglia TWO project are compliant with the Directive of the European Parliament and of the Council 2000/60/EC establishing a framework for community action in the field of water policy (generally known as the Water Framework Directive (WFD)).

2. The objectives of this compliance assessment are to:

   - Identify water bodies that could potentially be affected by the onshore infrastructure of the proposed East Anglia TWO project;
   - Identify onshore activities that could affect these WFD water bodies;
   - Assess the potential for the proposed East Anglia TWO project activities to result in a deterioration in the status of WFD water bodies, or prevent status objectives being achieved in the future; and
   - Determine the compliance of the proposed East Anglia TWO project with the requirements of the WFD.

3. This report is an appendix to ***Chapter 20 Water Resources and Flood Risk*** and has been prepared as part of the Environmental Statement (ES).

4. Note that potential impacts of offshore activities are considered in a separate WFD Compliance Assessment found in ***Appendix 8.1*** to ***Chapter 8 Water and Sediment Quality*** of the ES.

### 20.1.1 The Water Framework Directive

#### 20.1.1.1 Overview

5. The WFD is transposed into national law by means of the Water Environment (WFD) (England and Wales) Regulations 2017.

6. Unlike the EU Birds and Habitats Directives (EC Directive on the Conservation of Wild Birds (2009/147/EC) and EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC), respectively), which apply only to designated sites, the WFD applies to all bodies of water, including those that are man-made.

#### 20.1.1.2 Surface Waters

7. There are two separate classifications for surface water bodies (including rivers, lakes, transitional and coastal waters); ecological and chemical. For a water body to be in overall 'good' status, both ecological and chemical status must be at least 'good'.

8. The ecological status of a surface water body is assessed according to the condition of biological elements (e.g. fish, benthic invertebrates and other aquatic flora), the condition of supporting physico-chemical elements (e.g. thermal conditions, salinity, and concentrations of oxygen, ammonia and nutrients), concentrations of specific pollutants (e.g. copper and other priority substances), and the condition of the hydromorphological quality elements (e.g. morphological conditions and hydrological regime). Ecological status is recorded on the scale of high, good, moderate, poor or bad, with "High" denoting largely undisturbed conditions and the other classes representing increasing deviation from this natural condition; the target for all water bodies is Good Ecological Status (GES). The ecological status classification for the water body is determined from the worst scoring quality element, which means that the condition of a single quality element can cause a water body to fail to reach its WFD classification objectives.

9. Where the hydromorphology of a surface water body has been significantly altered for anthropogenic purposes, it can be designated as an Artificial or Heavily Modified Water Body (A/HMWB). An alternative environmental objective, Good Ecological Potential (GEP) applies in these cases.

10. Chemical status is assessed by compliance with environmental standards for chemicals that are listed in the EC Environmental Quality Standards Directive (2008/105/EC). These chemicals include priority substances, priority hazardous substances, and eight other pollutants carried over from the Dangerous Substance Daughter Directives. Chemical status is recorded as 'good' or 'fail'. The chemical status classification for the water body is determined by the worst scoring chemical.

11. In addition, some surface waters require special protection under other European legislation. The WFD therefore brings together the planning processes of a range of other European Directives, such as the revised Bathing Waters Directive (2006/44/EC) and the Habitats Directive. These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species and wildlife, and have been brought in line with the planning timescales of the WFD.

#### 20.1.1.3 Groundwater

12. Groundwaters are assessed in a different way to surface waters. Instead of GES and GEP, groundwaters are classified as either Poor or Good in terms of quantity (groundwater levels, flow directions) and quality (pollutant concentrations and conductivity). UKTAG[1] have provided guidance on how groundwater quantity and quality is assessed (UKTAG 2012a and 2012b).

### 20.1.2 Roles and Responsibilities

13. The Environment Agency is the competent authority for WFD implementation in England, and therefore must assess schemes to ensure that they are compliant with the requirements of the WFD. The Environment Agency also acts as a consultee to other regulators and bodies in relation to WFD compliance and therefore, for the proposed East Anglia TWO project, will advise the organisations involved in consenting the proposed East Anglia TWO project on the requirements of the WFD.

14. Whilst the Environment Agency acknowledges that assessing schemes for WFD compliance is best aligned with the steps of an Environmental Impact Assessment (EIA), they recommend that a separate WFD compliance assessment is undertaken by the applicant to ensure all aspects of WFD are clearly and overtly considered.

### 20.1.3 Report Structure

15. This report is divided into seven sections:

- ***Section 20.1*** (this section) describes the purpose of this report;
- ***Section 20.2*** provides a brief overview of the proposed East Anglia TWO project;
- ***Section 20.3*** presents the WFD compliance assessment methodology that is used in the report;
- ***Section 20.4*** presents the results of the screening exercise undertaken for Stage 1 of the WFD compliance assessment;
- ***Section 20.5*** presents the results of the scoping exercise undertaken for Stage 2 of the WFD compliance assessment;
- ***Section 20.6*** presents the results of the detailed assessment undertaken for Stage 3 of the WFD compliance assessment; and

[1] UKTAG is a partnership of the UK environment and conservation agencies which was set up to provide coordinated advice on the science and technical aspects of the European Union's Water Framework Directive.

- ***Section 20.7*** presents a summary of mitigation, improvements and monitoring, which comprises Stage 4 of the WFD compliance assessment.

## 20.2 Onshore Project Description

16. The onshore development area is within the administrative area of Suffolk County Council. The onshore development area is also within the administrative area of East Suffolk Council Local Planning Authority. East Suffolk Council (ESC) is the merger of Suffolk Coastal District Council (SCDC) and Waveney District Council (WDC), which became effective from 1st April 2019. The following onshore infrastructure will be required:

- The landfall site with an associated transition bay to connect the onshore and offshore cables;
- Onshore cable route, accesses, trenchless crossing technique (e.g. Horizontal Directional Drilling (HDD)) temporary working areas and construction consolidations sites (CCS);
- Up to six onshore cables and up to two fibre optic cables, associated jointing bays and associated distributed temperature sensing (DTS) cabling (some or all of which may be installed in ducts);
- Onshore underground cable ducts and cable jointing bays, into which the cables will be installed;
- Onshore substation; and
- National Grid infrastructure.

## 20.3 Assessment Method

17. This section sets out the approach for each of the key stages in the WFD compliance assessment process. For each stage, a description of the procedure is provided, together with initial, relevant information that may facilitate decision-making at this early stage of the process.

### 20.3.1 Overall Approach

18. There is no detailed published methodology for the assessment of plans or projects in relation to undertaking WFD compliance assessments across all types of water bodies. There are, however, several sets of guidance that have been developed to support these assessments in the different water body types, predominantly written by the Environment Agency. The following are considered to be the most relevant to the onshore infrastructure of the proposed East Anglia TWO project:

- Advice Note 18: The WFD (Planning Inspectorate 2017), which provides an overview of the WFD and provides an outline methodology for considering WFD as part of the Development Consent Order (DCO) process;
- WFD risk assessment: How to assess the risk of your activity (Environment Agency 2016a), which provides guidance for bodies planning to undertake activities that would require a flood risk activity permit; and
- Protecting and improving the water environment: WFD compliance of physical works in rivers (Environment Agency 2016b) and associated supplementary guidance (Environment Agency 2016c), which provides more detailed guidance for assessing WFD compliance of various activities in river water bodies.

19. For the purposes of this assessment, the broad methodologies outlined in the guidance documents listed above have been brought together to develop an assessment methodology that can be used for all types of water bodies. The assessment process therefore covers the following four stages, which are described in more detail in the subsequent sections:

- Stage 1: Screening;
- Stage 2: Scoping;
- Stage 3: Detailed compliance assessment; and
- Stage 4: Summary assessment and mitigation.

### 20.3.2 Stage 1: Screening

20. This stage consists of an initial screening exercise to identify relevant water bodies in the onshore development area. Water bodies will be selected for inclusion in the early stages of the compliance assessment using the following criteria, with reference to the 2015 Anglian River Basin Management Plan (RBMP) (as presented in the online Catchment Data Explorer; Environment Agency 2018):

- All surface water bodies that could potentially be directly impacted by the proposed East Anglia TWO project;
- Any surface water bodies that have direct connectivity (e.g. upstream and downstream) that could potentially be affected by the proposed East Anglia TWO project; and
- Any groundwater bodies that underlie the proposed East Anglia TWO project.

### 20.3.3 Stage 2: Scoping

21. This stage identifies whether there is potential for deterioration in water body status or failure to comply with WFD objectives for any of the water bodies identified in Stage 1. This stage considers potential non-temporary impacts and impacts on critical or sensitive habitats for each water body and each activity. Water bodies and activities can be scoped out of further assessment if it can be satisfactorily demonstrated that there will be no impacts. If impacts are predicted, it will be necessary to undertake a detailed compliance assessment.

22. The Stage 2 assessment considers the potential for each activity planned as part of the proposed East Anglia TWO project to affect each quality element in turn, based on a series of trigger questions for the quality elements that are applicable in each type of water body.

23. The water body and activity under assessment will be progressed to the detailed compliance assessment (Stage 3) if the answer to one or more of the scoping questions is 'Yes', but only for those quality elements that could potentially be impacted. Conversely, if the answer to a scoping question is 'No' or enough information can be provided at this stage to scope the issue out, the quality element is scoped out of further assessment.

### 20.3.4 Stage 3: Detailed Compliance Assessment

#### 20.3.4.1 Overview of Method

24. The Stage 3 assessment determines whether the activities and/or proposed East Anglia TWO project components that have been put forward from the Stage 2 scoping assessment will cause deterioration and whether this deterioration will have a significant non-temporary effect on the status of one or more WFD quality elements at water body level. For priority substances, the process requires the assessment to consider whether the activity is likely to cause the quality element to achieve good chemical status. If it is established that an activity and/or proposed East Anglia TWO project component is likely to affect status at water body level (that is, by causing deterioration in status or by preventing achievement of WFD objectives and the implementation of mitigation measures for HMWBs), or that an opportunity may exist to contribute to improving status at a water body level, potential measures to avoid the effect or achieve improvement must be investigated. This stage considers such measures and, where necessary, evaluates them in terms of cost and proportionality. Note that this stage is referred to as a WFD Impact Assessment in the Planning Inspectorate (2017) guidance.

### 20.3.4.2 Determination of Deterioration

25. Th Environment Agency has not issued guidance on how deterioration in the status of water bodies should be assessed. The assessment therefore draws upon the following guidance documents:

- The WFD (Standards and Classification) Directions (England and Wales (2015). This document provides the most up to date standards used to determine the ecological and chemical status of surface water bodies and quantitative and chemical status of groundwater.
- UKTAG (2011) Defining & Reporting on Groundwater Bodies. This document provides information on the approaches used to classify groundwater bodies.
- Joint Defra/EA Flood and Coastal Erosion Risk Management R&D Programme (2009) WFD Expert Assessment of Flood Management Impacts. This document provides a framework for the assessment of changes to hydromorphology.
- UKTAG (2003) Guidance on Morphological Alterations and the Pressures and Impacts Analyses. This document provides additional information on hydromorphological pressures.
- Internal Environment Agency guidance on WFD deterioration and risk to the status objectives of river water bodies (Environment Agency 2016c). This document provides an assessment of the level of risk of deterioration in water body status associated with different activities, based upon activity type and risk screening thresholds.

26. A detailed summary of the assessment criteria used for rivers and groundwater is provided in ***Annex 1 Scoping Tables***. The assessment considers the potential for between class, within class and temporary deterioration in water body status. Where deterioration is not predicted, the activity will also be considered against the water body objectives to ensure status objectives (i.e. GES or GEP) will not be prevented.

