Preliminary Environmental Information Report Volume 2

Appendix 12.2 Water Environment Regulations (WER) Compliance Assessment

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Contents

1 Introduction

1.1 Purpose of this report

1.1.1 This report presents a Preliminary Water Environment Regulations (WER) Compliance Assessment (also referred to as a Water Framework Directive (WFD) Compliance Assessment) for the Great Britain onshore components of LionLink (the 'Proposed Onshore Scheme') the boundary of which comprises the components described in **Chapter 2 Description of the Proposed Scheme** of this Preliminary Environmental Information Report (PEIR). This report forms an appendix to **Chapter 12 Hydrology, Hydrogeology and Drainage** of the PEIR, published by the Applicant as part of statutory consultation.

1.1.2 This report presents an assessment of the potential impact of the Proposed Onshore Scheme on WER objectives for onshore surface water bodies and groundwater bodies. Potential scheme impacts on transitional and coastal (TraC) water bodies from offshore components of the Proposed Offshore Scheme are detailed in **Chapter 18 Marine Physical Environment** and **Appendix 18.2 Proposed Offshore Scheme Water Framework Directive Assessment**. This report provides a summary of the Proposed Onshore Scheme, the assessment methodology and the results of the preliminary assessment. The assessment has been undertaken in accordance with relevant WER legislative context and guidance (as described in **Section 1.2** and **Annex A: WER background information – water body status determination and compliance assessment**) and has involved a desk-based study using the latest available Environment Agency baseline information and datasets. The assessment is based on the currently available design information for the Proposed Onshore Scheme.

1.1.3 The assessment is preliminary and will be updated to final as part of the Environmental Statement to be submitted with the application for development consent.

1.2 Legislative context

1.2.1 The European Union (EU) Water Framework Directive (WFD) has been in force since 2000 and is currently the largest and most influential piece of EU legislation relating to the water environment. The Directive was transposed into UK law by The Water Environment (WFD) (England and Wales) Regulations 2017 (WER) (Ref 1). As of 31 December 2020, the WER became retained EU law, and the references in the WER to the WFD refer to the version of the Directive that was in force at the time when the WER came into force (10 April 2017). The WER therefore currently mirror the EU Directive but now form the principal legal basis. In this report, "WFD" is used throughout in reference to the WER applicable to England and Wales, not the EU Directive.

1.2.2 The WER aims to protect and enhance the quality of the water environment across all EU Member States. It takes a holistic approach to the sustainable management of water by considering the interactions between surface water, groundwater and water-dependent ecosystems.

1.2.3 Under the WER, 'water bodies' are the basic management units and are defined as all or part of a river system or aquifer. These water bodies form part of a larger River Basin District (RBD), for which River Basin Management Plans (RBMPs) are developed by EU Member States and environmental objectives are set. These RBMPs are produced every six years, in accordance with the river basin management planning cycle.

1.2.4 The statutory objective of the WER is to prevent deterioration of all designated water bodies at good or high status or potential and to prevent water bodies at less than good status or potential from deteriorating further. A series of objectives for maintaining or improving conditions so that water bodies reach and/or maintain 'good status or potential' have also been set out. These overall Environmental Objectives are to:

a. prevent the deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
b. aim to achieve at least 'Good' ecological status or potential and 'Good' surface water chemical status for all water bodies by 22nd December 2021. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve Good status or potential by 2027;
c. meet the requirements of WER Protected Areas;
d. promote sustainable use of water as a natural resource;
e. conserve habitats and species that depend directly on water;
f. progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
g. progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
h. contribute to mitigating the effects of floods and droughts.

1.2.5 All activities with the potential to impact upon the water environment now need to be guided by the requirements of the WER. In England, the Environment Agency is the competent authority for implementing the WER, although many objectives will be delivered in partnership with other relevant public bodies and private organisations (for example, local planning authorities, water companies, Rivers Trusts, large private landowners and developers). As part of its regulatory role and statutory consultee on planning applications and environmental permitting (under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (Ref 2), the Environment Agency must consider whether proposals for new developments have the potential to influence WFD status by:

a. causing a deterioration of a water body from its current status or potential; and/or

b. preventing the future attainment of a water body's status or potential objectives where not already achieved.

1.2.6 In determining whether a development is compliant or non-compliant with the WER objectives for a water body, the Environment Agency must also consider the conservation objectives of any relevant WFD Protected Areas (areas within the water body catchments requiring special protection because of their sensitivity to pollution or due to their particular economic, social, or environmental importance; as defined by previous EU Directives).

2 Assessment methodology

2.1 Scope of the assessment

2.1.1 WER compliance assessments comprise a stepped process undertaken in parallel with the design development for a Proposed Onshore Scheme. This includes the following key steps:

a. screening assessment;
b. scoping assessment;
c. detailed impact assessment (where deemed to be required); and
d. the application of Regulation 19 derogation assessments (where deemed to be required).

2.1.2 These key steps are described in **Annex A: WER background information – water body status determination and compliance assessment** of this report.

2.1.3 A preliminary assessment has been undertaken at this stage. The assessment will be reviewed and updated as necessary, in consultation with the Environment Agency, as part of the subsequent Environmental Statement.

2.1.4 Baseline walkover surveys were undertaken in April and May 2024 to support the assessment (see **Section 2.3, Annex C: Survey data**).

2.1.5 The spatial scope of the assessment includes all WFD surface water and groundwater bodies potentially affected by the Proposed Onshore Scheme. The study area therefore comprises the Draft Order Limits and a 500m buffer. This considers the potential impacts of the Proposed Onshore Scheme on all the relevant quality elements associated with the surface water and groundwater bodies affected, at the water body scale.

2.1.6 The assessment focuses primarily on the permanent impacts of the Proposed Onshore Scheme from onshore scheme components. Temporary impacts are not considered to result in deterioration in water body status and so have not been considered within the assessment in accordance with current guidance (Ref 3). In this sense, impacts are considered to be temporary with no risk of deterioration of the status if the water body:

a. is only impacted for a short time period;
b. is likely to recover within a short time period; and
c. is likely to recover without the need for any restoration measures.

2.1.7 Potential impacts of the Proposed Scheme on transitional and coastal water bodies from offshore scheme components are detailed in **Chapter 18 Marine Physical Environment** and **Appendix 18.2 Proposed Offshore Scheme Water Framework Directive Assessment.**

2.2 Baseline data sources

2.2.1 The following Environment Agency datasets and resources are readily available online and have been collated to support this assessment:

a. Environment Agency, "Cycle 3 River Basin Management Plan (RBMP), Anglian River Basin Management Plan", 2022 (Ref 4);
b. Anglian Cycle 3 RBMP 2022 and 2019 water body status classification and status objectives data (taken from the Environment Agency's Catchment Data Explorer website (Ref 5));
c. WFD Protected Area data (taken from the Environment Agency's Catchment Data Explorer website (Ref 5));
d. Freshwater biological survey datasets for invertebrates, macrophytes and diatoms, including monitoring site locations, dates and results (taken from the taken from the Environment Agency's BIOSYS dataset on the Environment Agency's Ecology and Fish Data Explorer (Ref 6));
e. Freshwater fish survey data collated from fisheries monitoring work, including monitoring site locations, dates and fish species count results (taken from the Environment Agency's National Fish Populations Database (NFPD) on the Environment Agency's Ecology and Fish Data Explorer (Ref 6)); and
f. Water quality monitoring datasets, including monitoring site locations, dates and results (taken from the Environment Agency's water quality data archive (Ref 7)).

2.2.2 A data request was submitted to the Environment Agency on 03 April 2025 to request relevant information which is not publicly available. Where provided, this data is detailed in **Annex B: Water body baseline data** and includes information such as summary of investigations, reasons for failure and high-level water body level measure actions. The following additional, key sources of data have also been used to inform this assessment:

a. Ordnance Survey mapping (Ref 8);
b. Satellite imagery (Ref 9);
c. British Geological Society (BGS) Geo Index viewer (Ref 10); and
d. MAGIC Map (Ref 8).

2.3 Field surveys

2.3.1 A suite of reconnaissance walkover surveys was undertaken in April and May 2024 of the watercourses crossed by the route of the proposed Underground Cable Corridor. The aim of these surveys was to establish the baseline hydromorphological condition and aquatic habitat potential of the watercourses, to inform receptor valuation and screening, and to feed into the design development process.

2.3.2 The field surveys were led by an experienced fluvial geomorphologist and water environment engineer. These surveys are observations, recording photographs and reach-scale observations of parameters such as morphological processes and features, flow type, structures and riparian vegetation.

2.3.3 Summary results and photographs from the surveys are provided in **Annex C: Survey data**.

2.3.4 Other environmental surveys were undertaken to support the wider PEIR and are of relevance to this report, including:

a. Modular River Physical (MoRPh) surveys (**Chapter 8 Ecology and Biodiversity, Appendix 8.4 Baseline Report – River Condition Assessment Survey**); and
b. eDNA surveys (**Chapter 8 Ecology and Biodiversity, Appendix 8.5 Baseline Report – eDNA Survey**).

2.4 Other relevant reports

2.4.1 This assessment should be read in conjunction with the following PEIR documents available at statutory consultation, which have been used to inform this assessment:

a. **Chapter 2 Description of the Proposed Scheme**;
b. **Chapter 8 Ecology and Biodiversity**;
   i. **Appendix 8.4 Baseline Report – River Condition Assessment Survey;**
   ii. **Appendix 8.5 Baseline Report – eDNA Survey;**
c. **Chapter 12 Hydrology, Hydrogeology and Drainage**;
   i. **Appendix 12.1 Flood Risk Assessment;**
   ii. **Appendix 12.3 Hydrogeological Impact Assessment;**
   iii. **Appendix 12.4 Water Cycle Study;**
d. Drainage reports;
   i. Summary Report: Converter Station Site 3 (0004648-BHK-XX-CS-RP-C-0001);
   ii. Summary Report: Kiln Lane Substation (LLK1-BRH-REP-CVD-000021);
e. **Chapter 18 Marine Physical Environment**; and
   i. **Appendix 18.2 Proposed Offshore Scheme Water Framework Directive Assessment.**

2.5 Watercourse receptor valuation

2.5.1 Activities associated with the Proposed Onshore Scheme have the potential to affect a number of watercourse receptors. The watercourses present within each WFD water body catchment that have the potential to be affected by the Proposed Onshore Scheme have therefore been identified, assessed and assigned a receptor value using desk-top information and professional judgement. The criteria use to classify watercourse receptor value is summarised in **Table 2.1**.

Table 2.1: Watercourse receptor values and criteria

Receptor value	Criteria
Very High	• Main River. • Part of main WFD river water body extent. • Within or in close hydraulic connectivity with a statutory designated site (e.g. Site of Special Scientific Interest (SSSI) or Special Area of Conservation (SAC)). • Permanent baseflow. Definable flow types. • Evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars). • Supports freshwater fish, macroinvertebrate and/or macrophyte communities. Subject to Environment Agency freshwater monitoring regime. • Channel may be subject to physical modifications (e.g. historically straightened or reprofiled). • Riparian zone typically exhibits some structural diversity. May be impacted or heavily modified by adjacent land uses (e.g. agricultural) and/or vegetation maintenance.
High	• Main River or significant Ordinary watercourse. • Part of main WFD water body extent. • Permanent baseflow. Definable flow types. • Evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars). • Supports freshwater fish, macroinvertebrate and/or macrophyte communities. Typically to Environment Agency freshwater monitoring regime. • Channel may be subject to physical modifications (e.g. historically straightened or reprofiled). • Riparian zone may be impacted or heavily modified by adjacent land uses (e.g. agricultural) and/or regular vegetation maintenance.
Moderate	• Ordinary watercourse. • Tributary of main WFD water body. • Some limited baseflow. Generally shallow flows with limited hydraulic diversity. • Some limited evidence of active fluvial geomorphological processes and features (e.g. fluvial bank erosion and bars). • Potential to support some freshwater fish, macroinvertebrate and/or macrophyte communities (but typically low diversity and/or abundance). Generally, not subject to Environment Agency freshwater monitoring regime. • Channel may be subject to physical modifications (e.g. historically straightened or reprofiled). • Riparian zone may be impacted or heavily modified by adjacent land uses (e.g. agricultural) and/or regular vegetation maintenance.
Low	• Ordinary watercourse. • Minor tributary (within WFD water body catchment). Typically comprising artificially created drainage ditch or small and/or ephemeral channel. • Little or no baseflow. Largely very shallow and/or ponded flows under normal conditions, with potential to dry-out during periods of dry weather.

Receptor value	Criteria
	• Little evidence of active fluvial geomorphological processes and features (such as, fluvial bank erosion and bars). • Little or no potential to support freshwater fish, macroinvertebrate and/or macrophyte communities. Not subject to Environment Agency freshwater monitoring. • Riparian zone typically impacted or heavily modified by adjacent land uses (such as, agricultural).

3 Existing site

3.1 Site location

3.1.1 The Draft Order Limits of the Proposed Onshore Scheme are located in the county of Suffolk. The Draft Order Limits are located between the towns of Friston to the south and Walberswick to the north, as shown in **Figure 1.2** of the PEIR. **Chapter 2 Description of the Proposed Scheme** provides further information on the Draft Order Limits.

3.2 Land use

3.2.1 The existing land use is predominantly arable farmland with some highways including the A12 and multiple B-roads. The Applicant is aware that the railway line which passes through Leiston is being extended for the Sizewell Nuclear Power Station. There are also several towns and villages located within or in proximity to the study area.

3.3 Existing topography

3.3.1 The Draft Order Limits have an undulating topography which varies by approximately 30m across the area. There are topographic highs of 20-30 metres above Ordnance Datum (mAOD) in Zone C2 (see **Figure 2.1 Zoning Plan** of this PEIR) near Darsham, and a low of 0mAOD at the coast.

3.4 Watercourses

3.4.1 There are 13 watercourses within the Draft Order Limits that are potentially impacted by the Proposed Onshore Scheme, as shown on **Figure 12.8** of the PEIR (see **Table 3.1**). Two sections of the Dunwich River watercourse and designated Main River but are not located within a WFD water body.

Table 3.1: Watercourses potentially impacted by the Proposed Onshore Scheme

WFD water body catchment	Watercourse name	Designation
Fromus	Unnamed Tributary of the River Fromus 1	Ordinary Watercourse
	River Fromus	Main River
Hundred River	Unnamed Tributary of the Hundred River 1	Main River
	Unnamed Tributary of the Hundred River 2	Part Ordinary Watercourse, part Main River
	Hundred River	Main River

WFD water body catchment	Watercourse name	Designation
Minsmere Old River	Minsmere Old River	Main River
	Unnamed Tributary of the Minsmere Old River 1	Main River
	Unnamed Tributary of the Minsmere Old River 2	Ordinary Watercourse
	Unnamed Tributary of the Minsmere Old River 3	Ordinary Watercourse
	Unnamed Tributary of the Minsmere Old River 4	Ordinary Watercourse
	Unnamed Tributary of the Minsmere Old River 5	Main River
Not within a WFD water body	Dunwich River	Main River
	Dunwich River (tidal)	Main River

3.5 Geology

3.5.1 The BGS 1:50,000 scale mapping (Ref 10) indicates the bedrock geology is sand, gravel, silt and clay Crag in the entire corridor (**Figure 9.3** of the PEIR). Bedrock age is typically 5.3 - 0Ma. The superficial geology in the study area consists of tidal flat deposits in tidal regions, chalky till, and localised accumulations of sand and gravel; head alluvium (clay, silt, sand and gravel); and peat deposits (**Figure 9.2** of the PEIR).

4 Proposed Scheme

4.1 Overview

4.1.1 LionLink is a proposed electricity interconnector between Great Britain and the Netherlands that will supply up to 2.0 gigawatts (GW) of electricity and will connect to Dutch offshore wind via an offshore converter platform in Dutch waters (hereafter the 'Project'). The Project will play an important role in reducing the UK's reliance on fossil fuels and supporting the UK government's objectives to create a secure, reliable, and affordable energy supply for UK households.

