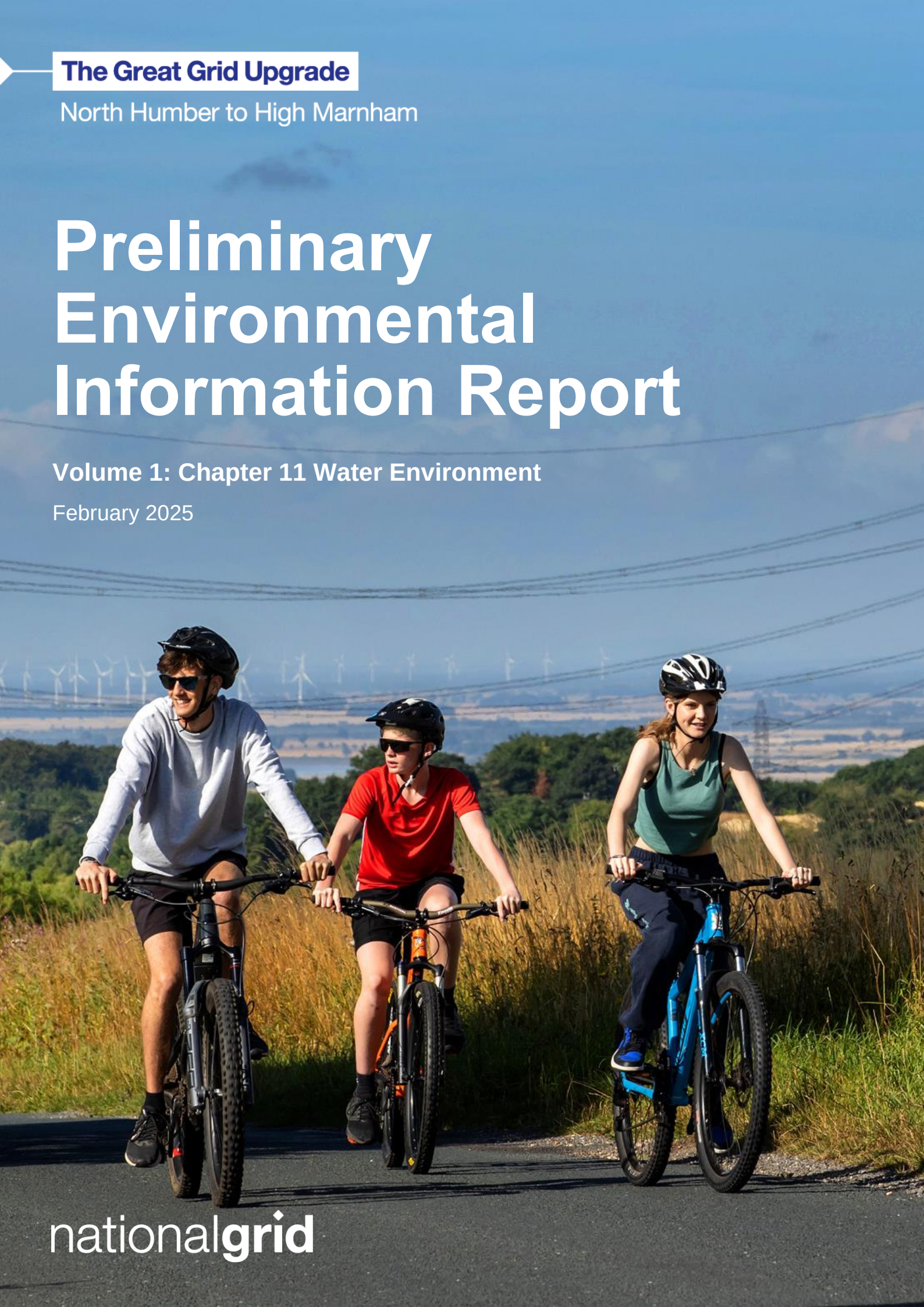
The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Volume 1: Chapter 11 Water Environment

February 2025



nationalgrid

Contents

North Humber to High Marnham
Document Control

Document Properties	
Organisation	Arcadis
Author	Arcadis
Approved by	National Grid
Title	Preliminary Environmental Information Report Chapter 11 Water Environment
Document Register ID	NHHM-NG-ENV-REP-001
Data Classification	Public

Version History

Document	Version	Status	Description / Changes
Chapter 11	1.0	Final	First Issue

11. Water Environment

nationalgrid

11. Water Environment

11.1 Introduction

11.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents information about the preliminary environmental assessment of the likely significant water environment effects identified to date, that could result from the proposed overhead line between the proposed Birkhill Wood Substation and the proposed High Marnham Substation as described in **Chapter 4 Description of the Project.**

11.1.2 **Chapter 1 Introduction** explains that the proposed Birkhill Wood Substation and proposed High Marnham Substation are proposed to be authorised through separate consenting procedures, however, they have also been included as part of the Project. As explained in **Chapter 5 Approach to Preparing the PEIR**, the environmental effects of these two substations including their associated overhead line reconfigurations, hereafter referred to as the Proposed Substation Works, have accordingly been considered within **Chapter 20 Substations and Associated Works**. For the purpose of this chapter the proposed overhead line between the proposed Birkhill Wood Substation and the proposed High Marnham Substation is hereafter referred to as the Proposed Overhead Line.

11.1.3 To ensure that the Project as a whole has been assessed a summary has been included within this preliminary assessment of the likely significant effects on the water environment which brings together the assessment of the Proposed Overhead Line and Proposed Substation Works for the water environment.

11.1.4 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, mitigation and the preliminary water environment residual significant effects that could result from the Proposed Overhead Line.

11.1.5 This chapter covers effects on the following:

- Hydromorphology, surface water quality and existing water interests (abstractions and discharges) during construction; and
- Land drainage and flood risk from all relevant sources, during construction and operation (noting that maintenance and decommissioning are scoped out).

11.1.6 This chapter should be read in conjunction with:

- **Chapter 4 Description of the Project**;
- **Chapter 5 Approach to Preparing the PEIR**; and
- **Chapter 20 Substations and Associated Works**.

11.1.7 There are interrelationships related to the potential effects on water environment and other environmental topics. Therefore, please also refer to the following chapters:

- **Chapter 8 Ecology**;
- **Chapter 12 Geology and Hydrogeology**;

- **Chapter 13 Agriculture and Soils**;
- **Chapter 18 Health and Wellbeing**; and
- **Chapter 21 Cumulative Effects**.

11.1.8 This chapter is supported by the following figures in Volume 2 and appendices in Volume 3:

- **Figure 11.1 Study Area and Water Environment Features**;
- **Figure 11.2 Flood Risk Areas**;
- **Figure 11.3 Water Framework Directive Surface Waterbody Status**; and
- **Appendix 11.1 Water Environment Baseline Data**.

11.2 Regulatory and Planning Context

11.2.1 This section sets out the legislation and planning policy that is relevant to the preliminary water environment assessment. A full review of compliance with relevant national and local planning policy will be provided within the Planning Statement that will be submitted as part of the application for Development Consent.

11.2.2 **Chapter 2 Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential water environment effects associated with the construction, operation and maintenance of the Project is presented below.

Legislation

11.2.3 The legislation listed below has been considered when identifying potential constraints to the Project, design options, and mitigation.

- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 11.43) consolidate, revoke and replace the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (Ref 11.2). The 2017 Regulations place a general duty on the Secretary of State (SoS), the Welsh Ministers, the Environment Agency (EA), and Natural Resources Wales (NRW) to exercise their 'relevant functions' so as to secure compliance with the Water Framework Directive (WFD) (Regulation 3).
- The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 (Ref 11.3) make amendments to legislation in the fields of floods and water. The regulations ensure that floods and water legislation will continue to be operable in the United Kingdon (UK) after the UK leaves the European Union (EU).
- The Environment Act 2021 (Ref 11.4) brings together measures to strengthen and update the existing regulatory and long-term planning framework for water, helping to reduce environmental risks, including to water quality and land drainage. It also strengthens the regulation of water and sewerage undertakers by the newly established Office for Environmental Protection.
- The Land Drainage Act 1991 (Ref 11.5); Environmental Permitting (England and Wales) Regulations 2016 (Ref 11.6) and the Water Resources Act 1991 (Ref 11.7) provide for the Environment Agency to prevent the obstruction of any main river through the construction of flow control structures, culverts or any other

structure in a main river. Where culverting or other works have a potential to affect the flow regime on ordinary watercourses, consent is required from the Lead Local Flood Authority (LLFA) under the Flood and Water Management Act 2010 (Ref 11.8) which provides a more comprehensive flood risk management framework for people, homes, and businesses.

National Policy Statements (NPSs)

11.2.4 **Chapter 2 Regulatory and Planning Context** sets out the overarching policy context relevant to the Project, including the Overarching NPS for Energy (EN-1) (Ref 11.1). This is supported by the NPS for Electricity Networks Infrastructure (EN-5) (Ref 11.10).

11.2.5 Paragraph 5.8.13 of EN-1 states:

'*A site-specific flood risk assessment should be provided for all energy projects in Flood Zones 2 and 3 in England…In Flood Zone 1 in England…, an assessment should accompany all proposals involving*:

- *Sites of 1 hectare or more*
- *Land which has been identified by the EA or NRW as having critical drainage problems*
- *Land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future*
- *Land that may be subject to other sources of flooding (for example surface water)*
- *Where the EA or NRW, Lead Local Flood Authority, Internal Drainage Board or other body have indicated that there may be drainage problems*.'

11.2.6 Paragraph 5.8.14 states that Flood Risk Assessments (FRA) '*should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account*'.

11.2.7 The minimum requirements for FRA are set out in Paragraph 5.8.15 and include that an FRA should '*be proportionate to the risk and appropriate to the scale, nature and location of the project and consider the risk of flooding arising from the project in addition to the risk of flooding to the project*'.

11.2.8 EN-1, in section 5.16, also covers the potential for development to lead to increased demand for water, involve discharges to water and cause physical modifications to the water environment, and to pose an increased risk of spills and leaks of pollutants to the water environment. Paragraph 5.16.3 stipulates that:

'*the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment, and how this might change due to the impact of climate change on rainfall patterns and consequently water availability across the water environment, as part of the Environmental Statement (ES) or equivalent*'.

11.2.9 EN-5 covers resilience to climate change and the need to look to design for flood resilience. Paragraph 2.3.2 of EN-5 states:

'*Applicants should in particular set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it would be resilient to flooding, particularly for substations that are vital for the electricity transmission and distribution network*'.

11.2.10 Paragraph 2.3.3 of EN-5 advises that:

'*the resilience of the project to the effects of climate change must be assessed in the ES accompanying an application*',

also stating that:

'*future increased risk of flooding would be covered in any flood risk assessment*'.

Other National Policy

11.2.11 Although the Project will be tested in line with the NPSs stated above, the preliminary assessment has also been undertaken in accordance with, and with reference to, the following national policy:

- National Planning Policy Framework (NPPF) 2024 (Ref 11.11) and accompanying planning practice guidance with regard to flood risk and climate change, and water quality and supply. The NPPF sets out government's planning policies for England and how these are expected to be applied. With regard to the Water Environment, plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, water quality, biodiversity and landscapes (Ref 11.11).

Regional and Local Policy

11.2.12 **Chapter 2 Regulatory and Planning Context** lists relevant regional and local policy. Key local policy relevant to water environment that has informed this preliminary assessment and will inform the assessment within the ES, comprises:

- East Riding Local Plan 2012-2029, Adopted 2016 (Ref 11.12)
  - Policy ENV6 Management of Environmental Hazards
- East Riding Local Plan Update 2020-2023 (Ref 11.13)
  - Policy ENV5: Enhancing biodiversity and geodiversity
  - Policy ENV6: Managing environmental hazards
- North Lincolnshire Local Development Framework Core Strategy 2006 – 2026, Adopted 2011 (Ref 11.14)
  - Policy CS18 Sustainable use of Natural Resources
  - Policy CS19 Flood Risk
- Bassetlaw District Local Plan 2020-2038, Adopted 2024 (Ref 11.16)
  - Policy DM12 Flood Risk and Sustainable Drainage
- Cottingham Neighbourhood Plan and Design Guide 2015-2029, Adopted 2018 (Ref 11.17)
  - Policy GP3 Sustainable Drainage
- Clarborough and Welham Neighbourhood Plan 2016-2031, Adopted 2017 (Ref 11.18)
  - Policy P5 Reducing the Risk of Flooding

- Nottinghamshire County Council Minerals Local Plan, Adopted 2021 (Ref 11.19)
  - Policy DM2 Water Resources and Flood Risk

11.2.13 North Lincolnshire Council submitted the New Local Plan for Examination in November 2022. The Examination progressed however the authority took the decision to formally withdraw the New Local Plan from the Examination in September 2024. The Saved Policies in the Local Plan (2003) as updated in October 2024 (Ref 11.42), North Lincolnshire Local Development Framework Core Strategy (2011) (Ref 11.14) from the adopted Development Plan and have been considered in the PEIR where relevant.

11.3 Scoping Opinion and Consultation

Scoping Opinion

11.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 11.20) provided by the Planning Inspectorate on behalf of the Secretary of State, following submission of the Environmental Impact Assessment (EIA) Scoping Report (Ref 11.21). The scope has also been informed through consultation and engagement with relevant stakeholders.

11.3.2 A summary of the Scoping Opinion (Ref 11.21) together with a response from National Grid against each point of relevance to the water environment, is provided in Table 11.1

Table 11.1 - Scoping Opinion comments

ID	Inspectorate's comments	Response
3.5.1	**Watercourses and water bodies, existing water interest - pollution from silt, hydrocarbons and other construction materials, increased rates and volumes of rainfall runoff, reduced channel flow capacity due to siltation and disruption to the land drainage regime – Construction** The Applicant proposes to scope out these matters for the phase and receptors identified on the basis that measures set out in the Scoping Report would be implemented to manage work site runoff to ensure watercourses are not polluted, nor their flow capacities reduced, and the function of existing land drainage routes and systems are retained. Although the Inspectorate acknowledges the information and measures within the Scoping Report, it considers that there is currently insufficient evidence to scope out these matters for the phase identified. The Applicant should ensure that any measures identified are set out clearly within the	Further information on the measures proposed to manage construction work site runoff and the good practice measures that will be enacted to prevent pollution of the water environment are provided in **Appendix 4.1 Draft Outline CoCP** in Volume 3 and will be agreed with relevant stakeholders during preparation of the ES.

ID	Inspectorate's comments	Response
	Construction Environmental management Plan (CEMP), agreed with the relevant stakeholders and appropriately secured within the Development Consent Order (DCO).	
3.5.2	**Increased surface water flood risk - Operational runoff from impermeable surfaces, such as Cable Sealing End Compounds (CSECs) – Operation** The Applicant proposes to scope out this matter for the phase identified on the basis that measures set out in the Scoping Report would be implemented to sustainably manage operational drainage from CSECs to prevent increases in surface water flood risk. Although the Inspectorate acknowledges the information and measures within the Scoping Report, it considers that as the numbers and locations of the CSECs, plus other potential areas of impermeable surface are not yet available, there is currently insufficient evidence on the amount of impermeable surface to scope out this matter for the phase identified. The Applicant should ensure that any measures identified are agreed with the relevant stakeholders, that they take into account any projected changes in rainfall as a result of climate change, and that they are appropriately secured within the DCO.	The Project no longer proposes any CSECs, however it will introduce new permanent impermeable surfaces. Therefore, further information on the measures proposed to manage surface water runoff from operational infrastructure are provided in **Appendix 4.1 Draft Outline CoCP** and will be agreed with relevant stakeholders. The operational surface water drainage design will account for the predicted effects of climate change on rainfall intensity in accordance with published guidance
3.5.3	**Floodplains, landowners and infrastructure - loss of floodplain storage and changes in floodplain flow conveyance routes, increased rates and volumes of rainfall runoff, disruption to the land drainage regime – Operation** The Applicant proposes to scope out this matter for this phase and receptor on the basis that the nature and footprint of operational above ground infrastructure (pylons and CSECs) would not cause significant floodplain storage losses or disruption to floodplain flow paths. Although the Inspectorate acknowledges the information and measures within the Scoping Report, it considers that there is currently insufficient information to scope out this matter for the phase identified. The Applicant should ensure that any measures identified	The Flood Risk Assessment that will be prepared to inform the Environmental Statement will address the potential for the project to increase flood risk from rivers and surface water during its operational lifetime, taking account of published climate change guidance. The Flood Risk Assessment that will be prepared in consultation with relevant stakeholders, and any mitigation measures required will be agreed with these parties and secured within the draft DCO.