27. This assessment is informed by the data and assessments provided in the appropriate technical chapters of the ES (including ***Chapter 18 Ground Conditions and Contamination***, ***Chapter 20 Water Resources and Flood Risk*** and ***Chapter 22 Onshore Ecology***).

### 20.3.4.3 Article 4.7

28. In the unlikely event that no suitable measures can be identified to mitigate the potential adverse impacts of the proposed East Anglia TWO project, it may be necessary to undertake an Article 4.7 assessment (noting that the overall ethos of the proposed East Anglia TWO project is to prevent deterioration in water body status and avoid the need for an application for an exemption under Article 4.7 of

the WFD). To determine the scope of this assessment, consultation with the Environment Agency will be required, and will include:

- An assessment of whether the proposed East Anglia TWO project can be classified as being of imperative overriding public interest and if the benefits to society resulting from the proposed East Anglia TWO project outweigh the local benefits of WFD implementation;
- An assessment of whether all practicable steps to avoid adverse impacts have been taken. These steps are defined as those that are technically feasible, not disproportionately costly, and compatible with the overall requirements of the proposed East Anglia TWO project; and
- An assessment of whether the proposed East Anglia TWO project can be delivered by an alternative, environmentally better option. This option will need to be technically feasible and not disproportionately costly to be feasible.

### 20.3.5 Stage 4: Summary of Assessment and Mitigation Requirements

29. This stage of the process provides a summary of the preceding stages and any mitigation proposals for each of the activities assessed.

## 20.4 Stage 1: Screening

### 20.4.1 Purpose of this Section

30. This section describes the WFD water bodies that are located in the vicinity of the onshore development area, and identifies the potential mechanisms by which the proposed East Anglia TWO project could impact on these water bodies. This section then determines which of the water bodies could potentially be impacted by the proposed East Anglia TWO project and therefore need to be considered further in this assessment.

### 20.4.2 Identification of Water Bodies

31. The water bodies that could potentially be affected by the proposed East Anglia TWO project have been identified using the method outlined in ***section 20.3***, building upon:

- Details of the current proposed East Anglia TWO project, as outlined in ***section 20.2***; and
- The information included on water body extent in the Catchment Data Explorer (Environment Agency 2018).

32. ***Figure 20.4.1*** (for river, transitional and coastal water bodies) and ***Figure 20.4.2*** (for groundwater bodies) show the WFD water bodies screened into the WFD

compliance assessment. These water bodies are described below in ***Table A20.4.1***

**Table A20.4.1 WFD Water Bodies Screened into the WFD Compliance Assessment**

| Water body name and WFD reference | Water body type | Status and comments (summarised from Environment Agency, 2018) |
|---|---|---|
| Hundred River (GB105035046260) | River | HMWB at moderate ecological potential due to low levels of dissolved oxygen, elevated concentrations of phosphate and resulting pressures on fish populations. These pressures are attributed to drought and continuous sewage discharges. |
| Leiston Beck (GB105035046271) | River | HMWB at moderate ecological potential. Good potential has not been achieved due to low dissolved oxygen concentrations and elevated phosphate concentrations. These pressures are attributed to continuous sewage discharges. |
| Minsmere Old River (GB105035046270) | River | HMWB due to physical modification resulting from agricultural and rural land management and land drainage. Currently at moderate ecological potential as a result of morphological pressures (barriers and land drainage) which restrict fish populations. |
| Alde – Ore Downstream Confluence (GB105035045950) | River | Not designated as artificial or heavily modified. Currently at moderate ecological status due to low dissolved oxygen concentrations, elevated phosphate levels and resulting pressures on fish. These pressures are attributed to point source pollution from continuous and intermittent sewage discharges, diffuse source pollution from agriculture and poor soil management, and groundwater abstraction by the water and agricultural sectors. |
| Fromus (GB105035045980) | River | Not designated as artificial or heavily modified. Currently at poor ecological status due to low concentrations of dissolved oxygen, high concentrations of phosphate and pressures on fish and invertebrates. These pressures are attributed to physical modifications (which cause barriers and ecological discontinuity), point source pollution from continuous sewage discharges and industrial discharges, diffuse source pollution from agriculture, poor soil management and transport drainage, and natural drought. |
| Alde & Ore (GB520503503800) | Transitional Water | HMWB at moderate ecological potential due to elevated levels of dissolved inorganic nitrogen. This is attributed to sewage discharge and poor nutrient management. |
| Waveney and East Suffolk Chalk & Crag (GB40501G400600) | Groundwater Body | Current at poor status due to groundwater and surface water abstraction, and diffuse source pollution from agriculture. |
| Suffolk (GB650503520002) | Coastal water Body | HMWB at moderate ecological potential as a result of elevated concentrations of dissolved inorganic nitrogen. This is attributed to continuous sewage discharges and diffuse source pollution due to poor nutrient management and agriculture. |

33. The onshore substation and National Grid infrastructure are located within the catchment of the Friston watercourse (as discussed in ***Chapter 20 Water Resources and Flood Risk***). The Friston watercourse catchment is largely composed of a uniform, straightened drainage channel, bounded by a network of smaller drains. Although the watercourse is too small to have been designated as a river water body, it drains into the Alde & Ore transitional water body (GB520503503800). It is therefore considered to be part of this water body for the purposes of this assessment.

34. Baseline data for each of the water bodies screened into the assessment were obtained from the second River Basin Management Plan status objectives published by the Environment Agency, as presented in the online Catchment Data Explorer (Environment Agency 2018).

### 20.4.3 Potential Impacts of the Proposed East Anglia TWO Project

35. Detailed information on the scale and nature of proposed East Anglia TWO project-related effects is available in ***Chapter 6 Project Description*** of the ES. However, on the basis of the range of activities associated with the proposed East Anglia TWO project, ***Table A20.4.2*** and ***Table A20.4.3*** set out examples of the types of effects potentially relevant to the WFD compliance assessment that could be expected within the construction and operational phases. It should be noted that these impact mechanisms are theoretical and do not necessarily indicate that an effect is likely to occur, nor is the list intended to be exhaustive.

36. It may be possible, for relatively straightforward reasons (e.g. no identifiable impact pathway), to scope out some construction or operational activities during Stage 2. However, to do so will require sufficient programme information to be available that allows reasoned and clear conclusions to be reached. Where there is uncertainty over the potential for an activity to have an effect then a precautionary view will be taken and the activity will be screened in for further assessment.

**Table A20.4.2 List of Proposed East Anglia TWO Project Activities and Potential Impact Mechanism During Construction**

| Activity | Potential mechanisms for impact on WFD quality elements |
|---|---|
| Site establishment, construction of haul road and earthworks and other construction activities associated with the onshore cable route (including the installation of 1.2m deep cable ducts), onshore substation and National Grid infrastructure | Changes in surface water quality, quantity and distribution associated with land use change from natural vegetated surface to hard standing (hydromorphology), sediment laden run off (hydromorphology, physico-chemistry), changes in surface water chemistry due to changes in the proportion of water received from different sources (physico-chemistry) and changes in water quality associated with leakage or accidental spills of fuels, oils, lubricants and construction materials (physico-chemistry and priority substances).<br><br>Changes in infiltration to the groundwater body (groundwater quantity) and potential for ingress of spilled contaminants (groundwater quality).<br><br>Changes to the volume and distribution of surface water flows, with the potential for hydromorphological adjustment (hydromorphology). Hydromorphological and physico-chemical changes could have direct effects on biological elements.<br><br>Increase in sediment from wind-blown dust derived from disturbed ground (hydromorphology). |
| Watercourse crossing (Hundred River) using open cut methodology (e.g. temporary dam and divert and temporary culverts) | Direct changes to bed and bank habitats (hydromorphology, biology).<br><br>Changes to surface water hydrology and sediment conveyance, with the potential for hydromorphological adjustment (hydromorphology).<br><br>Changes in water quality associated with leakage or accidental spills of fuels, oils, lubricants and construction materials (physico-chemistry and priority substances).<br><br>Hydromorphological and physico-chemical changes could have direct effects on biological elements. |
| Temporary watercourse crossings (e.g. culverts) along the haul road | Direct changes to bed and bank habitats (hydromorphology, biology). Changes to surface water hydrology and sediment conveyance, with the potential for hydromorphological adjustment (hydromorphology). Changes in water quality associated with leakage or accidental spills of fuels, oils, lubricants and construction materials (physico-chemistry and priority substances). Hydromorphological and physico-chemical changes could have direct effects on biological elements. |

**Table A20.4.3 List of proposed East Anglia TWO Project Activities and Potential Impact Mechanisms During Operation**

| Activity | Potential mechanisms for impact on WFD quality elements |
|---|---|
| Presence of cable ducting | Changes in infiltration to the groundwater body (groundwater quantity).<br>Changes to groundwater flows associated with the installation of buried infrastructure, which has the potential to change subsurface flow routes and change the distribution of groundwater (groundwater quantity). |
| Operational works and maintenance of onshore cable route | Changes in surface water chemistry due to changes in water quality associated with runoff and leakage or accidental spills of fuels, oils, lubricants and other potential contaminants (physico-chemistry and priority substances) and sediment laden run off (hydromorphology, physico-chemistry).<br>Hydromorphological and physico-chemical changes could have direct effects on biological elements. |
| Presence of permanent infrastructure along the onshore cable route (e.g. jointing bays and watercourse crossing) and at the onshore substation and National Grid infrastructure. | Changes to the volume and distribution of surface water flows, with the potential for hydromorphological adjustment (hydromorphology).<br>Changes in surface water quality, quantity and distribution associated with discharge of site runoff into the surface drainage network (hydromorphology, physico-chemistry).<br>Changes in surface water chemistry due to changes in the proportion of water received from different sources (physico-chemistry) and changes in water quality associated with runoff and leakage or accidental spills of fuels, oils, lubricants and other potential contaminants (physico-chemistry and priority substances).<br>Hydromorphological and physico-chemical changes could have direct effects on biological elements.<br>Changes in infiltration to the groundwater body (groundwater quantity) and potential for ingress of road-related contaminants (groundwater quality).<br>Changes to groundwater flows associated with the installation of surface infrastructure, which has the potential to change surface and subsurface flow routes and change the distribution of groundwater. |

### 20.4.4 Results of Initial Screening of Water Bodies

37. A screening exercise has been undertaken to identify which of the water bodies described in ***section 20.4.2*** (and shown in ***Figure 20.4.1*** and ***Figure 20.4.2***) have the potential to be impacted by the activities described in ***section 20.4.3***. The results of this exercise are shown in ***Table A20.4.4***

38. The screening exercise demonstrates that the following water bodies could potentially be impacted by the proposed East Anglia TWO project, and therefore need to be considered in the Stage 2 scoping assessment:

- River water bodies:
  - Hundred River (GB105035046260)
  - Leiston Beck (GB105035046271)
- Transitional water body:
  - Alde & Ore (GB520503503800)
- Groundwater body:
  - Waveney and East Suffolk Chalk & Crag (GB40501G400600)
- Coastal water body:
  - Suffolk (GB650503520002)