4.1.2 The Proposed Scheme consists of:

a. Kiln Lane Substation;
b. proposed Underground High Voltage Alternating Current (HVAC) Cable Corridor between the proposed Converter Station in Suffolk and Kiln Lane Substation;
c. proposed Converter Station in Suffolk, east of Saxmundham;
d. proposed Underground High Voltage Direct Current (HVDC) Cable Corridor between the proposed Converter Station in Suffolk, and a proposed Landfall Site at Walberswick; and
e. proposed Offshore HVDC Cable Corridor from the proposed Landfall Site at the UK coast to the edge of the UK Exclusive Economic Zone (EEZ).

4.1.3 **Chapter 2 Description of the Proposed Scheme** of the PEIR provides detailed information regarding the Proposed Scheme. A summary of the key components of the Proposed Onshore Scheme is provided below.

4.1.4 **Kiln Lane Substation:** Kiln Lane Substation is located at the southern extent of the Draft Order Limits, to the north of Friston. It is the proposed connection point for the Project to the British NETS. There are two scenarios for the construction delivery of Kiln Lane Substation as part of the Proposed Onshore Scheme, as described in **Chapter 2 Description of the Proposed Scheme**. One is that minor upgrades to Kiln Lane Substation are delivered through the Proposed Onshore Scheme, because main works to Kiln Lane Substation are delivered through a third-party project which has already received a development consent. The Full Build of Kiln Lane Substation Scenario is assumed as the 'worst-case' scenario for this assessment, as it encompasses a larger footprint including overhead line connections over the Hundred River.

4.1.5 **Proposed Underground HVAC Cable Corridor:** The proposed Underground HVAC Cables will take electricity between Kiln Lane Substation north of Friston and the proposed Converter Station east of Saxmundham. Two routes (Northern and Southern) are possible. Both the Southern Route and the Northern Route options will cross the Unnamed Tributary of the River Fromus 1, though the crossing points will be at different locations. Both Route options for the underground HVAC Cable Corridor have been considered for this assessment.

For the HVAC Cable Southern Route Option, the HVAC Cable Route LionLink Infrastructure and ducting for Sea Link Scenario has been assessed as the worst case.

4.1.6 **Proposed Converter Station:** The proposed Converter Station is to be located east of Saxmundham, within the south-west of the Draft Order Limits. The construction of the proposed Converter Station includes a new permanent bridge crossing the River Fromus.

4.1.7 **Proposed Underground HVDC Cable Corridor:** The proposed Underground HVDC Cables will take electricity between the proposed Converter Station east of Saxmundham, and the proposed Landfall Site. Two routes (Eastern and Western) are possible in Section B3-B4. Both routes would cross the same watercourses. The Western route would include a mixture of open cut trench and trenchless crossings, and the Eastern route would only have open cut trench crossings. Both Route options for the proposed Underground HVDC Cable Corridor have been considered for this assessment.

4.1.8 **Proposed Landfall Site:** The proposed Offshore HVDC Cable Corridor will land onshore at the proposed Landfall Site, at the north-east extent of the Draft Order Limits.

4.1.9 **Proposed Offshore HVDC Cable Corridor:** This aspect of the Proposed Onshore Scheme is not covered by the scope of this assessment. However, these proposed Underground Cables will connect to the proposed Underground HVDC Cable Corridor via a joint bay at the proposed Landfall Site.

4.2 Design mitigation and assumptions

4.2.1 Embedded mitigation has been included within the design of the Proposed Onshore Scheme that will be secured through the application for development consent. Those relevant to this assessment include:

a. Trenchless crossings are proposed for the majority of watercourses to minimise impacts. These include receptors with a value of moderate or above.
b. Open trench cutting methods are solely undertaken on receptors with a value of low.
c. The new road crossing over the River Fromus will be clear span, with abutments setback from the bank top.
d. Drainage infrastructure required for the Proposed Onshore Scheme will follow Sustainable Drainage Systems (SuDS) principles where possible, or will discharge to the surface water system at an attenuated rate.

4.2.2 The following assumptions have been adopted for this assessment:

a. If other components of the Proposed Onshore Scheme are required within proximity to the river corridor, these are setback at least 8m from the bank top.
b. Where ground excavations are required, these will be shallow foundations. Piled foundations may be required for structures with a high structural load.

c. Suitable site drainage to control surface water runoff will be implemented, such as for the proposed Converter Station, Kiln Lane Substation and new roads.
d. No above ground link boxes along the proposed Underground HVDC Cable Corridor.

4.3 Construction mitigation measures

Overview

4.3.1 An Outline Onshore Code of Construction Practice (CoCP) has been prepared and describes comprehensive control measures and standards proposed to be implemented throughout the construction of the Proposed Onshore Scheme (see **Appendix 2.1 Outline Onshore Code of Construction Practice**).

4.3.2 The Outline Onshore CoCP will be updated for submission as part of the ES, however it will remain as 'draft' as it is likely to be considered further and amended with a final draft agreed during the examination process. The Final Onshore CoCP will be developed substantially in accordance with the Outline Onshore CoCP and submitted for approval by relevant local planning authorities prior to commencement of construction at stage one.

4.3.3 The Outline Onshore CoCP includes measures to avoid and minimise impacts to the water environment during construction of the Proposed Onshore Scheme, in alignment with Environment Agency guidance and best practice. This includes reference to the environmental good practice advice in the Pollution Prevention Guidelines (PPG), together with the replacement guidance series, Guidance for Pollution Prevention (GPP). Whilst PPGs and GPPs do not provide regulatory guidance in England, they form environmental good practice guidance for the whole UK. Key aspects are summarised in the following sections.

Pollution control

4.3.4 Best practice will be adopted in line with GPP 5 (Ref 11) to minimise the risk of silt pollution to nearby watercourses during construction activities. This will involve the identification of potential sources and pathways, and the application of appropriate measures, where necessary, to avoid or control silt runoff. For example, this may include:

a. seeding or covering exposed ground and sediment stockpiles;
b. only removing vegetation from areas that need to be exposed in the near future;
c. minimising the amount of time soil stockpiles are exposed for;
d. all plant and wheel washing to be carried out in a designated area at least 10m from any water body or surface drain;
e. runoff to be collected in lagoons or settlement tanks (or similar) to allow suspended solids to settle and be removed to appropriate levels before discharge to the nearby watercourse; and

f. any runoff water containing silt or other pollutants to be treated appropriately before discharge back to the water environment.

Spillages

4.3.5 A pollution risk assessment should be carried out for the site of the Proposed Onshore Scheme ahead of construction, considering both the storage and transportation of materials used. This would identify potentially hazardous materials or activities and assess the probability and magnitude of potentially harmful effects. From this, a pollution incident response plan (see GPP 21 (Ref 12), or equivalent, would be compiled to identify the specific measures needed to reduce the likelihood of a spillage happening, and to minimise the impact of any spills that may occur.

Managing contamination risk

4.3.6 The site history and previous ground investigation data suggest that the made ground beneath the site may contain a range of contaminants including localised areas of asbestos and polycyclic aromatic hydrocarbons (PAHs). Whilst the geo-environmental risk to the water environment is anticipated to be moderate/low (see **Appendix 9.1 Preliminary Contamination Risk Assessment**), appropriate controls and good practice measures should be implemented through **Appendix 2.1 Outline Onshore Code of Construction Practice**. This should include further ground investigation to help inform a detailed risk assessment, remediation options appraisal and remediation strategy (if appropriate) and inspection of materials for any evidence of further contamination. Should any further evidence of contamination be identified this should be further assessed and tested as appropriate to enable any required additional controls/works to be determined. Such measures should mitigate potential environmental impacts associated with the potential mobilisation of contaminated soils at the site during construction.

Minimising disturbance

4.3.7 Open trench cutting and cable plough methods will be used to install the proposed Underground Cables. At sensitive river crossings, trenchless methods will be used to install the proposed Underground Cables below the bed of the river to minimise disturbance and physical impacts to the river and riparian corridor during construction.

4.3.8 Appropriate measures should be included within the work method statements to reduce potential environmental impacts of in-channel and marginal construction activities. This should include measures to:

a. minimise the footprint of any in-channel works as far as reasonable possible to reduce the degree of physical disturbance of the riverbed and banks;
b. reinstate any impacted in-channel and/or marginal habitats where necessary and practicable;

c. reduce any associated noise, vibration, and artificial lighting impacts where practicable; and
d. where feasible, control the timing of works so that any in-channel works are programmed to take place outside of sensitive times of year for juvenile fish and migratory fish.

Biosecurity

4.3.9 Good biosecurity practices are vital for preventing the spread of invasive non-native species (INNS) and pathogens such as waterborne fish diseases. Measures should be adopted so that the construction activities do not lead to the spread of invasive non-native species or pathogens. **Appendix 2.1 Outline Onshore Code of Construction Practice** sets out that best practice biosecurity measures during construction within aquatic environments will prevent the spread of INNS in these environments.

4.3.10 All site personnel and site visitors would be informed that the presence of invasive species have been recorded within the vicinity of the Proposed Onshore Scheme and that they are jointly responsible for preventing its spread/impacts. Visitors would be made aware of what invasive species looks like, so they can avoid them where possible and take appropriate actions. Biosecurity measures would be in place to prevent the spread of INNS, as set out in **Chapter 8 Ecology and Biodiversity** of the PEIR. This will include clearing and disinfection of (but not limited to): all equipment; footwear; clothing; vehicle parts (wheels, tracks, buckets); pumps; pipework; any other equipment in contact with the watercourse of riverbanks.

5 Screening and baseline assessment

5.1 Overview

5.1.1 The screening and baseline assessment stage has identified the relevant WFD surface water bodies that will potentially be affected by the Proposed Onshore Scheme. These water bodies are summarised in the sections below along with the latest available Environment Agency baseline data.

5.2 River Basin Management Plans

5.2.1 The Proposed Scheme is located within the 'Anglian' River Basin District (RBD), as covered by the Anglian River Basin Management Plan (RBMP) (Ref 4). The Environment Agency management and operational catchments of the surface water and groundwater bodies present at the location of the Proposed Onshore Scheme are summarised in **Table 5.1.**

5.3 Relevant water bodies

5.3.1 There are four surface water bodies and one groundwater body present within the study area, as summarised in **Table 5.1**, and shown in **Figure 12.3** and **12.4** of the PEIR.

5.3.2 The Proposed Onshore Scheme, including the proposed Underground Cable Corridor and supporting infrastructure, has the potential to result in direct or indirect impact pathways which could affect the watercourses and/or groundwater receptors.

5.3.3 The following three surface water bodies and the one groundwater body have been screened into the assessment due to the potential for impacts to arise from the Proposed Onshore Scheme:

a. Minsmere Old River (GB105035046270);
b. Hundred River (GB105035046260);
c. Fromus (GB105035045980); and
d. Waveney and East Suffolk Chalk and Crag (GB40501G400600).

5.3.4 Whilst the Proposed Onshore Scheme does enter the Blyth (d/s Halesworth) surface water body catchment, the Proposed Onshore Scheme will be at least 500m away from the nearest watercourse within this catchment. It is anticipated that the proposed works will therefore not directly or indirectly impact any watercourses within this water body. Given the nature and location of the proposed works, this surface water body has therefore been screened out of the assessment.

5.3.5 There are no Proposed Onshore Scheme components proposed within the Alde and Ore transitional water body (GB520503503800). Current proposals for Proposed Onshore Scheme components in the upstream Fromus

(GB105035045980) surface water body include a proposed bridge crossing, new access road and associated drainage, electricity substation and buried cables. These Proposed Onshore Scheme components are relatively low-risk given that they are located approximately 5km upstream of the Alde and Ore water body, include embedded mitigation (such as surface water drainage strategy), while the distance between scheme proposals and the Alde and Ore water body will also contribute to a dilution factor. Therefore, based on currently available information, the Alde and Ore transitional water body is screened out from the assessment at this stage, though this will be reviewed as part of the update at Environment Statement when more design information is available.

5.3.6 It should be noted that two watercourses potentially impacted by the Proposed Onshore Scheme (Dunwich River and Dunwich River (tidal)) are not part of a WFD surface water body catchment. Potential impacts to these watercourses are covered within the wider environmental assessment, within **Chapter 12 Hydrology, Hydrogeology and Drainage**. Engagement with stakeholders (such as the Environment Agency and the East Suffolk Internal Drainage Board (IDB) will continue prior to submission of the Environmental Statement to confirm the assessment approach for watercourses which are not part of a WFD water body.

5.3.7 Potential impacts arising from the Proposed Scheme on transitional and coastal water bodies from offshore scheme components are detailed in **Chapter 18 Marine Physical Environment** and **Appendix 18.2 Proposed Offshore Scheme Water Framework Directive Assessment.**

Table 5.1: Relevant WER water bodies of the Proposed Onshore Scheme (water body catchment areas intersect with the Draft Order Limits)

Water body name	Water body ID	Management and Operational catchment	Water body type	Hydromorphological designation	Catchment area/length	Screening outcome
Blyth (d/s Halesworth)	GB105035046290	Suffolk East/Suffolk Coastal	River	Heavily modified	14.072km^2/5.661km	Screened out
Minsmere Old River	GB105035046270	Suffolk East/Suffolk Coastal	River	Heavily modified	70.109km^2/23.697km	Screened in
Hundred River	GB105035046260	Suffolk East/Suffolk Coastal	River	Heavily modified	26.096km^2/11.072km	Screened in
Fromus	GB105035045980	Suffolk East/Suffolk Coastal	River	Not designated artificial or heavily modified	34.568km^2/13.276km	Screened in
Alde and Ore	GB520503503800	Suffolk Transitional and Coastal	Transitional	Heavily modified	11.4466km^2	Screened out
Waveney and East Suffolk Chalk and Crag Water Body	GB40501G400600	Waveney and Suffolk East Chalk and Crag	Groundwater	Not applicable	1454.909km^2	Screened in

5.4 Water body baseline data

5.4.1 A summary of the Environment Agency's latest status classification data for each of the screened in surface water bodies and groundwater bodies is provided in **Table 5.2** and **Table 5.3**, respectively.

5.4.2 Full details of baseline data for these water bodies is provided in **Annex B: Water body baselinedata.**

Table 5.2: Summary of latest RBMP Cycle 3 status classification information for WFD surface water bodies screened in.

Water body name	Minsmere Old River	Hundred River	Fromus
Water Body ID	GB105035046270	GB105035046260	GB105035045980
Water Body Type	River	River	River
Hydromorphological Designation	Heavily modified	Heavily modified	Not designated artificial or heavily modified
Length (km)	23.697	11.072	13.276
OVERALL STATUS	**Moderate**	**Bad**	**Poor**
Ecological Status/Potential (Status Objective)	**Moderate** (Good (2027))	**Bad** (Moderate (2027))	**Poor** (Good (2027))
Biological Quality Elements - *limiting elements* (Status objective)	Poor - *Fish, macrophytes* (Poor (2015))	Bad - *Fish* (Bad (2015))	Poor - *Fish* (Good (2027))
Physico-chemical Quality Elements - *limiting elements* (Status objective)	Moderate - *Dissolved oxygen* (Good (2015))	Moderate - *Phosphate* (Moderate (2015))	Moderate - *Dissolved oxygen* (Good (2027))
Hydromorphological Supporting Elements (Status objective)	Not high (Not high (2015))	Not high (Not high (2015))	Not high (Not high (2015))
Specific Pollutants (Status objective)	-	High (High (2015))	High (High (2015))
Supporting Elements, Mitigation Measures Assessment	Moderate (Good (2027))	Good (Good (2015))	-
*Chemical Status - *limiting elements* (Status objective)	***Fail** - *Mercury, PBDE* (Good (2063))	***Fail** - *Hexachlorobenzene, Mercury* (Good (2063))	***Fail** - *Mercury, PBDE* (Good (2063))

*Latest classification data from 2019 as Chemical Status is only assessed at the start of the water body cycle.