ID	Inspectorate's comments	Response
	are agreed with the relevant stakeholders, that they take into account any projected changes in rainfall as a result of climate change, and that they are appropriately secured within the DCO.	
3.5.4	**Water Environment Receptors – use of machinery and vehicles for non-intrusive inspections and localised repairs – Operation** The Applicant proposes to scope out this matter for the phase and receptors identified on the basis that the nature and scale of the maintenance activities would not cause pollution of the water environment and any physical disturbance would be highly localised. The Inspectorate is content that this matter can be scoped out on the basis that activity for the phase identified would be unlikely to give rise to significant effects.	This matter has been scoped out of further assessment as agreed.
3.5.5	**Water Quality effects – Operation** The Applicant proposes to scope out this matter for the phase identified on the basis that there would be no operational discharges to surface watercourses and rainfall runoff from the CSECs would be sustainably attenuated (and if required treated) prior to discharge to the receiving water environment. Physio-chemical elements supporting the Water Framework Directive waterbody status would therefore be safeguarded. The Applicant therefore proposes that no likely significant effects are anticipated in relation to water quality. The Inspectorate considers that, subject to the provision of further evidence that no pollutant sources are present or present a risk, and that the relevant stakeholders agree that the drainage proposals and any emergency plans / operational environmental management plans are sufficient to eliminate the risk, that an assessment would not be required. Therefore, the Inspectorate is content that this matter can be scoped out for the phase identified.	The Project is engaging with stakeholders to agree drainage proposals, including in response to an emergency e.g., a spillage or extreme weather event. During operation works to maintain the CSECs would be undertaken in line with the appropriate operational environmental management plans. Further details of operational drainage principles are provided in **Chapter 4 Description of the Project.**

ID	Inspectorate's comments	Response
3.5.6	**Water Environment Receptors – Operation** The Applicant proposes to scope out all maintenance effects, including pollution of watercourses and physical disturbance on water environment receptors on the basis that maintenance activities would generally be limited to non-intrusive inspections. Where repairs are necessary, the Applicant proposes that activities involved would be similar to those for construction, albeit over a much smaller area and scale and that maintenance would be undertaken in line with the Applicant's operational management procedures. The Applicant therefore proposes that maintenance activities are unlikely to result in likely significant effects. The Inspectorate is content that this matter can be scoped out on the basis of the explanation provided and subject to a number of mitigation measures being identified within the relevant control documentation and secured within the DCO.	This matter has been scoped out of further assessment as agreed. The ES will set out the mitigation measures required to safeguard water environment receptors during maintenance activities and how these measures will be secured within the DCO.
3.5.7	**NPPF reference – Development and Flood Risk** Reference to paragraph 154 of the NPPF is noted, however as there is flood risk associated with certain areas within the scoping boundary, the Inspectorate also draws the Applicant's attention to NPPF policies specifically relating to development and flood risk (paragraphs 159-169). It is expected that these paragraphs will be referenced as necessary within the forthcoming ES.	It is noted that an update to the NPPF was published in December 2024, therefore paragraph referencing has changed since receipt of the Scoping Opinion. All relevant paragraphs of the revised NPPF will be referenced as necessary within the Flood Risk Assessment and ES, which will include details of how the Project has achieved compliance.
3.5.8	**Limits of Deviation – Flood Risk** In order to facilitate flexibility in terms of underground cables and trenchless crossings and water crossings, the Inspectorate advises that flood risk be taken into consideration when setting the Limits of Deviation.	As a result of ongoing assessment and appraisal, no sections of undergrounding on the proposed overhead line are proposed. There is the requirement to divert existing utilities including low voltage wood pole and telecommunication overhead lines. This includes undergrounding of these assets.

ID	Inspectorate's comments	Response
		Flood risk will be considered in development the LoDs for the undergrounding of these assets.
3.5.9	**Flood Risk Data Sources** The Inspectorate recommends that the Applicant also utilise local Strategic Flood Risk Assessments in addition to the other sources listed.	Relevant Strategic Flood Risk Assessments will be referenced to inform the Flood Risk Assessment that is being prepared for the Project.
3.5.10	**Flood Risk Models** The Inspectorate advises that a thorough assessment of the suitability of any flood models should be undertaken prior to deciding whether any new or updated modelling is necessary to undertake a site-specific flood risk assessment.	The flood models received will be reviewed for their suitability to inform the Flood Risk Assessment and use of any model data will be agreed with the Environment Agency.
3.5.11	**Scope of Assessment** The Inspectorate advises that the proximity to main rivers and any flood defences assets should be scoped into the assessment, with regard to current and future flood risk, to ensure that flood risk is not increased elsewhere.	The Flood Risk Assessment that will be prepared will identify all main rivers and existing flood defence assets with the potential to be impacted by the Project. Through project design and mitigation there will be no significant effects on flood risk elsewhere.
3.5.12	**Fluvial and Tidal Flood Risk** Whilst the Applicant acknowledges that parts of the study area are at high risk of flooding and that areas of the Proposed Development would cross large extents of fluvial and coastal floodplain, fluvial flood risk has been scoped out of the assessment. The Inspectorate advises that this matter should therefore be scoped into further assessment. Similarly, the Inspectorate considers that there is not adequate justification for scoping out tidal flood risk from further assessment at this time and the Inspectorate therefore advises that this matter should also be scoped in.	The Flood Risk Assessment will also assess tidal flooding and the potential for obstruction of flood flow routes and loss of floodplain storage, identifying any necessary flood resilience and mitigation measures.
3.5.13	**Flood Flow Routes** The Applicant has identified structures which would have the potential to obstruct flood flow routes and reduce flood storage capacity if	The FRA will also assess tidal flooding and the potential for obstruction of flood flow routes and loss of floodplain storage,

ID	Inspectorate's comments	Response
	not appropriately located or designed, including open cut (trenched) watercourse crossings. In addition, the Applicant has identified that some sites located in the floodplain could see localised flood impacts associated with the storage of spoil, reducing available floodplain storage or interrupting key floodplain flow paths. Flood flow routes should therefore be scoped into the ES to ensure that any impacts on flow routes are given adequate consideration.	identifying any necessary flood resilience and mitigation measures.
3.5.14	**Future flood risk** The Applicant states that the design life of the Proposed Development is to be at least 80 years, with regular maintenance it could be extended further. The Inspectorate therefore advises that, as a minimum, the Applicant should assess the potential flood risk implications of the scheme for the next 80 years.	The Flood Risk Assessment will reflect a Project design life of 80 years, inclusive of applicable climate change allowance for this time horizon.
3.5.15	**Rising sea level due to Climate Change** The Inspectorate advises that where development is proposed in an Internal Drainage Board managed area, the ES should also consider the long-term future of the proposal in terms of climate change. The Applicant should also engage with the Internal Drainage Board.	The Project will continue to engage with relevant Internal Drainage Boards (IDBs) to shape surface water and flood risk management / mitigation measures. This engagement will inform the Flood Risk Assessment, which will consider the potential effects of climate change over the operational lifetime of the Project, and ES.

Project Engagement and Consultation

11.3.3 The water environment assessment has been, and will continue to be, informed by consultation and engagement with stakeholders including the relevant Lead Local Flood Authorities, the Environment Agency and relevant IDBs. Correspondence from these discussions will be detailed in the ES.

11.4 Assessment Approach and Methods

11.4.1 **Chapter 5 Approach to Preparing the PEIR** sets out the overarching approach which has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the baseline conditions, sensitivity of receptors and magnitude of impacts and sets out the criteria that have been used for the preliminary water environment assessment. This section also identifies further assessment needed to be undertaken to inform the ES.

Guidance Specific to the Water Environment Assessment

11.4.2 Relevant guidance specific to the water environment, that has informed this preliminary assessment and will inform the assessment within the ES, comprises:

- Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive, 2024 (Ref 11.1);
- Various Construction Industry Research and Information Association publications that provide construction good practice for preventing pollution of the water environment, for example, C532: Control of water pollution from construction sites (Ref 11.22);
- Design Manual for Roads and Bridges (DMRB) LA 113: Road drainage and the water environment, 2020 (Ref 11.23);
- Guidance: Pollution Prevention for Businesses, 2024 (Ref 11.24); and
- Flood Risk Management Guidance published by the relevant LLFAs (Ref 11.25).

11.4.3 The assessment of water environment effects considers potential sources of effects, during both construction and operation.

Study Area

11.4.4 As defined in the EIA Scoping Report (Ref 11.21), the study area for the water environment assessment includes the area within the draft Order Limits and extends to a 500 m buffer around the draft Order Limits. This is considered an appropriate study area based on the nature of Project construction and operation activities and technical knowledge of similar schemes. The study area for the water environment is presented in **Figure 11.1 Study Area and Water Environment Features**. This is presented for the Project inclusive of both the Proposed Overhead Line and Proposed Substation Works.

Baseline Data Collection and Forecasting Methods

Data sources

11.4.5 The baseline assessment has been informed by a desk study which has drawn on the following key information sources:

- Ordnance Survey (OS) mapping and aerial imagery from Magic Maps (Ref 11.26);
- OS 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
- Hydrology Data Explorer (Ref 11.27);
- Statutory Main River map for England (Ref 11.28) ;
- Catchment data explorer database of Cycle 2 and 3 WFD information (Ref 11.29);
- Humber River Basin Management Plan (Ref 11.30);
- Water quality data archive (Ref 11.31);
- Records of licensed surface water abstractions and consented discharges to surface water sources (Ref 11.32);
- Flood Map for Planning (Ref 11.33);

- Long term flood risk map for England (Ref 11.34);
- Risk of Surface Water Maps (Ref 11.35);
- Spatial flood defence database (Ref 11.36);
- The Historic Flood Map and Recorded Flood Outlines dataset (Ref 11.37) ;
- Flood Estimation Handbook webservice (Ref 11.38) defining surface water catchment areas and hydrological properties (e.g., rainfall, slopes, soil permeability); and
- High-resolution aerial imagery available to the Project.

Further data to be collected to inform the ES

11.4.6 In addition to the data collected for this preliminary assessment, the ES will be informed by the following additional third-party data and data obtained through surveys:

- Environment Agency flood model outputs (including flood extent and flood depth data) for the floodplains that are proposed to be crossed by Project infrastructure and information from the Humber River Basin Management Plan (Ref 11.30).
- Additional data on local sources of flood risk from relevant published Strategic Flood Risk Assessments and Management Plans prepared by the LLFAs and land drainage data and information from relevant IDBs.
- Field notes and photographs collected during ecology surveys, to characterise attributes such as the hydromorphology of watercourses proposed to be crossed.

11.4.7 All the further information received from stakeholders will be incorporated into future stages of the assessment.

Assessment Methods and Criteria

11.4.8 The following section describes the methodology proposed to be used for the assessment which builds on the general assessment methodology presented in **Chapter 5 Approach to Preparing the PEIR**.

11.4.9 The preliminary assessment is based on guidance set out in DMRB LA113 (Ref 11.23).

11.4.10 In section 11.5 baseline information is provided to characterise existing flood risk within the study area. Given the size of the Project, and the presence of areas of Flood Zone 3 (land having a 1% or greater annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of tidal flooding) (Ref 11.30), this baseline will be further detailed and an FRA will be produced for the Project alongside the ES. The FRA will be prepared in accordance with the requirements of the Energy National Policy Statements EN-1 and EN-5 and local flood risk management guidelines published by the LLFAs. The FRA will consider flood risk from all relevant sources during both construction and operation, incorporating allowance for climate change in accordance with published Environment Agency guidance where applicable (Ref 11.39). It will also include details of the measures proposed to adhere to local drainage and flood risk planning policies, for example with regard to avoiding disruption to land drainage routes and maintaining baseline rainfall runoff rates.

11.4.11 Baseline data for WFD surface waters is included in section 11.5, with WFD groundwater bodies characterised in **Chapter 12 Geology and Hydrogeology.** To

inform the ES, a WFD Screening Assessment will be produced for the Project guided by Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 11.1). The effects of the Project on the Humber River Basin Management Plan (Ref 11.30) and the waterbodies therein will be described, and the assessment will set out how the Project design has been developed to align with the requirements of the Regulations. A qualitative approach is proposed, and the preliminary assessment will identify how the Project design will avoid waterbody deterioration, as well as any other mitigation necessary.

Sensitivity

11.4.12 The method set out in the DMRB (Ref 11.23) provides guidance on assigning value (sensitivity) to receptors (for example, watercourses and floodplains). Table 11.2 presents the receptor value criteria.

Table 11.2 - Criteria for assigning value (sensitivity) to water environment receptors

Value of resource or receptor	Criteria	Typical examples
Very high	Nationally significant attribute of high importance	Site protected/designated under European Commission (EC) or UK legislation (Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Ramsar site). Watercourse having a Water Framework Directive (WFD) classification shown in a River Basin Management Plan (RBMP) and a Q95 > 1.0 m^3/s. Watercourse in natural equilibrium exhibiting a range of morphological features (e.g., pools, riffles) that is free from any modification or human influence. Essential infrastructure or highly vulnerable development.
High	Locally significant attribute of high importance	Watercourse having a WFD classification shown in a RBMP and a Q95 <1.0 m^3/s. Very limited signs of modification or other human influences on morphology. More vulnerable development.
Medium	Of moderate quality and rarity	Watercourses not having a WFD classification shown in a RBMP and Q95 > 0.001 m^3/s. Watercourse showing signs of modifications and having a limited range of morphological features. Less vulnerable development.
Low	Lower quality, common place	Watercourses not having a WFD classification in a RBMP and a Q95 flow <0.001 m^3/s. A highly modified watercourse, changed by human pressures. No morphological diversity. Water compatible development.

Magnitude

11.4.13 The method also provides criteria for assigning impact magnitude. The criteria consider the scale/extent of the predicted change and the nature and duration of the impact and are summarised in Table 11.3.

Table 11.3 - Criteria for assigned impact magnitude

Magnitude of impact*	Criteria	Typical examples
Large adverse	Results in loss of attribute and/or quality and integrity of the attribute	Loss or extensive change to a fishery. Loss or extensive change to a designated nature conservation site. Reduction in waterbody WFD classification. Pollution of a public water supply or loss of a major commercial/industrial/agricultural supply. Extensive change to channel planform, replacement of large extent of natural bed/banks with artificial material. Increase in peak flood level (1% Annual Exceedance Probability (AEP)) of >100 mm.
Medium adverse	Results in effect on integrity of attribute, or loss of part of attribute	Partial loss in productivity if a fishery. Pollution of a non-potential source of abstraction. Contribution to reduction in waterbody WFD classification. Degradation (quality or reliability) of a potable, commercial or agricultural water supply. Replacement of natural bed material or banks with artificial material over more than 3% of the water body's total length. Increase in peak flood level (1% AEP) of >50 mm.
Small adverse	Results in some measurable change in attribute quality or vulnerability	Minor effects on water supplies. Slight change from baseline conditions of channel bed/banks. Increase in peak flood level >10 mm.
Negligible	Results in effect on attribute of insufficient magnitude to affect the use or integrity	Negligible change in peak flood level (<10 mm). No measurable impact on WFD waterbodies or river channel planform.
Small beneficial	Results in some positive effect on an attribute or a reduced risk of negative effect occurring	Creation of flood storage and reduction in peak flood level (1% AEP) >10 mm.