**Table A20.4.4 Results of Screening Exercise**

| Water body name and ID number | Type | Screened in | Justification |
|---|---|---|---|
| Hundred River (GB105035046260) | River | Yes | Screened in because the onshore cable corridor crosses the Hundred River. A trench crossing has been proposed due to insufficient room for a trenchless technique which could lead to changes to the hydromorphology of the water body. Other activities proposed within the catchment (including site establishment, construction of haul road and earthworks and other construction activities associated with the cable route) could potentially increase the supply of sediment and contaminants. |
| Leiston Beck (GB105035046271) | River | Yes | Screened in because site establishment, ground excavations and other construction activities have the potential to increase the supply of sediment and contaminants across the onshore development area. |
| Minsmere Old River (GB105035046270) | River | No | Screened out because this water body catchment is approximately 4km north of the onshore cable corridor, and will not be directly disturbed by it. It is downstream of Leiston Beck, which joins the river close to Minsmere Sluice where it meets the sea, but there is little potential for and impacts on the Leiston Beck to become transmitted into the Old Minsmere River. |
| Alde – Ore Downstream Confluence (GB105035045950) | River | No | Screened out because due to its location, there is no direct mechanism by which it could be impacted by construction or operational activities. There is potential for small-scale impacts within the Alde & Ore transitional water body, but no mechanism for these to be extended upstream to the Alde – Ore confluence. |
| Fromus (GB105035045980) | River | No | Screened out because due to its location, there is no direct mechanism by which it could be impacted by construction or operational activities. There is potential for small-scale impacts within the Alde & Ore transitional water body, but no mechanism for these to be extended upstream to the Alde – Ore confluence. |
| Alde & Ore (GB520503503800) | Trans-itional | Yes | Screened in because site establishment, ground excavations and other construction activities have the potential to increase the supply of sediment and contaminants to this water body. Although it will not be directly disturbed, the water body has the potential to be affected via the Friston watercourse. |

| Water body name and ID number | Type | Screened in | Justification |
|---|---|---|---|
| Suffolk (GB650503520002) | Coastal | Yes | Screened in because site establishment, ground excavations and other construction activities at the landfall have the potential to increase the supply of sediment and contaminants to this water body. |
| Waveney and East Suffolk Chalk & Crag (GB40501G400600) | Ground-water | Yes | Screened in because the activities proposed within this water body (including cable installation and joint pit excavation) could potentially impact upon water body status. |

## 20.5 Stage 2: Scoping

### 20.5.1 Purpose of this Section

39. This section presents the results of the scoping assessment undertaken on the water bodies identified in ***section 20.4.4*** of this report, using the method outlined in ***section 20.3.3***.

40. This assessment examines the potential for activities associated with the proposed East Anglia TWO project to impact upon WFD quality elements and overall water body status under both scenarios. It therefore identifies which water bodies may be potentially impacted by the proposed East Anglia TWO project and which quality elements are at risk of impact. The results of this scoping stage determine which water bodies will require further assessment (Stage 3 detailed compliance assessment).

41. The scoping assessment was undertaken for the water bodies screened in for further assessment following the outcomes of Stage 1, as detailed in ***section 20.4.4***:

- Hundred River (GB105035046260);
- Leiston Beck (GB105035046271);
- Alde & Ore (GB520503503800);
- Suffolk (GB650503520002); and
- Waveney and East Suffolk Chalk & Crag (GB40501G400600).

### 20.5.2 Construction Impacts

42. Onshore construction activities have the potential to impact upon the geomorphology, hydrology and physical habitat value of the water body catchments in which these activities will take place (***Table A20.4.5*** and ***Table A20.4.6***), including the crossing of the Hundred River.

#### 20.5.2.1 Hydromorphology

43. There is potential for impacts on the hydromorphology (hydrological regime and morphological conditions) of the river and transitional water bodies as a result of:

- Onshore construction activities:
  - Alteration of surface water flows entering river and transitional water bodies due to changes in land use during construction of surface infrastructure for the onshore substation and National Grid infrastructure. This could impact upon the hydrology of the surface water system.
  - Increased sediment supply to surface waters through erosion of soils exposed by earthworks along the onshore cable corridor (including the

haul road) and onshore substation and National Grid substation by surface runoff. This could impact upon the geomorphology and hydromorphology of the river and transitional water bodies.

- Watercourse crossing:
  - Alterations to the geomorphology of the watercourse by disrupting flow conveyance and sediment transport (particularly of coarse bed sediments), for example through the installation of temporary culverts and the use of damming and diverting techniques for open trenching that will cause localised, reversible disruption to the bed and banks.
  - Temporary changes to surface flows as a result of the trenched crossing of the Hundred River, particularly if the capacity of any pumps, pipes or flumes or temporary watercourse crossing is exceeded.
  - Alteration of surface water flows as a result of impoundment by temporary culverts or dams and culverts while the water body is being crossed. This could impact upon the hydrology of the surface water system, change patterns of erosion and sedimentation, and impede river continuity.

#### 20.5.2.2 Physico-chemistry

44. There is potential for impacts on the physico-chemistry (oxygenation conditions, salinity and acidification status) of the river and transitional water bodies as a result of:

- Onshore construction activities:
  - Increased sediment supply to river and transitional water bodies through erosion of exposed soils by surface runoff, which could impact upon surface water quality.
  - Supply of contaminants to surface waters through surface runoff or accidental spillage during excavation of contaminated soils, or accidental spillage or leakage of fuel oils or lubricants from construction vehicles, which could impact upon surface water quality.
- Watercourse crossing and onshore construction activities:
  - Supply of contaminants to surface waters through surface runoff or accidental spillage during excavation of contaminated soils, or accidental spillage or leakage of fuel oils or lubricants from construction vehicles, which could impact upon surface water quality.

#### 20.5.2.3 Biology

45. There is potential for impacts on the biology (aquatic flora, benthic invertebrate fauna and fish fauna) of the river and transitional water bodies as a result of the

potential changes to hydromorphology and physico-chemistry described above, as well as:

- A reduction in dissolved oxygen concentrations resulting from increased sediment loads, or the presence of temporary dams causing changes to flow conditions. This could adversely affect stream biota (e.g. macrophytes, aquatic invertebrates and fish) and adversely affecting stream biota.
- Reduction in light penetration and smothering of existing bed habitats due to increased sediment loads.

#### 20.5.2.4 Summary

46. Construction activities (including the watercourse crossing) have therefore been scoped in to Stage 3 of the assessment for the following river and transitional water bodies:

- Hundred River;
- Leiston Beck; and
- Alde & Ore.

47. ***Table A20.4.5*** and ***Table A20.4.6*** demonstrate that, due to their size relative to the scale of the water body, the onshore construction activities do not have the potential to impact upon the quantity or quality of the groundwater or coastal water body. The following water bodies have therefore been scoped out of the assessment at this stage:

- Waveney and East Suffolk Chalk & Crag; and
- Suffolk.

**Table A20.4.5 Onshore Construction Activities: Scoping Questions for River Water Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| **Biology** | | | |
| Aquatic flora | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic plants? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| Benthic invertebrates | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic invertebrates? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Fish | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of shelter, feeding and spawning habitats for fish? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| **Hydromorphology** | | | |
| Hydrological regime | Could the activity change the volume, energy or distribution of flows in the water body? | Yes | Hundred River |
| | | No | Leiston Beck |
| Morphological conditions | Could the activity change the width, depth, bank conditions, bed substrates and structure of the riparian zone? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| River continuity | Could the activity create a permanent barrier to the downstream movement of water and/or sediment, or the upstream movement of fish? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |
| **Physico-chemistry** | | | |
| General | Could the activity change the temperature, pH, oxygenation, salinity or nutrient concentrations in the water body? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| Specific pollutants | Could the activity release dangerous chemicals into the water body? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| **Protected Areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| **Improvement Measures and Mitigation Measures** | | | |
| Improvement measures (non-A/HMWBs) and mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the improvement or mitigation measures in place? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement or mitigation measures that is not yet in place? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |

**Table A20.4.6 Onshore Construction Activities: Scoping Questions for Transitional Water Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| **Biology** | | | |
| Fish | Will the activity present a barrier to fish movement, risk of entrainment, risk to health and/or impact on a spawning area? | Yes | - |
| | | No | Alde & Ore |
| Phytoplankton | Will the activity change water temperature, salinity, transparency, microbial concentrations, dissolved oxygen concentrations and/or nutrient levels of the water body for greater than 14 days or in a water body with a phytoplankton status of moderate, poor or bad? | Yes | - |
| | | No | Alde & Ore |
| | Is the activity in a water body with a history of significant and persistent algal blooms or toxic algal blooms? | Yes | - |
| | | No | Alde & Ore |
| Flora/fauna/angiosperms /benthic invertebrates | Which type of habitat is likely to be impacted and what percentage of the habitat is impacted within the water body? | Yes | - |
| | | No | Alde & Ore |
| **Hydromorphology** | | | |
| Hydromorphology | Is the water body high status/is the water body heavily modified for the same reason/use as the proposed project? | Yes | - |
| | | No | Alde & Ore |
| | Will the activity have a significant impact on the hydromorphology of any other water body not at high status? | Yes | - |
| | | No | Alde & Ore |
| **Physico-chemistry** | | | |
| Chemistry | Is the activity potentially releasing dangerous chemicals from surfaces, sediments and/or outfalls into the water body? | Yes | Alde & Ore |
| | | No | - |
| | Is the activity taking place in an area with limited water exchange (with the potential to cause thermal changes or change dilution factors)? | Yes | - |
| | | No | Alde & Ore |
| **Protected areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Alde & Ore |
| | | No | - |
| **Improvement Measures and Mitigation Measures** | | | |
| | | Yes | - |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Improvement measures (non-A/HMWBs | Is the activity likely to impact on one of the improvement measures in place? | No | Alde & Ore |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement measures that is not yet in place? | Yes | - |
| | | No | Alde & Ore |
| Mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the mitigation measures in place? | Yes | - |
| | Is the activity likely to prevent the delivery or effectiveness of one of the mitigation measures that is not yet in place? | No | Alde & Ore |

**Table A20.4.7 Onshore Construction Activities: Scoping Questions for Coastal Water Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| **Biology** | | | |
| Fish | Will the activity impinge the movement of estuarine fish, or place them at risk of entrainment? | Yes | - |
| | | No | Suffolk |
| Phytoplankton | Will the activity change water temperature, salinity, transparency, microbial concentrations, dissolved oxygen concentrations and/or nutrient levels of the water body for greater -than 14 days or in a water body with a phytoplankton status of moderate, poor or bad? | Yes | - |
| | | No | Suffolk |
| | Is the activity in a water body with a history of significant and persistent algal blooms or toxic algal blooms? | Yes | - |
| | | No | Suffolk |
| Flora/fauna/ angiosperms/ benthic invertebrates | Which type of habitat is likely to be impacted and what percentage of the habitat is impacted within the water body? | Yes | - |
| | | No | Suffolk |
| **Hydromorphology** | | | |
| Hydromorphology | Is the water body high status/is the water body heavily modified for the same reason/use as the proposed project? | Yes | - |
| | | No | Suffolk |
| | | Yes | - |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| | Will the activity have a significant impact on the hydromorphology of any other water body not at high status? | No | Suffolk |
| **Physico-chemistry** | | | |
| Chemistry | Is the activity potentially releasing dangerous chemicals from surfaces, sediments and/or outfalls into the water body? | Yes | - |
| | | No | Suffolk |
| | Is the activity taking place in an area with limited water exchange (with the potential to cause thermal changes or change dilution factors)? | Yes | - |
| | | No | Suffolk |
| **Protected areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Suffolk |
| | | No | - |
| **Improvement Measures and Mitigation Measures** | | | |
| Improvement measures (non-A/HMWBs | Is the activity likely to impact on one of the improvement measures in place? | Yes | |
| | | No | Suffolk |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement measures that is not yet in place? | Yes | - |
| | | No | Suffolk |
| Mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the mitigation measures in place? | Yes | - |
| | Is the activity likely to prevent the delivery or effectiveness of one of the mitigation measures that is not yet in place? | No | Suffolk |