Table 5.3: Summary of latest RBMP Cycle 3 status classification information for WFD groundwater body screened in

Water body name	Waveney and East Suffolk Chalk and Crag
Water body ID	GB40501G400600
Water body type	Groundwater
Hydromorphological designation	Not applicable
Surface area (km^2)	1454.909
OVERALL STATUS	**Poor/Poor (2015)**
Quantitative	Poor (Good (2027))
Quantitative Status Element	Poor (Good (2027))
Chemical (GW)	Poor (Poor (2015))
Chemical Status Element	Poor (Poor (2015))
Supporting Elements (GW)	Not assessed

5.5 Watercourse baseline and receptor valuation

5.5.1 As described in **Section 2.3,** reconnaissance surveys have been undertaken to establish the baseline hydromorphological condition and aquatic habitat potential of the watercourses present within or in the vicinity of the Draft Order Limits that have the potential to be impacted by the Proposed Onshore Scheme. Further details of the surveys and results are provided **Annex C: Survey data.**

5.5.2 A receptor value has been assigned to each of the relevant watercourses, based on the available desktop information, survey findings and expert judgement (as described in **Section 2.5**). The receptor valuations are summarised in **Table 5.4**.

5.5.3 The baseline condition of the watercourse receptors has been reviewed alongside the activities and components of the Proposed Onshore Scheme (as summarised in **Section 4.1**) to inform the screening. In total, 10 of the 13 watercourses have been screened in and taken forward as part of the assessment. The Unnamed Tributary of Minsmere Old River 5 has been screened out as no impact pathways are identified at this stage. The Proposed Onshore Scheme will utilise existing roads adjacent to the watercourses for construction access but not physical modifications or additional crossing structures are proposed at this stage. The Dunwich River and Dunwich Rivers (tidal) watercourses have also been screened out of the WER compliance assessment as the watercourses are not designed as WFD water bodies or fall within the catchment area of any designated WFD water bodies. Potential impacts on these receptors are therefore covered under **Chapter 12 Hydrology, Hydrogeology and Drainage** of the PEIR as part of the wider EIA process.

5.5.4 Of the watercourses screened in, five are Main Rivers. Three of these watercourses (Fromus, Hundred River, and Minsmere Old River) comprise the main designated sections of WFD river water bodies, and so are considered to be of High receptor value based on their potential to support Biological quality elements, evidence of active geomorphological process (e.g. sediment transport) and their size and location in the catchment relative to their interface with the Proposed Onshore Scheme.

5.5.5 Two sections of Main River have been classified as Moderate value receptors (Unnamed Tributary of the Hundred River 1, Unnamed Tributary of the Minsmere Old River 1). One watercourse is part Ordinary Watercourse, part Main River and is considered to be of Moderate receptor value based on its potential to support Biological quality elements (Unnamed Tributary of the Hundred River 2).

5.5.6 Three watercourses are designated Ordinary Watercourse and do not comprise part of the WFD water body line. These watercourses have a Low receptor value as they are unlikely to support Biological quality elements (Unnamed Tributary of the Minsmere Old River 2, Unnamed Tributary of the Minsmere Old River 3 and Unnamed Tributary of the Minsmere Old River 4)

5.5.7 The other four watercourses are considered to be of Low receptor value, with limited baseflow, fluvial geomorphological processes, or potential to support WER biological quality elements.

Table 5.4: Watercourse receptor values and screening

WFD water body catchment	Watercourse name	Designation	Receptor value (at location of Proposed Onshore Scheme)	Screening outcome
Fromus	Fromus	Main River, WFD water body	High*	Screened in
	Unnamed Tributary of the River Fromus 1	Ordinary Watercourse	Low	Screened in
Hundred River	Hundred River	Main River, WFD water body	High*	Screened in
	Unnamed Tributary of the Hundred River 1	Main River	Moderate	Screened in
	Unnamed Tributary of the Hundred River 2	Part Ordinary Watercourse, part Main River	Moderate	Screened in
Minsmere Old River	Minsmere Old River	Main River, WFD water body	High	Screened in
	Unnamed Tributary of the Minsmere Old River 1	Main River	Moderate	Screened in
	Unnamed Tributary of the Minsmere Old River 2	Ordinary Watercourse	Low	Screened in
	Unnamed Tributary of the Minsmere Old River 3	Ordinary Watercourse	Low	Screened in
	Unnamed Tributary of the Minsmere Old River 4	Ordinary Watercourse	Low	Screened in
	Unnamed Tributary of the Minsmere Old River 5	Main River	Moderate (precautionary basis)*	Screened out
	Dunwich River	Main River	Low	Screened out

WFD water body catchment	Watercourse name	Designation	Receptor value (at location of Proposed Onshore Scheme)	Screening outcome
Not part of or within a WFD water body	Dunwich River (tidal)	Main River	High	Screened out

* Precautionary basis. Watercourse not surveyed as no impact pathways are anticipated at this stage.

6 Scoping and impact assessment

6.1 Overview

6.1.1 Impacts considered with regard to WER compliance risk are if the Proposed Onshore Scheme is:

a. causing a deterioration in current status of the water body, whether individual quality elements or for the water body as a whole; and/or
b. preventing the future achievement of water body status objectives.

6.1.2 The assessment process for determining the potential risk of status deterioration uses the following coloured rating system to assign the magnitude of the likely effect anticipated on each of the quality elements of the affected water bodies:

a. **Dark Blue**: beneficial effect of a scale sufficient to increase status class for the quality element at water body scale.
b. **Light Blue**: minor/localised beneficial effect resulting in a localised improvement but insufficient to increase status class for the quality element at water body scale.
c. **Green**: negligible effect on (or no measurable change to) status class for the quality element at water body scale.
d. **Yellow**: minor/localised adverse effect when balanced against mitigation included in the design – insufficient to affect status class for the quality element at water body scale.
e. **Amber**: an adverse effect is possible when balanced against mitigation included in the design – the extent of effect is uncertain, and there remains a potential to affect status class for the quality element at water body scale. Additional mitigation and residual effects need to be considered.
f. **Red**: adverse effect of sufficient scale to impact on status class for the quality element at a water body scale (certain). Additional mitigation or re-design required to avoid non-compliance.

6.1.3 Where adverse (amber or red) effects on quality elements with a risk of causing deterioration of status or preventing future attainment of the objectives are identified, the assessment identifies additional mitigation requirements and the resultant residual effect.

6.1.4 Where any residual adverse (amber or red) effects remain following consideration of additional mitigation, Regulation 19 derogation assessment requirements should be considered in consultation with the Environment Agency.

6.2 Relevant components

Temporary works (construction phase)

6.2.1 A feasible approach of the construction methodology and outline activities for the Proposed Onshore Scheme are described in **Chapter 2 Description of the Proposed Scheme** of the PEIR. Activities will be required during construction to

install the Proposed Onshore Scheme, such as ground excavations for installation of proposed Underground Cables, cable joint bays and foundations associated with Kiln Lane Substation, the proposed Converter Station and pylons. Ground excavations for the Proposed Onshore Scheme are to be relatively shallow, with shallow foundations anticipated to be suitable depending on the applied structural loads.

6.2.2 Groundworks and excavations could lead to localised changes to surface water flow pathways, release fine sediment and/or provide a source for potential contaminants (such as hydrocarbons) to enter the water environment. It is anticipated that these groundworks and excavations will only directly influence the shallow groundwater, and will not affect the underlying Waveney and East Suffolk Chalk and Crag Water Body WFD groundwater body.

6.2.3 An Outline Onshore CoCP has been produced (**see Appendix 2.1 Outline Onshore Code of Construction Practice**) which will be further developed as the EIA progresses and implemented for construction phase of the Proposed Onshore Scheme. An overview of key construction mitigation measures relevant to the water environment to be included with in **Appendix 2.1 Outline Onshore Code of Construction Practice** is provided in **Section 4.3**.

6.2.4 Assuming embedded and statutory construction mitigation methods are implemented during the construction phase through the Outline Onshore CoCP (and the associated groundwater management plan) to manage and reduce potential impacts, potential impacts arising from construction are anticipated to be temporary in nature with no risk of deteriorating the current status and/or preventing the future achievement of the status objectives of the relevant water bodies.

Permanent components of the Proposed Onshore Scheme (operational phase)

6.2.5 The relevant components of the Proposed Onshore Scheme that have the potential to impact upon water bodies screened in are:

a. The proposed Underground Cable Corridor. While most of the watercourse crossings are to be installed with a trenchless technique, there are two low receptor value watercourses that are anticipated to be crossed via open cut trenching. The proposed Underground Cables would be joined together at cable joint bays, including the proposed Landfall.
b. Foundations for the proposed Converter Station and Kiln Lane Substation. Shallow foundations should be suitable depending on the applied structural loads. Alternatively, piled foundations should be used for structures with high loadings. Required depth is currently unknown.
c. Associated infrastructure for operation of the proposed Converter Station and Kiln Lane Substation e.g. lighting, new pylons, and fencing which penetrate the ground.
d. The proposed Fromus Bridge Crossing (associated with the proposed Converter Station). A clear span bridge would be required over the River

Fromus (approximate National Grid Reference TM388622) to provide access to the proposed Converter Station from the B1121 Main Road. **Table 6.1** provides an overview of parameters for the crossing.

e. New permanent access roads. The access road across the Fromus would be constructed between NGR TM385621 and TM397625. A second access road would be constructed to provide access to Kiln Lane Substation from the B1121 Main Road between NGR TM401611 and TM412611.

f. Overhead lines. In the potential 'Full Build Out of Kiln Lane Substation Scenario' (the default scenario assumed for assessment), pylons for overhead lines will require shallow foundations.

Table 6.1: Approximate dimensions for the River Fromus bridge crossing structure

Option	Clearspan	Width of bridge structure	Assumed width of channel	Setback of abutment and wing walls	Height of sofit above top of bank
6m clearance of the bridge soffit from the Q95 flow level of the river)	24m	6m	8m	Minimum of 8m	4m

Potential effects on the water environment

6.2.6 Embedded mitigation for the Proposed Onshore Scheme is outlined in **Section 4.2**. The potential effects from permanent components of the Proposed Onshore Scheme (identified in **Paragraph 6.2.5**) on surface water and groundwater WER water bodies, factoring in consideration of the embedded mitigation measures, are summarised below:

a. The proposed Underground Cable Corridor will need to cross watercourses. trenchless methods will be used to pass the proposed Underground Cables beneath certain watercourses (including all watercourses with a receptor value of moderate or high), while two watercourses with a receptor value of low will be crossed using open trench cutting techniques. The proposed Underground Cables buried beneath watercourses have the potential to affect fish behaviours and negatively impact individual organisms during the embryonic and larval life stages due to the electromagnetic fields (EMF) generated by currents passing through the proposed Underground Cables.

b. Below ground infrastructure, such as foundations for infrastructure, proposed Underground Cables installed below ground levels and cable joint bays, have the potential to affect local groundwater flows and/or levels, which may in turn have indirect effects on dependent surface water bodies and/or habitats. It is assumed that any below ground works will be shallow and only enter the superficial deposits, therefore not impacting bedrock groundwater/aquifers. Installation of hardstanding, required for the proposed Converter Station and Kiln Lane Substation, has the potential to alter surface water runoff to watercourses due to changes in permeability, existing ground elevations and land drainage systems.

c. Infrastructure associated with the Proposed Onshore Scheme could provide a source and pathway for potential contaminants to enter the water

environment, whether through routine use or through response to a potential incident.

d. Installation of a new bridge over the River Fromus has the potential to impact its biology and hydromorphology.
e. New access roads have the potential to alter surface water runoff to watercourses, due to changes in permeability and drainage systems.
f. Aside from the cable crossing locations and the new bridge over the River Fromus, the physical footprint of the Proposed Onshore Scheme is not anticipated to affect watercourses directly.

6.2.7 A summary of permanent components and their potential effects on surface water bodies and groundwater bodies is provided in **Table 6.2** and **Table 6.3**, respectively.

Table 6.2: Permanent Components of the Proposed Onshore Scheme and their potential effects on surface water bodies.

Proposed Scheme Component:		Proposed Converter Station and Kiln Lane Substation			Permanent access roads			Proposed Underground Cable Corridor		Overhead Lines (pylons) (if the Proposed Onshore Scheme progressed with the Full Build out of Kiln Lane Substation)	
Potential Effects:		Infrastructure /hardstanding causing alteration of surface water permeability, flow paths and runoff to watercourses	Source and pathway for potential contaminants runoff to watercourses	Below ground infrastructure causing alteration of shallow groundwater flows/levels potentially affecting watercourse flows	Infrastructure /hardstanding causing alteration of surface water permeability, flow paths and runoff to watercourses	Source and pathway for potential contaminants runoff to watercourses	New watercourse crossing structure affecting local hydromorphology and river continuity	Buried cable crossings beneath watercourses (production of electro-magnetic fields)	Below ground infrastructure causing alteration of shallow groundwater flows/levels potentially affecting watercourse flows	Infrastructure /hardstanding causing alteration of surface water permeability, flow paths and runoff to watercourses	Below ground infrastructure causing alteration of shallow groundwater flows/levels potentially affecting watercourse flows
WER surface water quality elements	Biological quality elements	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
	Hydromorphological Supporting Elements	✓	-	✓	✓	-	✓	✓	✓	✓	✓
	Physico-chemical quality elements	-	✓	-	-	✓	-	-	-	-	-
	Specific Pollutants	-	✓	-	-	✓	-	-	-	-	-
	Chemical Status	-	✓	-	-	✓	-	-	-	-	-

A tick (✓) indicates a potential effect may arise and a dash (-) indicates no effect.

Table 6.3: Permanent Components of the Proposed Onshore Scheme and their potential effects on groundwater bodies.

Proposed Onshore Scheme Component:		Proposed Converter Station and Kiln Lane Substation			Proposed Underground Cable Corridor		Overhead Lines (pylons) (if the Proposed Onshore Scheme progressed with the Full Build Out of Kiln Lane Substation)	
Potential Effects:		Infrastructure/hardstanding causing alteration of surface water permeability, flow paths and runoff to watercourses	Source and pathway for potential contaminants runoff to watercourses	Below ground infrastructure causing alteration of shallow groundwater flows/levels potentially affecting watercourse flows	Buried cable crossings beneath watercourses (production of electro-magnetic fields)	Below ground infrastructure causing alteration of shallow groundwater flows/levels potentially affecting watercourse flows	Infrastructure/hardstanding causing alteration of surface water permeability, flow paths and runoff to watercourses	Below ground infrastructure causing alteration of shallow groundwater flows/levels potentially affecting watercourse flows
WER groundwater quality elements	Quantitative Status element	✓	-	✓	-	✓	✓	✓
	Chemical Status element	-	✓	-	✓	-	-	-
	Supporting elements (Groundwater)	-	-	-	-	-	-	-

A tick (✓) indicates a potential effect may arise and a dash (-) indicates no effect.

6.3 Potential effects on current status

6.3.1 The assessment has considered the potential effects of the key permanent components of the Proposed Onshore Scheme on the current status of the surface and groundwater bodies screened in. These are described in the sections below.

6.3.2 The assessment is based on the currently available desk study and outline design information and should be reviewed and updated, where necessary, in the final WER compliance assessment as part of the Environmental Statement.

Potential effects on surface water bodies

Changes to surface water runoff to watercourses

6.3.3 The construction of Kiln Lane Substation, the proposed Converter Station, pylons and permanent access roads have the potential to reduce infiltration and alter existing surface water runoff and land drainage pathways. They could also reduce surface permeability by increasing hardstanding areas and result in the physical loss of existing land drains within their footprint.

6.3.4 These changes have the potential to impact watercourse flows, in turn affecting fluvial geomorphological processes and aquatic habitats. Such impacts therefore have the potential to affect the Hydromorphological Supporting Elements and Biological Quality Elements of the relevant surface water bodies.

6.3.5 As summarised in **Section 4.2**, embedded mitigation is incorporated into the design for the Proposed Onshore Scheme to minimise potential impacts of surface water runoff on the adjacent watercourses. This includes:

a. drainage infrastructure will follow SuDS principles; and
b. the above-ground elements of the Proposed Onshore Scheme will be set back 8m from the bank-top of watercourses.

6.3.6 Kiln Lane Substation and the proposed Converter Station are not in proximity to watercourse receptors (see **Table 6.4**, **Table 6.5** and **Table 6.6**). As such any localised changes in surface water runoff within the catchment areas of these watercourses are anticipated to have **negligible effects** on hydromorphological and biological status at the water body scale. The nature of overhead lines and location of pylons mean that this activity is not anticipated to affect Hydromorphological Supporting Elements and Biological quality elements for the Hundred River.