Magnitude of impact*	Criteria	Typical examples
Medium beneficial	Results in moderate improvement of attribute quality	Contribution to improvement waterbody WFD classification. Improvements to morphological diversity at the local scale. Creation of flood storage and reduction in peak flood level (1% AEP) >50 mm.
Large beneficial	Results in major improvement of attribute quality	Removal of existing polluting discharge or removing likelihood of polluting discharges to a watercourse. Major improvement to morphological diversity at reach scale e.g., through culvert removal. Improvement in waterbody WFD classification. Creation of flood storage and reduction in peak flood level (1% AEP) >100 mm.
No change	No change, either beneficial or detrimental, to attribute quality	

*Terminology has been adapted from that used in LA113, DMRB (Ref 11.23)

Significance of effects

11.4.14 The significance of an effect is then derived using the matrix set out in **Chapter 5 Approach to Preparing the PEIR.**

Approach to defining significance in the PEIR

11.4.15 As set out in **Chapter 5 Approach to Preparing the PEIR** the general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels.

11.4.16 Following on from the identification of whether an effect is considered likely to be significant or not significant, a rating is given to reflect the confidence in the prediction at this preliminary stage. Confidence is rated as high, moderate, or low in line with the confidence level definitions presented in **Chapter 5 Approach to Preparing the PEIR**.

Preliminary Assessment Assumptions and Limitations

11.4.17 The assessment has been undertaken based on preliminary design information for the Proposed Overhead Line as described in **Chapter 4 Description of the Project**. This information is likely to develop further in response to ongoing design, assessment and stakeholder feedback, and will be updated for the ES as the design evolves.

11.4.18 It is currently assumed that other than treated surface water runoff, no discharges to surface waters would be required for the Proposed Overhead Line during its operation (and maintenance). Should any discharges be generated during operation or maintenance of the Proposed Overhead Line, these would be managed in accordance with the conditions of the relevant consent or permit as applicable.

11.4.19 It is also assumed that there would be no new temporary or permanent abstractions from surface water sources and that the water supply needs of the Proposed Overhead

Line during construction would be sourced either from mains water supply or, in remote locations where this option may not be available, water would be brought to site in tankers. With regards to grey water generated from welfare facilities, it is assumed that this would be discharged to the public sewer, or where this is not practicable, be collected and taken off site via tankers to a licenced disposal facility.

11.4.20 New overhead lines would oversail watercourses, including the River Ouse. However, the choice of watercourse crossing technique for the construction access road is dependent on several factors, for example, watercourse size, flood risk sensitivity, ecological sensitivity, and location. It is assumed in this preliminary assessment that most ordinary watercourses and land drains would be culverted for access, whereas any large watercourses that require crossing (main river and WFD waterbodies), would be crossed using open span bridges.

11.4.21 Where there is uncertainty on watercourse crossing techniques due to the design still evolving, culvert crossings have been assessed as it is the worst-case. Crossings techniques proposed at each watercourse will be confirmed and described in the ES once the design has evolved, and ground conditions are better understood following ground investigation works.

11.4.22 It has been assumed that temporary discharges generated from dewatering activities, for example around pylon bases, would be made to ground, rather than to watercourses. Where this is not practicable in localised areas, any discharge to surface water would be made in compliance with relevant consents.

11.4.23 The preliminary assessment is presented based on the development of the Proposed Overhead Line to date and data gathered at this point.

11.4.24 The key parameters and assumptions will be reviewed based on the design presented in the DCO application and, where required, updated or refined.

Further Assessment within the ES

11.4.25 The ES will present a detailed assessment in accordance with guidance with the significance of the effect on a receptor presented during construction and operation (where relevant), when considered in relation to the sensitivity or value of the receptor and the magnitude of the potential effect.

11.4.26 The ES will be informed by the FRA and WFD assessments, which will be prepared in parallel to the impact assessment.

11.4.27 Full assessment will be presented within the ES, including refining the assigned value (sensitivity) to receptors (for example, watercourses and floodplains) where necessary based on the findings of all data collected, as well as the magnitude of effects (change in the baseline conditions). The criteria will consider the scale/extent of the predicted change and the nature and duration of the effect. The factors will be combined to give an overall significance of effect with reference to a matrix.

11.4.28 The ES will present the final key parameters and assumptions used within that assessment, particularly drawing attention to any areas that may have evolved from what is presented in this preliminary assessment.

11.4.29 The ES will provide final details of embedded, standard, and additional mitigation measures, which will be informed by the findings of the preliminary assessment, statutory consultation and ongoing engagement with stakeholders.

11.5 Baseline Conditions

11.5.1 This section describes the baseline water environment in the study area where it relates to the Proposed Overhead Line. The baseline water environment in the study area in relation to the Proposed Substation Works is presented in **Chapter 20 Substations and Associated Works**.

11.5.2 Baseline conditions have been gathered from desk-based information and is presented with reference to the section of the Project that they are located within. For more information on the section of the Project please read **Chapter 4 Description of the Project.**

11.5.3 In addition to the description of the baseline water environment presented in the sections below, supplementary information also presented in **Appendix 11.1 Water Environment Baseline**.

11.5.4 With regard to sites designated for their nature conservation interest, details are provided in **Chapter 8 Ecology**. Where, informed by ongoing surveys and desk study, surface waters are confirmed to play a key role in sustaining designated interest features, these sites will be included as water environment receptors in the ES and assigned high or very high sensitivity according to whether the site has a designation at the local or national scale respectively.

11.5.5 Data to characterise existing surface water interests (abstractions and discharges) has been collected from the Environment Agency. The data, which is presented in **Appendix 11.1 Water Environment Baseline** and illustrated in **Figure 11.1 Study Area and Water Environment Features**, confirms that several watercourses in the study area receive, transport, and dilute consented discharges and supply water for a range of uses. The sensitivity of those watercourses that support these uses has been assigned as high, as they provide a function of high importance at the local scale.

11.5.6 Information on private water supplies and groundwater abstractions is provided in **Chapter 12 Geology and Hydrogeology.**

11.5.7 It should be noted that local Strategic Flood Risk Assessments have not been used to inform the baseline at this stage but will be included in the FRA.

Route Section 1: Creyke Beck to Skidby

Watercourses, their water quality and hydromorphology

11.5.8 Watercourses in the study area are shown in **Figure 11.1 Study Area and Water Environment Features**.

11.5.9 Within Route Section 1: Creyke Beck to Skidby, there is an ordinary watercourse (Beverly and Barmston Drain) assigned high sensitivity given its WFD status and flow characteristics, that frames part of the study area boundary at Creyke Beck. It has a total length of 3.5 km^2 and flows in an easterly direction, away from the study area, and into the Western Drain. There are also minor watercourses and ditches that are assigned medium sensitivity, as they provide a key land drainage function at the local scale. The catchment can be categorised as partially rural in its land use, as well as partially urban with the inclusion of the town Beverly and the villages Woodmansey and Cottingham. The topography slopes in a north-easterly direction.

11.5.10 Route Section 1 is in the catchment of the Beverley and Barmston Drain WFD waterbody (GB104026067211). A summary of the WFD status data (Cycle 3) for this waterbody is provided in Table 11.4, and the catchment is illustrated in **Figure 11.3 Water Framework Surface Waterbody Status.**

Table 11.4 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Beverley and Barmston Drain (GB104026067211)	Moderate	Fail	Artificial

11.5.11 The WFD classifications for the waterbody are informed by monitoring a range of parameters that are indicators of water quality at Environment Agency monitoring sites. The waterbody has a moderate ecological status and a failing chemical status. Multiple Reasons for Not Achieving Good (RNAG) status are reported for this waterbody, including 'Polybrominated Diphenyl Ethers (PBDE)', 'Phosphate' from flow (land drainage) and diffuse (riparian activities) sources, and 'poor nutrient management'.

11.5.12 The Route Section 1 study area is not located within a surface water Drinking Water Protected Area and is located within the Springhead (GWSGZ0248) surface water Drinking Water Safeguard Zone. Route Section 1 is located within a Nitrate Vulnerable Zone (NVZ).

11.5.13 In terms of physical form, the WFD waterbody within the study area is designated as 'artificial', indicating a waterbody created by human activity. In terms of the hydrological regime, the waterbody is designated with a status of 'supports good'. In terms of its hydromorphological qualities, the waterbodies have low sensitivity, being highly modified.

Flood risk and land drainage

11.5.14 A summary of the baseline information for flood risk and land drainage in Route Section 1: Creyke Beck to Skidby is provided below.

11.5.15 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.16 In this Route Section, according to the Environment Agency Flood Map for Planning, the draft Order Limits are located almost entirely in Flood Zone 1 (low risk), equivalent to an annual chance of flooding from rivers and the sea of less than 1 in 1,000 (0.1%). An access road which connects the study area to the A1079 road is located in Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers of 1 in 100 (1%) or greater, associated with an unnamed tributary (trib) located in the north of the study area in this Route Section.

11.5.17 According to the Environment Agency Asset Information and Maintenance (AIMS) (Ref 11.40) database, there are no flood defences located within Route Section 1.

11.5.18 The Recorded Flood Outline dataset (Ref 11.37) shows one area of historical flooding associated with fluvial flooding from the Beverly and Barmston Drain.

11.5.19 The Risk of Flooding from Surface Water map shows that most of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%). However, there are several small areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk located within the Route Section. Areas at high risk are associated with topographical depressions or follow the alignment of land drainage features.

11.5.20 The Long-term flood risk map for England (Ref 11.34) shows there is low risk of reservoir flooding within Route Section 1 and notes that groundwater flooding is unlikely. However, it is noted that the groundwater dataset is relatively crude and this form of flooding will be assessed in further detail in the FRA.

11.5.21 The land within the draft Order Limits in the Route Section insofar as they relate to the Proposed Overhead Line is therefore assigned low sensitivity in terms of the existing risk of flooding from rivers, the sea, surface water, reservoirs and groundwater.

Route Section 2: Skidby to A63 Dual Carriageway

Watercourses, their water quality and hydromorphology

11.5.22 Within Route Section 2: Skidby to A63 dual carriageway, the ordinary watercourse, Brantingham Beck (which flows into and becomes the Ellerker Beck south of the A63), is located in the south of the Route Section and is crossed by the draft Order Limits, as illustrated in **Figure 11.1 Study Area and Water Environment Features**. The watercourse flows in south westerly direction, underneath the A63, and into Route Section 3 and is assigned high sensitivity as an important receptor at the local scale. There are also minor watercourses and ditches, which are assigned medium sensitivity as they provide a key land drainage function at the local scale. The catchment can be categorised as generally rural in its land use, with several villages located within the catchment. The topography is undulating, with a downward slope towards the village of Brantingham.

11.5.23 Route Section 2 drains to the Mill Beck 2 (Ellerker Area) WFD waterbody catchment (GB104026066660) and Fleet Drain WFD waterbody catchment (GB104026066750). A summary of the WFD Status Data (Cycle 3) is provided in Table 11.5 and the catchment is illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**. In accordance with the assessment criteria these waterbodies are assigned high sensitivity.

Table 11.5 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Mill Beck 2 (Ellerker Area) (GB104026066660)	Moderate	Fail	Heavily modified

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Fleet Drain (GB104026066750)	Moderate	Fail	Artificial

11.5.24 The waterbodies have a moderate ecological status and a failing chemical status. Multiple reasons for not achieving good (RNAG) status are described within the River Basin Management Plan and include physical modification through flood protection and structures, as well as the presence of 'Benzo(g-h-i)perylene' and 'Perfluorooctane sulphonate (PFOS)' (source activity unknown – pending investigation).

11.5.25 The Route Section 2 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 2 is located within NVZ.

11.5.26 In terms of physical form, the Mill Beck WFD waterbody within Route Section 2 is designated as 'heavily modified'. This refers to a watercourse being modified from its natural state for human use, for example to facilitate land drainage. The Fleet Drain WFD waterbody, within Route Section 2, is designated as 'artificial', indicating a waterbody created by human activity. In terms of their hydrological regimes, the waterbodies are designated as 'supports good' status for these attributes. These waterbodies are therefore assigned as low sensitivity with regard to their hydromorphological characteristics.

Flood risk and land drainage

11.5.27 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.28 In this Route Section, the draft Order Limits are located entirely in Flood Zone 1 (low risk), equivalent to an annual chance of flooding from rivers and the sea of less than 1 in 1,000 (0.1%).

11.5.29 According to the Environment Agency AIMS database there are no flood defences located within Route Section 2.

11.5.30 The Recorded Flood Outline dataset shows no areas within Route Section 2 that have previously been flooded.

11.5.31 The Risk of Flooding from Surface Water map shows that the vast majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%). However, there are several small, isolated areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk located within the Route Section. Moreover, several low risk surface water flow routes are mapped in several areas, including along Riplingham Road and Ellerker Wold Lane.

11.5.32 The Long-term flood risk map for England (Ref 11.34) shows there is low risk of reservoir flooding within Route Section 2 and indicates that flooding from groundwater is unlikely.

11.5.33 The land within the draft Order Limits in Route Section 2 is therefore assigned low sensitivity in terms of the existing risk of flooding from rivers, the sea, surface water, reservoirs and groundwater.

Route Section 3: A63 Dual Carriageway to River Ouse Crossing

Watercourses, their water quality and hydromorphology

11.5.34 Within Route Section 3: A63 dual carriageway to River Ouse crossing, there is a main river (Mill Beck) and a canal (Market Weighton Canal) that are crossed by the draft Order Limits. These receptors are assigned high sensitivity, as important receptors at the local scale. There are also numerous ordinary watercourses, minor watercourses, and ditches (including Broomfleet Beck, Scarlby Warping Drain, Bishopsoil Drain, Blacktoft Warping Drain and Bellasize Drain) which are assigned high to medium sensitivity. These watercourses are illustrated in **Figure 11.1 Study Area and Water Environment Features.**

11.5.35 Ellerker Beck flows in a south-westerly direction, underneath the A63 and beyond the draft Order Limits, before flowing into Route Section 3 again approximately 2 km further downstream. Mill Beck meanders in a southerly direction across the draft Order Limits.

11.5.36 The Market Weighton Canal, and three other drainage tributaries (Bishopsoil Drain, Blacktoft Drain and Bellasize Drain) all flow across the draft Order Limit. The catchment can be categorised as generally rural in its land use, with several villages located within the catchment. The topography is relatively flat, with the exception of a downward slope towards the village of Brantingham.

11.5.37 Route Section 3 covers the downstream extent of the Mill Beck 2 (Ellerker Area) waterbody catchment (GB104026066660), with the status of this waterbody summarised in Table 11.5 above.

11.5.38 The Route Section 3 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 3 is partially located within an NVZ.

11.5.39 In terms of their physical form, the watercourses in this Route Section generally have straight, uniform channels reflecting their function for land drainage and the East Riding of Yorkshire IDB manage several watercourses for this purpose. They therefore have low hydromorphological diversity and are assigned as having low sensitivity with regard to this attribute.

Flood risk and land drainage

11.5.40 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.41 In this Route Section, the draft Order Limits are mostly located in Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers of 1 in 100 (1%) or greater, associated with the River Ouse (which has a tidal influence in this reach). The rest of the Route Section, between the A63 dual carriageway and Sands Lane (which crosses the draft Order Limits), is located in Flood Zone 1 (low risk), equivalent to an annual chance of flooding from rivers and the sea of less than 1 in 1,000 (0.1%).

11.5.42 According to the Environment Agency AIMS database the Mill Beck and the Market Weighton Canal have natural high ground on both banks, which offer flood protection.