**Table A20.4.8 Onshore Construction Activities: Scoping Questions for Groundwater Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Groundwater quantity | Could the activity change groundwater levels, affecting Groundwater Dependent Terrestrial Ecosystems (GWDTEs) or dependent surface water features? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| | Could the activity lead to saline intrusion? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the level of proposed groundwater abstraction (dewatering) exceed recharge at a water body scale? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity lead to an additional surface water body that will become non-compliant and lead to failure of the Dependent Surface Water test? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity result in additional abstraction that will exceed any groundwater body scale headroom between the Fully licensed quantity and the limit imposed by the total recharge? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| Groundwater quality | Could the activities have the potential to result in or exacerbate widespread diffuse pollution at a water body scale? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities have the potential to result in pollution of groundwater dependent terrestrial ecosystems (GWDTEs) or other dependent surface water features? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity lead to saline intrusion? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities have the potential to cause deterioration in the quality of a drinking water abstraction? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | | Yes | - |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| | Could the activities have the potential to result in increasing trends in pollutant concentrations or reduce the ability of the water body being able to reverse significant trends in groundwater pollutants? | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities result in the failure of the 'prevent or limit' objective of the Groundwater Daughter Directive? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |

### 20.5.3 Operational Impacts

48. The permanent presence and maintenance (scheduled and unplanned) of proposed East Anglia TWO project infrastructure (including installed cables, the onshore substation and permanent access road) and National Grid infrastructure has the potential to impact upon the hydromorphology, physico-chemistry and biology of the water bodies in which these activities will take place (***Table A20.4.9***).

#### 20.5.3.1 Hydromorphology

49. There is potential for impacts on the hydromorphology (hydrological regime, morphological conditions and river continuity) of the river and transitional water bodies as a result of:

- An increase in the proportion of impermeable surfaces in the sub-catchment resulting in a corresponding decrease in local infiltration. Presence of buried cable ducting along onshore cable route introducing an impermeable barrier with potential to impact on surface water flows.
- Alteration of surface water flows entering river water bodies as a result of changes in land use due to the permanent presence of the onshore substation. This could impact upon the hydrology the surface water system; and
- Increased sediment supply to surface waters during operation via surface runoff from the onshore substation and National Grid substation, which could impact upon the geomorphology of the river water bodies.

#### 20.5.3.2 Physico-chemistry

50. There is potential for impacts on the physico-chemistry (oxygenation conditions, salinity and acidification status) of the river and transitional water bodies as a result of:

- Increased sediment supply to surface waters via surface runoff from operational sites, which could impact upon surface water quality; and
- Supply of contaminants to surface waters through surface runoff or accidental spillage or leakage of fuel oils or lubricants from vehicles during operational activities (including maintenance), which could impact upon surface water quality.

#### 20.5.3.3 Biology

51. There is potential for impacts on biological quality elements such as aquatic flora, benthic invertebrate fauna and fish fauna in the river and transitional water bodies as a result of the potential changes to hydromorphology and physico-chemistry described above.

#### 20.5.3.4 Summary

52. Operational activities have therefore been scoped into Stage 3 of the assessment for the following water bodies:

- Hundred River;
- Leiston Beck; and
- Alde & Ore.

53. Although the presence of the buried cable ducting throughout the cable route has the potential to impact upon the quantitative status of the groundwater body which underlie the proposed East Anglia TWO project, the size of the cable ducting in comparison to the size of the groundwater bodies will result in a negligible impact upon infiltration rates, groundwater flows, subsurface flow routes and alterations in the distribution of groundwater. Furthermore, there are no mechanisms for impact upon the chemical quality elements of groundwater.

54. The relative size of the coastal water body in comparison to the cable ducting mean that any potential impacts will be negligible.

55. Operational activities have therefore not been scoped into Stage 3 of the assessment for the following water bodies:

- Waveney and East Suffolk Chalk and Crag; and
- Suffolk.

**Table A20.4.9 Project Operation and Maintenance: Scoping Questions for River Water Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| **Biology** | | | |
| Aquatic flora | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic plants? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| Benthic invertebrates | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic invertebrates? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| Fish | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of shelter, feeding and spawning habitats for fish? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |
| **Hydromorphology** | | | |
| Hydrological regime | Could the activity change the volume, energy or distribution of flows in the water body? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| Morphological conditions | Could the activity change the width, depth, bank conditions, bed substrates and structure of the riparian zone? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |
| River continuity | Could the activity create a permanent barrier to the downstream movement of water and/or sediment, or the upstream movement of fish? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |
| **Physico-chemistry** | | | |
| General | Could the activity change the temperature, pH, oxygenation, salinity or nutrient concentrations in the water body? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| Specific pollutants | Could the activity release dangerous chemicals into the water body? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| **Protected areas** | | | |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Hundred River<br>Leiston Beck |
| | | No | - |
| **Improvement Measures and Mitigation Measures** | | | |
| Improvement measures (non-A/HMWBs) and mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the improvement or mitigation measures in place? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement or mitigation measures that is not yet in place? | Yes | - |
| | | No | Hundred River<br>Leiston Beck |

**Table A20.4.10 Project Operation and Maintenance: Scoping Questions for Transitional Water Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| **Biology** | | | |
| Fish | Will the activity present a barrier to fish movement, risk of entrainment, risk to health and/or impact on a spawning area? | Yes | - |
| | | No | Alde & Ore |
| Phytoplankton | Will the activity change water temperature, salinity, transparency, microbial concentrations, dissolved oxygen concentrations and/or nutrient levels of the water body for greater than 14 days or in a water body with a phytoplankton status of moderate, poor or bad? | Yes | - |
| | | No | Alde & Ore |
| | Is the activity in a water body with a history of significant and persistent algal blooms or toxic algal blooms? | Yes | - |
| | | No | Alde & Ore |
| Flora/fauna/ angiosperms/benthic invertebrates | Which type of habitat is likely to be impacted and what percentage of the habitat is impacted within the water body? | Yes | - |
| | | No | Alde & Ore |
| **Hydromorphology** | | | |
| Hydromorphology | Is the water body high status/is the water body heavily modified for the same reason/use as the proposed project? | Yes | - |
| | | No | Alde & Ore |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| | Will the activity have a significant impact on the hydromorphology of any other water body not at high status? | Yes | - |
| | | No | Alde & Ore |
| **Physico-chemistry** | | | |
| Chemistry | Is the activity potentially releasing dangerous chemicals from surfaces, sediments and/or outfalls into the water body? | Yes | Alde & Ore |
| | | No | - |
| | Is the activity taking place in an area with limited water exchange (with the potential to cause thermal changes or change dilution factors)? | Yes | - |
| | | No | Alde & Ore |
| **Protected areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Alde & Ore |
| | | No | - |
| **Improvement Measures and Mitigation Measures** | | | |
| Improvement measures (non-A/HMWBs) | Is the activity likely to impact on one of the improvement measures in place? | Yes | - |
| | | No | Alde & Ore |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement measures that is not yet in place? | Yes | - |
| | | No | Alde & Ore |
| Mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the mitigation measures in place? | Yes | - |
| | Is the activity likely to prevent the delivery or effectiveness of one of the mitigation measures that is not yet in place? | No | Alde & Ore |

**Table A20.4.11 Project Operation and Maintenance: Scoping Questions for Coastal Water Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| **Biology** | | | |
| Fish | Will the activity impinge the movement of estuarine fish, or place them at risk of entrainment? | Yes | - |
| | | No | Suffolk |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Phytoplankton | Will the activity change water temperature, salinity, transparency, microbial concentrations, dissolved oxygen concentrations and/or nutrient levels of the water body for greater - than 14 days or in a water body with a phytoplankton status of moderate, poor or bad? | Yes | - |
| | | No | Suffolk |
| | Is the activity in a water body with a history of significant and persistent algal blooms or toxic algal blooms? | Yes | - |
| | | No | Suffolk |
| Flora/fauna/ angiosperms/benthic invertebrates | Which type of habitat is likely to be impacted and what percentage of the habitat is impacted within the water body? | Yes | - |
| | | No | Suffolk |
| **Hydromorphology** | | | |
| Hydromorphology | Is the water body high status/is the water body heavily modified for the same reason/use as the proposed project? | Yes | - |
| | | No | Suffolk |
| | Will the activity have a significant impact on the hydromorphology of any other water body not at high status? | Yes | - |
| | | No | Suffolk |
| **Physico-chemistry** | | | |
| Chemistry | Is the activity potentially releasing dangerous chemicals from surfaces, sediments and/or outfalls into the water body? | Yes | - |
| | | No | Suffolk |
| | Is the activity taking place in an area with limited water exchange (with the potential to cause thermal changes or change dilution factors)? | Yes | - |
| | | No | Suffolk |
| **Protected areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Suffolk |
| | | No | - |
| **Improvement Measures and Mitigation Measures** | | | |
| Improvement measures (non-A/HMWBs) | Is the activity likely to impact on one of the improvement measures in place? | Yes | - |
| | | No | Suffolk |
| | | Yes | - |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement measures that is not yet in place? | No | Suffolk |
| Mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the mitigation measures in place? | Yes | - |
| | Is the activity likely to prevent the delivery or effectiveness of one of the mitigation measures that is not yet in place? | No | Suffolk |

**Table A20.4.12 Project Operation and Maintenance: Scoping Questions for Groundwater Bodies**

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Groundwater quantity | Could the activity change groundwater levels, affecting Groundwater Dependent Terrestrial Ecosystems (GWDTEs) or dependent surface water features? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity lead to saline intrusion? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the level of proposed groundwater abstraction (dewatering) exceed recharge at a water body scale? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity lead to an additional surface water body that will become non-compliant and lead to failure of the Dependent Surface Water test? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity result in additional abstraction that will exceed any groundwater body scale headroom between the Fully licensed quantity and the limit imposed by the total recharge? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity result in additional groundwater depletion of surface water flows that will exceed any groundwater body scale headroom between Fully Licensed depletion and the Limit imposed by the total low flows resource? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |

| Parameter | Scoping question | Answer | Applicable water bodies |
|---|---|---|---|
| Groundwater quality | Could the activities have the potential to result in or exacerbate widespread diffuse pollution at a water body scale? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities have the potential to result in pollution of groundwater dependent terrestrial ecosystems (GWDTEs) or other dependent surface water features? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activity lead to saline intrusion? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities have the potential to cause deterioration in the quality of a drinking water abstraction? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities have the potential to result in increasing trends in pollutant concentrations or reduce the ability of the water body being able to reverse significant trends in groundwater pollutants? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |
| | Could the activities result in the failure of the 'prevent or limit' objective of the Groundwater Daughter Directive? | Yes | - |
| | | No | Waveney and East Suffolk Chalk & Crag |

### 20.5.4 Summary of Stage 2

56. The Stage 2 scoping assessment has established that onshore construction and operation-stage activities have the potential to cause deterioration in the status of two river water bodies (Hundred River and Leiston Beck) and the transitional water body (Alde & Ore) (*Error! Reference source not found.*). The potential impacts of these activities have therefore been carried forward to the Stage 3 Detailed Compliance Assessment.

57. No mechanism for impact on the groundwater or coastal water bodies was identified during the Stage 2 assessment. These have therefore been excluded from further assessment.