6.3.7 There is one high value watercourse, the Fromus, which will have an access road in proximity to it with the potential to affect surface water runoff. This watercourse is likely to have some baseflow, active geomorphological processes and high aquatic potential for biological quality elements. Embedded mitigation will ensure any localised changes in surface water runoff will result in **negligible**

effects on Hydromorphological Supporting Elements and Biological quality elements status.

6.3.8 Given the embedded mitigation measures and drainage design, the baseline receptor value and sensitivity of the nearby watercourses, and the magnitude of change in the context of scale of the relevant water body catchments, Kiln Lane Substation, the proposed Converter Station, overhead lines (pylons) and permanent access tracks are anticipated to have a **negligible effect** on the Hydromorphological Supporting and Biological quality elements of the relevant surface water bodies.

Potential sources of contaminant runoff to watercourses

6.3.9 Kiln Lane Substation, the proposed Converter Station and permanent access roads for the Proposed Onshore Scheme could provide a source and pathway for potential contaminants (such as hydrocarbons) to enter the water environment.

6.3.10 This has the potential to impact on the water quality of watercourses downstream, which in turn could adversely affect the Biological Quality Elements, Physico-chemical Quality Elements, Specific Pollutants and Chemical Status of the relevant surface water bodies.

6.3.11 As summarised in **Section 4**, embedded mitigation is incorporated into the design for the Proposed Onshore Scheme to minimise potential impacts of potential contaminant releases to nearby watercourses. This includes drainage infrastructure that follows SuDS principles.

6.3.12 Given the embedded mitigation and the proposed site operating regime, the baseline receptor value and sensitivity of the nearby watercourses, and the location and scale of the proposed infrastructure in the context of scale of the relevant water body catchments, it is anticipated that the potential for the introduction of source and pathways is low and so the Proposed Onshore Scheme will have a **negligible effect** on Biological and Physico-chemical quality elements, Specific Pollutants and Chemical Status.

Watercourse crossings

6.3.13 One new watercourse crossing structure will be required for the Proposed Onshore Scheme – an access road over the River Fromus. This has the potential to impact on river continuity (flow, sediment and fish passage), which could affect the Hydromorphological Supporting Elements and Biological status of the relevant surface water body.

6.3.14 The River Fromus has a high receptor value. The crossing will comprise a clear span crossing structure in order to minimise any potential impacts on hydromorphological process and aquatic habitats, with setback abutments. The bridge will be appropriately designed and sized (e.g. the abutments are sufficiently offset from the banks), and therefore it is anticipated that the new watercourse crossing structure will have a **negligible effect** with no measurable

change on the Hydromorphological Supporting Elements or Biological Quality Elements of the Fromus.

6.3.15 The proposed Underground Cables will pass beneath watercourses using either trenchless methods or open-cut trenching methods, depending on the watercourse.

6.3.16 Trenchless methods will be used for the vast majority of watercourse cable crossing locations, including Main Rivers and/or main WFD river water bodies. This will prevent impacts to Hydromorphological Supporting Elements.

6.3.17 It is understood that the proposed Underground Cables will be installed a minimum of 2m below the bed of the river. EMF can be generated when electricity passes through the proposed Underground Cables. EMF has the potential to impact on fish through both a behavioural response in migratory fish swimming over the cable as well as negatively impact individual organisms during the embryonic and larval life stages. This therefore has the potential to affect the Biological Quality Elements of the water bodies. Trenchless methods will be used to cross beneath the Unnamed Tributary of the Hundred River 1, Unnamed Tributary of the Hundred River 2, Minsmere Old River and Unnamed Tributary of the Minsmere Old River 1 (see **Figure 2.2 Proposed Onshore Scheme**, **Figure 2.3 Proposed Onshore Scheme Crossing Points** and **Figure 12.8 WER Surface Water Bodies**). There is therefore the potential for **minor localised adverse effects** on the Biological Quality Elements. There is therefore the potential for **minor localised adverse effects** on the Biological Quality Elements. As described in **Chapter 8 Ecology and Biodiversity**, further assessment of fish habitat will be completed in advance of the ES to determine whether notable habitats for notable fish species exist within the underground cable corridor. A detailed assessment covering the potential impact on migratory fish will be discussed in future Environment Agency technical consultation and completed as part of the ES.

6.3.18 Trenchless methods are also proposed on the Unnamed Tributary of the Minsmere Old River 2, a low value receptor. This is anticipated to result in a **negligible effect** on the Biological Quality Elements, as this watercourse is not anticipated to support fish based on the recon field surveys undertaken to date.

6.3.19 All remaining watercourse receptors with cable crossings are low value, and open-cut trenching methods will be used for these. These watercourses affected are the Unnamed Tributary of the Fromus 1, Unnamed Tributary of the Minsmere Old River 3 and Unnamed Tributary of the Minsmere Old River 4 (see **Figure 12.8** of the PEIR). Open-cut trenching would result in some localised physical modification within the channel and the riparian zone of the watercourses. However, this is anticipated to be a localised area, and vegetation will re-establish. This is anticipated to have a **negligible effect** on the Biological Quality Elements and Hydromorphological status of the relevant water bodies, given the low value nature of the watercourses affected with little/no baseflows, limited

geomorphological processes and low aquatic habitat potential for sustaining biological quality element communities.

6.3.20 For all watercourses, cable crossings are anticipated to have **no permanent effects** on Physico-chemical quality elements, Specific Pollutants and Chemical Status.

Potential effects on groundwater bodies

6.3.21 Kiln Lane Substation and the proposed Converter Station could reduce surface permeability by increasing hardstanding areas. This in turn could lead to some local changes in the rate of recharge to the underlying groundwater, which has the potential to affect Groundwater Quantitative Status. At the scale of the WER groundwater body, the area of impermeable hardstanding is negligible. Therefore, the Proposed Onshore Scheme is anticipated to have a **negligible effect** on groundwater Quantitative Status.

6.3.22 Below ground infrastructure for operation of the Proposed Onshore Scheme is likely to encompass shallow building foundations, overhead lines (pylon) foundations (if the Proposed Onshore Scheme were to progress with the Full Build Out of Kiln Lane Substation Scenario), cable installations and joint bays. As these components will be located in the shallow superficial aquifer, it is anticipated that these would have **no effect** on the Quantitative Status and Chemical Status of the groundwater bodies present at the site.

Summary of potential effects on current status

6.3.23 Summaries of the anticipated effects of the Proposed Onshore Scheme on WFD surface water bodies provided in **Table 6.4**, **Table 6.5**, and **Table 6.6**).

6.3.24 A summary of the anticipated effects of the Proposed Onshore Scheme on the WFD groundwater bodies is provided in **Table 6.7**.

Table 6.4: Summary of anticipated effects of Proposed Scheme on status elements of relevant watercourses in the Minsmere Old River (GB105035046270) river water body catchment.

Minsmere Old River	Receptor value	Relevant components	Biological status	Hydromorphological Supporting Elements	Physico-chemical quality elements	Specific Pollutants	Chemical Status	Overall effect at watercourse level
Minsmere Old River	High	Cable crossings (trenchless methods)	Minor/localised adverse effect	-	-	-	-	Minor/localised adverse effect (no deterioration of status)
Unnamed Tributary of the Minsmere Old River 1	Moderate	Cable crossings (trenchless methods)	Minor/localised adverse effect	-	-	-	-	Minor/localised adverse effect (no deterioration of status)
Unnamed Tributary of the Minsmere Old River 2	Low	Cable crossings (trenchless methods)	Negligible	-	-	-	-	Negligible – no measurable change
Unnamed Tributary of the Minsmere Old River 3	Low	Cable crossings (open-cut trench)	Negligible	Negligible	-	-	-	Negligible – no measurable change
Unnamed Tributary of the Minsmere Old River 4	Low	Cable crossings (open-cut trench)	Negligible	Negligible	-	-	-	Negligible – no measurable change
Cumulative effect on quality elements/water body status			Minor/localised adverse effect	-	-	-	-	Minor/localised adverse effect (no deterioration of status)

A dash (-) represents no impact

Table 6.5: Summary of anticipated effects of Proposed Scheme on status elements of relevant watercourses in the Hundred River (GB105035046260) river water body catchment.

Hundred River	Receptor value	Relevant components	Biological status	Hydromorphological Supporting Elements	Physico-chemical quality elements	Specific Pollutants	Chemical Status	Overall effect at watercourse level
Hundred River	High	Overhead lines	-	-	-	-	-	No impact expected
Unnamed Tributary of the Hundred River 1	Moderate	Cable crossings (trenchless methods)	Minor/localised adverse effect	-	-	-	-	Minor/localised adverse effect (no deterioration of status)
Unnamed Tributary of the Hundred River 2	Moderate	Cable crossings (trenchless methods)	Minor/localised adverse effect	-	-	-	-	Minor/localised adverse effect (no deterioration of status)
Cumulative effect on quality elements/water body status			Minor/localised adverse effect	-	-	-	-	Minor/localised adverse effect (no deterioration of status)

A dash (-) represents no impact

Table 6.6: Summary of anticipated effects of Proposed Scheme on status elements of relevant watercourses in the Fromus (GB105035045980) river water body catchment.

Fromus	Receptor value	Relevant components	Biological status	Hydromorphological Supporting Elements	Physico-chemical quality elements	Specific Pollutants	Chemical Status	Overall effect at watercourse level
Fromus	High	Access tracks	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible – no measurable change
		Proposed Converter Station	-	Negligible	Negligible	Negligible	Negligible	
		Proposed bridge crossing	Negligible	Negligible	-	-	-	
Unnamed Tributary of the River Fromus 1	Low	Proposed cable crossings (open-cut trench)	Negligible	Negligible	-	-	-	Negligible – no measurable change
		Proposed Converter Station	Negligible	Negligible	Negligible	Negligible	Negligible	
		Kiln Lane Substation	Negligible	Negligible	Negligible	Negligible	Negligible	
		Access tracks	-	-	Negligible	Negligible	Negligible	
Cumulative effect on quality elements/water body status			Negligible	Negligible	Negligible	Negligible	Negligible	Negligible – no measurable change

A dash (-) represents no impact

Table 6.7: Summary of anticipated effects of Proposed Scheme on status elements of groundwater body Waveney and East Suffolk Chalk and Crag (GB40501G400600) river water body catchment.

Relevant components	Quantitative Status element	Chemical Status element	Supporting elements (Groundwater)	Overall effect
Hardstanding, proposed Converter Station, Kiln Lane Substation	Negligible	-	-	Negligible – no measurable change
Access tracks	-	Negligible	-	
Below ground infrastructure	Negligible	-	-	
Cumulative effect on quality elements/water body status	Negligible	Negligible	-	

A dash (-) represents no impact

6.4 Potential effects on future status objectives

Effects on existing pressures on status

6.4.1 The Reasons for Not Achieving Good (RNAGs) for each of the screened in water bodies are detailed in **Annex B: Water body baselinedata**. These have been reviewed against the Proposed Onshore Scheme proposals to determine whether the Proposed Onshore Scheme is anticipated to exacerbate the existing RNAGs.

6.4.2 The Minsmere Old River and the Fromus water bodies both have existing RNAGs relating to fish, due to barriers which result in ecological discontinuity.

6.4.3 The structure(s) which relate to this RNAG are not provided for the Minsmere Old River water body. The Proposed Onshore Scheme includes a proposed Underground Cable Corridor to pass beneath the bed of the Minsmere Old River and Unnamed Tributary of the Minsmere Old River 1 through trenchless methods. Cables have the potential to generate EMFs as electricity passes through them, which has the potential to affect fish behaviour. As outlined in **Paragraph 6.3.17**, the cables will be buried at depth and therefore effects are anticipated to be minor, localised adverse, which will not result in deterioration in status of the quality element or water body. Further assessment of fish habitat will be completed in advance of the ES to determine whether notable habitats for notable fish species exist within the underground cable corridor. A detailed assessment covering the potential impact on migratory fish will be discussed in future Environment Agency technical consultation and completed as part of the ES. Therefore, it is not anticipated that the Proposed Onshore Scheme will exacerbate this RNAG.

6.4.4 One structure which contributes to the RNAG for ecological discontinuity is provided for the Fromus water body – a weir at NGR TM 38813 62987, beneath the B1119 Church Street bridge. A new bridge crossing is proposed over the Fromus, approximately 500m downstream of the existing weir. The proposed bridge will have abutments setback from the bank top, and with a soffit approximately 4m above the bank top. Therefore, this structure will not act as a barrier to fish passage, and therefore will not exacerbate the existing RNAG for the Fromus water body.

6.4.5 The remainder of the existing RNAGs for the relevant water bodies relate to Priority Hazardous Substances, Dissolved Oxygen, Hydrology and Phosphate. These RNAGs result are associated with transport drainage (diffuse pollution), sewage and trade discharges (point source), land drainage for agriculture, groundwater abstraction, impacts on low flow and drought. The Proposed Onshore Scheme will not include proposals which affect these quality elements. Therefore, when considering the Proposed Onshore Scheme and its potential effects, the Proposed Onshore Scheme is not anticipated to exacerbate existing

RNAGs or pressures on water body status for the Minsmere Old River, Hundred River or Fromus water bodies .

Effects on water body measures and actions

6.4.6 The Proposed Onshore Scheme has been reviewed against the water body measures and actions in **Annex B: Water body baselinedata.** The Proposed Onshore Scheme is not anticipated to contribute towards or prevent implementation of these water body measures and actions for the relevant water bodies.

6.5 Mitigation requirements and compliance

6.5.1 Based on the latest design information available at this stage, there is the potential for the Proposed Onshore Scheme to have minor, localised adverse effects on the Biological status of the Minsmere Old River and Hundred River water bodies.

6.5.2 This relates to the proposed trenchless methods cable crossings of some moderate and high value watercourses and the associated potential impact of EMF from the proposed Underground Cables beneath the watercourses on the behaviour and movement of fish. At the scale of the water bodies, these effects are deemed unlikely to result in a deterioration in the current status of the water bodies.

6.5.3 The remaining components of the Proposed Onshore Scheme are anticipated to have negligible effects on the relevant water bodies.

6.5.4 Therefore, the Proposed Onshore Scheme is anticipated to comply with the requirements of the WER, and no additional mitigation is expected to be required at this stage to avoid the risk of a deterioration in the current status of the water bodies, or the prevention of the future achievement of status objectives.

6.5.5 Further assessment of fish habitat will be completed in advance of the ES to determine whether notable habitats for notable fish species exist within the underground cable corridor. A detailed assessment covering the potential impact on migratory fish will be discussed in future Environment Agency technical consultation and completed as part of the ES.

7 Conclusions

7.1.1 An assessment of the compliance of the Proposed Onshore Scheme with the objectives of the WER has been undertaken.

7.1.2 This has included a baseline and screening assessment to identify the relevant WER water bodies potentially affected by the Proposed Onshore Scheme, and collate available data, including reconnaissance survey information regarding water body baseline condition, WER status and objectives. This has also included identification of the relevant permanent components of the Proposed Onshore Scheme with the potential to affect the water bodies, together with the relevant embedded construction and design mitigation developed at this stage.

7.1.3 The screening assessment has concluded that the Proposed Onshore Scheme has the potential to affect the following WER water bodies:

a. Minsmere Old River (GB105035046270);
b. Hundred River (GB105035046260); and
c. Fromus (GB105035045980); and Waveney and East Suffolk Chalk and Crag (GB40501G400600).

7.1.4 A preliminary assessment has been undertaken to identify the potential effects of the Proposed Onshore Scheme on the current status and status objectives of these water bodies. This assessment has been based on the currently available site and design information, and assumptions regarding best practice and mitigation to be developed and included within **Appendix 2.1 Outline Onshore Code of Construction Practice** for the Proposed Onshore Scheme at the construction stage.

7.1.5 Based on the currently available design information, the components of the Proposed Onshore Scheme which interact with low value receptors on the Minsmere Old River and Hundred River water bodies are anticipated to result in negligible effects on the quality elements. However, the Proposed Onshore Scheme has the potential to have minor, localised adverse effects on the Biological quality elements (fish) for moderate and high value watercourses within the Minsmere Old River and Hundred River water bodies. This effect is associated with the proposed trenchless methods cable crossings which have the potential to impact on fish populations due to EMF. At the scale of the water body, these effects are not anticipated to result in a deterioration in the current status of the water body, or prevent the future achievement of status objectives. However, mitigation is being explored for the next design stage to reduce the potential effects of the proposed trenchless methods cable crossings on fish within moderate and high value water courses within the water bodies.