11.5.43 The Recorded Flood Outline dataset shows no areas within Route Section 3 that have previously been flooded.

11.5.44 The Risk of Flooding from Surface Water map shows that the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%). However, there are several small, localised areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk located within the Route Section. Risks of flooding from this source are reduced by the operational and maintenance activities undertaken by the East Riding of Yorkshire IDB.

11.5.45 The Long-term flood risk map for England (Ref 11.34) shows there is risk of reservoir flooding 'when river levels are normal' in the surroundings of the Market Weighton Canal, as well as significant reservoir flooding 'when there is also flooding from rivers', in close proximity to the River Ouse. Overall, there is high risk of reservoir flooding within Route Section 3. Groundwater flooding is noted to be unlikely.

11.5.46 The land within the draft Order Limits in Route Section 3 is therefore assigned high sensitivity in terms of the existing risk of flooding from rivers and the sea, surface water and reservoirs and a low sensitivity with regard to groundwater flooding.

Route Section 4: River Ouse Crossing

Watercourses, their water quality and hydromorphology

11.5.47 Within Route Section 4: River Ouse crossing, one main river (River Ouse), which is assigned very high sensitivity, and an unnamed ordinary watercourse (medium sensitivity) is crossed by the draft Order Limits, as illustrated in **Figure 11.1 Study Area and Water Environment Features**. There are also minor watercourses and ditches (assigned medium sensitivity). The River Ouse flows in an easterly direction, towards the Humber Estuary. The catchment can be categorised as rural in its land use, with topography that is generally flat.

11.5.48 Route Section 4 covers the Humber Upper WFD waterbody catchment (GB530402609203), status data for which is summarised in Table 11.6 and the catchment is illustrated in **Figure 11.3 Water Framework Directive Surface Waterbody Status**.

Table 11.6 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Humber Upper (GB530402609203)	Moderate	Fail	Heavily modified

11.5.49 The waterbody has a moderate ecological status and a failing chemical status. Multiple reasons for not achieving good (RNAG) status for this waterbody are cited in the RBMP and include 'Angiosperms' (affected by natural and physical modification through natural conditions and flood protection), and 'Dissolved Oxygen' (affected by point and diffuse

source and flow through sewage discharge, poor nutrient management and surface water abstraction).

11.5.50 The Route Section 4 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 4 is located within a NVZ to the south of the River Ouse.

11.5.51 In terms of physical form, the Humber Upper waterbody is designated as 'heavily modified' from its natural state for human use, for example navigation. In terms of the hydrological regime, the waterbody is designated as 'supports good' status. Its hydromorphological attributes are therefore assigned as having medium sensitivity in accordance with the assessment criteria applied.

Flood risk and land drainage

11.5.52 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 (river and sea flooding) within the study area and the areas at high risk of surface water flooding.

11.5.53 In this Route Section the draft Order Limits are located in Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers of 1 in 100 (1%) or greater, associated with the River Ouse.

11.5.54 According to the Environment Agency AIMS database, the floodplain of the River Ouse is defended by raised embankments along both banks of the river.

11.5.55 The Recorded Flood Outline dataset shows no areas within Route Section 4 that have previously been flooded, this reflects the high standard of protection offered by the flood defences that are present.

11.5.56 The Risk of Flooding from Surface Water map shows that the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%). However, there are several small, localised areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk located within the Route Section.

11.5.57 The Long-term flood risk map for England (Ref 11.34) shows there is significant reservoir flooding risk 'when there is also flooding from rivers', on the embankments of the River Ouse. Overall, there is high risk of reservoir flooding within Route Section 4.

11.5.58 The land within the draft Order Limits in Route Section 4 is therefore assigned medium sensitivity in terms of the existing risk of flooding from rivers and the sea (given the presence of flood defences with a high standard of protection), surface water and reservoirs, and a low sensitivity with regard to groundwater flooding.

Route Section 5: River Ouse Crossing to Luddington

Watercourses, their water quality and hydromorphology

11.5.59 As illustrated in **Figure 11.1 Study Area and Water Environment Features,** within Route Section 5: River Ouse crossing to Luddington, there are numerous ordinary watercourses (including Adlingfleet Drain), several of which are crossed by the draft Order Limits. These watercourses are assigned high sensitivity, being important receptors at the local scale. The Adlingfleet Drain flows in a north-easterly direction to an outlet sluice into the River Trent. The catchment can be categorised as rural in its land use, with topography that is flat and low-lying, with land drainage served by a network of minor watercourses and ditches, assigned medium sensitivity.

11.5.60 Route Section 5 covers the Adlingfleet Drain Upper Catchment (trib of Trent) waterbody catchment (GB104028064310). A summary of its WFD status data (Cycle 3) is provided in Table 11.7 and the catchment is illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**.

Table 11.7- Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Adlingfleet Drain Upper Catchment (trib of Trent) (GB104028064310)	Moderate	Fail	Artificial

11.5.61 The waterbody has a moderate ecological status and a failing chemical status. There are multiple reasons for not achieving good (RNAG) status for this waterbody which include 'Ammonia' (affected through natural mineralisation) and 'Invertebrates' (affected by diffuse source pollution through poor soil management, and physical modification through flood protection).

11.5.62 The Route Section 5 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 5 is located within a NVZ.

11.5.63 In terms physical form, Adlingfleet Drain is designated as 'artificial', referring to a waterbody created by human activity. It therefore has a low hydromorphological diversity and is assigned as having low sensitivity with regard to this attribute. In terms of the hydrological regime, the Drain is designated as 'supports good' status.

Flood risk and land drainage

11.5.64 Figure **11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.65 In this Route Section, according to the Environment Agency Flood Map for Planning, the draft Order Limits are located in Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers of 1 in 100 (1%) or greater, associated with the River Ouse. As illustrated in **Figure 11.1 Study Area and Water Environment Features**, land drainage is managed by the Isle of Axholme IDB.

11.5.66 According to the Environment Agency AIMS database there are no flood defences located within Route Section 5 and the Recorded Flood Outline dataset shows no areas within Route Section 5 that have previously been flooded.

11.5.67 The Risk of Flooding from Surface Water map (Ref 11.35) shows that the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%). However, there are multiple small, localised areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk located within the Route Section. Risks of flooding from this source are reduced by the operational and maintenance activities undertaken by the Isle of Axholme IDB.

11.5.68 The Long-term flood risk map for England (Ref 11.34) shows there is significant reservoir flooding 'when there is also flooding from rivers', in close proximity to the River Ouse and River Trent. Overall, there is high risk of reservoir flooding within Route Section 5. Groundwater flooding is noted as being unlikely.

11.5.69 The land within the draft Order Limits in Route Section 5 is therefore assigned high sensitivity in terms of the existing risk of flooding from rivers and the sea, surface water and reservoirs and a low sensitivity with regard to groundwater flooding.

Route Section 6: Luddington to M180 Motorway

Watercourses, their water quality and hydromorphology

11.5.70 As illustrated in **Figure 11.1 Study Area and Water Environment Features**, within Route Section 6: Luddington to M180 Motorway, there are six main rivers (North Soak Drain, South Soak Drain, Hatfield Waste Drain, North Engine Drain, River Torne, and South Engine Drain) and a canal (Sheffield and South Yorkshire Navigation) that are crossed by the draft Order Limits. These receptors are all assigned high sensitivity in accordance with the assessment criteria.

11.5.71 There are also numerous ordinary watercourses, minor watercourses, and ditches (including Paupers Drain, Beverly Drain and Bewcarrs Drain) that are crossed by and flow through the draft Order Limits. These water features are assigned medium sensitivity. The watercourses in Route Section 6 generally flow in an easterly direction towards the River Trent. Their catchments can be categorised as rural, with topography that is flat and low-lying.

11.5.72 The study area drains the catchments of several WFD waterbodies, summarised in Table 11.8 and illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**.

Table 11.8 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
North Soak Drain (trib of Torne/Three Rivers) (GB104028064350)	Moderate	Fail	Artificial
Hatfield Waste Drain (trib of Torne/Three Rivers) (GB104028064330)	Poor	Fail	Artificial
Paupers Drain (trib of Trent) (GB104028064300)	Moderate	Fail	Artificial

11.5.73 Two of the waterbodies share a moderate ecological status and all share a failing chemical status. The Hatfield Waste Drain has a poor ecological status. Multiple reasons for not achieving good (RNAG) status are reported for these waterbodies, with

‘Polybrominated diphenyl ethers (PBDE)’ and ‘Mercury and its compounds’ being common to all. ‘Phosphate’ from point (sewage discharge) and diffuse (poor agricultural and soil management) sources is also common to all the waterbodies except the North Soak Drain. A RNAG common to the North Soak Drain and Hatfield Waste Drain is ‘Dissolved Oxygen’, and this is attributed to land drainage. Poor soil management, ecological discontinuity, land drainage and sewage discharges are also factors that are reported to impact on the ecological status of several waterbodies, in particularly their biological status (fish).

11.5.74 The Route Section 6 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 6 is located within a NVZ.

11.5.75 In terms of their physical form, the WFD waterbodies within the study area are designated as ‘artificial’, i.e., created by human activity. It is noted that watercourses that serve a land drainage function tend to have relatively low hydromorphological diversity, typically having uniform channel profiles and straightened channel forms and therefore assigned as having low sensitivity for this attribute. However, in terms of their hydrological regime, the waterbodies are all designated as ‘support good’ status.

Flood risk and land drainage

11.5.76 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.77 In this Route Section the draft Order Limits are almost entirely located in Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers of 1 in 100 (1%) or greater, associated with the River Trent. Land drainage is managed by the Isle of Axholme IDB.

11.5.78 According to the Environment Agency AIMS database all of the main rivers in this Route Section are prevented from routinely inundating their floodplains by natural high ground and embankments, situated on both sides of the watercourses.

11.5.79 The Recorded Flood Outline dataset shows no areas within Route Section 6 that have previously been flooded.

11.5.80 The Risk of Flooding from Surface Water map (Ref 11.35) shows that the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%). However, there are multiple small, localised areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk located within the Route Section, generally according with the channels of watercourses and depressions in the topography. Risks of flooding from this source are reduced by the operational and maintenance activities undertaken by the Isle of Axholme IDB.

11.5.81 The Long-term flood risk map for England (Ref 11.34) shows there is significant reservoir flooding ‘when there is also flooding from rivers’, within the northern area of the Route Section. From Crowle to the M180 motorway, there is a low risk of reservoir flooding within Route Section 6. Groundwater flooding is noted as unlikely.

11.5.82 The land within the draft Order Limits in Route Section 6 is therefore assigned high sensitivity in terms of the existing risk of flooding from rivers and the sea, surface water and reservoirs and a low sensitivity with regard to groundwater flooding.

Route Section 7: M180 Motorway to Graizelound

Watercourses, their water quality and hydromorphology

11.5.83 Within Route Section 7: M180 motorway to Graizelound, there are multiple ordinary watercourses (including Ferry Drain and Warping Drain (high sensitivity)) that would be crossed by the draft Order Limits, and several minor watercourses and ditches (medium sensitivity). The watercourses in Route Section 7 generally flow in an easterly direction towards the River Trent. Their catchments can be categorised as rural, with a topography that slopes from localised high points towards the flat and low-lying floodplain of the Trent.

11.5.84 The study area drains the catchments of several WFD waterbodies, summarised in Table 11.9, and illustrated in in **Figure 11.3 Water Framework Surface Waterbody Status**.

Table 11.9 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Ferry Drain (trib of Trent (GB104028058241)	Moderate	Fail	Heavily modified
Warping Drain (trib of Trent) (GB104028058240)	Moderate	Fail	Artificial

11.5.85 The two waterbodies share a moderate ecological status and both have a failing chemical status. Multiple reasons for not achieving good (RNAG) status are reported for these waterbodies, ‘Polybrominated diphenyl ethers (PBDE)’ and ‘Mercury and its compounds’ being common to both. RNAGs applicable to the Ferry Drain include ‘Dissolved Oxygen’, attributed to land drainage, poor nutrient management and sewage discharges, and Phosphate from point (sewage discharge) and diffuse (poor agricultural and soil management) sources.

11.5.86 The Route Section 7 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 7 is located within a NVZ.

11.5.87 In terms of their physical form, the waterbodies within the study area are designated as ‘heavily modified’ or ‘artificial’, as indicated in Table 11.9. ‘Heavily modified’ refers to watercourses that have been modified from their natural state for human use, whereas artificial waterbodies are those created by human activity. In terms of the hydrological regime, the Ferry Drain is designated as ‘supports good’ status, while the Warping Drain is designated as ‘does not support good’ status for hydrological regime.

Flood risk and land drainage

11.5.88 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.89 In this Route Section, the draft Order Limits are partially located in Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers of 1 in 100 (1%) or greater, associated with the River Trent. The rest of the land is in Flood Zone 1 (low risk), equivalent to an annual chance of flooding from rivers and the sea of less than 1 in 1,000 (0.1%),

11.5.90 According to the Environment Agency AIMS database there are no flood defences located within Route Section 7 and the Recorded Flood Outline dataset shows that Route Section 7 has previously flooded at the most southern boundary of the Route Section.

11.5.91 The Risk of Flooding from Surface Water map shows that while the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%), there are several larger areas of high (3.3.% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk, as well as several surface water flow routes of varying risk that flow through the draft Order Limits.

11.5.92 The Long-term flood risk map for England (Ref 11.34) shows there is low risk of reservoir flooding within the most northerly area of the Route Section. From Owston Ferry to Misterton, there is significant reservoir flooding ‘when there is also flooding from rivers’, located within proximity to the River Trent, as well as significant reservoir flooding ‘when river levels are normal’ within the most southern area of the Route Section. Groundwater flooding is noted as unlikely.

11.5.93 Land within Route Section 7 of the draft Order limits has a range of sensitivity (high to low) in terms of the existing risk of flooding from rivers and the sea, surface water, reservoirs and groundwater.

Route Section 8: Graizelound to Chesterfield Canal

Watercourses, their water quality and hydromorphology

11.5.94 As illustrated in **Figure 11.1 Study Area and Water Environment Features,** within Route Section 8: Graizelound to Chesterfield Canal, there is a main river (River Idle) assigned high sensitivity, as well as several ordinary watercourses (including minor watercourses and ditches) which are assigned with medium sensitivity. The watercourses in Route Section 8 generally flow in an easterly/north-easterly direction towards the River Trent. The catchment can be categorised as rural, with topography that is flat.

11.5.95 Route Section 8 covers the catchment of the Idle from Ryton to Trent WFD water body (GB104028058110). A summary of its WFD status data (Cycle 3) is presented in Table 11.10 and the catchment is illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**.

Table 11.10 - Summary of WFD status data (Cycle 3) 2019/2022

WFD Waterbody Name (ID)	Ecological Status	Chemical Status	Hydromorphological Designation
Ryton to Trent (GB104028058110)	Moderate	Fail	Artificial

11.5.96 As Table 11.10 shows, the waterbody has a moderate ecological status and a failing chemical status. Reasons for not achieving good (RNAG) status for this waterbody include 'Polybrominated diphenyl ethers (PBDE)', 'Phosphate from point (sewage discharge)' and diffuse (poor agricultural and soil management) sources, and 'Macrophytes and Phytobenthos Combined' (through sewage discharges, land drainage, poor soil management and transport drainage).

11.5.97 The Route Section 8 study area is partially located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 8 is located within a NVZ.

11.5.98 In terms of physical form, the WFD waterbody within the study area is designated as 'artificial' (therefore assigned low sensitivity with regard to its hydromorphology attributes). In terms of its hydrological regime, the waterbody is designated as 'does not support good' for hydrological regime.

Flood risk and land drainage

11.5.99 **Figure 12.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.100 In this Route Section, the draft Order Limits are mostly located in Flood Zones 2 (medium risk), equivalent or to an annual chance of flooding from rivers of 1 in 1,000 (0.1%) or greater, and 3 (high risk). The flood extents are associated with the River Idle.