**Table A20.4.13 Summary of Stage 2 Scoping Assessment**

| Water body | Construction activities | Watercourse crossings | Operation and maintenance |
|---|---|---|---|
| Hundred River | ✓ | ✓ | ✓ |
| Leiston Beck | ✓ | × | ✓ |
| Alde & Ore | ✓ | × | ✓ |
| Suffolk | × | × | × |
| Waveney and East Suffolk Chalk & Crag | × | × | × |

## 20.6 Stage 3: Detailed Compliance Assessment

### 20.6.1 Purpose of this Section

58. This section presents the results of the detailed compliance assessment undertaken on the water bodies identified in ***section 20.5.4*** of this report, using the method outlined in ***section 20.3.4***.

59. This assessment determines whether the activities and/or components of the proposed East Anglia TWO project that have been put forward from the Stage 2 scoping assessment will cause deterioration and whether this deterioration will have a significant non-temporary effect on the status of one or more WFD quality elements at water body level. The findings are presented in this section.

### 20.6.2 Control Measures

60. In a WFD context, the term ‘mitigation measures’ is used specifically to refer to measures identified by the Environment Agency in the relevant RBMP to address pressures in A/HMWBs. The term “control measures” is therefore used in this assessment to refer to measures used to mitigate the impacts of the proposed East Anglia TWO project. These control measures are analogous to the ‘mitigation measures’ referred to in the ES.

61. A range of different information sources has been considered as part of embedding control measures into the design of the proposed East Anglia TWO project (for further details see ***Chapter 6 Project Description*** and ***Chapter 4 Site Selection and Assessment of Alternatives***) including development of design principles, engineering preferences, feedback from community and landowners, ongoing discussions with stakeholders and regulators, commercial considerations and environmental best practice.

62. Embedding control measures into the project design is a type of primary mitigation and is an inherent aspect of the EIA process. It is important to acknowledge that the potential impacts of the proposed East Anglia TWO project

on water bodies would be minimised by the inclusion of in-built control measures within the proposed East Anglia TWO project design. Where embedded control measures have been developed into the design of the proposed East Anglia TWO project with specific regard to surface and groundwaters, these are described in ***Table A20.4.14***.

**Table A20.4.14 Embedded Control Measures for Surface and Groundwater**

| Parameter | Mitigation Measures Embedded into the Project Design |
|---|---|
| **Construction** | |
| Surface Drainage | A construction-stage Surface Water and Drainage Management Plan (SWDP) will be developed as part of the Code of Construction Practice (CoCP) that will be produced post consent, as secured under the requirements of the draft DCO. An Outline CoCP (OCoCP) has been submitted with this DCO application (doc ref xx).<br><br>The SWDP will be implemented to minimise water ingress to the onshore cable trench and ensure ongoing drainage of surrounding land. Where water enters the trenches during construction from surface runoff or groundwater seepage, this will be pumped via settling tanks, sediment basins or mobile treatment facilities to remove sediment, before being discharged into local ditches or drains via temporary interceptor drains in order to prevent increases in fine sediment supply to the watercourses.<br><br>All discharges will be limited to a controlled rate (equivalent to the greenfield runoff rate), agreed in consultation with the Lead Local Flood Authority (LLFA) (Suffolk County Council) and Environment Agency.<br><br>Measures to ensure that any redirected overland flow routes do not cause an increase in off-site flood risk will also be incorporated into the SWDP. Note that the SWDP will encompass construction of all onshore infrastructure.<br><br>Note that management measures of operational stage surface water drainage will be detailed and secured in the final Landscape Mitigation Plan (LMP) produced post-consent to discharge requirements of the draft DCO. The final LMP will be based upon the Outline Landscape and Ecological Management Strategy (OLEMS) submitted with this DCO application. |
| Sediment Management | Work along the onshore cable route would be limited to short sections (constructed in 4 sections concurrently, each with a length of 500m to 2km) at any one time. Work within these sections works will be sequential. Topsoil would be stripped from the entire width of the onshore cable route for the length of the section and stored and capped to minimise wind and water erosion. Once all the trenching is completed and back-filled, the stored topsoil will be re-distributed over the area of the section, with the exception of the access road and any associated drainage.<br><br>CCS and temporary works areas within the onshore development area will comprise hardstanding of permeable gravel aggregate underlain by |

| Parameter | Mitigation Measures Embedded into the Project Design |
|---|---|
| | geotextile, or other suitable material to a minimum of 50% of the total area to minimise the area of open ground.<br><br>A CoCP will be developed for the construction activities (and outline of which is submitted with this DCO application) and will adhere to construction industry good practice guidance as detailed in the Environment Agency's Pollution Prevention Guidance (PPG) notes (including PPG01, PPG05, PPG08 and PPG21)[2] and Construction Industry Research and Information Association (CIRIA)'s 'Control of water pollution from construction sites: Guidance for consultants and contractors (C532)' (2001). Specific measures to control sediment supply that will be captured within the CoCP include:<br><br>• Subsoil exposure will be minimised and strips of undisturbed vegetation will be retained on the edge of the working area;<br><br>• On-site retention of sediment will be maximised by routing all drainage through the site drainage system;<br><br>• The drainage system will include measures to intercept sediment runoff at source. Suitable filters will be used to remove sediment from any water discharged into the surface drainage network;<br><br>• Additional measures will be included in parts of the working area that are in proximity to surface drainage channels;<br><br>• Soil and sediment accumulation on road surfaces will be minimised as reasonably practicable by cleaning the wheels of vehicles leaving site and, where required, cleaning of the road surface. Traffic movement would be restricted to minimise the potential for surface disturbance; and<br><br>• Cable routeing to avoid water resources and flood risk receptors, and individual landowner requirements e.g. irrigation reservoirs.<br><br>An OCoCP has been submitted with this DCO application (doc ref xx), as secured under the requirements of the draft DCO. The final CoCP which will be submitted post-consent, in consultation with the relevant regulators, will be further developed upon this OCoCP. |
| Pollution Prevention | Specific measures relating to pollution prevention that will be captured within the CoCP include:<br><br>• Concrete and cement mixing and washing areas will be situated at least 10m away from the nearest watercourse. These will incorporate settlement and recirculation systems to allow water to be re-used. All washing out of equipment will be undertaken in a contained area, and all water will be collected for off-site disposal;<br><br>• All fuels, oils, lubricants and other chemicals will be stored in an impermeable bund with at least 110% of the stored capacity. Damaged containers will be removed from site. All refuelling will take place in a dedicated impermeable area, using a bunded bowser. The refuelling and fuel storage area will be located at least 10m from the nearest watercourse. Biodegradable oils will be used; |

[2] The PPGs are revoked as regulatory guidance in England, but still provide a useful guide for best practice measures.

| Parameter | Mitigation Measures Embedded into the Project Design |
|---|---|
| | • Spill kits will be available on site at all times. Sand bags or stop logs will also be available for deployment on the outlets from the site drainage system in case of emergency spillages; and<br>• Foul drainage (e.g. from construction welfare facilities) will be collected through a mains connection to an existing mains sewer (if a suitable connection is available), or collected in a septic tank located within the onshore development area and transported off site for disposal at a licensed facility. The specific approach will be determined during detailed design with consideration of the availability of mains connections and the number of working hours for site attendees. |
| Fluvial Flood Risk | All materials to be stored outside of areas at higher risk of flooding (e.g. Flood Zones 2 and 3) as far as is reasonably practicable.<br>A Flood Management Plan (FMP) will be developed as part of the CoCP that will be produced post consent, as secured under the requirements of the draft DCO. The FMP will be developed in consultation with the Environment Agency and Lead Local Flood Authority. This will include a commitment to subscribe to the Environment Agency's flood warning service. |
| **Operation** | |
| Surface Drainage | Operational surface water drainage requirements will be presented in the final LMP and will be designed to meet the requirements of the National Planning Policy Framework (NPPF) and National Policy Statement (NPS) EN-5, with runoff limited, where feasible, through the use of infiltration techniques which can be accommodated within the area of development. The drainage strategy will be developed according to the principles of the sustainable drainage system (SuDS) discharge hierarchy. Generally, the aim will be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable: i) into the ground (infiltration); ii) to a surface water body; iii) to a surface water sewer, highway drain or another drainage system; or iv) to a combined sewer. Measures to ensure that any redirected overland flow routes do not cause an increase in off-site flood risk will also be incorporated into the LMP.<br>Changes in surface water runoff as a result of the increase in impermeable area from the onshore substations and National Grid infrastructure will be attenuated and discharged at a controlled rate, in consultation with the Lead Local Flood Authority (LLFA) (Suffolk County Council) and Environment Agency. The controlled runoff rate will be equivalent to the greenfield runoff rate.<br>Following consultation and engineering design work, attenuation ponds (as part of the SuDS) will be included at the onshore substation and National Grid infrastructure to provide sufficient attenuation to enable discharge at greenfield runoff rates into the closest watercourse or sewer connection.<br>The attenuation ponds at the onshore substation will be designed to attenuate flows up to the 1:200 year event (i.e. better than the 1:100 year plus climate change allowance) and will aim to reduce the discharge rate by 20% compared with the existing runoff rate. The full specification for the |

| Parameter | Mitigation Measures Embedded into the Project Design |
|---|---|
| | attenuation ponds will be addressed post consent as part of detailed design, as secured under the requirements of the draft DCO.<br><br>The attenuation ponds at the National Grid substation will, as a minimum, be designed to attenuate flows up to the 1:100 year event plus a suitable allowance for climate change.<br><br>In addition, the Applicant retains the option to install further attenuation measures along the existing surface water flow route during the detailed design phase. The Applicant has committed to providing an additional 'surface water management SuDS basin' (currently identified as concept within ***Chapter 29 Landscape and Visual Impact Assessment***, and in the OLEMS (doc ref xx) to reduce water in-flow rates to the substation area and potentially reduce flood risk for the village of Friston, in addition to the Surface Water Drainage Strategy currently proposed. Confirmation of the size, volume and location of this additional 'surface water management SuDS basin' will follow establishment of an appropriate catchment hydraulic model and the detailed design of the onshore substation and National Grid substation. As a result, the additional attenuation and wider catchment benefit associated with this proposed additional 'surface water management SuDS basin' is not therefore incorporated within this chapter and is therefore a worst case scenario.<br><br>The site drainage system will be maintained by the site operator during the operational phase of the proposed East Anglia TWO project (until the site is decommissioned). |
| Foul Drainage | As a first preference, foul drainage at the onshore substations will be collected through a mains connection to the existing Local Authority sewer system (if a suitable connection is available) or collected in a septic tank located within the onshore development area and transported off site for disposal at a licensed facility. It is acknowledged that the use of a septic tank may not be appropriate at some locations, and that alternative options would be considered in consultation with the Environment Agency if mains collections are not achievable. |
| Pollution Prevention | A Pollution Prevention and Response Plan will be developed as part of the CoCP that will be produced post consent, as secured under the requirements of the draft DCO. Specific measures to control the supply of pollutants that will be captured within the Pollution Prevention and Response Plan include:<br><br>• All fuels, oils, lubricants and other chemicals will be stored in an impermeable bund with at least 110% of the stored capacity. Damaged containers will be removed from site. All refuelling will take place in a dedicated impermeable area, using a bunded bowser. The refuelling and fuel storage area will be located at least 10m from the nearest watercourse. Biodegradable oils will be used;<br><br>• Spill kits will be available on site at all times. Sand bags or stop logs will also be available for deployment on the outlets from the site drainage system in case of emergency; and |

| Parameter | Mitigation Measures Embedded into the Project Design |
|---|---|
| | • Foul drainage (e.g. from permanent welfare facilities) will be collected through a mains connection to an existing mains sewer (if a suitable connection is available), or collected in a septic tank located within the onshore development area and transported off site for disposal at a licensed facility. The specific approach will be determined during detailed design with consideration of the availability of mains connections and the number of working hours for site attendees. |

63. The assessment presented in the subsequent sections of this report assumes that these control measures are in place, and identifies additional measures where appropriate.