7.1.6 The Proposed Onshore Scheme is anticipated to have negligible effects on the Fromus River water body, and Waveney and East Suffolk Chalk and Crag groundwater bodies.

7.1.7 The Proposed Onshore Scheme is not anticipated to result in new or exacerbate existing RNAGs for the water bodies. Additionally, the Proposed Onshore Scheme will not contribute towards or prevent achievement of water body level measures and actions.

7.1.8 Therefore, the Proposed Onshore Scheme is not anticipated to pose a risk of causing a deterioration in status or preventing the future attainment of status objectives for the relevant water bodies screened in for assessment. As such, the current design of the Proposed Onshore Scheme is deemed to be compliant with the requirements and objectives of the WER.

7.1.9 This WER preliminary assessment provides an indication of the likely compliance of the Proposed Onshore Scheme at the time the assessment was prepared. This assessment will be updated for the application for development consent, once the final design of the Proposed Onshore Scheme has been confirmed and the construction stages of the Proposed Onshore Scheme to account for any:

a. new baseline information that becomes available for the study area and/or the relevant WER water bodies present within the study area; and
b. developing updates to the design details and construction methodology for the Proposed Onshore Scheme.

References

Ref 1 Statutory Instruments (2017), No.407, The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

Ref 2 Statutory Instruments (2016), No.1154 The Environmental Permitting (England and Wales) Regulations 2016.

Ref 3 Natural Resource Wales (2017) Guidance for assessing activities and projects for compliance with the Water Framework Directive.

Ref 4 Environment Agency (2022), Cycle 3 River Basin Management Plan (RBMP), Anglian River Basin Management Plan.

Ref 5 Environment Agency, Catchment Data Explorer (Online) Available: https://environment.data.gov.uk/catchment-planning (Accessed 26 June 2025)

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Ref 7 Environment Agency, Water Quality Archive (Online) Available: https://environment.data.gov.uk/water-quality/view/landing (Accessed 26 June 2025)

Ref 8 Department of Food and Rural Affairs, Magic Map.

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Ref 11 NRW, NIEA, and SEPA (2018), Guidance for Pollution Prevention: Works and maintenance in or near water: GPP 5.

Ref 12 NRW, NIEA, and SEPA (2017) “Guidance for Pollution Prevention: Pollution Incident Response Plans: GPP21.

Ref 13 Official Journal of the European Union (2013), Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy.

Ref 14 Environment Agency (2010) Assessing new modifications for compliance with WFD: detailed supplementary guidance.

Ref 15 Planning Inspectorate (2024), NSIPs advice on the Water Framework Directive.

Topic Glossary

Acronym/Phrase/Abbreviation	Definition
EMF	Electromagnetic fields
BGS	British Geological Survey
CoCP	Code of Construction Practice
DCO	Development Consent Order
EA	Environment Agency
EEZ,	European Economic Zone
EU	European Union
GPP	Guidance for Pollution Prevention
HVAC	High voltage alternating current
HVDC	High voltage direct current
INNS	Invasive non-native species
NGR	National Grid Reference
PPG	Pollution Prevention Guidelines
PBDE	Polybrominated diphenyl ethers
PEIR	Preliminary Environmental Information Report
RNAG	Reasons for Not Achieving Good
SuDS	Sustainable drainage systems
TRaC	Transitional and Coastal waters
WER	Water Environment Regulations
WFD	Water Framework Directive

Annex A: WER background information – water body status determination and compliance assessment

A.1 Surface water bodies

A.1.1 Overview

A.1.1.1 As described in **Section 1**, surface water bodies are defined with WER legislation, and a status classification is derived for each via the RBMP cycles. The status classification method applied by the Environment Agency for surface water bodies is described in the following sections.

A.1.1.2 Surface water bodies are categorised on the basis of the following three hydromorphological designations, which in turn dictate the status classification process applied for each:

a. natural (non-heavily modified or acritical) water bodies;
b. heavily modified water bodies (HMWBs); or
c. artificial water bodies (AWBs).

A.1.1.3 The Overall Status of natural surface water bodies is determined on the basis of their Ecological Status and Chemical Status. Whilst the Overall Status of A/HMWBs is classified based on their Ecological Potential and Chemical Status.

A.1.2 Ecological status

A.1.2.1 Ecological Status is assigned to surface water bodies that are natural and considered by the Environment Agency not to have been significantly modified for anthropogenic purposes.

A.1.2.2 Ecological Status of water bodies is classified on a five-point scale as either High, Good, Moderate, Poor or Bad status. The definitions of the five status classes are provided in **Table A.1**.

Table A.1 Definition of status classes used to define surface water body status (Environment Agency, 2022)

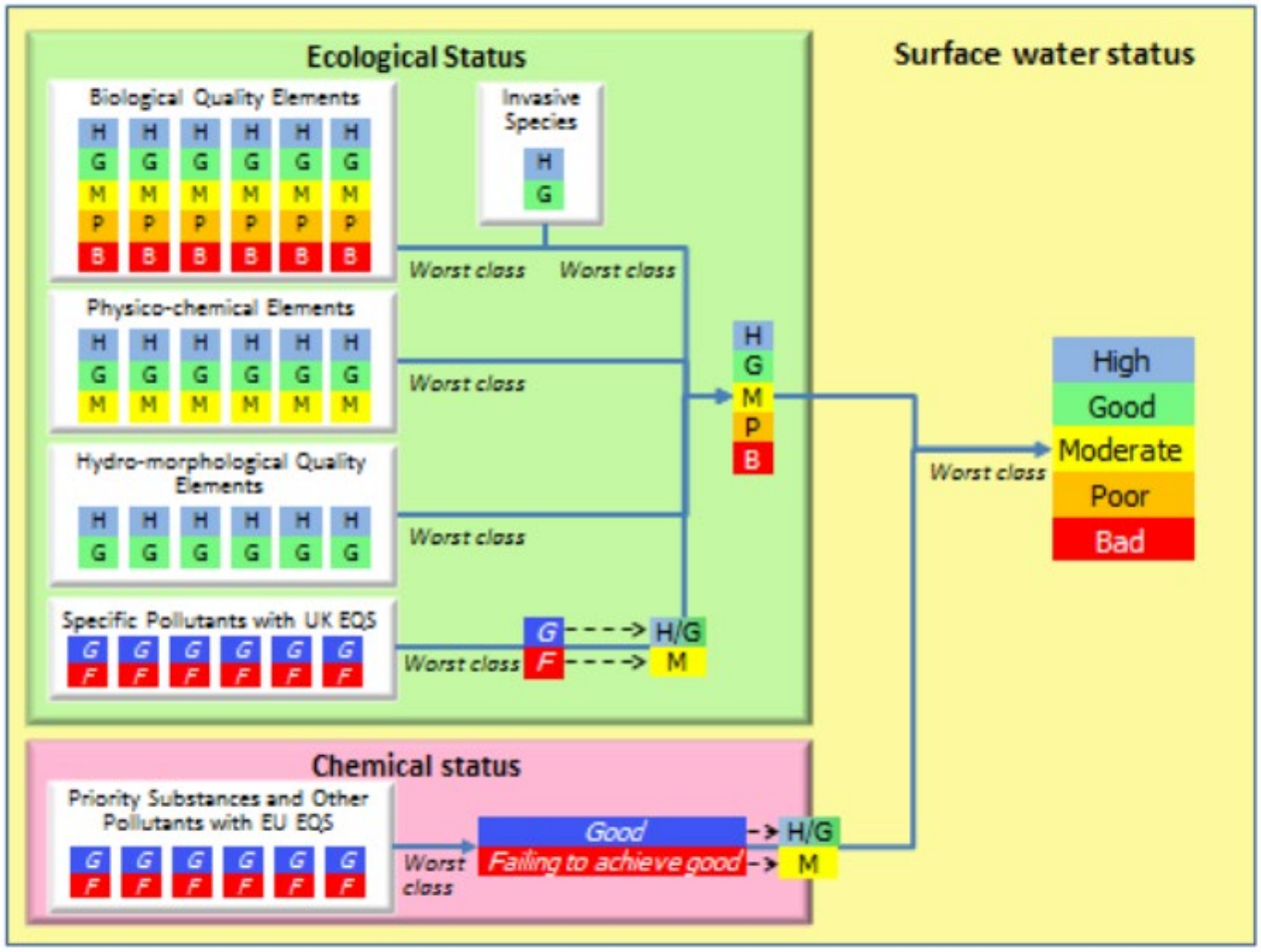
Status	Definition
High	Near natural conditions. No restriction on the beneficial uses of the water body. No impacts on amenity, wildlife or fisheries.
Good	Slight change from natural conditions as a result of human activity. No restriction on the beneficial uses of the water body. No impact on amenity or fisheries. Protects all but the most sensitive wildlife.
Moderate	Moderate change from natural conditions as a result of human activity. Some restriction on the beneficial uses of the water body. No impact on amenity. Some impact on wildlife and fisheries.
Poor	Major change from natural conditions as a result of human activity. Some restrictions on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
Bad	Severe change from natural conditions as a result of human activity. Significant restriction on the beneficial uses of the water body. Major impact on amenity. Major impact on wildlife and fisheries with many species not present.

A.1.2.3 Ecological Status is defined by the overall quality of the structure and functioning of aquatic ecosystems associated with surface waters, i.e. the condition of the watercourse. This is assigned on the basis of four sub-classification elements or 'tests', as follows:

a. Biological - this test is designed to assess the status indicated by a biological quality element such as fish, invertebrates, macrophytes or phytobenthos (diatoms). The biological quality elements can influence an overall water body status from Bad through to High. It is also important to note that the presence of invasive species prevents a water body from achieving High status when all other elements attain High;
b. Physicochemical - this test is designed to assess the status indicated by physicochemical quality elements such as dissolved oxygen, phosphorus and ammonia, against environmental standards. The physicochemical quality elements can only influence an overall water body status from Moderate through to High; and
c. Hydromorphology - for natural surface water bodies this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High Overall Status. It specifically assesses hydromorphological quality elements such as flow, substrate composition, longitudinal continuity, lateral connectivity with the floodplain, and the structure of the riparian habitat, against reference or 'largely undisturbed' conditions. This hydromorphological assessment is used to determine between Good and High Overall Status only. If the hydromorphological quality elements are deemed to not support High Ecological Status, then the Overall Status of the water body is limited to Good. The hydromorphological assessment is not used to drive a water body status class below Good. The 'does not support good' classification is reported for the purposes of identifying water bodies which fail the flow test.

A.1.2.4 The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system. This system is summarised in **Inset A.1.**

Inset A.1: Ecological status classification process for surface water bodies (Environment Agency, 2022)



A.1.3 Ecological potential (for A/HMWB)

A.1.3.1 Ecological Potential is assigned to AWB (such as reservoirs and canals), or natural water bodies which, as a result of physical alterations by human activity, are substantially changed in character. The latter are termed HMWB. The term 'ecological potential' is used to classify AWBs and HMWBs as it may be impossible for these water bodies to achieve good Ecological Status (GES) because of their creation or modification for a specific use, such as navigation, water supply or flood protection. The Ecological Potential of an AWB or HMWB represents the degree to which the quality of the water body approaches the optimum condition it could achieve given its artificial or heavily modified state.

A.1.3.2 AWB and HMWB are subject to an additional set of rules that need to be implemented prior to running the one-out-all-out process. These rules determine which biological quality elements should be used in the water body Ecological Potential classification. Under normal circumstances, AWB and HMWB are classified according to an assessment of Mitigation Measures, which defines good Ecological Potential (GEP) in waterbodies where all applicable mitigation is in place, and moderate ecological potential in water bodies where some or all

relevant mitigation is missing. However, to prevent AWB and HMWB being incorrectly classified as good potential in situations where all mitigation is in place, but other pressures are causing an impact (e.g. nutrient enrichment or pollution from toxic substances), the methodology adopted in the UK additionally considers biological indicators providing they are not sensitive to the heavily modified nature of the water body.

A.1.3.3 AWB and HMWB hydromorphological elements are assessed using a three-stage process, firstly looking at flow, then Mitigation Measures and biological quality elements. Flow conditions are assessed initially on a fail or pass basis to determine which of the biological and physicochemical quality elements should be used in the classification of Ecological Potential

A.1.3.4 Where the flow conditions are unaffected by the physical modification (flow conditions pass), the water body Ecological Potential is determined by the worst of either the Mitigation Measures Assessment, or any element that is not sensitive to the modified nature of the water body.

A.1.3.5 Where the flow conditions are significantly impacted by the physical modification (flow conditions fail), the water body Ecological Potential is determined by the worst of any of the Mitigation Measures Assessments or the assessment of biological quality elements, physicochemical quality elements or specific pollutants.

A.1.3.6 Where a water body is designated as artificial or heavily modified for water resources usage, either solely or jointly with other uses, the flow condition is assumed to be good (pass).

A.1.4 Chemical status

A.1.4.1 Chemical Status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2013/39/EU) (Ref 14). This is assigned on a scale of Good or Fail.

A.1.4.2 Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being of good Chemical Status.

A.2 Groundwater bodies

A.2.1 Overview

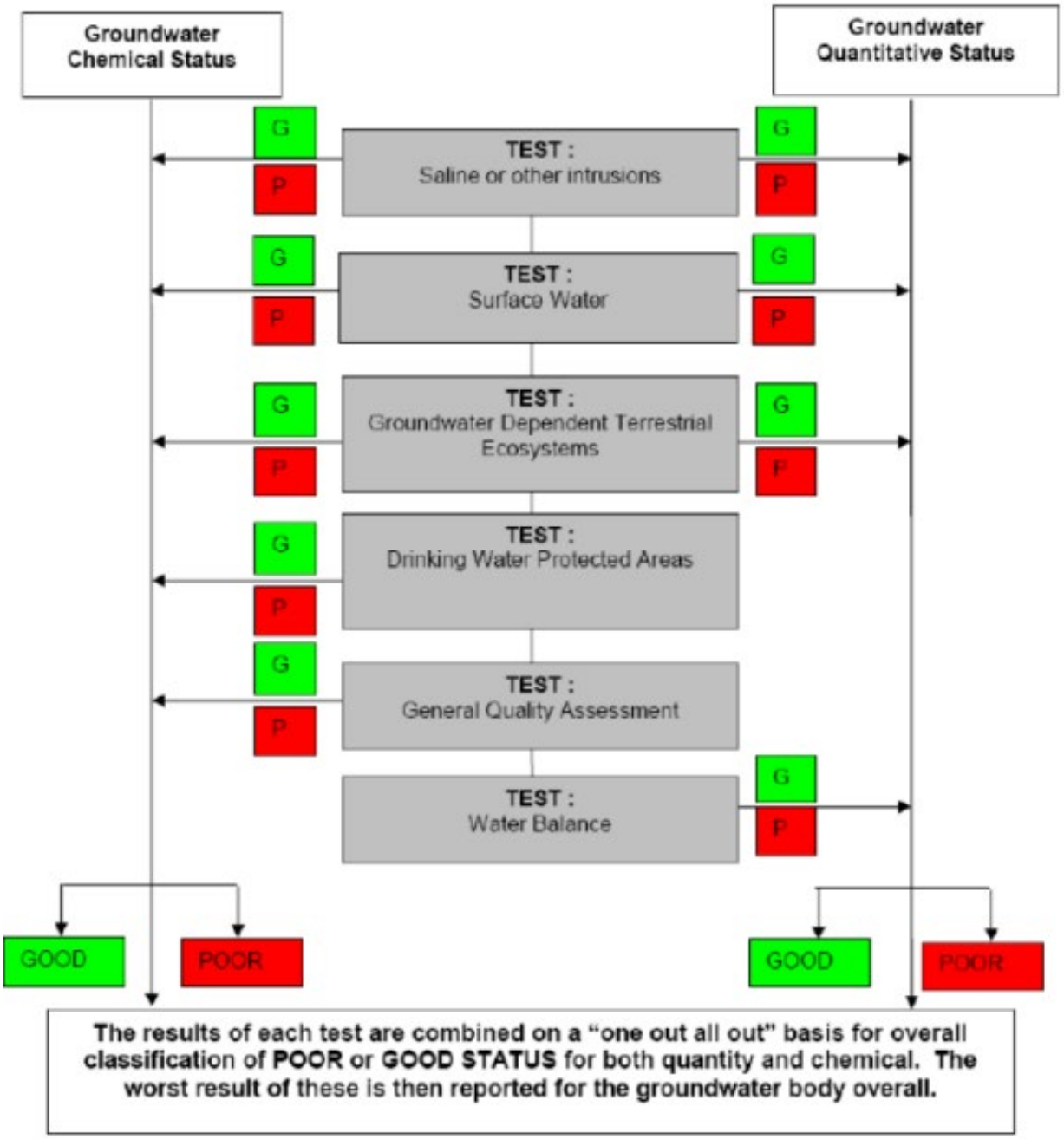
A.2.1.1 As described in **Section 1**, groundwater bodies are defined with WER legislation, and a status classification is derived for each via the RBMP cycles. The status classification method applied by the Environment Agency for groundwater bodies is described in the following sections.