11.5.101 According to the Environment Agency AIMS database the floodplain of the River Idle is defended from routine inundation by raised embankments. However, the Recorded Flood Outline dataset shows that large swathes of land in Route Section 8 have previously flooded.

11.5.102 The Risk of Flooding from Surface Water map shows that while the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%), there are several larger areas of high (3.3% annual chance of flooding), medium (1% annual chance of flooding) and low (0.1% annual chance of flooding) risk, as well as several surface water flow routes of varying risk.

11.5.103 The Long-term flood risk map for England (Ref 11.34) shows there is low risk of reservoir flooding within Route Section 8 and this data source references groundwater flooding as unlikely.

11.5.104 Land within Route Section 8 of the draft Order limits is therefore assigned high sensitivity in terms of the existing risk of flooding from rivers and the sea, surface water, reservoirs and groundwater.

Route Section 9: Chesterfield Canal to A620 East of North Wheatley

Watercourses, their water quality and hydromorphology

11.5.105 **Figure 11.1 Study Area and Water Environment Features** shows that within Route Section 9: Chesterfield Canal to A620 east of North Wheatley, there is a canal (Chesterfield Canal) (high sensitivity) and several unnamed ordinary watercourses (medium sensitivity) that would be crossed by the draft Order Limits. The watercourses in Route Section 9, which include minor watercourses and land drains, generally flow in a north-easterly and south-easterly direction towards the River Trent. The catchment can be categorised as rural, with an undulating topography.

11.5.106 The study area drains to the catchments of two WFD waterbodies. These are listed in Table 11.11, which summarises baseline WFD status data, and the catchments are illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**.

Table 11.11 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Idle from Ryton to Trent (GB104028058110)	Moderate	Fail	Artificial
Trent from Carlton-on-Trent to Laughton Drain (GB104028058480)	Moderate	Fail	Artificial

11.5.107 The two waterbodies share a moderate ecological status and both have a failing chemical status. Multiple reasons for not achieving good (RNAG) status are reported for these waterbodies include ‘Polybrominated diphenyl ethers (PBDE)’ and ‘Mercury and its compounds’, and ‘Phosphate’, from point (sewage discharge) and diffuse (poor agricultural and soil management) sources, being common to both.

11.5.108 The Route Section 9 study area is largely located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 9 is located within a NVZ.

11.5.109 In terms of their physical form, the waterbodies within the study area are designated as ‘artificial’, with low sensitivity in terms of their hydromorphological attributes. In terms of the hydrological regime, the Trent from Carlton-on-Trent to Laughton Drain is designated as ‘supports good’, while the Idle from Ryton to Trent is designated as ‘does not support good’ status for its hydrological regime.

Flood risk and land drainage

11.5.110 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.111 In this Route Section, the draft Order Limits are almost entirely located entirely in Flood Zone 1 (low risk), equivalent to an annual chance of flooding from rivers and the sea of less than 1 in 1,000 (0.1%).

11.5.112 According to the Environment Agency AIMS database there are no flood defences located within this Route Section and the Recorded Flood Outline dataset shows that land within Route Section 9 has not previously flooded.

11.5.113 The Risk of Flooding from Surface Water map shows that while the majority of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%), there are multiple surface water flow routes with risk ranging from high (3.3.% annual chance of flooding) to low (0.1% annual chance of flooding).

11.5.114 The Long-term flood risk map for England (Ref 11.34) shows there is low risk of reservoir flooding within Route Section 9 and the flooding from groundwater is unlikely.

11.5.115 Land within Route Section 9 of the draft Order limits is therefore assigned low sensitivity in terms of the existing risk of flooding from rivers and the sea, surface water, reservoirs and groundwater.

Route Section 10: A620 East of North Wheatley to Fledborough

Watercourses, their water quality and hydromorphology

11.5.116 **Figure 11.1 Study Area and Water Environment Features** shows that within Route Section 10: A620 east of North Wheatley to Fledborough, there is one main river (East Drayton), assigned very high sensitivity and numerous ordinary watercourses assigned (including Wheatly Beck, North Beck and Fledborough Beck, high sensitivity) that would be crossed by the draft Order Limits. The watercourses in Route Section 10, which include a number of minor watercourses and land drains (medium sensitivity), generally flow in an easterly/north-easterly direction, towards the River Trent. The catchment can be categorised as mostly rural in its land-use, with topography that slopes in an easterly direction.

11.5.117 The study area in this Route Section drains to several WFD waterbody catchments. These are listed in Table 11.12, which summarises baseline WFD status data for the study area, and the catchments are illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**.

Table 11.12 - Summary of WFD status data (Cycle 3) 2019/2022

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
Wheatley Beck (trib of Trent)	Moderate	Fail	Not designated artificial or heavily modified

WFD waterbody name (ID)	Ecological status	Chemical status	Hydromorphological designation
North Beck (trib of Trent)	Moderate	Fail	Not designated artificial or heavily modified
Tuxford Beck (trib of North Beck)	Moderate	Fail	Not designated artificial or heavily modified
Fledborough Beck (trib of Trent)	Moderate	Fail	Not designated artificial or heavily modified

11.5.118 All waterbodies share a moderate ecological status and have a failing chemical status. Multiple reasons for not achieving good (RNAG) status are reported for these waterbodies and include 'Polybrominated diphenyl ethers (PBDE)', 'Mercury and its compounds', and 'Phosphate' from point (sewage discharge) and diffuse (poor agricultural and soil management) sources, being common to all. A RNAG common to the Wheatley Beck, the North Beck and the Tuxford Beck are 'Macrophytes and Phytobenthos Combined', from point (sewage discharge) and diffuse (poor agricultural and soil management) sources.

11.5.119 The Route Section 10 study area is not located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 10 is located within a NVZ.

11.5.120 In terms of their physical form, the waterbodies within the study area have a range of designations, as indicated in Table 11.12. A waterbody 'Not designated or heavily modified' is substantially natural in character, with high sensitivity. In terms of their hydrological regime, the Trent from Carlton-on-Trent to Laughton Drain is designated as 'supports good' (in 2019 and 2022). The other waterbodies are all designated as 'supports good', however they were all assessed in 2015.

Flood risk and land drainage

11.5.121 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.122 In this Route Section the draft Order Limits are mostly located in Flood Zone 1 (low risk). However, there are several areas of Flood Zones 2 (medium risk) and 3 (high risk), located in proximity to the watercourses crossed by the draft Order Limits.

11.5.123 According to the Environment Agency AIMS database (Ref 11.40), one of the unnamed watercourses has natural high ground on both banks.

11.5.124 The Recorded Flood Outline dataset shows that the majority of land in Route Section 10 (Option 1) has not previously flooded, with the exception of a small area of land near Fledborough.

11.5.125 The Risk of Flooding from Surface Water map shows that while large areas of the land within this Route Section are at very low risk of surface water flooding (annual chance of flooding of less than 0.1%), there are multiple surface water flow routes with risk ranging from high (3.3.% annual chance of flooding) to low (0.1% annual chance of flooding).

11.5.126 The Long-term flood risk map for England (Ref 11.34) shows there is some reservoir flooding 'where there is also flooding from rivers' along the eastern edge of the Route

Section, in close proximity to the River Trent, however this does not appear to surpass the draft Order Limits. Overall, there is a low risk of reservoir flooding within Route Section 10. Land within Route Section 10 of the draft Order limits insofar as they relate to the proposed overhead line has a range of sensitivity (high to low) in terms of the existing risk of flooding from rivers and the sea, surface water and reservoirs, and a low sensitivity with regard to groundwater flooding

Route Section 11: Fledborough to High Marnham

Watercourses, their water quality and hydromorphology

11.5.127 Within Route Section 11: Fledborough to High Marnham, four drains (assigned medium sensitivity) would be crossed by the draft Order Limits. The Route Section can be categorised as mostly rural, with topography that slopes in an easterly direction towards the River Trent.

11.5.128 Route Section 11 covers the catchment of the Fledborough Beck (trib of Trent) WFD water body (GB104028058290). A summary of its WFD status data (Cycle 3) is presented in Table 11.12 and the catchment is illustrated in **Figure 11.3 Water Framework Surface Waterbody Status**.

11.5.129 The Route Section 11 study area is located within a surface water Drinking Water Protected Area and is not located within a surface water Drinking Water Safeguard Zone. Route Section 11 is located within a NVZ.

Flood risk and land drainage

11.5.130 **Figure 11.2 Flood Risk Areas** shows the extents of Flood Zones 2 and 3 within the study area and the areas at high risk of surface water flooding.

11.5.131 In this Route Section the draft Order Limits are mostly located in Flood Zone 1 (low risk). However, there are several areas of Flood Zones 2 (medium risk) and 3 (high risk), located in proximity to the watercourses crossed by the draft Order Limits.

11.5.132 The Recorded Flood Outline dataset (Ref 11.37) shows that no land in this Route Section has previously been flooded, however there has been flooding previously of land in close proximity to the Route Section limits.

11.5.133 The Risk of Flooding from Surface Water map shows that while a large area of the land within this Route Section is at very low risk of surface water flooding (annual chance of flooding of less than 0.1%), there are several large areas of surface water flooding ranging from high (3.3% annual chance of flooding) to low (0.1% annual chance of flooding) risk.

11.5.134 The Long-term flood risk map for England (Ref 11.34) shows there is some reservoir flooding ‘where there is also flooding from rivers’ along the eastern edge of the Route Section, in close proximity to the River Trent, however this does not appear to surpass the draft Order Limits. This data source also defines flooding from groundwater is unlikely.

11.5.135 Land within Route Section 11 of the draft Order limits insofar as they relate to the proposed overhead line is therefore assigned low sensitivity in terms of the existing risk of flooding from rivers and the sea, groundwater and reservoirs, and has a range of sensitivity (negligible to high) with regard to surface water flooding.

Future Baseline

11.5.136 Predicting future baseline requires projecting forward any trends in change and considering how they may affect the baseline conditions over time. The nature of future baseline is influenced by a combination of natural and human processes, including climate change.

11.5.137 With regard to flood risk and drainage, future baseline conditions within the ES will be forecast, drawing on current best practice guidelines from the Environment Agency about the predicted effects of climate change on rainfall intensities and peak river flows. These future conditions will be considered to factor climate change resilience into the Project drainage design.

11.5.138 When assigning value to water environment resources and receptors, the implementation of future cycles of River Basin Management Plans (RBMP), driving future improvements in the ecological and chemical quality of water bodies, will be considered; and the potential effects of other planned development on the quality of the water environment within the study area will also be considered.

11.5.139 Consideration was given to the following development-related changes that potentially alter or influence the identified water environment resources.

Construction year baseline (2028)

11.5.140 The future baseline has been determined qualitatively by considering the possibility for changes in the attributes that are considered when deciding the importance of water bodies in the study area.

11.5.141 It is considered that the baseline conditions at the start of construction would not be significantly different to the baseline reported in this chapter for much of the Project. There are, however, known planning applications that have been considered by the impact assessment and presented in **Chapter 21 Cumulative Effects**.

11.5.142 Proposed developments located in common hydrological catchments to the Project, and/or situated within the same areas of floodplain or in proximity to common water environment receptors have been identified. These are:

a. Bumble bee solar farm and battery storage facility, Gainsborough Road Saundby

b. Wood lane solar farm, Land North West And South Of Field Farm Wood Lane Sturton Le Steeple

c. Tuxford Solar Farm, Land North And South Tuxford Road Skegby

d. Erect Storage Building (Class B8) with Associated Weigh Bridge at Fledborough Road High Marnham.

11.5.143 For any planning applications that are granted and begin construction/are completed, it is assumed best practice would be followed and would comply with legislation that safeguards land drainage and the water environment. It is therefore assumed they would not cause any significant changes the baseline conditions of the water resources in the study area.

Opening year baseline (2031)

11.5.144 Generally, there is an improving trend in surface water quality and the environmental health of waterways in the UK since the commencement of significant investment in sewage treatment in the 1990s, the adoption of the WFD from 2003 and the application of more stringent planning policies. Despite these improvements, only 14% of England's rivers meet the standards of a 'good ecological status' under the Water Framework Directive. Additionally, issues like sewage pollution continue to affect many waterways. However, as it presents a reasonable worst-case baseline for assessment, the future baseline for water quality impacts assumes that all WFD water bodies achieve their final target status.

11.5.145 It is likely that through the action of new legislative requirements and more stringent planning policy and regulation, that the health of the water environment (water quality, hydromorphology) would continue to improve post-2031.

11.5.146 The Environment Act 2021 (Ref 11.4), the Levelling-Up and Regeneration Act 2023 (Ref 11.41) and regulatory requirements (Water Company Price Review) include measures to tackle storm sewage discharges and set new requirements on nutrient removal from sewage treatment works. There are however significant challenges such as adapting to a changing climate and pressures of population growth that could hold back the rate of improvement. However, it is difficult to forecast these changes with any certainty, and in addition the way the importance of water environment receptors will be determined considers a wide range of attributes, some of which are unlikely to change.

11.5.147 It is considered that the baseline conditions would be similar to those recorded at the date of undertaking the preliminary assessment. Any planning applications that are granted and begin construction/are completed are assumed to follow best practice and legislation and would not cause any significant changes the baseline conditions of the water resources in the study area.

11.5.148 It is not anticipated that baseline conditions for flood risk of all types would change significantly between the year of construction and the opening baseline.

11.6 Mitigation

11.6.1 As set out in **Chapter 5 Approach to Preparing the PEIR** mitigation measures fall into one of three categories: embedded measures; control and management measures; and additional mitigation measures. Those measures relevant to the assessment of impacts on the water environment effects are set out below.

Embedded Mitigation Measures

11.6.2 Environmental appraisal has been an integral part of the Project design from the outset, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable.

11.6.3 National Grid has also embedded measures into the design of the Project to avoid or reduce significant effects that may otherwise be experienced during construction and operation (and maintenance) of the Project.

11.6.4 The embedded measures that are intrinsic to and built into the design of the Project are presented in Table 4.2 in **Chapter 4 Description of the Project.** Measures of relevance to the Water Environment assessment include:

- Where possible the design of the temporary haul roads has sought to utilise existing bridges and culverts.
- Large or sensitive watercourses, for example those designated as main river, and those with Water Framework Directive (WFD) status, will be crossed by the temporary haul road using temporary clear span bridges.
- Application of appropriate stand-off distances have been applied to watercourses to avoid direct effects where practicable.

11.6.5 Further embedded design measures would be developed as the Project design evolves.

Control and Management Measures

11.6.6 Control and management measures, comprising management activities and techniques, will be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.

11.6.7 An Outline Code of Construction Practice (CoCP) is provided in **Appendix 4.1 Draft Outline CoCP**. Measures contained in the Draft Outline CoCP relevant to the control and management of impacts that could affect the water environment are:

- GG04: The CoCP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake site inspections to check conformance to the Management Plans.
- GG06: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project. Topics will include but not be limited to:
  - Working hours;
  - Ecology: working in or adjacent to protected sites and priority habitats, protected species, management, mitigation and controls;
  - Water management: legislation, buffer zones, control mechanisms, flood risks and emergency response procedures;
  - Waste management: legislation, segregation, contamination, best practice;
  - Agreed traffic routes and access points;
  - Nuisance: dust, behaviour, noise, vibration, management and controls;
  - Working around trees: tree and root protection;
  - Contaminated land: recognising and dealing with contaminated material;
  - Pollution prevision and incident response; and
  - Spill and emergency response.
- GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition and use. Hedgerows, fences and walls (including associated earthworks and boundary features) will be reinstated to a similar style and of similar or higher quality to those that were removed, unless otherwise agreed.
- GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses,

ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, soiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potential hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110 % of the maximum stored volume. Spill kits will be located nearby.

- GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).
- GG17: Wash down of vehicles and equipment will take place in designated areas, for example within construction compounds and intermittently along construction access roads. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps.
- GG18: Wheel washing facilities will be provided at each main compound, where appropriate. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits.
- GG19: Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate.
- GG23: An Emergency Action Plan will be developed for the construction phase which will outline procedures to be implemented in case of unplanned events, including but not limited to site flooding and pollution incidents.
- W01: All works within main rivers or ordinary watercourses will be in accordance with a method approved under environmental permits issued under the Environmental Permitting Regulations or the protective provisions of the DCO for the benefit of the Environment Agency and the Lead Local Flood Authorities.
- W02: For open cut watercourse crossings and installation of vehicle crossing points, good practice measures will include but not be limited to, where practicable:
  - reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working;
  - installation of a pollution boom downstream of open cut works;
  - the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;
  - have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident;
  - the use of all static plant such as pumps in appropriately sized spill trays;
  - prevent refuelling of any plant or vehicle within 15 m of a watercourse;

  - prevent storing of soil stockpiles within 15 m of a main river;
  - inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and
  - reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used

- W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Natural substrate will be provided through temporary watercourse crossings box culverts.
- W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats or stone placed over the backfilled area to permit the passage of plant, equipment, materials and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge.
- W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard to volumes and discharge rates and will include discharges to land, water bodies or third-party drains/sewers.
- W06: Where new or additional surfacing is required on any access tracks and compound areas, these will be permeable surfaces where ground conditions allow. The Project will incorporate appropriate surface water drainage measures into its final design for the any access tracks so that they do not lead to a significant increase in flood risk. Temporary haul routes will be removed at the end of the construction phase and the ground surface will be reinstated to pre-Project levels.
- W07: The contractor(s) will subscribe to the Environment Agency's flood warning e-service, which provides advance notification of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The contractor(s) will implement a suitable flood risk action plan, which will include appropriate evacuation procedures should a flood occur or be forecast.
- W08: Active private water supplies will be identified with landowners through the landowner discussions. Appropriate measures will be considered during construction. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response will be provided within 24 hours. Where the installation works have affected a private water supply, an alternative water supply will be provided, as appropriate.
- W09: In the event of a significant spill during construction, all relevant landowners/tenants located within 250 m of the spill, will be contacted as soon as is reasonably practicable, within 24 hours, to determine if there are any private water supplies that might be affected; an assessment of the likelihood of groundwater contamination reaching identified private water supplies will be

undertaken, and where a private water supply is judged likely to be affected, an alternative water supply will be provided, as appropriate.

- W10: Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes. Any affected drainage systems would be reinstated or replaced to ensure their existing function is maintained.
- W11: Temporary infrastructure such as construction compounds and access routes would be drained using Sustainable Drainage Systems (SuDS) techniques that are suitable for local ground conditions and topography.
- W12: Where construction works are undertaken in proximity to existing main river flood defences, the Contractor would carry out works in accordance with the conditions of the associated Environmental Permit and agree any necessary monitoring requirements with the Environment Agency.
- GH05: All use and storage of chemicals and fuels are to be undertaken in accordance with EA guidance and the Control of Pollution (Oil Storage) Regulations. The use and storage of chemicals and fuels will also be controlled and monitored under the CoCP which will include, for example, procedures for good general construction site practices, environmental and waste management procedures, regular vehicle checks, use of spill kits, correct waste storage and disposal, use of oil-water separators as necessary (for example, for drainage from refuelling areas), collection of process water from the washout/cleaning of ready-mix concrete vehicles and equipment for treatment/disposal.
- AS05: Consultation with affected landowners will be carried out to investigate the current extent of land drainage. A scheme of pre-construction land drainage will be designed with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working area during construction. The Project may include a system of ‘cut-off’ drains which feed into a new header drain and the Project will also take into account surface water runoff measures.
- B11: All ponds will be retained, with minimum 10 m stand-off buffers applied where practicable. Stand-off buffers to all watercourses and land drains to 10 m will be maintained where practicable, with the exception of those to be crossed with a new or modified crossing point.

Additional Mitigation Measures

11.6.8 Additional mitigation comprises measures over and above any embedded and standard mitigation measures, to further reduce significant environmental effects.

11.6.9 Any works with the potential to affect the floodplain or flow regime of a main river would be subject to consent under the Environmental Permitting (England and Wales) Regulations 2017 (Ref 11.6) (as covered by the control and management measures W01 and W12). The Project would seek to disapply the need for consent under the Land Drainage Act 1991 (Ref 11.5) for works with potential to impede land drainage or the flow regime of any ordinary watercourse, and include these powers within the DCO, following agreement of protective provisions with relevant land drainage authorities.

11.6.10 The FRA will identify and outline any additional mitigation measures/commitments required to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences.

11.7 Preliminary Assessment

11.7.1 This section first identifies the potential effects that could occur as a result of the construction and operation of the Proposed Overhead Line. The preliminary assessment is then presented for the 11 Route Sections as described in **Chapter 4 Description of the Project**. The preliminary assessment of the Proposed Substation Works is presented in **Chapter 20 Substations and Associated Works**.

11.7.2 The preliminary assessment takes into account the embedded, control and management, and additional mitigation measures as set out in section 11.6.

Potential Effects

11.7.3 The potential for the Proposed Overhead Line to result in likely significant effects on water environment receptors was determined through the EIA Scoping process. This section lists those potential effects that have been scoped into the assessment within the Scoping Report (Ref 11.21) taking into account the comments received within the Scoping Opinion (Ref 11.20).

11.7.4 Where the Scoping Opinion (Ref 11.20) disagreed with the scoping out of certain aspects, this was because there was deemed to be insufficient design information or evidence being available to support the scoping decisions. Where this is the case, these aspects have been scoped into this preliminary assessment.

11.7.5 It should be noted that this assessment is ongoing and will be updated as necessary within the ES where the Project design has evolved.

11.7.6 A full detailed assessment will be presented within the ES submitted with the DCO.

Construction

11.7.7 The potential effects that could result from the construction of the Proposed Overhead Line are:

- Construction activities such as soil stripping, earthworks and excavation and the use and refuelling of plant, giving rise to pollution of water environment receptors from silt, hydrocarbons, and other construction materials.
- Physical disturbance and change in flow regime at watercourse crossings, on main rivers and ordinary watercourses.
- Increased rates and volumes of rainfall runoff, reduced channel flow capacity due to siltation, and disruption to the land drainage regime.
- Temporary works in the floodplains of watercourses, for example materials storage, reducing floodplain storage and disrupting flow routes, consequently increasing flood risk to people, existing property, and infrastructure.
- Increased surface water flood risk due to the construction of areas with impermeable land cover e.g., substations, permanent access roads, pylon foundations/bases, generating increased rates and volumes of surface water runoff, and disruption to the land drainage regime.

11.7.8 Interactions with groundwater in the cable Route Sections and where pylon excavations or topsoil stripping is required are assessed in **Chapter 12 Geology and Hydrogeology**.

Operation

11.7.9 The potential effects that could result from the operation of the Proposed Overhead Line are limited to increased surface water flood risk due to the introduction of permanent areas of impermeable land cover for pylon foundations/bases, generating increased rates and volumes of surface water runoff, and disruption to the land drainage regime.

11.7.10 The potential during operation for pollution and consequent likely significant effects on water quality, as well as physical disturbance to watercourses, has been scoped out. This is on the basis that that there would be no operational discharges from the Proposed Overhead Line to the water environment, other than rainfall runoff, and that following construction and reinstatement there would be no continued physical disturbances to watercourses.

Maintenance

11.7.11 All potential effects on the water environment from the maintenance of the Proposed Overhead Line have been scoped out given the nature of the activities that would be required.

Route Section 1: Creyke Beck to Skidby

11.7.12 This section provides a preliminary assessment of the Proposed Overhead Line. The preliminary assessment of the Proposed Substation Works at Birkhill Wood is presented in **Chapter 20 Substations and Associated Works**.

Preliminary Construction Effects

Sites designated for nature conservation interest

11.7.13 No sites have currently been identified , with a potential hydrological link to the Project.

11.7.14 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.15 During construction, two minor watercourses would be crossed for temporary access. This may require upgrades to existing culverts at the proposed crossing locations. Existing upgrades may entail complete replacement if structures are beyond repair, and these are likely to remain. These works could result in channel bed/bank modifications causing disruption to flow regimes and effects on hydromorphology and water quality.

11.7.16 The potential effects on these attributes are summarised in Table 11.13.

Table 11.13 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 1

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality of watercourses	Minor watercourses (Medium)	CoCP Measures: W04	Negligible adverse and not significant	Moderate
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Negligible and effects not significant.	Moderate

Flood risk and land drainage

11.7.17 This Route Section is located in the low-risk flood zone (Flood Zone 1) therefore there would be no negative effects associated with loss of floodplain storage or disruption to floodplain flow routes. The confidence for this prediction is High.

11.7.18 In this Route Section new areas of temporary impermeable land cover would be created, such as construction compounds and haul routes, and there would be some topsoil stripping and earthworks. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. These activities could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. Areas with a sloping topography where topsoil has been stripped would be particularly vulnerable to these changes. The works may also disrupt or sever existing field drainage systems. Temporary measures would be put in place to maintain such drainage routes during construction, then the systems would be reinstated post-construction (W10). Access roads and compound areas would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) (W11), as well as outfalls into local ditches where ground conditions are unsuitable for infiltration.

11.7.19 Consequently, negative effects on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. The preliminary impacts are therefore anticipated to be negligible and overall effects not significant. The confidence for this prediction is Moderate.

11.7.20 No further effects on flood risk and drainage are expected.

Preliminary operation effects

Flood risk and land drainage

11.7.21 During operation, there would be no interaction with floodplains in this Route Section. Once the overhead line construction is complete land temporarily affected, and any associated land drainage, would be reinstated. The existing watercourse crossings that would be utilised, potentially following their upgrade or replacement, would be retained and proposed new culverts would be constructed. The preliminary impacts on flood risk and land drainage are therefore anticipated to be negligible and effects are assessed as not significant. The confidence for this prediction is High.

Route Section 2: Skidby to A63 Dual Carriageway

Preliminary construction effects

Sites designated for nature conservation interest

11.7.22 No sites have currently been identified , with a potential hydrological link to the Project.

11.7.23 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.24 In this Route Section there is one proposed watercourse crossing, via an existing culvert which may require an upgrade. Other construction activities generally maintain a minimum buffer of 9 m from any land drains and watercourses where it is possible to do so, such as the Brantingham Beck (B08).

11.7.25 The potential effects on the water quality and hydromorphology of watercourses in this Route Section are summarised in Table 11.14.

Table 11.14 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 2

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Minor watercourse (medium)	CoCP Measures: B08, GG15, GG16	Small adverse to negligible and not significant	High
Temporary effects on flow regime and hydromorphology due to physical disturbance of	Minor watercourse (low)	CoCP Measures: W01, W03, W04, W12, B08	Negligible and effects not significant	High

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
channels, beds, or riparian corridors				

Flood risk and land drainage

11.7.26 This Route Section is located in the low risk flood zone (Flood Zone 1) therefore there would be no negative effects associated with loss of floodplain storage or disruption to floodplain flow routes. The confidence for this prediction is High.

11.7.27 In this Route Section creation of new areas of temporary impermeable land cover would be minimal but there would be some topsoil stripping and earthworks. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. These activities could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. The works may also disrupt or sever existing field drainage systems. Temporary measures would be put in place to maintain such drainage routes during construction, then the systems would be reinstated post-construction (W10). Access roads would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable (W11).

11.7.28 Consequently, negative effects on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. Therefore, preliminary impacts are anticipated to be negligible, with an effect that is not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and drainage

11.7.29 During operation, the interactions are limited to Flood Zone 1. Potential negative effects on flood risk from rivers and the sea are expected to be not significant. The confidence for this prediction is High.

11.7.30 Once the overhead line construction is complete land temporarily affected, and any associated land drainage would be reinstated. The existing watercourse crossing that would be utilised, potentially following its upgrade, would be retained. The preliminary impacts on flood risk and land drainage are therefore anticipated to be negligible, with effects that are not significant. The confidence for this prediction is Moderate.

Route Section 3: A63 Dual Carriageway to River Ouse Crossing

Preliminary construction effects

Sites designated for nature conservation interest

11.7.31 No sites have currently been identified , with a potential hydrological link to the Project.

11.7.32 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.33 During construction, multiple temporary watercourse crossings are proposed. These include 26 crossings that utilise existing culverts which may require upgrading, including culverts on the Broomfleet Beck and Ellerker Beck. New temporary culverts would be required at 17 locations on ordinary watercourses including the Bishopsoil Drain, Blacktoft Warping Drain and Bellasize Drain. Temporary bridges are also proposed for crossings of Mill Beck, a main river, and the market Weighton Canal.

11.7.34 The potential effects on these attributes of watercourse in this Route Section are summarised in Table 11.15.

Table 11.15 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 3

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Broomfleet Beck Ellerker Beck, Bishopsoil Drain, Blacktoft Warping Drain Bellasize Drain, Mill Beck (high) Minor watercourses (medium) Market Weighton Canal (high)	CoCP Measures: W04	Small adverse to negligible and not significant	Moderate
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (low) Broomfleet Beck and other named ordinary watercourses (medium to low)	CoCP Measures: W01, W03, W04, W12.	Small adverse to negligible and effects not significant	Moderate

Flood risk and land drainage

11.7.35 In this Route Section there are areas of land within the draft Order Limits that are in Flood Zone 3. Construction of stone access tracks and new pylons are proposed within this zone.

11.7.36 There is therefore the potential for the Project to increase flood risk during construction through the creation of soil stockpiles and temporary works areas, which could result in the temporary loss of floodplain storage or could impede flood flows.

11.7.37 The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences. Implementation of these would reduce potential negative effects on the flood storage and floodplain flow attributes of watercourses in the study area. Considering the nature and footprint of the Proposed Overhead Line and using professional judgement, the impact is anticipated to be negligible and overall, the effect is assessed as not significant. The confidence for this prediction is Medium.

11.7.38 There would also be changes to land surface permeabilities with new areas of temporary impermeable land cover created, such as construction compounds. Earthworks could also locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. This could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. The works may also disrupt or sever existing field drainage systems. Temporary measures would be put in place to maintain such drainage routes during construction, then the systems would be reinstated post-construction.

11.7.39 Access roads and compound areas would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions permit.

11.7.40 Consequently, negative effects on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. Therefore, impacts are anticipated to be negligible and consequent effects not significant. The confidence for this prediction is Medium.

11.7.41 In addition, works affecting the land drainage regime would be temporary and localised, with land, any existing field drainage systems reinstated on completion of construction works. Considering the nature and footprint of the Project, and using professional judgement, impacts would be negligible and overall effects not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and drainage

11.7.42 During operation, the interactions are limited to mostly Flood Zone 3, with a smaller area of Flood Zone 1. The FRA will outline the proposed mitigation measures/commitments to ensure the Proposed Overhead Line is safe from flooding over its lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. The exact requirements for any potential mitigation measures have not been fully developed at this stage but may include flood compensation proposals if necessary. Subject to the implementation of such measures, if required, potential negative impacts on flood risk from rivers and the sea are expected to be small adverse to negligible and overall effects are assessed as not significant. The confidence for this prediction is Moderate.

11.7.43 Once construction is complete, land affected temporarily and any associated land drainage would be reinstated. Surface water runoff from any permanent infrastructure would be drained using appropriate Sustainable drainage systems (SuDS) techniques to meet with LLFA discharge requirements. Impacts on the land drainage regime are assessed to be negligible, with consequent effects that are not significant. The confidence for this prediction is Moderate.

Route Section 4: River Ouse Crossing

Preliminary construction effects

Sites designated for nature conservation interest

11.7.44 The following sites have been identified with a hydrological link to the Project: Humber Estuary SAC, Humber Estuary Ramsar, and Humber Estuary SSSI.