### 20.6.3 Construction Activities at the Onshore Substation and along the Onshore Cable Route

#### 20.6.3.1 Overview

64. Onshore construction activities (including site establishment, ground excavations, development of the haul road, installation of jointing bays and construction of the onshore substation and National Grid infrastructure) have the potential to impact upon the hydromorphology, physico-chemistry and biology of the following water bodies:

- Hundred River;
- Leiston Beck; and
- Alde & Ore.

65. This considers all construction activities that will take place within the water body catchments, excluding watercourse crossings which are considered separately in ***section 20.6.4***.

66. With regards to hydromorphology, there is potential for impacts on the hydrological regime and morphological conditions of the river and transitional water bodies as a result of:

- Alteration of surface water flows entering river and transitional water bodies due to changes in land use during the construction of the landfall, the onshore substation and the National Grid substation. This could impact upon the hydrology of the surface water system.
- Increased sediment supply to surface waters through erosion of exposed soils along the onshore cable corridor and within the landfall, onshore substation and National Grid substation sites by surface runoff, which could impact upon the hydromorphology of the river and transitional water bodies.

67. With regards to physico-chemistry, there is potential for impacts on the oxygenation conditions, salinity and acidification status of the river and transitional water bodies as a result of:

- Increased sediment supply to surface waters through erosion of exposed soils by surface runoff, which could impact upon surface water quality.
- Supply of contaminants to surface waters through surface runoff or accidental spillage during excavation of contaminated soils, or accidental spillage or leakage of fuel oils or lubricants from construction vehicles, which could impact upon surface water quality.

68. With regards to biology, there is potential for impacts on aquatic flora, benthic invertebrate fauna and fish fauna in the river and transitional water bodies as a result of the potential changes to hydromorphology and physico-chemistry described above. However, the proposed control measures that will be in place to reduce the potential for impacts on these quality elements will also prevent impacts to the biological quality elements.

69. The scale of the potential impact upon a water body is likely to be proportional to the area of each water body catchment that would be disturbed during construction. This is used as the basis of the assessment presented below.

#### 20.6.3.2 Potential Impacts on Water Body Status

70. Construction-stage activities will include work within the catchments of the Hundred River and Leiston Beck, and also the Friston watercourse which drains into the Alde & Ore transitional water body (although it is not a WFD water body itself). These activities will consist of:

- Earthworks which will create areas of bare ground by removing surface vegetation cover, and excavations for installation of jointing pits and cabling.
- The development of a haul road and accesses, possible HDD compounds and trenchless crossings of obstructions such as roads and mobilisation areas.
- Construction activities associated with the building of the onshore substation and National Grid infrastructure.

71. The maximum total area that could be disturbed in each water body catchment scoped into this stage of the assessment during the construction period is summarised in ***Table A20.4.15.***

**Table A20.4.15 Area of Disturbed Ground in Water Body Catchments**

| Water body | Estimated Maximum total area of disturbed ground | |
|---|---|---|
| | $m^2$ | % of catchment |
| Hundred River | 242,800 | 0.93 |
| Leiston Beck | 83,500 | 0.52 |
| Alde & Ore | 250,700 | 0.15 |

### 20.6.3.3 Control Measures

72. In addition to the embedded control measures set out in ***section 20.6.2***, the potential for impacts associated with increased supply of sediment and other contaminants will be reduced by a range of additional control measures, as set out below:

- Buffer strips will be retained adjacent to the Hundred River (and Friston Watercourse), where possible, to intercept surface runoff and any dissolved or particulate contaminants associated with it. Where surface vegetation has been removed, it will be reseeded to prevent future runoff (excluding arable crops).
- Cable installation activities will be designed in consultation with the Environment Agency, and will not affect groundwater in any significant manner. Excavations will be shallow (approximately 1.8m) and significantly above the level of the Principal Aquifer. If subsurface works are required in Source Protection Zone (SPZ1) or SPZ2, the construction methodology will stipulate that the best available techniques are used for any installations, agreed in advance with the Environment Agency. Furthermore, a hydrogeological risk assessment meeting the requirements of Groundwater Protection Principles and Practice (GP3) (Environment Agency, 2017) will be undertaken for any trenchless crossing locations in SPZ2 or SPZ3. If significant risks are identified, alternatives to cross the SPZ will be considered.

73. The potential for impacts associated with changes to surface water runoff and flood risk will be reduced by the following additional measure:

- Existing land drains along the onshore cable route and at the onshore substation will be reinstated following construction. A local specialised drainage contractor will undertake surveys to locate drains and create drawings both pre- and post-construction, and ensure appropriate reinstatement. The pre-construction drainage plan will include provisions to minimise water within the working area and ensure ongoing drainage of surrounding land.

#### 20.6.3.4 Summary of Impacts on Water Body Status

74. Following the application of the embedded and the additional control measures listed above, there will be no direct mechanisms for impact upon the hydromorphology, physico-chemistry and biology of any river or transitional water bodies as a result of the onshore construction activities, excluding the watercourse crossing.

75. This means that these construction stage activities will not result in deterioration in the status of any river water bodies or prevent WFD objectives being achieved in these water bodies in the future.

### 20.6.4 Installation of Watercourse Crossings

#### 20.6.4.1 Overview

76. The onshore cable route will need to cross the Hundred River, and therefore has the potential to directly alter the geomorphology, hydrology and physical habitat value of the watercourse.

77. The installation of the onshore cables will directly disturb the bed and banks of the watercourse, and could potentially result in the direct loss of natural geomorphological features (and associated physical habitat niches) and geomorphological instability (e.g. due to enhanced scour and increased sediment supply). However, this would be a temporary impact provided that the bed and banks are reinstated to their original level, position, planform and profile.

78. The presence of temporary dams could potentially result in reduced flow and sediment conveyance (particularly of coarse sediment), create upstream impoundment, affect patterns of erosion and sedimentation, impede river continuity, increase turbidity and potentially encourage fine sedimentation on the bed upstream. Changes to flow conditions could also result in a reduction in the dissolved oxygen concentrations supported in the watercourses upstream of the impoundment. These activities could therefore reduce the physical habitat value of the watercourse for aquatic plants, invertebrates and fish species. The temporary dams could also act as a barrier to the movement of fish and other aquatic organisms. However, these impacts are considered to be temporary (i.e. confined to the duration of construction) and would be reversed once the temporary impounding structures were removed.

79. In addition, a temporary bridge or culvert would be required to allow the haul road to cross the watercourse. The installation of this temporary structure would directly disturb the bed and banks of the watercourse and result in the direct loss of natural geomorphological features within the footprint of the structure. This impact would be reversible once temporary culverts have been removed and the bed and banks reinstated.

#### 20.6.4.2 Control Measures

80. The following additional measures would be applied to reduce the impacts associated with the trenched crossing of the Hundred River:

- In order to ensure that there are no adverse impacts resulting from the installation of temporary dams, the amount of time that temporary dams are in place would be restricted to a maximum of 10 weeks, and flumes, pipes or pumps would be adequately sized to maintain flows downstream of the obstruction whilst minimising upstream impoundment. Furthermore, a fish rescue would be undertaken in the area between the temporary dams prior to dewatering;
- The temporary bridge or culvert for the haul road would be adequately sized to avoid impounding flows. If a culvert is used, the invert level of the structure will be installed below the natural bed of the channel so that sediment transport and the movement of fish and aquatic invertebrates can be maintained;
- Cable ducts would typically be installed 2m below the bed of the watercourse, allowing the necessary water volumes and flows (sufficient to account for climate-related changes in fluvial flows and erosion). This would be dependent upon local geology and geomorphological risks (e.g. bed scour and channel instability) and avoid exposure during periods of higher energy flow where the bed could be mobilised; and
- Localised improvements to the geomorphology and in-channel habitats will be considered and agreed in advance with stakeholders where they are crossed using open cut techniques. This will include sympathetic reinstatement of banks (e.g. by replacing re-sectioned banks with more natural profiles that are typical of the natural geomorphology of the watercourse). Note that any improvements would be restricted to within the working area of the proposed East Anglia TWO project.

#### 20.6.4.3 Summary of Impacts on Water Body Status

81. Following the implementation of the embedded and additional control measures, there would be no adverse impacts upon the hydromorphology, physico-chemistry and biology of the river water body as a result of the installation of the trenched watercourse crossing of the Hundred River. This means that these construction stage activities will not result in deterioration in the status of the Hundred River water body or prevent WFD objectives being achieved in this water body in the future.

### 20.6.5 Operation and Maintenance of Permanent Onshore Infrastructure

#### 20.6.5.1 Potential Impacts on Water Body Status

82. The permanent above-ground infrastructure, including the onshore substation, National Grid substation and any new, permanent access tracks will result in permanent changes to land use. There is potential for impacts upon geomorphology, hydrology, physico-chemistry and biology quality elements within the following water bodies as a result of these permanent changes to land use along the onshore cable route, the onshore substation and National Grid infrastructure:

- The Hundred River;
- Leiston Beck; and
- Alde & Ore.

83. With regards to geomorphology and hydrology, there is potential for impacts on the hydrological regime, morphological conditions and river continuity of the river and transitional water bodies as a result of an increase in impermeable surfaces associated with the installation of jointing pits along the onshore cable route, the onshore substation and the National Grid infrastructure.

84. This can lead to corresponding decrease in local infiltration and an increase in surface runoff. There is therefore potential for changes in surface runoff as a result of the increase in impermeable areas which could be sufficient to impact on the hydrology of the surface water system and result in permanent changes to geomorphology by increasing rates of bed and bank erosion and encouraging geomorphological adjustment.

85. With regards to physico-chemistry, there is potential for impacts on the oxygenation conditions, salinity and acidification status of the river and transitional water bodies as a result of:

- Increased sediment supply to surface waters via surface runoff from operational sites, which could impact upon surface water quality; and
- Supply of contaminants to surface waters through surface runoff or accidental spillage or leakage of fuel oils or lubricants from vehicles during operational activities, which could impact upon surface water quality.

86. With regards to biology, there is potential for impacts on quality elements such as aquatic flora, benthic invertebrate fauna and fish fauna in the river and transitional water bodies as a result of the potential changes to hydrology, geomorphology and physico-chemistry described above. However, control

measures in place to prevent any impacts on these quality elements will also prevent impacts on the biological quality elements.

#### 20.6.5.2 Control Measures

87. In addition to the embedded mitigation measures to intercept site drainage from operational infrastructure, as described in ***section 20.6.2***, the potential for impacts associated with changes to surface water runoff and flood risk will be reduced by the following additional measure:

- Existing land drains along the onshore cable route and at the onshore substation and the National Grid infrastructure will be reinstated following construction (noting that they will need to be rerouted in areas which contain permanent above-ground infrastructure). A local specialised drainage contractor will undertake surveys to locate drains and create drawings both pre- and post-construction, and ensure appropriate reinstatement. The pre-construction drainage plan will include provisions to minimise water within the working area and ensure ongoing drainage of surrounding land.