A.2.1.2 Groundwater body status is classified on the basis of Quantitative Status and Chemical Status. Quantitative status is defined by the quantity of groundwater available as base flow for different resources. Chemical status is a function of several components indicative of groundwater quality. Status is assessed primarily using data collected from the Environment Agency monitoring network; therefore, the scale of assessment means that groundwater status is mainly

influenced by larger scale effects such as significant abstraction or widespread/diffuse pollution.

A.2.1.3 The worst-case classification dictates the Overall Status, via a 'one-out all-out' system. This system is summarised in **Inset A.2**.

Inset A.2: Status classification process for groundwater bodies (Environment Agency, 2022)



A.2.2 Quantitative status

A.2.2.1 Quantitative Status is defined by the quantity of groundwater available as base flow to watercourses and water-dependent ecosystems and as 'resource' available for use as drinking water and other consumptive purposes. It is

assigned on a scale of good or poor, and on the basis of four classification elements or 'tests' as follows:

a. saline or other intrusions - this test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions;
b. surface water - this test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the Ecological Status of associated surface water bodies;
c. Groundwater Dependent Terrestrial Ecosystems (GWDTE) - this test is designed to identify groundwater bodies where groundwater abstraction is leading to significant damage to associated GWDTE; and
d. water balance - this test is designed to identify groundwater bodies where groundwater abstraction exceeds the 'available groundwater resource', defined as the rate of overall recharge to the groundwater body itself less the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTE.

A.2.3 Chemical status

A.2.3.1 Chemical Status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of good or poor, and on the basis of five classifications elements or 'tests', as follows:

a. saline or other intrusions - this test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions;
b. surface water - this test is designed to identify groundwater bodies where groundwater is leading to a significant diminution of the Chemical Status of associated surface water bodies;
c. GWDTE - this test is designed to identify groundwater bodies where groundwater is leading to significant damage to associated GWDTE;
d. Drinking Water Protected Areas (DrWPA) - this test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WER or at risk of failing in the future. The aim is no deterioration in the quality of waters for human consumption; and
e. general quality assessment - this test is designed to identify groundwater bodies where widespread deterioration in quality has, or will, compromise the strategic use of groundwater. The aim is no significant impairment of human use of groundwater and no significant environmental risk from pollutants across a groundwater body. Status is assessed primarily using data collected from the Environment Agency monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread diffuse pollution.

A.2.4 Environmental standards

A.2.4.1 Under the WER, a range of environmental standards and condition limits are applied in order to help the classification of water body status and the setting of status objectives via the RBMP process. These environmental standards define the range of environmental conditions that support "healthy" aquatic life. For instance, standards are set for the composition of biological communities, the physicochemical water quality parameters, the concentration of pollutants, and the level of flows in rivers (as described above).

A.3 Water Environment Regulations assessment requirements for new developments

A.3.1 Overview

A.3.1.1 To ensure compliance with the WER, decision makers must consider whether proposals for new developments have the potential to:

a. cause a deterioration of a water body from its current status or potential;
a. prevent future attainment of good status or potential where not already achieved;
b. impact on protected areas; and/or
c. provide opportunities to improve the water environment.

A.3.1.2 A ruling by the European Union Court of Justice on 1 July 2015 has significant implications for projects that may impact water bodies, namely:

a. consent for development must not be granted by an authorising authority – unless a derogation is granted - where the project may cause a deterioration in the status of a body of surface water or where it jeopardises the attainment of good Ecological Status or of good Ecological Potential and good Chemical Status by the date laid down in the Directive;
b. that deterioration of the status of the relevant body of surface water includes a fall by one class of any element of the quality elements within the meaning of Annex V of the WER even if the fall does not result in a fall of the classification of the body of surface water as a whole; and
c. if the quality element is already in the lowest class, any deterioration of that element represents deterioration of status within the meaning of Article 4(1)(a)(i).

A.3.2 Guidance

A.3.2.1 Whilst there is no established methodology for assessing compliance with WER legislation, the WER Compliance Assessment will be based upon expert judgement, established best practice and consultation with the Environment Agency and will be undertaken in accordance with relevant Environment Agency guidance (Ref 15) and the advisory guidance provided by The Planning Inspectorate (Ref 16).

A.3.2.2 WER Compliance Assessment comprises a stepped process undertaken in parallel with the design development for a proposed scheme in accordance with available guidance. WER Compliance Assessment comprises a stepped process

undertaken in parallel with the design development for a proposed scheme in accordance with available guidance

A.3.3 Screening assessment

A.3.3.1 The key objective of the screening assessment is to identify the relevant WFD surface water bodies (including any relevant tributary watercourses) and groundwater bodies potentially affected by the Proposed Onshore Scheme and to establish their baseline condition.

A.3.3.2 This stage has identified the relevant construction and operational phase scheme components that have the potential to impact surface water and/or groundwater bodies and that may affect the WFD status. This has included identifying and recognising all relevant embedded mitigation measures within the construction strategy and design at this stage.

A.3.3.3 Where potential impact pathways have been identified, the relevant water bodies are screened in for further scoping assessment.

A.3.3.4 The baseline condition of screened in water bodies is also set out via desk-top assessment, utilising readily available Environment Agency datasets. Where deemed required and possible, this is supplemented with baseline site visit and field survey information for the relevant watercourse and/or groundwater feature receptors.

A.3.4 Scoping Assessment

A.3.4.1 The objective of the scoping assessment is to establish the relevant likely effects of the Proposed Development on the status elements of the relevant WFD surface water and groundwater bodies screened in. This includes identification of potential impact types/ mechanisms of each of the relevant scheme components and the WFD quality elements that may potentially be affected by each.

A.3.4.2 The scoping assessment considers both the beneficial and adverse effects of the relevant elements of the Proposed Development and applies a risk-based method, as described in **Section 6.1**. Effects are considered with regard to the risk of the Proposed Onshore Scheme causing a deterioration inf the current status of quality elements of the relevant water bodies and/or preventing the future achievement of status objectives. Potential effects on the future achievement of water body status objectives have been considered by scoping the likely effects of the Project on the latest available RNAGs, 'Programme of measures' (PoM), and 'A/HMWB Mitigation Measure' datasets identified by the Environment Agency for the relevant water bodies. Here, the scoping assessment considered the potential for the Project to exacerbate existing pressures on water body status and/or to hinder the future implementation of catchment and water body-level measures identified to address existing pressures and support the achievement of status objectives.

A.3.4.3 This assessment stage determines if and where any further baseline and/or impact assessment is required.

A.3.5 Impact assessment

A.3.5.1 Based on the findings of the scoping assessment, further impact assessment may be required in order to establish the nature and anticipated magnitude of the

effects of certain scheme components on the quality elements of the WFD surface water and groundwater bodies affected by the Proposed Onshore Scheme. This may include:

a. further description of the Proposed Onshore Scheme and the activities and components scoped in for assessment (based on any updates to the design, assumptions and/or embedded mitigation);
b. further, more detailed baseline assessment (e.g. field surveys or modelling) of the relevant water bodies and watercourse receptors in relation to areas of likely impact identified by the scoping assessment;
c. a description of the methods used to detail the baseline condition and determine and quantify the impacts and associated magnitude of effects of the Proposed Onshore Scheme components on the quality elements of the relevant WFD water bodies;
d. an updated assessment of the risk of deterioration of the current status of the quality elements of the relevant WFD water bodies and the risk of prevention of future achievement of status objectives;
e. an explanation of any additional mitigation that is required (beyond the embedded mitigation) and how its delivery is secured; and
f. an explanation of any enhancements and/or positive contributions to water body and wider River Basin Management Plan (RBMP) objectives that are proposed and how their delivery would be secured.

Annex B: Water body baseline data

B.1 Minsmere Old River (GB105035046270)

B.1.1 Current status and objectives

B.1.1.1 The Minsmere Old River water body is designated as heavily modified in recognition of significant anthropogenic influence on the water course. It is currently having an Overall Status of Moderate, with an Ecological Status of Moderate and a Chemical Status of Fail. The water body is therefore currently failing the overarching Good Overall Status objective under the WER.

B.1.1.2 A breakdown of the current status and status objectives for the water body are provided in **Table B.1.** The quality elements currently limiting the Ecological Potential of the water body are Fish (Poor), Macrophytes Sub Element (Moderate) and Dissolved Oxygen (Moderate). The quality element limiting the Chemical status of the water body are Mercury and Its Compounds (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail).

Table B.1: Latest Cycle 3 status classification and status objectives for Minsmere Old River (GB105035046270) water body

Classification Item	Status (2019/2022)	Status Objective (by which year)
Ecological	Moderate	Good (2027)
Biological quality elements	Poor	Poor (2015)
Fish	Poor	Poor (2015)
Invertebrates	Good	Good (2015)
Macrophytes Sub Element	Moderate	Not assessed
Physico-chemical quality elements	Moderate	Good (2015)
Ammonia (Phys-Chem)	High	Good (2015)
Biochemical Oxygen Demand (BOD)	High	Not assessed
Dissolved oxygen	Moderate	Good (2015)
Phosphate	Good	Good (2015)
Temperature	High	Good (2015)
pH	High	Good (2015)
Hydromorphological Supporting Elements	Supports good	Supports good (2015)
Hydrological Regime	Supports good	Supports good (2015)
Supporting elements (Surface Water)	Moderate	Good (2027)
Mitigation Measures Assessment	Moderate or less	Good (2027)
Chemical	Fail	Good (2063)
Priority hazardous substances	Fail	Good (2063)
Benzo(a)pyrene	Good	Good (2015)
Dioxins and dioxin-like compounds	Good	Good (2015)
Heptachlor and cis-Heptachlor epoxide	Good	Good (2015)

Classification Item	Status (2019/2022)	Status Objective (by which year)
Hexabromocyclododecane (HBCDD)	Good	Good (2015)
Hexachlorobenzene	Good	Good (2015)
Hexachlorobutadiene	Good	Good (2015)
Mercury and Its Compounds	Fail	Good (2040)
Perfluorooctane sulphonate (PFOS)	Good	Good (2015)
Polybrominated diphenyl ethers (PBDE)	Fail	Good (2063)
Priority substances	Good	Good (2015)
Cypermethrin (Priority)	Good	Good (2015)
Fluoranthene	Good	Good (2015)
Other Pollutants	Does not require assessment	Not assessed

B.1.2 Protected Areas

B.1.2.1 There are nine WFD Protected Areas associated with the water body catchment. Five of these relate to the Nitrates Directive, two of these Special Protection Areas, one is a Special Area of Conservation, and one is a Ramsar site. Full details are provided in **Table B.2.**

Table B.2: WFD Protected Areas for the Minsmere Old River (GB105035046270) water body

Protected Area Name	ID	Directive
Sandlings and Chelmsford	G78	Nitrates Directive
Outer Thames Estuary	UK9020309	Special Protection Area
Blyth NVZ	S417	Nitrates Directive
Minsmere-Walberswick	UK9009101	Special Protection Area
Minsmere-Walberswick	UK11044	Ramsar Site
Minsmere To Walberswick Heaths and Marshes	UK0012809	Special Area of Conservation
Yoxford	G166	Nitrates Directive
Leiston Beck NVZ	S661	Nitrates Directive
Leiston Beck and Minsmere Old River NVZ	S415	Nitrates Directive

B.1.3 Environment Agency monitoring data

B.1.3.1 There is one Environment Agency biological monitoring site relating to freshwater fish survey found within the Minsmere Old River water body extent that has been surveyed within the last 12 years (A12 Yoxford, Site ID 47163). This freshwater fish survey site is located 3km upstream of the closest section of corridor. The most recent fish survey carried out at this site on the 14 January 2013 recorded the presence of 3-spined stickleback and 10-spined stickleback.

B.1.4 Reasons for not achieving good

B.1.4.1 There are five reasons for not achieving good (RNAGs) for the water body. The causes of these RNAGs include physical modification for land drainage and the introduction of physical barriers. Full details are provided in **Table B.3**.

Table B.3: RNAGs for the Minsmere Old River (GB105035046270) water body

		RNAG			
Failing Element	**ID**	**Category**	**Business Sector**	**SWMI**	**Activity**
Fish	582959	Other	Not applicable	Physical modification	Barriers - ecological discontinuity
Mercury and Its Compounds	582958	No sector responsible	Not applicable	Measures delivered to address reason, awaiting recovery	Not applicable
Polybrominated diphenyl ethers (PBDE)	582961	No sector responsible	Not applicable	Measures delivered to address reason, awaiting recovery	Not applicable
Fish	582960	Agriculture and rural land management	Not applicable	Physical modification	Land drainage - operational management
Mitigation Measures Assessment	588205	Agriculture and rural land management		Physical modification	Other (not in list, must add details in comments)

B.1.5 Water body measures and actions

B.1.5.1 Water body measures and actions have been provided by the Environment Agency following the submission of a data request. It should be noted that the document provided by the Environment Agency is a combined report[1], covering Summary of Investigations, Investigations (Reasons for Failure), and an overview of recommended actions. An extract from the Environment Agency's CPS has not been provided, and therefore it is not possible to provide CPS Action IDs for the recommendations within the report.

B.1.5.2 No obvious water body level measures and actions were identified for the water body within this report.

B.1.5.3 Recommended water body level measures and actions for the Minsmere Old River include:

[1] Environment Agency, 2013, Waterbody Technical Report – GB105035046270 – Leiston Beck and Minsmere Old River

a. Improve dissolved oxygen levels
b. Set back embankments
c. Earth bunds in place of flood walls
d. Improve floodplain connectivity
e. Appropriate channel maintenance strategies and techniques

B.2 Hundred River (GB105035046260)

B.2.1 Current status and objectives

B.2.1.1 The Hundred River water body is designated as heavily modified in recognition of significant anthropogenic influence on the water course. It is currently having an Overall Status of Bad, with an Ecological Status of Moderate and a Chemical Status of Fail. The water body is therefore currently failing the overarching Good Overall Status objective under the WER.

B.2.1.2 A breakdown of the current status and status objectives for the water body are provided in **Table B.4.** The quality elements currently limiting the Ecological Potential of the water body are Fish (Bad), Dissolved Oxygen (Bad) and Phosphate (Moderate). The quality element limiting the Chemical status of the water body are Hexachlorobenzene (Fail) and Mercury and Its Compounds (Fail).