11.7.45 An assessment of effects on these sites will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.46 There is the potential for direct physical disturbance to the channel form or flow regime of the River Ouse associated with the temporary Jetties proposed for conductor stringing. As set out in **Chapter 4 Description of the Project**, alternative stringing methodologies are being explored. The potential for direct physical disturbance will be assessed in full as part of the Environmental Statement, Several ordinary watercourses, including minor watercourses and drains, would be crossed for temporary access via four new culverts. These works would result in localised channel bed/bank modifications causing disruption to flow regimes and effects on hydromorphology and water quality.

11.7.47 The potential effects on these attributes of watercourses in this Route Section are summarised in Table 11.16.

Table 11.16 - Potential effects watercourses, their water quality and hydromorphology - Route Section 4

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Minor watercourses (medium)	CoCP Measures: W04	Negligible and effects not significant	Moderate
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Small adverse and effects not significant	Moderate

Flood risk and land drainage

11.7.48 All of the land in this Route Section are located in Flood Zone 3 and Proposed Overhead Line construction activities therefore have the potential to result in the temporary loss of floodplain storage or impede flood flows.

11.7.49 The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences. Implementation of these would reduce potential negative effects on the flood storage and floodplain flow attributes of watercourses in the study area. Considering the nature and footprint of the Proposed Overhead Line and using professional judgement, the impact is anticipated to be small adverse to negligible, with an effect that is not significant. The confidence for this prediction is Medium.

11.7.50 There would also be changes to land surface permeabilities and potential for disruption to field drainage systems and the current land drainage regime, resulting in ponding of water or waterlogging of soils. Temporary measures would be put in place to maintain existing drainage routes during construction, and field drainage systems would be reinstated post-construction.

11.7.51 Access roads and compound areas would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

11.7.52 Consequently, negative effects on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Project itself. Impacts are anticipated to be small adverse to negligible and overall effects are anticipated to be not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and drainage

11.7.53 During operation, Project infrastructure would be located in Flood Zone 3. The FRA will outline the proposed mitigation measures/commitments to ensure the Project is safe from flooding over its lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. The exact requirements for any potential mitigation measures have not been fully developed at this stage but may include flood compensation proposals if necessary. Subject to the implementation of such measures, if required, potential negative impacts on flood risk from rivers and the sea are expected to be small adverse to negligible and effects not significant. The confidence for this prediction is Moderate.

11.7.54 Once construction is complete, land temporarily affects and any associated land drainage would be reinstated, and all new temporary watercourse crossings would be removed where there would be no benefits to retaining them.

11.7.55 Surface water runoff from any permanent infrastructure would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Impacts on the land drainage regime would be small adverse to negligible and overall effects not significant. The confidence for this prediction is Moderate.

11.7.56 Potential effects on groundwater flows and levels are addressed in **Chapter 12 Geology and Hydrogeology**.

Route Section 5: River Ouse Crossing to Luddington

Preliminary construction effects

Sites designated for nature conservation interest

11.7.57 No sites have currently been identified , with a potential hydrological link to the Project.

11.7.58 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.59 In this Route Section a total of 20 watercourse crossings are proposed. Eleven of these crossings would utilise existing structures (culverts and a bridge), which may require upgrading, including two on the Adlingfleet Drain. The remaining eight crossings could require new temporary culverts which would be removed post construction.

11.7.60 The potential effects on the water quality, flow regimes and hydromorphology of the watercourses in this Route Section are summarised in Table 11.17.

Table 11.17- Potential effects watercourses, their water quality and hydromorphology - Route Section 5

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Minor watercourses (medium) Adlingfleet Drain (high)	CoCP Measures: W04	Negligible and effects not significant	Moderate
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (medium) Adlingfleet Drain (low)	CoCP Measures: W01, W03, W04, W12.	Small adverse to negligible and effects not significant	Moderate

Flood risk and land drainage

11.7.61 Most of the land in this Route Section is located in Flood Zone 3 and project construction activities therefore have the potential to result in the temporary loss of floodplain storage or impede flood flows.

11.7.62 The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences. Implementation of these would reduce potential negative effects on the flood storage and floodplain flow attributes of watercourses in the study area. Considering the nature and footprint of the Proposed Overhead Line and using professional judgement, the impact is anticipated to be small adverse to negligible and the overall effect is assessed as not significant. The confidence for this prediction is Medium.

11.7.63 There would also be changes to land surface permeabilities and potential for disruption to field drainage systems and the current land drainage regime, resulting in ponding of water or waterlogging of soils. Temporary measures would be put in place to maintain existing drainage routes during construction, and field drainage systems would be reinstated post-construction.

11.7.64 Access roads and compound areas would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

11.7.65 Consequently, negative effects on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. Impacts are anticipated to be small adverse to negligible and the overall effect not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and drainage

11.7.66 During operation, Proposed Overhead Line infrastructure would be located in Flood Zone 3. The FRA will outline the proposed mitigation measures/commitments to ensure the Proposed Overhead Line is safe from flooding over its lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. The exact requirements for any potential mitigation measures have not been fully developed at this stage but may include flood compensation proposals if necessary. Subject to the implementation of such measures, if required, potential negative impacts on flood risk from rivers and the sea are expected to be small adverse to negligible and overall effects would be not significant. The confidence for this prediction is Moderate.

11.7.67 Once construction is complete, land and any associated land drainage would be reinstated, and all new temporary watercourse crossings would be removed where there would be no benefits to retaining them.

11.7.68 Surface water runoff from any permanent infrastructure would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Impacts on the land drainage regime would be small adverse to negligible and overall effects would be not significant. The confidence for this prediction is Moderate.

11.7.69 Potential effects on groundwater flows and levels are addressed in **Chapter 12 Geology and Hydrogeology**.

Route Section 6: Luddington to M180 Motorway

Preliminary Construction Effects

Sites designated for nature conservation interest

11.7.70 The following sites have been identified , with a potential hydrological link to the Proposed Overhead Line pending further investigation and awaited information: Thorn and Hatfield Moor SAC, Hatfield Chase Ditches SSSI, Eastoft Meadow SSSI, Thorne, Crowle and Goole Moors SSSI and the Humberhead Peatlands National Nature Reserve.

11.7.71 Where hydrological links are confirmed, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.72 There are several main rivers (North Soak Drain, South Soak Drain, Hatfield Waste Drain, North Engine Drain, River Torne, and South Engine Drain) in this Route Section, all of which would be oversailed. A temporary bridge is proposed to cross the South Engine Drain, otherwise there would be no or very limited physical disturbance to the channels, beds, riparian corridors, or flow regimes of these main rivers.

11.7.73 There are also numerous ordinary watercourses, including minor watercourses and drains, 48 crossings of these watercourses are required. Approximately half of the crossings would utilise existing culverts that may be subject to upgrade. The remaining crossings would utilise two existing bridges, new culverts and new bridges on Paupers Drain and Bewcarrs Drain. These works would result in localised channel bed/bank modifications and could cause disruption to flow regimes and effects on hydromorphology and potentially water quality, as summarised in Table 11.18.

Table 11.18 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 6

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	South Engine Drain (high) Paupers Drain (high), Beverley Drain, Bewcarrs Drain (medium) Minor watercourses (medium)	CoCP Measures: W04	Negligible and effects not significant	Moderate

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	South Engine Drain (low) Paupers Drain, Beverley Drain, Bewcarrs Drain (low) Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Small adverse and effects not significant	Moderate

Flood risk and land drainage

11.7.74 Most of the land in this Route Section is located in Flood Zone 3 and Proposed Overhead Line construction activities therefore have the potential to result in the temporary loss of floodplain storage or impede flood flows.

11.7.75 The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences. Implementation of these would reduce potential negative effects on the flood storage and floodplain flow attributes of watercourses in the study area. Considering the nature and footprint of the Proposed Overhead Line and using professional judgement, the impact is anticipated to be small adverse to negligible and the effect not significant. The confidence for this prediction is Medium.

11.7.76 There would also be changes to land surface permeabilities and potential for disruption to field drainage systems and the current land drainage regime, resulting in ponding of water or waterlogging of soils. Temporary measures would be put in place to maintain existing drainage routes during construction, and field drainage systems would be reinstated post-construction. The impact is anticipated therefore to be small adverse and the effect not significant. The confidence for this prediction is Medium.

Preliminary operation effects

Flood risk and drainage

11.7.77 During operation, Proposed Overhead Line infrastructure would be located in Flood Zone 3. The FRA will outline the proposed mitigation measures/commitments to ensure the Proposed Overhead Line is safe from flooding over its lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. The exact requirements for any potential mitigation measures have not been fully developed at this stage but may include flood compensation proposals if necessary. Subject to the implementation of such measures, if required, potential negative impacts on flood risk from rivers and the sea are expected to be negligible and effects not significant. The confidence for this prediction is Moderate.

11.7.78 Once construction is complete, land and any associated land drainage would be reinstated, and all new temporary watercourse crossings would be removed where there would be no benefits to retaining them.

11.7.79 Surface water runoff from any permanent infrastructure would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Impacts on the land drainage regime would be small adverse to negligible and overall effects would not be significant. The confidence for this prediction is Moderate.

11.7.80 Potential effects on groundwater flows and levels are addressed in **Chapter 12 Geology and Hydrogeology**.

Route Section 7: M180 Motorway to Graizelound

Preliminary construction effects

Sites designated for nature conservation interest

11.7.81 No sites have currently been identified, with a potential hydrological link to the Project.

11.7.82 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.83 In this Route Section, there are 29 proposed watercourse crossings. Eight of these are proposed to use existing culverts which may require upgrading. Twenty-one of these would require new temporary culverts which would be removed following construction. These works would result in localised channel bed/bank modifications causing disruption to flow regimes and effects on hydromorphology, and potentially water quality as summarised in Table 11.19.

Table 11.19 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 7

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Ferry Drain and Warping Drain (high) Minor watercourses (medium)	CoCP Measures: W04	Negligible and effects not significant	Moderate

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Negligible and effects not significant	Moderate

Flood risk and land drainage

11.7.84 Lands within this Route Section are located in Flood Zone 1 and Flood Zone 3, therefore there is some potential for construction activities to result in the temporary loss of floodplain storage or impede flood flows. Effects would be reduced by avoiding any large-scale stockpiling or storage of construction materials in the floodplain where practicable.

11.7.85 The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences. Implementation of these would reduce potential negative effects on the flood storage and floodplain flow attributes of watercourses in the study area. Considering the nature and footprint of the Proposed Overhead Line and using professional judgement, the impact is anticipated to be small adverse to negligible and the overall effect not significant. The confidence for this prediction is Medium.

11.7.86 There would also be changes to land surface permeabilities and potential for disruption to field drainage systems and the current land drainage regime, resulting in ponding of water or waterlogging of soils. Temporary measures would be put in place to maintain existing drainage routes during construction, and field drainage systems would be reinstated post-construction. The impact is anticipated to be negligible, with an effect that is not significant. The confidence for this prediction is Medium

11.7.87 Access roads would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

Preliminary operation effects

Flood risk and land drainage

11.7.88 During operation, some Proposed Overhead Line infrastructure would be located in Flood Zone 3. The FRA will outline the proposed mitigation measures/commitments to ensure the Proposed Overhead Line is safe from flooding over its lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. The exact requirements for any potential mitigation measures have not

been fully developed at this stage but may include flood compensation proposals if necessary. Subject to the implementation of such measures, if required, potential negative impacts on flood risk from rivers and the sea are expected to be negligible, and effects not significant. The confidence for this prediction is Moderate.

11.7.89 Once construction is complete, land and any associated land drainage would be reinstated, and all temporary watercourse crossings would be removed where there would be no benefits to retaining them.

11.7.90 Surface water runoff from any permanent infrastructure would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Effects on the land drainage regime would be negligible, and effects not significant. The confidence for this prediction is Moderate.

11.7.91 Potential effects on groundwater flows and levels are addressed in **Chapter 12 Geology and Hydrogeology**.

Route Section 8: Graizelound to Chesterfield Canal

Preliminary construction effects

Sites designated for nature conservation interest

11.7.92 The following sites have been identified with a potential hydrological link to the Proposed Overhead Line pending further investigation and awaited information: Chesterfield Canal SSSI, Mother Drain Misterton SSSI, Haxey Grange Fen SSSI and the River Idle Washlands SSSI.

11.7.93 Where hydrological links are confirmed, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.94 In this Route Section there is a main river, the River Idle, which would be oversailed with no physical disturbance to its channel, bed or flow regime and limited potential for impacts on its water quality. There are 23 proposed crossings of ordinary watercourses (including minor watercourse and land drains) for temporary access. At 10 of these crossings, it is proposed to use existing culverts, which may require upgrading. The remaining 13 crossings would be via new temporary culverts. These works would result in localised channel bed/bank modifications that could cause disruption to flow regimes and effects on hydromorphology, as well as potential for water quality degradation as summarised in Table 11.20.

Table 11.20 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 8

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Minor watercourses (medium)	CoCP Measures: W04	Negligible and effects not significant	Moderate
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Small adverse to negligible and effects not significant	Moderate

Flood risk and land drainage

11.7.95 Lands within this Route Section are located in Flood Zone 1 and Flood Zone 3 therefore there is some potential construction activities to result in the temporary loss of floodplain storage or impede flood flows. Effects would be reduced by avoiding any large-scale stockpiling or storage of construction materials in the floodplain where practicable.

11.7.96 The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences. Implementation of these would reduce potential negative effects on the flood storage and floodplain flow attributes of watercourses in the study area. Considering the nature and footprint of the Proposed Overhead Line and using professional judgement, the impact is anticipated to be negligible, with over effects that are not significant. The confidence for this prediction is Medium.

11.7.97 There would also be changes to land surface permeabilities and potential for disruption to field drainage systems and the current land drainage regime, resulting in ponding of water or waterlogging of soils. Temporary measures would be put in place to maintain existing drainage routes during construction, and field drainage systems would be reinstated post-construction. The impact is anticipated therefore to be negligible, with an overall effect that is not significant. The confidence for this prediction is Medium.

11.7.98 Access roads would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

Preliminary operation effects

Flood risk and land drainage

11.7.99 During operation, some Proposed Overhead Line infrastructure would be located in Flood Zone 3. The FRA will outline the proposed mitigation measures/commitments to ensure the Proposed Overhead Line is safe from flooding over its lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. The exact requirements for any potential mitigation measures have not been fully developed at this stage but may include flood compensation proposals if necessary. Subject to the implementation of such measures, if required, potential negative impacts on flood risk from rivers and the sea are expected to be negligible, with effects that are not significant. The confidence for this prediction is Moderate.

11.7.100 Once construction is complete, land and any associated land drainage would be reinstated, and all new temporary watercourse crossings would be removed where there would be no benefits to retaining them.

11.7.101 Surface water runoff from any permanent infrastructure would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Effects on the land drainage regime would be negligible, with overall effects that are not significant. The confidence for this prediction is Moderate.

11.7.102 Potential effects on groundwater flows and levels are addressed in **Chapter 12 Geology and Hydrogeology**.

Route Section 9: Chesterfield Canal to A620 East of North Wheatley

Preliminary construction effects

Sites designated for nature conservation interest

11.7.103 No sites have currently been identified, with a potential hydrological link to the Project.

11.7.104 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.105 There is one canal (Chesterfield Canal) and several ordinary watercourses located within the draft Order Limits in this Route Section. The canal would be oversailed, avoiding impacts on this water feature. However, 14 ordinary watercourses, as well as minor watercourses and drains, would be crossed for temporary access. One of these crossings proposes to use an existing culvert that may need to be upgraded and 11 would require new temporary culverts, with the remainder crossed by bridges. These works would result in localised channel bed/bank modifications and could cause disruption to flow regimes and effects on hydromorphology and water quality, as summarised in Table 11.21.