#### 20.6.5.3 Summary of Impacts on Water Body Status

88. Following application of the embedded and additional control measures described above, there will be no direct mechanism for impact upon the hydromorphology, physico-chemistry and biology of any river or transitional water bodies as a result of the operation or maintenance of the proposed East Anglia TWO project.

89. This means that these operational stage activities will not result in deterioration in the status of any river or transitional water bodies or prevent WFD objectives being achieved in these water bodies in the future.

### 20.6.6 Cumulative Impacts

90. The East Anglia ONE North offshore windfarm project (the proposed East Anglia ONE North project) is also in the application phase. The proposed East Anglia ONE North project has a separate Development Consent Order (DCO) which has been submitted at the same time as the proposed East Anglia TWO project. The two projects share the same landfall location and onshore cable corridor and the two onshore substations are co-located, and connect into the same National Grid substation.

91. The assessment considers the proposed East Anglia TWO project and the proposed East Anglia ONE North project under two construction scenarios:

- Scenario 1 - the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously; and
- Scenario 2 - the proposed East Anglia TWO project and the proposed East Anglia ONE North project are constructed sequentially.

92. Impacts following scenario 1, and control measures under scenario 1, will be identical to those listed in ***section 20.6.5***.

93. Scenario 2 represents the worst case scenario in terms of impacts to water bodies.

94. As a result of the direct disturbance of the Hundred River water body under scenario 2:

- The temporary dams and culvert will be removed following construction of the proposed East Anglia TWO project, and the channel will be reinstated. A new set of temporary dams and a temporary culvert will then be installed in a similar location as part of the proposed East Anglia ONE North project.
- This is likely to occur several years after the initial period of disturbance, and the river and its associated habitats could either be still recovering or may have only recently recovered. As a result, the magnitude of the effect resulting from the proposed East Anglia TWO project and proposed East Anglia ONE North project being constructed in succession has the potential to increase.

95. However, the lack of geomorphological diversity observed in the system suggests that any impacts are likely to be highly localised impacts and insignificant. The maximum construction presence at any one time across all water bodies has been taken into account in the main assessment and any potential impacts will be fully mitigated by control measures embedded within the proposed East Anglia TWO project design or recommended to prevent further impact. These activities will not therefore result in deterioration in water body status or prevent status objectives being achieved in the future. This means that there will be no mechanism for further cumulative impacts to occur in the river water bodies scoped in to the assessment for either scenario 1 or scenario 2.

## 20.7 Stage 4: Summary of Assessment and Requirement for Control Measures

### 20.7.1 Purpose of this Section

96. This section summarises the results of the compliance assessment, detailing the activities screened out and those assessed in detail. A description of the proposed control measures that are required to address any impacts, and prevent

deterioration in status or failure to meet WFD objectives set for the relevant water bodies is then detailed.

### 20.7.2 Summary of Assessment

97. The results of the WFD compliance assessment process outlined in this report is provided in ***Table A20.4.16****Error! Reference source not found.*

**Table A20.4.16 Summary of WFD Compliance Assessment**

| Water body | Stage 2 | Stage 3 | Deterioration in status? | Prevent objectives being achieved? | Compliant with WFD? |
|---|---|---|---|---|---|
| **Rivers** | | | | | |
| The Hundred River (GB105035046260) | ✓ | ✓ | No | No | Yes |
| Leiston Beck (GB105035046271) | ✓ | ✓ | No | No | Yes |
| Minsmere Old River (GB105035046270) | ✓ | × | No | No | Yes |
| Alde – Ore Downstream Confluence (GB105035045950) | ✓ | × | No | No | Yes |
| Fromus (GB105035045980) | ✓ | × | No | No | Yes |
| **Transitional** | | | | | |
| Alde & Ore (GB520503503800) | ✓ | ✓ | No | No | Yes |
| **Coastal** | | | | | |
| Suffolk (GB650503520002) | ✓ | × | No | No | Yes |
| **Groundwater** | | | | | |
| Waveney and East Suffolk Chalk and Crag (GB40501G00600) | ✓ | × | No | No | Yes |

98. This demonstrates that, following the control measures summarised in ***sections 20.6.2, 20.6.3, 20.6.4*** and ***20.6.5***, there will be no non-temporary impacts on the status of any river or transitional water bodies that are sufficient to result in deterioration in status of these water bodies, all of which are currently of moderate status. Furthermore, the proposed East Anglia TWO project will not prevent water body status from being achieved in the future. The proposed East Anglia TWO project is therefore considered to be compliant with the requirements of the WFD.

### 20.7.3 Summary of Control Measures

99. The embedded control measures that will be implemented as part of the proposed East Anglia TWO project to avoid or reduce impacts and prevent deterioration in status or failure to meet WFD objectives are presented in *Error! Reference source not found.* in ***section 20.6.2***. In addition to these embedded control measures, a range of further control measures are outlined in ***sections 20.6.3, 20.6.4*** and ***20.6.5*** that are specific to particular construction and operation activities. All measures required to manage impacts associated with potential changes to surface runoff, sediment supply and the supply of contaminants will be within the CoCP as secured under the requirements of the draft DCO.

100. The control measures will, when implemented, prevent adverse impacts on WFD objectives and ensure that the proposed East Anglia TWO project is compliant with the requirements of the WFD.

### 20.7.4 Summary of Improvements

101. The scope to deliver measures that could improve the status of the water bodies in which the proposed East Anglia TWO project will be located is limited to within the confines of the onshore development area. It may be possible to deliver localised improvements to the geomorphology and in-channel habitats supported by the watercourse (the Hundred River) that would be crossed using open cut techniques, through sympathetic reinstatement of banks (e.g. by replacing re-sectioned banks with more natural profiles that are typical of the natural geomorphology of the watercourse). These enhancements could locally improve the hydromorphology of the Hundred River and could potentially contribute towards an improvement in water body status.

## 20.8 References

Bathing Waters Directive, (2006/44/EC).

Defra and Environment Agency, (2009) Flood and Coastal Erosion Risk Management R&D Programme expert assessment framework.

EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC).

EC Directive on the Conservation of Wild Birds, (2009/147/EC).

EC Environmental Quality Standards Directive, (2008/105/EC).

Environment Agency, (2016a) Water Framework Directive risk assessment: How to assess the risk of your activity.

Environment Agency, (2016b) Protecting and improving the water environment: Water Framework Directive compliance of physical works in rivers (Position Statement 488_10, version 2).

Environment Agency, (2016c) Internal Environment Agency guidance on WFD deterioration and risk to the status objectives of river water bodies (Document reference 488_10_SD06).

Environment Agency, (2017) Groundwater Protection Principles and Practice.

Environment Agency, (2018) Catchment Data Explorer (08/08/2018 update), [Online], Available: http://environment.data.gov.uk/catchment-planning/ Accessed [03 August 2018].

Planning Inspectorate, (2017) Advice Note 18: The Water Framework Directive.

The Water Framework Directive (Standards and Classification) Directions (England and Wales, (2015).

UKTAG, (2003) Guidance on Morphological Alterations and the Pressures and Impacts Analyses.

UKTAG, (2011) Defining & Reporting on Groundwater Bodies.

UKTAG, (2012a) Paper 11b(i) Groundwater Chemical Classification March 2012, [Online], Available: https://www.wfduk.org/resources%20/paper-11bi-groundwater-chemical-classification-march-2012 Accessed [30 July 2018].

UKTAG, (2012b) Paper 11b(ii) Groundwater Quantitative Classification March 2012, [Online], Available: at: https://www.wfduk.org/resources%20/paper-11bii-groundwater-quantitative-classification-march-2012 Accessed [31 July 2018].

Water Environment (Water Framework Directive) (England and Wales) Regulations, (2017).

# Annex 1: Scoping Tables

# Scoping Questions for River Water Bodies

| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| **Biology** | | | |
| Aquatic flora | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic plants? | Yes | Further assessment required |
| | | No | No further action |
| Benthic invertebrates | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of habitats for aquatic invertebrates? | Yes | Further assessment required |
| | | No | No further action |
| Fish | Could the activity change the hydromorphology and/or physico-chemistry of the water body, or lead to the direct loss or modification of shelter, feeding and spawning habitats for fish? | Yes | Further assessment required |
| | | No | No further action |
| **Hydromorphology** | | | |
| Hydrological regime | Could the activity change the volume, energy or distribution of flows in the water body? | Yes | Further assessment required |
| | | No | No further action |
| Morphological conditions | Could the activity change the width, depth, bank conditions, bed substrates and structure of the riparian zone? | Yes | Further assessment required |
| | | No | No further action |
| River continuity | Could the activity create a permanent barrier to the downstream movement of water and/or sediment, or the upstream movement of fish? | Yes | Further assessment required |
| | | No | No further action |
| **Physico-chemistry** | | | |
| General | Could the activity change the temperature, pH, oxygenation, salinity or nutrient concentrations in the water body? | Yes | Further assessment required |
| | | No | No further action |

| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| Specific pollutants | Could the activity release dangerous chemicals into the water body? | Yes | Further assessment required |
| | | No | No further action |
| **Protected Areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area? | Yes | Further assessment required |
| | | No | No further action. |
| **Improvement measures and mitigation measures** | | | |
| Improvement measures (non-A/HMWBs) | Is the activity likely to impact on one of the improvement measures in place? | Yes | Further assessment required |
| | | No | No further action |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement measures that is not yet in place? | Yes | Further assessment required |
| | | No | No further action |
| Mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the mitigation measures in place? | Yes | Further assessment required |
| | | No | No further action |
| | Is the activity likely to prevent the delivery or effectiveness of one of the mitigation measures that is not yet in place? | Yes | Further assessment required |
| | | No | No further action |

## Scoping Questions for Transitional and Coastal Water Bodies

| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| **Biology** | | | |
| Fish (transitional water bodies) | Will the activity present a barrier to fish movement, risk or entrainment, risk to health and/or impact on a spawning area? | Yes | Further assessment required |
| | | No | No further action |
| Fish (coastal water bodies) | Will the activity impinge the movement of estuarine fish, or place them at risk of entrainment? | Yes | Further assessment required |
| | | No | No further action |
| Phytoplankton | Will the activity change water temperature, salinity, transparency, microbial concentrations, dissolved oxygen concentrations and/or nutrient levels of the water body for greater than 14 days or in a water body •with a phytoplankton status of moderate, poor or bad? | Yes | Further assessment required |
| | | No | No further action |
| | Is the activity in a water body with a history of significant and persistent algal blooms or toxic algal b looms? | Yes | Further assessment required |
| | | No | No further action |
| Flora / fauna / angiosperms / benthic invertebrates | Which type of habitat is likely to be impacted and what percentage of the habitat is impacted within the water body? | Further assessment will be required if the footprint of the activity is either:<br>0.5km$^2$ or larger.<br>Covers 1% or more of the total water body area.<br>Within 500m of any higher sensitivity habitat. | |

| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| | | Covers 1% of lower sensitivity habitats in the water body.<br>For dredging calculate the footprint to be assessed above as 1.5 times the actual area to be dredged.<br>No further action will be required if the above criteria are not met (i.e. the activity footprint is below the thresholds outlined above). | |
| **Hydromorphology** | | | |
| Hydromorphology | Is the water body high status/is the water body heavily modified for the same reason/use as the proposed project? | Yes | Further assessment required |
| | | No | No further action. |
| | Will the activity have a significant impact on the hydromorphology of any other water body not at high status? | Yes | Further assessment required |
| | | No | No further action |
| **Physico-chemistry** | | | |
| Chemistry | Is the activity potentially releasing dangerous chemicals from surfaces, sediments and/or outfalls into the water body? | Yes | Further assessment required |
| | | No | No further action. |
| | Is the activity taking place in an area with limited water exchange (with the potential to cause thermal changes or change dilution factors)? | Yes | Further assessment required |
| | | No | No further action. |