Table B.4: Latest Cycle 3 status classification and status objectives for Hundred River (GB105035046260) water body

Classification Item	Status (2019/2022)	Status Objective (by which year)
Ecological	Bad	Moderate (2027)
Biological quality elements	Bad	Bad (2015)
Fish	Bad	Bad (2015)
Invertebrates	High	Good (2015)
Macrophytes and Phytobenthos Combined	High	Not assessed
Macrophytes Sub Element	High	Not assessed
Physico-chemical quality elements	Moderate	Moderate (2015)
Ammonia (Phys-Chem)	High	Good (2015)
Biochemical Oxygen Demand (BOD)	High	Not assessed
Dissolved oxygen	Bad	Bad (2015)
Phosphate	Moderate	Moderate (2015)
Temperature	High	Good (2015)
pH	High	Good (2015)
Hydromorphological Supporting Elements	Supports good	Supports good (2015)
Hydrological Regime	Does not support good	Supports good (2027)
Supporting elements (Surface Water)	Good	Good (2015)
Mitigation Measures Assessment	Good	Good (2015)
Specific pollutants	Fail	High (2015)
Iron	Fail	High (2015)
Chemical	Good	Good (2063)
Priority hazardous substances	Good	Good (2063)
Benzo(a)pyrene	Good	Good (2015)
Dioxins and dioxin-like compounds	Good	Good (2015)

Classification Item	Status (2019/2022)	Status Objective (by which year)
Heptachlor and cis-Heptachlor epoxide	Good	Good (2015)
Hexabromocyclododecane (HBCDD)	Good	Good (2015)
Hexachlorobenzene	Fail	Good (2015)
Hexachlorobutadiene	Good	Good (2015)
Mercury and Its Compounds	Fail	Good (2040)
Perfluorooctane sulphonate (PFOS)	Good	Good (2015)
Polybrominated diphenyl ethers (PBDE)	Good	Good (2063)
Priority substances	Good	Good (2015)
Cypermethrin (Priority)	Does not require assessment	Good (2015)
Fluoranthene	Good	Good (2015)
Other Pollutants	Does not require assessment	Not assessed

B.2.2 Water Framework Directive Protected Areas

B.2.2.1 There is one WFD Protected Area associated with the water body catchment relating to the Nitrates Directive, as shown in **Table B.5**.

Table B.5: WFD Protected Areas for the Hundred River (GB105035046260) water body

Protected Area Name	ID	Directive
Sandlings and Chelmsford	G78	Nitrates Directive

B.2.3 Environment Agency monitoring data

B.2.3.1 There are two Environment Agency biological monitoring sites relating to freshwater fish survey and invertebrates survey found within the Hundred River water body extent (shown in **Figure 14.15** of the PEIR) that have been surveyed within the last 8 years (Site IDs 631 and 54974 respectively). The freshwater fish survey site (Knodishall Common) is located 4.4km downstream of the corridor crossing of the watercourse. The most recent fish survey carried out at this site on 02 March 2017 recorded the presence of 3-spined stickleback and 10-spined stickleback.

B.2.4 Reasons for not achieving good

B.2.4.1 There are six RNAGs for the water body. The causes for these RNAGs include point source pollution, low flow, and drought. Full details are provided in **Table B.6**.

Table B.6: RNAGs for the Hundred River (GB105035046260) water body

Failing Element	RNAG ID	RNAG Category	RNAG Business Sector	RNAG SWMI	RNAG Activity
Polybrominated diphenyl ethers (PBDE)	582957	No sector responsible	Not applicable	measures delivered to address reason, awaiting recovery	Not applicable
Dissolved oxygen	582956	Water Industry	Not applicable	Point source	Sewage discharge (continuous)
Dissolved oxygen	582954	No sector responsible	Not applicable	Flow	Low Flow (not drought)
Mercury and Its Compounds	582952	No sector responsible	Not applicable	measures delivered to address reason, awaiting recovery	Not applicable
Phosphate	561491	Water Industry	Waste water treatment	Point source	Sewage discharge (continuous)
Fish	561490	No sector responsible	Not applicable	Natural	Drought

B.2.5 Water body measures and actions

B.2.5.1 Water body measures and actions have been provided by the Environment Agency following the submission of a data request. It should be noted that the document provided by the Environment Agency is a combined report[2], covering Summary of Investigations, Investigations (Reasons for Failure), and an overview of recommended actions. An extract from the Environment Agency's CPS has not been provided, and therefore it is not possible to provide CPS Action IDs for the recommendations within the report.

B.2.5.2 Recommended water body level measures and actions for the Hundred River include:

a. improve dissolved oxygen levels (if linked to having a biological impact);
b. set back embankments;
c. improve floodplain connectivity; and
d. appropriate channel maintenance strategies and techniques.

[2] Environment Agency, 2013, Waterbody Technical Report – GB105035046260 – Hundred River

B.3 Fromus (GB105035045980)

B.3.1 Current status and objectives

B.3.1.1 The Fromus water body is designated as not artificial or heavily modified in recognition of lack of significant anthropogenic influence on the water course. It is currently having an Overall Status of Poor, with an Ecological Status of Poor and a Chemical Status of Fail. The water body is therefore currently failing the overarching Good Overall Status objective under the WER.

B.3.1.2 A breakdown of the current status and status objectives for the water body are provided in **Table B.7.** The quality elements currently limiting the Ecological Potential of the water body are Fish (Poor), and Dissolved Oxygen (Poor). The quality element limiting the Chemical status of the water body are Mercury and Its Compounds (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail).

Table B.7: Latest Cycle 3 status classification and status objectives for Fromus (GB105035045980) water body

Classification Item	Status (2019/2022)	Status Objective (by which year)
Ecological	Poor	Good (2027)
Biological quality elements	Poor	Good (2027)
Fish	Poor	Good (2027)
Invertebrates	Good	Good (2021)
Macrophytes and Phytobenthos Combined	Good	Good (2015)
Macrophytes Sub Element	Good	Not assessed
Physico-chemical quality elements	Moderate	Good (2027)
Acid Neutralising Capacity	High	Not assessed
Ammonia (Phys-Chem)	High	Good (2015)
Biochemical Oxygen Demand (BOD)	High	Good (2015)
Dissolved oxygen	Bad	Good (2027)
Phosphate	High	Good (2027)
Temperature	High	Good (2015)
pH	High	Good (2015)
Hydromorphological Supporting Elements	Supports good	Supports good (2015)
Hydrological Regime	Supports good	Supports good (2015)
Morphology	Supports good	Not assessed
Specific pollutants	High	High (2015)
Iron	High	High (2015)
Manganese	High	High (2015)
Chemical	Fail	Good (2063)
Priority hazardous substances	Fail	Good (2063)
Benzo(a)pyrene	Good	Good (2015)

Classification Item	Status (2019/2022)	Status Objective (by which year)
Dioxins and dioxin-like compounds	Good	Good (2015)
Heptachlor and cis-Heptachlor epoxide	Good	Good (2015)
Hexabromocyclododecane (HBCDD)	Good	Good (2015)
Hexachlorobenzene	Good	Good (2015)
Hexachlorobutadiene	Good	Good (2015)
Mercury and Its Compounds	Fail	Good (2040)
Perfluorooctane sulphonate (PFOS)	Good	Good (2015)
Polybrominated diphenyl ethers (PBDE)	Fail	Good (2063)
Priority substances	Good	Good (2015)
Cypermethrin (Priority)	Good	Good (2015)
Fluoranthene	Good	Good (2015)
Other Pollutants	Does not require assessment	Not assessed

B.3.2 Water Framework Directive Protected Areas

B.3.2.1 There are two WFD Protected Areas associated with the water body catchment, both relating to the Nitrates Directive. Details are provided in **Table B.8.**

Table B.8: WFD Protected Areas for the Fromus (GB105035045980) water body

Protected Area Name	ID	Directive
Sandlings and Chelmsford	G78	Nitrates Directive
Fromus NVZ	S412	Nitrates Directive

B.3.3 Environment Agency monitoring data

B.3.3.1 There are two Environment Agency biological monitoring sites relating to invertebrates survey and fish survey found within the Fromus water body extent that have been surveyed within the last 14 years (Site ID 54845 and 619 respectively). The freshwater fish survey site (Snape Watering) is located 2.2km downstream of the corridor crossing of the watercourse. The most recent fish survey carried out at this site on 10 Feb 2011 recorded the presence of stone loach, brook lamprey ammocoetes, 3-spined stickleback and 10-spined stickleback.

B.3.4 Reasons for not achieving good

B.3.4.1 There are five RNAGs for the water body. The causes for these RNAGs include physical modification for land drainage and the introduction of barriers. Full details are provided in **Table B.9**.

Table B.9: RNAGs for the Fromus (GB105035045980) water body

	RNAG				
Failing Element	ID	Category	Business Sector	SWMI	Activity
Fish	582959	Other	Not applicable	Physical modification	Barriers - ecological discontinuity
Mercury and Its Compounds	582958	No sector responsible	Not applicable	Measures delivered to address reason, awaiting recovery	Not applicable
Polybrominated diphenyl ethers (PBDE)	582961	No sector responsible	Not applicable	Measures delivered to address reason, awaiting recovery	Not applicable
Fish	582960	Agriculture and rural land management	Not applicable	Physical modification	Land drainage - operational management
Mitigation Measures Assessment	588205	Agriculture and rural land management		Physical modification	Other (not in list, must add details in comments)

B.3.5 Water body measures and actions

B.3.5.1 Water body measures and actions have been provided by the Environment Agency following the submission of a data request[3]. It should be noted that the document provided by the Environment Agency is a combined report, covering Summary of Investigations, Investigations (Reasons for Failure), and an overview of recommended actions. An extract from the Environment Agency's CPS has not been provided, and therefore it is not possible to provide CPS Action IDs for the recommendations within the report.

B.3.5.2 Recommended water body level measures and actions for the Fromus include:

a. improvement of Benhall WWTW – consider phosphate removal;
b. improvements to diffuse pollution;
c. improvements to point source pollution; and
d. address barriers to fish passage.

[3] Environment Agency, 2013, Environment Agency Waterbody Technical Report – GB105035045980 - Fromus

B.4 Waveney and East Suffolk Chalk and Crag Groundwater Body (GB40501G400600)

B.4.1 Current status and objectives

B.4.1.1 The groundwater body is currently assessed as having a Poor overall Status with a Poor Quantitative status and a Poor Chemical Status. The groundwater body is therefore currently failing the overarching Good Overall Status objective under the WER.

B.4.1.2 A breakdown of current status and future status objectives for the groundwater body is provided in **Table B.10.** The quality element limiting the Quantitative status element is the Quantitative Dependent Surface Water Body Status (Poor). The quality elements limiting the Chemical Status include the Chemical Drinking Water Protected Area (Poor), General Chemical Test (Poor) and the Trend Assessment (Upward Trend).

Table B.10: Latest status classification and status objectives for the Waveney and East Suffolk Chalk and Crag Water Body (GB40501G400600) groundwater body

Classification Item	Status (2019)	Status Objective (by which year)
Overall Water Body	Poor	(Poor)
Quantitative	Poor	(Good)
Quantitative Status element	Poor	(Good)
Quantitative Dependent Surface Water Body Status	Poor	(Good)
Quantitative GWDTEs test	Good	(Good)
Quantitative Saline Intrusion	Good	(Good)
Quantitative Water Balance	Good	(Good)
Chemical (GW)	Poor	(Poor)
Chemical Status element	Poor	(Poor)
Chemical Dependent Surface Water Body Status	Good	(Good)
Chemical Drinking Water Protected Area	Poor	(Good)
Chemical GWDTEs test	Good	(Good)
Chemical Saline Intrusion	Good	(Good)
General Chemical Test	Poor	(Poor)
Supporting elements (Groundwater)	Not assessed	Not assessed
Prevent and Limit Objective	Active	Not assessed
Trend Assessment	Upward trend	Not assessed

B.4.2 Protected Areas

B.4.2.1 There are 40 WFD Protected Areas associated with the groundwater catchment. Five of these relate to Special Areas of Conservation, six to Specia Protection Areas, one to a drinking water protected area, 24 relate to the Nitrates Directive and four relate to Ramsar sites. Details are provided in **Table B.11.**

Table B.11: WFD Protected Areas for the Waveney and East Suffolk Chalk and Crag Water Body (GB40501G400600) groundwater body

Protected Area Name	ID	Directive
River Waveney NVZ	S396	Nitrates Directive
Ely Ouse and Cut-off channel NVZ	S390	Nitrates Directive
Sandlings and Chelmsford	G78	Nitrates Directive
Deben Estuary	UK9009261	Special Protection Area
Deben Estuary	UK11017	Ramsar Site
Shottisham Mill River NVZ	S406	Nitrates Directive
Outer Thames Estuary	UK9020309	Special Protection Area
River Gipping NVZ	S416	Nitrates Directive
Norwich Crag and Gravels	G79	Nitrates Directive
Waveney and East Suffolk Chalk and Crag	UKGB40501G400600	Drinking Water Protected Area
Blyth NVZ	S417	Nitrates Directive
Deben NVZ	S419	Nitrates Directive
Stour And Orwell Estuaries	UK9009121	Special Protection Area
Alde NVZ	S411	Nitrates Directive
Minsmere-Walberswick	UK9009101	Special Protection Area
Minsmere-Walberswick	UK11044	Ramsar Site
Benacre To Easton Bavents Lagoons	UK0013104	Special Area of Conservation
Benacre To Easton Bavents	UK9009291	Special Protection Area
Fromus NVZ	S412	Nitrates Directive
Lower Stour NVZ	S424	Nitrates Directive
Lark/Fynn NVZ	S407	Nitrates Directive
Alde-Ore Estuary	UK9009112	Special Protection Area
Minsmere To Walberswick Heaths and Marshes	UK0012809	Special Area of Conservation
Yoxford	G166	Nitrates Directive
Leiston Beck NVZ	S661	Nitrates Directive
Leiston Beck and Minsmere Old River NVZ	S415	Nitrates Directive
Byford	G168	Nitrates Directive
Stour And Orwell Estuaries	UK11067	Ramsar Site
Orfordness-Shingle Street	UK0014780	Special Area of Conservation
Alde-Ore Estuary	UK11002	Ramsar Site

Protected Area Name	ID	Directive
Alde-Ore and Butley Estuaries	UK0030076	Special Area of Conservation
Bucklesham Mill River NVZ	S405	Nitrates Directive
Wang NVZ	S418	Nitrates Directive
Holbrook NVZ	S422	Nitrates Directive
Belstead Brook NVZ	S410	Nitrates Directive
Stutton Brook NVZ	S423	Nitrates Directive
Lothingland Hundred NVZ	S414	Nitrates Directive
Easton Broad NVZ	S413	Nitrates Directive
Dew's Ponds	UK0030133	Special Area of Conservation
Black Ditch (East Suffolk) NVZ	S660	Nitrates Directive

B.4.3 Environment Agency monitoring data

B.4.3.1 There are no monitoring sites for the water body.

B.4.4 Reasons for not achieving good

B.4.4.1 There are five RNAGs for this water body. The causes of these RNAGs include diffuse pollution associated with agriculture, and flow (abstraction). Full details are provided in **Table B.12**.

Table B.12: RNAGs for the Waveney and East Suffolk Chalk and Crag Water Body (GB40501G400600) groundwater body

Classification Element	ID	Category	Business Sector	SWMI	Activity
Trend Assessment	559509	Agriculture and rural land management	Agriculture - Livestock	Diffuse source	Poor Livestock Management
Quantitative Water Balance	559508	Agriculture and rural land management	Agriculture - Arable	Flow	Surface water abstraction
Quantitative Water Balance	559507	Agriculture and rural land management	Agriculture - Arable	Flow	Groundwater abstraction
General Chemical Test	559506	Agriculture and rural land management	Agriculture - Livestock	Diffuse source	Poor Livestock Management
Chemical Drinking Water Protected Area	559503	Agriculture and rural land management	Agriculture - Livestock	Diffuse source	Poor Livestock Management

B.4.5 Water body measures and actions

B.4.5.1 Water body measures and actions have been provided by the Environment Agency following the submission of a data request. [4] It should be noted that the document provided by the Environment Agency is a short report regarding an investigation of failure (Reasons for Failure). An extract from the Environment Agency's CPS has not been provided, and therefore it is not possible to provide CPS Action IDs for the recommendations within the report.

B.4.5.2 The report includes reference to one water body level measures and actions, regarding measures to reduce nitrate loading – and this is currently in place for the water body, awaiting recovery.

[4] Environment Agency, *unknown year*, Investigation of the Failure of Water Framework Directive Tests – Waveney and East Suffolks Chalk and Crag Groundwater body – GB40501G400600

Annex C: Survey data

C.1.1.1 The following sections provides an overview of results from watercourse reconnaissance walkover surveys undertaken in April and May 2024. These surveys were undertaken at watercourses[5] illustrated in **Figure 12.8** where they intersect the Draft Order Limits.