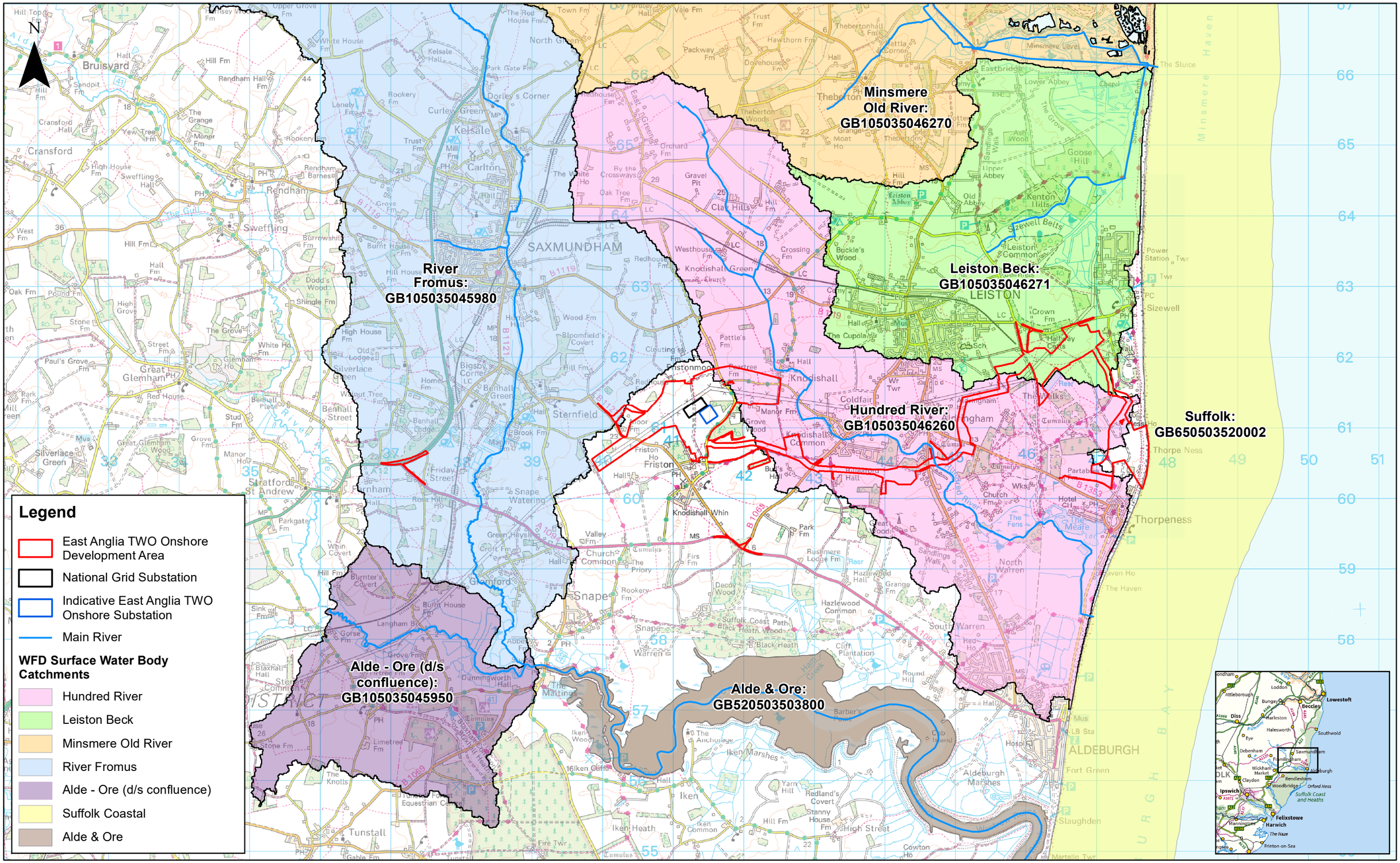
| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| **Protection Areas** | | | |
| Protected Areas | Is the activity within 2km of a protected area | Yes | Further assessment required |
| | | No | No further action. |
| **Improvement measures and mitigation measures** | | | |
| Improvement measures (non-A/HMWBs) | Is the activity likely to impact on one of the improvement measures in place? | Yes | Further assessment required |
| | | No | No further action |
| | Is the activity likely to prevent the delivery or effectiveness of one of the improvement measures that is not yet in place? | Yes | Further assessment required |
| | | No | No further action |
| Mitigation measures (A/HMWBs) | Is the activity likely to impact on one of the mitigation measures in place? | Yes | Further assessment required |
| | | No | No further action |
| | Is the activity likely to prevent the delivery or effectiveness of one of the mitigation measures that is not yet in place? | Yes | Further assessment required |
| | | No | No further action |

## Scoping Questions for Groundwater Bodies

| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| Groundwater quantity | Will the activity change groundwater levels affecting Groundwater Dependent Terrestrial Ecosystems (GWDTEs) or dependent surface water features | Yes | Further assessment required |
| | | No | No further action |
| | Will the activity (comprising abstraction) lead to saline intrusion? | Yes | Further assessment required |
| | | No | No further action |
| | Will the level of proposed groundwater abstraction (dewatering) exceed recharge at a water body scale? | Yes | Further assessment required |
| | | No | No further action |
| | Will the activity lead to an additional surface water body that will become non-compliant and lead to failure of the Dependent Surface Water test? | Yes | Further assessment required |
| | | No | No further action |
| | Will the activity result in additional abstraction that will exceed any groundwater body scale headroom between the Fully licensed quantity and the limit imposed by the total recharge? | Yes | Further assessment required |
| | | No | No further action |
| | Will the activity result in additional groundwater depletion of surface water flows that will exceed any groundwater body scale headroom between Fully Licensed depletion and the Limit imposed by the total low flows resource? | Yes | Further assessment required |
| | | No | No further action |
| Groundwater quality | Will the activities have the potential to result in or exacerbate widespread diffuse pollution at a water body scale? | Yes | Further assessment required |
| | | No | No further action. |
| | | Yes | Further assessment required |

| Parameter | Scoping question | Answer | Notes |
|---|---|---|---|
| | Will the activities have the potential to result in pollution of groundwater dependent terrestrial ecosystems (GWDTEs) or other dependent surface water features? | No | No further action. |
| | Will abstraction (dewatering) lead to saline intrusion? | Yes | Further assessment required |
| | | No | No further action. |
| | Will the activities have the potential to cause deterioration in the quality of a drinking water abstraction? | Yes | Further assessment required |
| | | No | No further action. |
| | Will the activities have the potential to result in increasing trends in pollutant concentrations or reduce the ability of the water body being able to reverse significant trends in groundwater pollutants? | Yes | Further assessment required |
| | | No | No further action. |
| | Will the activities result in the failure of the 'prevent or limit' objective of the Groundwater Daughter Directive? | Yes | Further assessment required |
| | | No | No further action. |

## Annex 2: Supporting Figures

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| 4 | 02/09/2019 | FC | Fourth Issue. | | |
| 3 | 26/07/2019 | FC | Third Issue. | Prepared: | FC |
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1:50,000 Scale @ A3

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# East Anglia TWO

WFD Surface Water Bodies

| | |
|---|---|
| Drg No | EA2-DEV-DRG-IBR-000707 |
| Rev | 4 |
| Date | 02/09/19 |
| Figure | 20.4.1 |

Coordinate System: BNG Datum: OSGB36

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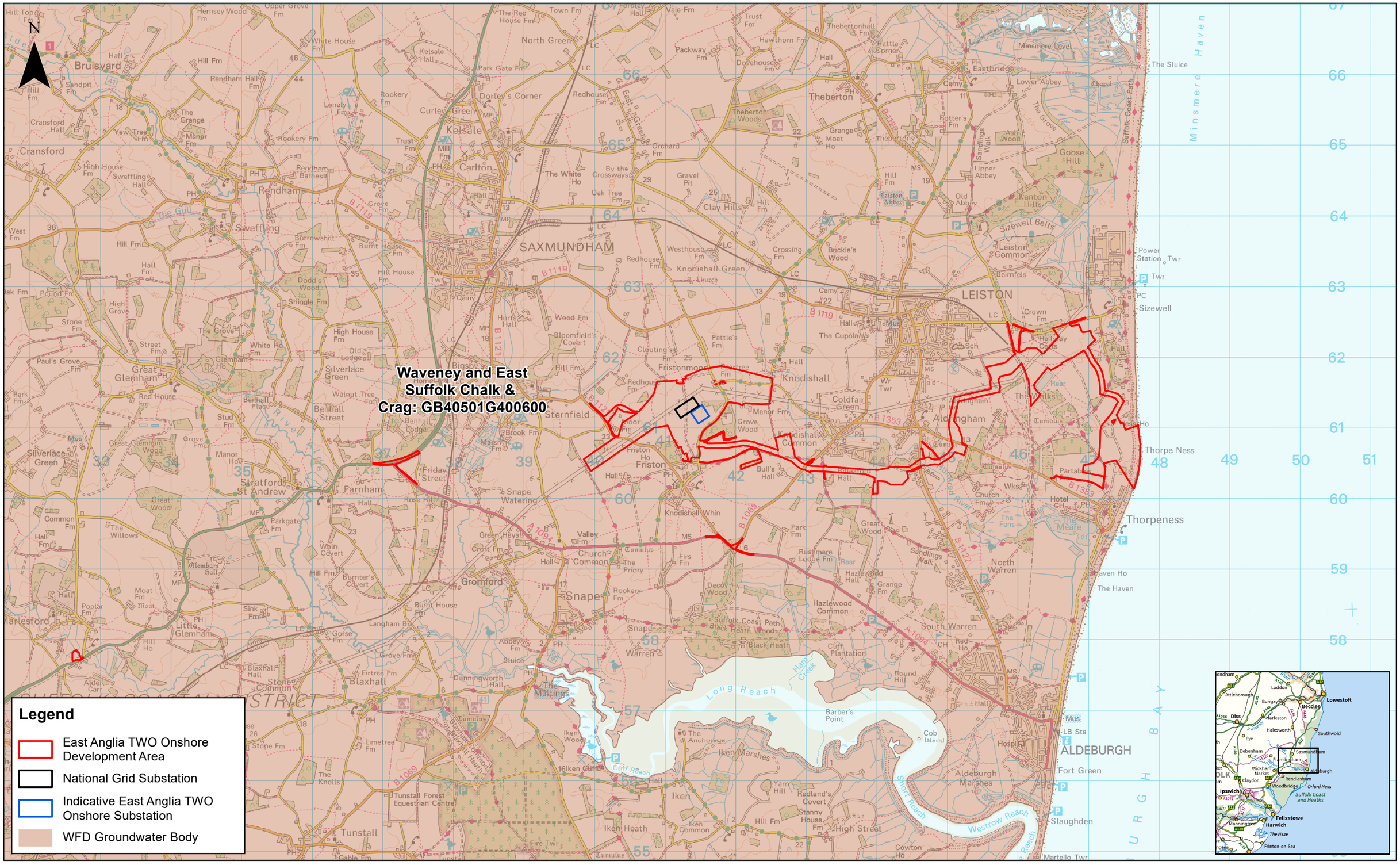


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# East Anglia TWO

## WFD Groundwater Bodies

| | |
|---|---|
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| Rev | 3 |
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| Figure | 20.4.2 |

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