C.1.1.2 The surveys comprised observations (– i.e. unintrusive) walkover surveys which recorded photographs and a reach-scale characterisation of baseline hydromorphological condition of the watercourse at the location of the Proposed Onshore Scheme. This including capturing information regarding typical channel dimensions and dominant geomorphological processes and features (such as flow types, erosion and depositional features), structures (such as culverts), and riparian vegetation.

C.1.1.3 The survey findings have been used to inform the receptor valuations and WER screening and scoping assessment.

C.2 Blyth (d/s Halesworth)

C.2.1 Unnamed Tributary of the River Blythe (d/s Halesworth) 1

Reach description

C.2.1.1 The channel planform is sinuous but, while water was present in the channel, flow was not perceptible. There is no evidence of erosion or sediment transport processes, such as bars, berms, pools, riffles. The channel is a depositional environment with fine sediment dominating, and there is a significant amount of aquatic vegetation growing in the channel, both towards the margins and the centre of the channel. The floodplain on the right bank was noticeably wet when walking across it, indicating the connected nature of the channel with the floodplain.

C.2.1.2 The channel is providing aquatic ecology value but does not appear to be flowing and therefore is unlikely to support WER quality elements, such as fish.

[5] Watercourse surveys were undertaken at all watercourses within **Figure 12.8**, with the exception of the River Fromus bridge crossing, Hundred River, Dunwich River (tidal) or Unnamed Tributary of Minsmere Old River 5.

Photos

Table C.1: Site photos – Unnamed Tributary of the River Blythe (d/s Halesworth) 1

No.	Approx. grid reference	Photo	Comment
1	642683E 276490N		View across stream. Note the presence of emergent aquatic vegetation growing in the channel.
2	642654E 276483N		View upstream

No.	Approx. grid reference	Photo	Comment
3	642841E 276528N		View downstream. Note the significant presence of emergent aquatic vegetation growing within the channel.
4	642922E 276529N		Wider landscape showing the wide, expansive floodplain and low topography.

No.	Approx. grid reference	Photo	Comment
5	642922E 276529N		View upstream. Aquatic vegetation has extended across the width of the channel.

C.2.2 River Blythe (d/s Halesworth)

Reach description

C.2.2.1 This section of channel was tidal, and the reconnaissance survey coincided with high tide.

C.2.2.2 A large weir was located immediately upstream of the survey reach which will limit sediment input to this section of channel. The channel has been realigned from its historically sinuous course, and is anticipated to be overly wide (natural typology is anticipated to have been passive meandering). The straight and tidal nature of the channel means there was little morphological or flow diversity evident at the time of the survey. A limited number of depositional features were observed in the channel, with a couple of berms observed close to the bank. The substrate was not visible during the survey. Informal embankments were present on along both banks (Table , Photo 1) which influenced channel connectivity with the floodplain at high tide. A low spot in this information embankment was present on the right bank, which allowed flow at high tide to enter the floodplain and support wetland habitat on the right bank downstream of the surveyed reach.

Photos

Table C.2: Site photos - River Blythe (d/s Halesworth)

No.	Approximate grid reference	Photo	Comment
1	642695E 276413N		View downstream at high tide. Note the informal embankment visible on the right bank.

No.	Approximate grid reference	Photo	Comment
2	642695E 276413N		View upstream
3	642929E 276349N		View across stream. Note the wide, expansive floodplain.

No.	Approximate grid reference	Photo	Comment
4	643076E 276289N		Wider landscape. Tidal water from high tide spills into drainage channels on the floodplain (right bank).
5	643007E 276314N		View across stream

C.2.3 Unnamed Tributary of the River Blythe (d/s Halesworth) 2

Reach description

C.2.3.1 The channel has a sinuous planform though did not appear to be functioning like a river during the survey. Water was present in the channel but flow was very slow and only just perceptible. The channel bed was dominated by silt. There was no evidence of erosion or sediment input, or signs of proper morphological features or processes (such as bars or berms). Emergent aquatic vegetation was observed to be growing in the channel during the survey.

C.2.3.2 The watercourse was anticipated to be providing aquatic ecology value but is unlikely to support WFD quality elements

Photos

Table C.1: Site photos - Unnamed Tributary of the River Blythe (d/s Halesworth) 2

No.	Approximate grid reference	Photo	Comment
1	642604E 276385N		View upstream

No.	Approximate grid reference	Photo	Comment
2	642679E 276292N		View across stream
3	642698E 276197N		View across stream. Flow was barely perceptible, and emergent aquatic vegetation is growing within the channel.

No.	Approximate grid reference	Photo	Comment
4	642679E 276292N		View downstream
5	642699E 276185N		Wider landscape

C.3 Minsmere Old River

C.3.1 Minsmere Old River

Reach description

C.3.1.1 This watercourse was flowing at the time of the survey. The gradient of the channel was relatively low, and therefore, while flow was moving, it was low energy and had relatively low diversity of flow (mostly slow flowing glides). The channel had a sinuous planform.

C.3.1.2 There was relatively low evidence of morphological processes and features. The channel was a depositional environment, reflecting the low energy of the flow. Deposition dominated, and while a couple of berms were observed, deposition this was across the channel bed rather than specific features being created such as bars and berms. There was no significant sediment input (erosion, tributaries).

C.3.1.3 Where sunlight reached the channel, emergent aquatic vegetation established towards the margins. Riparian vegetation tended to be dominated by grasses.

Photos

Table C.2: Site photos - Minsmere Old River

No.	Approximate grid reference	Photo	Comment
1	642390E 268436N		View downstream

No.	Approximate grid reference	Photo	Comment
2	642449E 268375N		View upstream
3	642581E 268325N		View upstream

No.	Approximate grid reference	Photo	Comment
4	642623E 268310N		View across stream
5	642698E 268282N		View downstream

C.3.2 Unnamed Tributary of the Minsmere Old River 1

Reach description

C.3.2.1 This channel had a very straight planform and was entrenched below the level of the surrounding land. Flow was low at the time of survey – the upper section of the surveyed reach was dry at the time of survey, though water was present further downstream.

C.3.2.2 There was some evidence of sediment transport processes and morphological features and processes in the channel. Gravels and sands were evident on the bed of the channel, and a couple of gravel bars (depositional features) were observed. Additionally, there were a few locations of flow diversity, with ponded flow followed by sections of faster, shallower flow known as runs and riffles.

C.3.2.3 Riparian vegetation was dominated by grasses in the upper section of the reach, though a dense line of trees became established on both banks further downstream. Surrounding land was dominated by agriculture.

C.3.2.4 While flow was low at the time of survey, the evidence of sediment transport and flow diversity suggests this watercourse has potential to support WER quality elements.

Photos

Table C.3: Site photos - Unnamed Tributary of the Minsmere Old River 1

No.	Approximate grid reference	Photo	Comment
1	641856E 267379N		View downstream. Note dry channel - clean gravels suggest signs of sediment transport when flowing.

No.	Approximate grid reference	Photo	Comment
2	641901E 267370N		View downstream. Wet channel
3	642026E 267367N		View downstream. Note gravel bar. Small riffle next to it with ponding downstream
4	641908E 267369N		Wider landscape

No.	Approximate grid reference	Photo	Comment
5	642066E 267376N		View across stream. Note clean gravels. Relatively low flow, potential evidence of bars. Sediment sorting in watercourse.

C.3.3 Unnamed Tributary of the Minsmere Old River 2

Reach description

C.3.3.1 This watercourse appears to have been modified historically, given that it had a straight planform, a trapezoidal cross-section and was entrenched below the level of the surrounding fields.

C.3.3.2 Flow in the channel was low at the time of the survey, with either sections of dry channel or ponded flow (i.e. stagnant). There was no consistent evidence of sediment transport, or morphological processes or features (e.g. bars or berms).

C.3.3.3 The channel bed was dominated by terrestrial vegetation, while grasses, herbaceous plants and trees were all present on the bank top.

Photos

Table C.4: Site photos - Unnamed Tributary of the Minsmere Old River 2

No.	Approximate grid reference	Photo	Comment
1	642729E 266047N		View into stream. Heavily vegetated.

No.	Approximate grid reference	Photo	Comment
2	642705E 266033N		Wider landscape
3	642960E 266104N		View downstream, channel deepens and is dominated by terrestrial vegetation.

No.	Approximate grid reference	Photo	Comment
4	643059E 266157N		View upstream. Note the very straight planform and trapezoidal cross-section.

C.3.4 Unnamed Tributary of the Minsmere Old River 3

Reach description

C.3.4.1 This watercourse appears to have been modified historically. It has a straight planform and the channel was entrenched below the level of the surrounding agricultural land.

C.3.4.2 Flow in the channel was low at the time of the survey, and this was not consistently flowing (i.e. sections of the channel bed contained water, while other sections were dry).

C.3.4.3 The substrate was dominated by fine sediments. Additionally, there were a number of accumulations of organic material in the channel bed, such as leaf litter and sticks. There was no consistent evidence of sediment transport and morphological processes or features (such as bars or berms).

C.3.4.4 Access to the watercourse was limited due to a line of dense trees and hedgerows, with other sections dominated by grasses and herbaceous plants.

C.3.4.5 It is anticipated that this watercourse would not support WER quality elements, such as fish.

Photos

Table C.5: Site photos - Unnamed Tributary of the Minsmere Old River 3

No.	Approximate grid reference	Photo	Comment
1	643028E 265581N		View downstream

No.	Approximate grid reference	Photo	Comment
2	642947E 265601N		View into stream

C.3.5 Unnamed Tributary of the Minsmere Old River 4

C.3.5.1 Similar to the unnamed tributary of the Minsmere Old River 3, this watercourse appears to have been modified historically. It has a relatively straight planform and the channel was entrenched below the level of the surrounding agricultural land.

C.3.5.2 Flow in the channel was low at the time of the survey, and this was not consistently flowing (i.e. sections of the channel bed contained water, while other sections were dry).

C.3.5.3 The substrate was dominated by fine sediments. Additionally, there were a number of accumulations of organic material in the channel bed, such as leaf litter and sticks. There was no consistent evidence of sediment transport and morphological processes or features (such as bars or berms).

C.3.5.4 Access to the watercourse was limited due to a line of dense trees and hedgerows, with other sections dominated by grasses and herbaceous plants.

C.3.5.5 It is anticipated that this watercourse would not support WER quality elements, such as fish.

Photos

Table C.6: Site photos - Unnamed Tributary of the Minsmere Old River 4

No.	Approximate grid reference	Photo	Comment
1	643043E 265361N		View upstream
2	642953E 265265N		View downstream

No.	Approximate grid reference	Photo	Comment
3	643147E 265465N		View downstream

No.	Approximate grid reference	Photo	Comment
4	643258E 265546N		After confluence. View into stream

No.	Approximate grid reference	Photo	Comment
5	643258E 265546N		After confluence. View upstream

C.4 Hundred River

C.4.1 Hundred River

C.4.1.1 This section of the Hundred River was not visited as part of the surface water environment surveys undertaken in spring 2024.

C.4.2 Unnamed Tributary of the Hundred River 1

Reach description

C.4.2.1 The channel has been historically modified – it was very straight, uniform and overly wide. The channel also had a trapezoidal cross-section and was entrenched below the level of the surrounding land. There was evidence of recent dredge deposits on the bank top in places, and an informal embankment on the right bank.

C.4.2.2 While there was water in the channel and it was flowing, flow was very shallow, and there was very little diversity of flow or morphology.

C.4.2.3 The substrate was dominated by fine sediments with occasional evidence of coarser material such as gravel and sand. There was no consistent evidence of sediment transport and morphological processes or features (such as bars or berms). Sediment input to the reach appeared to be predominantly from the surrounding fields.

C.4.2.4 Grasses and herbaceous plants dominated the riparian corridor. Trees were only really present on the right bank in the lower portion of the reach. The bank toe was bare (not colonised with vegetation) throughout the survey reach.

C.4.2.5 The section of watercourse is not anticipated to support WER quality elements, such as fish.

Photos

Table C.7: Site photos - Unnamed Tributary of the Hundred River 1

No.	Approximate grid reference	Photo	Comment
1	641521E 264702N		View downstream. Note the straight channel, informal embankment on the right bank and recent dredge deposits on the left bank.
2	641567E 264641N		View into stream. Note, bare sediment along the bank toe.

No.	Approximate grid reference	Photo	Comment
3	641567E 264641N		View upstream. Note, shallow flow with little diversity of morphology or flow.
4	641712E 264441N		View into stream showing substrate was dominated by fine sediments.

No.	Approximate grid reference	Photo	Comment
5	641762E 264222N		View downstream illustrating little diversity in flow or morphology.
6	641767E 264076N		View downstream. The lower portion of the reach had trees on the right bank.

C.4.3 Unnamed Tributary of the Hundred River 2

Reach description

C.4.3.1 The channel has been modified historically. It has a straight planform and is entrenched below the level of the surrounding agricultural land.

C.4.3.2 There was very little water in the channel at the time of the survey, with no evidence that this was flowing (i.e. flow was stagnant). There was no sign of consistent sediment transport, morphological features or processes (such as bars or berms).

C.4.3.3 Riparian vegetation was dominated by grasses and herbaceous plants throughout the survey reach, with only occasional trees present.

C.4.3.4 The watercourse is not anticipated to support WER quality elements, such as fish.

Photos

Table C.8: Site photos - Unnamed Tributary of the Hundred River 2

No.	Approximate grid reference	Photo	Comment
1	641161E 263974N		View across stream

No.	Approximate grid reference	Photo	Comment
2	641170E 263964N		View downstream
3	641223E 263916N		View downstream
4	641393E 263736N		View upstream. Vegetated and dry agricultural ditch.

C.5 Fromus

C.5.1 Unnamed Tributary of the Fromus

Reach description

C.5.1.1 This channel was dry at the time of survey, and characteristic of an agricultural drainage ditch. The channel has been historically straightened and was entrenched below the level of the surrounding land.

C.5.1.2 There is no flow in the channel at the time of the survey, and terrestrial vegetation (grasses) was evident growing on the bed of the watercourse.

C.5.1.3 There was no evidence of continuous morphological processes or features, though some coarse sediment was evident on the bed which indicates that a degree of sediment transport may occur at higher flow events.

C.5.1.4 The watercourse is not anticipated to support WER quality elements, such as fish.

Photos

Table C.9: Site photos - Unnamed Tributary of the Fromus

No.	Approximate grid reference	Photo	Comment
1	640468E 262304N		View upstream, illustrating the straight channel.

No.	Approximate grid reference	Photo	Comment
2	640468E 262304N		View downstream. Note the terrestrial vegetation growing on the bed of the channel, and the degree of entrenchment below the surrounding land.
3	640430E 262212N		View of the substrate. Dry agricultural drain, with terrestrial vegetation growing and pockets of exposed coarse sediment.

No.	Approximate grid reference	Photo	Comment
4	640353E 261935N		View into the channel, showing terrestrial vegetation growth on the channel bed.

C.6 Not within a water body

C.6.1 Dunwich River

Reach description

C.6.1.1 The channel was dry at the time of the survey, with no standing or flowing water present. While the channel appears to have been modified previously (i.e. straight planform), the channel was not overly entrenched below the surrounding land.

C.6.1.2 There was no evidence of morphological features or processes such as bars and berms. However, coarse sediments (sands, gravels) were visible on the bed of the dry watercourse channel, which indicates that when water does flow in the channel then there may be sufficient energy to transport these sediments, or at least keep these bed sediments clean from silt.

C.6.1.3 A dense line of trees was present on the left bank, though the right bank was dominated by grasses and herbaceous plants.

C.6.1.4 Based on the survey, this watercourse is not anticipated to support WER quality elements, such as fish.

Photos

Table C.10: Site photos - Dunwich River

No.	Approximate grid reference	Photo	Comment
1	643195E 271265N		Damp section of channel

No.	Approximate grid reference	Photo	Comment
2	643223E 271257N		View across stream
3	643240E 271248N		View downstream

No.	Approximate grid reference	Photo	Comment
4	643240E 271248N		View upstream
5	643240E 271248N		Wider landscape. Gentle slope down to ditch from crops

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