Table 11.21 - Potential effects on watercourses, their water quality and hydromorphology - Route Section 9

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	Minor watercourses (medium)	CoCP Measures: W04	Negligible and effects not significant	Moderate
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Small adverse to negligible and effects not significant	Moderate

Flood risk and land drainage

11.7.106 This Route Section is located in the low risk flood zone (Flood Zone 1) therefore there would be no negative impacts or effects associated with loss of floodplain storage or disruption to floodplain flow routes. The confidence for this prediction is High.

11.7.107 In this Route Section creation of new areas of temporary impermeable land cover would be minimal but there would be some topsoil stripping and earthworks. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. These activities could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. The works may also disrupt or sever existing field drainage systems. Temporary measures would be put in place to maintain such drainage routes during construction, then the systems would be reinstated post-construction. Access roads would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

11.7.108 Consequently, negative impacts on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. Therefore, effects are anticipated to be not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and land drainage

11.7.109 During operation, the interactions are limited to Flood Zone 1. Potential adverse impacts and effects on flood risk from rivers and the sea are expected to be not significant. The confidence for this prediction is High.

11.7.110 Once construction is complete, land and any associated land drainage would be reinstated. Surface water runoff from any permanent access roads would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Impacts on the land drainage regime are assessed to be negligible, with no significant effects. The confidence for this prediction is Moderate.

Route Section 10: A620 East of North Wheatley to Fledborough

11.7.111 This section provides a preliminary assessment of the Proposed Overhead Line. The preliminary assessment of the Proposed Substation Works at High Marnham is presented in **Chapter 20 Substations and Associated Works**.

Preliminary construction effects

Sites designated for nature conservation interest

11.7.112 No sites have currently been identified with a potential hydrological link to the Project.

11.7.113 Where sites with hydrological links are confirmed following pending further investigation and awaited information, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.114 There is one main river (East Drayton) and numerous watercourses (including Wheatley Beck and Fledborough Beck) within the study area in this Route Section. A total of 24 watercourse crossings are proposed, three using existing culverts that may need to be upgraded, and 18 via new temporary culverts. Crossings of Wheatley Beck, Fledborough Beck and East Drayton are proposed via new temporary bridges that would be removed following completion of construction.

11.7.115 The potential effects on the water quality and hydromorphology of receptors are summarised in Table 11.22.

Table 11.22 - Potential effects on Water Environment Receptors - Route Section 10 (Option 1)

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
Temporary effects on water quality	East Drayton (High) Wheatley Beck and Fledborough Beck (high)	CoCP Measures: W04	Negligible and effects not significant	Moderate

Potential effect	Receptor including preliminary value	Mitigation	Preliminary magnitude and significance of effect	Confidence in prediction
	Minor watercourses (medium)			
Temporary effects on flow regime and hydromorphology due to physical disturbance of channels, beds, or riparian corridors	East Drayton (medium) Wheatley Beck and Fledborough Beck (medium) Minor watercourses (low)	CoCP Measures: W01, W03, W04, W12.	Small adverse to negligible and effects not significant	Moderate

Flood risk and land drainage

11.7.116 The majority of land within this Route Section is located in the low risk flood zone (Flood Zone 1), therefore negative impacts and effects associated with loss of floodplain storage or disruption to floodplain flow routes should be able to be avoided. The confidence for this prediction is Medium.

11.7.117 In this Route Section new areas of temporary impermeable land cover would be created and there would be some topsoil stripping and earthworks. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. These activities could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. The works may also disrupt or sever existing field drainage systems. Temporary measures would be put in place to maintain such drainage routes during construction, then the systems would be reinstated post-construction. Access roads would have suitable drainage provisions, providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

11.7.118 Consequently, negative effects on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. Impacts are anticipated to be negligible, and overall effects are assessed as not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and land drainage

11.7.119 During operation, the interactions are limited to Flood Zone 1. Potential negative effects on flood risk from rivers and the sea are expected to be not significant. The confidence for this prediction is High.

11.7.120 Once construction is complete land temporarily affected and any associated land drainage would be reinstated. Surface water runoff from any permanent access roads would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Impacts on the land drainage regime are assessed to be negligible and effects not significant. The confidence for this prediction is Moderate.

Route Section 11: Fledborough to High Marnham

11.7.121 This section provides a preliminary assessment of the Proposed Overhead Line. The preliminary assessment of the Proposed Substation Works at High Marnham is presented in **Chapter 20 Substations and Associated Works**.

Preliminary construction effects

Sites designated for nature conservation interest

11.7.122 No sites have currently been identified with a potential hydrological link to the Project.

11.7.123 Pending further investigation and awaited information, should any hydrological links be confirmed, an assessment of effects will be presented in the ES, informed by further data and ecology surveys.

Watercourses, their water quality and hydromorphology

11.7.124 Receptors in this Route Section are limited to a small number of minor land drains, which would not be crossed by any elements of Proposed Overhead Line construction. There would therefore be no potential for localised channel bed/bank modifications causing disruption to flow regimes and effects on hydromorphology. There is High confidence in this prediction.

Flood risk and land drainage

11.7.125 The majority of land within this Route Section is located in the low risk flood zone (Flood Zone 1), therefore negative effects associated with loss of floodplain storage or disruption to floodplain flow routes would be avoided. The confidence for this prediction is High.

11.7.126 In this Route Section new areas of temporary impermeable land cover would be created and there would be some topsoil stripping and earthworks. This could locally reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. These activities could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. The works may also disrupt or sever existing field drainage systems. Temporary measures would be put in place to maintain such drainage routes during construction, then the systems would be reinstated post-construction. Access roads would have suitable drainage provisions,

providing for attenuation of runoff and encouraging infiltration of surface water runoff to ground (for example French drains) where conditions are suitable.

11.7.127 Consequently, negative impacts on the land drainage regime and rainfall infiltration and runoff patterns would be limited on receptors which include local land uses and the Proposed Overhead Line itself. Impacts are anticipated to be negligible and consequent effects not significant. The confidence for this prediction is Moderate.

Preliminary operation effects

Flood risk and land drainage

11.7.128 During operation, the interactions are limited to Flood Zone 1. Potential negative effects on flood risk from rivers and the sea are expected to be avoided. The confidence for this prediction is High.

11.7.129 Once construction is complete land temporarily affected and any associated land drainage would be reinstated. Surface water runoff from any permanent access roads would be drained using appropriate SuDS techniques to meet with LLFA discharge requirements. Effects on the land drainage regime are assessed to be not significant. The confidence for this prediction is Moderate.

Summary of the Preliminary Assessments of the Proposed Overhead Line with the Proposed Substation Works

11.7.130 The preliminary assessment of the Proposed Substation Works is presented in **Chapter 20 Substations and Associated Works**.

11.7.131 Shared receptors associated with the Proposed Substation Works at Birkhill Wood include Beverly and Barmston Drain, an unnamed ordinary watercourse, land drains, a surface water Drinking Safeguard Zone, a NVZ and Flood Risk.

11.7.132 Shared receptors associated with the Proposed Substation Works at High Marnham include Fledborough Beck, land drains, a NVZ and Flood Risk.

11.7.133 Taking account of the embedded measures set out in **Chapter 4 Description of the Project** and the control and management measures as set out **in Appendix 4.1 Draft Outline Code of Construction Practice** any potential effects from the Proposed Substation Works are not likely to be significant, and, when considered together are unlikely to change the preliminary significance that is presented in this Chapter.

11.8 References

Ref 11.1 Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. [Online]. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive [Accessed: November 2024].

Ref 11.2 H.M. Government (2003). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (revoked). [Online]. Available at: https://www.legislation.gov.uk/uksi/2003/3242/contents [Accessed: November 2024].

Ref 11.3 H.M Government (2019). The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019. [Online]. Available at: https://www.legislation.gov.uk/uksi/2019/558/contents [Accessed: November 2024].

Ref 11.4 H.M. Government (2021). Environment Act 2021. [Online]. Available at: https://www.legislation.gov.uk/ukpga/2021/30/contents [Accessed: November 2024].

Ref 11.5 H.M. Government (1991). Land Drainage Act 1991. [Online]. Available at: https://www.legislation.gov.uk/ukpga/1991/59/contents [Accessed: November 2024].

Ref 11.6 H.M. Government (2016). Environmental Permitting (England and Wales) Regulations 2016. [Online]. Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents [Accessed: November 2024].

Ref 11.7 H.M. Government (1991). Water Resources Act 1991. [Online]. Available at: https://www.legislation.gov.uk/ukpga/1991/57/contents [Accessed: November 2024]

Ref 11.8 H.M. Government (2010). Flood and Water Management Act 2010. [Online]. Available at: https://www.legislation.gov.uk/ukpga/2010/29/contents [Accessed: November 2024].

Ref 11.9 Department for Energy Security and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). [Online]. Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed: November 2024]

Ref 11.10 Department for Energy Security and Net Zero (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5). [Online]. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 [Accessed: November 2024].

Ref 11.11 Department for Levelling Up, Housing and Communities (2024). National Planning Policy Framework. [Online]. Available at: https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf [Accessed: December 2024].

Ref 11.12 East Riding of Yorkshire Council (2016). East Riding Local Plan 2012-2029 Strategy Document. [Online]. Available at: https://downloads.eastriding.org.uk/corporate/pages/east-riding-local-plan/Strategy%20Document%20-%20Adopted%20April%202016%20lo.pdf [Accessed: November 2024].

Ref 11.13 East Riding of Yorkshire Council (2021). Local Plan Update 2020-2039. [Online]. Available at: https://downloads.eastriding.org.uk/corporate/planning/proposed-submission-local-plan-update/PS-LP01%20Strategy%20Document%20Update.pdf [Accessed: November 2024].

Ref 11.14 North Lincolnshire Council (2011). North Lincolnshire Local Development Framework Core Strategy. [Online]. Available at: https://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/#1591178700859-b856fc83-069c [Accessed: November 2024].

Ref 11.15 North Lincolnshire Council (2022). North Lincolnshire Local Plan Publication Draft Addendum Plan. [Online]. Available at: https://m.northlincs.gov.uk/public/localplan/examination/Draft%20Local%20Plan%20and%20Supporting%20Information/Publication%20Draft%20Addendum%20May%202022.pdf [Accessed: November 2024].

Ref 11.16 Bassetlaw District Council (2024). Bassetlaw Local Plan 2020-2038. [Online]. Available at: https://www.bassetlaw.gov.uk/media/gn1kjm1b/adopted-bassetlaw-local-plan-2020-2038.pdf [Accessed: November 2024].

Ref 11.17 Cottingham Parish Council (2018). Cottingham Neighbourhood Plan and Design Guide 2015-2029. [Online]. Available at: https://downloads.eastriding.org.uk/corporate/pages/cottingham-neighbourhood-plan/Cottingham%20Neighbourhood%20Plan%20and%20Design%20Guide%20(2015-2029).pdf [Accessed: November 2024].

Ref 11.18 Clarborough and Welham Parish Council (2017). Clarborough and Welham Neighbourhood Plan. [Online]. Available at: https://www.bassetlaw.gov.uk/media/3324/clarborough-final-plan.pdf [Accessed: November 2024].

Ref 11.19 Nottinghamshire County Council (2021). Nottinghamshire County Council Minerals Local Plan, adopted 2021. [Online]. Available at: adoptedmineralslocalplancompressed.pdf (nottinghamshire.gov.uk) [Accessed: November 2024].

Ref 11.20 National Grid (2024). Scoping Opinion: Proposed North Humber to High Marnham Scoping Opinion Responses. [Online]. Available at: https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN020034/documents [Accessed: November 2024].

Ref 11.21 National Grid (2023). North Humber to High Marnham Environmental Impact Assessment Scoping Report. [Online]. Available at: https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN020034/documents [Accessed: November 2024].

Ref 11.22 Construction Industry Research and Information Association (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532). [Online]. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C532&Category=BOOK [Accessed: November 2024].

Ref 11.23 National Highways (2020). DMRB LA 113: Road drainage and the water environment. [Online]. Available from: https://www.standardsforhighways.co.uk/tses/attachments/d6388f5f-2694-4986-ac46-b17b62c21727?inline=true [Accessed: November 2024].

Ref 11.24 Department for Environment, Food and Rural Affairs and Environment Agency (2024). Guidance for Pollution Prevention, 2024. [Online]. Available from: https://www.gov.uk/guidance/pollution-prevention-for-businesses [Accessed: November 2024].

Ref 11.25 Flood Risk Management Guidance published by the relevant LLFAs Environment Agency (2022). Flood risk management plans 2021 to 2027. [Online]. Available at: https://www.gov.uk/government/publications/flood-risk-management-plans-2021-to-2027-you-said-we-did/flood-risk-management-plans-2021-to-2027-you-said-we-did [Accessed: November 2024].

Ref 11.26 Department for Environment Food and Rural Affairs (2024). Magic Map. [Online]. Available at: https://magic.defra.gov.uk/MagicMap.aspx [Accessed: November 2024].

Ref 11.27 Department for Environment Food and Rural Affairs (2024). Hydrology Data Explorer. [Online]. Available at https://environment.data.gov.uk/hydrology/explore [Accessed: November 2024]

Ref 11.28 Environment Agency (2024). Main River Map. [Online]. Available at:https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386 [Accessed: November 2024].

Ref 11.29 Environment Agency (2024). Catchment Data Explorer database of Cycle 2 and 3 WFD information. [Online]. Available at: https://environment.data.gov.uk/catchment-planning/ [Accessed: November 2024].

Ref 11.30 Department for Environment, Food and Rural Affairs and Environment Agency (2016). Humber river basin district river basin management plan. [Online]. Available at: https://www.gov.uk/government/publications/humber-river-basin-district-river-basin-management-plan [Accessed: November 2024].

Ref 11.31 Environment Agency (2024). Water Quality Data Archive. [Online]. Available at https://environment.data.gov.uk/water-quality/view/landing [Accessed: November 2024]

Ref 11.32 Environment Agency (2023). Records of licenced surface water abstractions and consented discharges to surface water sources. Provided by email as part of a data request from the Environment Agency, Received: August 2023.

Ref 11.33 Environment Agency (2024). Get flood risk information for planning in England. [Online]. https://flood-map-for-planning.service.gov.uk/ [Accessed: November 2024].

Ref 11.34 Environment Agency (2024). Long term flood risk map for England. [Online]. Available at: https://www.gov.uk/check-long-term-flood-risk [Accessed: November 2024].

Ref 11.35 Environment Agency (2019). Flood risk maps for surface water. [Online]. Available at: https://www.gov.uk/government/publications/flood-risk-maps-2019 [Accessed: November 2024].

Ref 11.36 Environment Agency (2024). Spatial flood defence database. [Online]. Available at: https://www.data.gov.uk/dataset/cc76738e-fc17-49f9-a216-977c61858dda/aims-spatial-flood-defences-inc-standardised-attributes [Accessed: November 2024].

Ref 11.37 Environment Agency (2024). The Historic Flood Map and Recorded Flood Outlines dataset. [Online]. Available at: https://www.data.gov.uk/dataset/76292bec-7d8b-43e8-9c98-02734fd89c81/historic-flood-map and https://www.data.gov.uk/dataset/16e32c53-35a6-4d54-a111-ca09031eaaaf/recorded-flood-outlines [Accessed: November 2024].

Ref 11.38 UK Centre for Ecology and Hydrology (2024). Flood Estimation Handbook webservice. [Online]. Available at: https://fehweb.ceh.ac.uk/ [Accessed: November 2024].

Ref 11.39 Environment Agency (2016). Flood risk assessments: climate change allowances. [Online]. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances [Accessed: November 2024].

Ref 11.40 Environment Agency (2024). Environment Agency Asset Information and Maintenance (AIMS). Available at: https://environment.data.gov.uk/asset-management/index.html [Accessed: November 2024].

Ref 11.41 Legislation.gov (2023). The Levelling-Up and Regeneration Act 2023. [Online]. Available at: https://www.legislation.gov.uk/ukpga/2023/55/contents [Accessed: November 2024].

Ref 11.42 North Lincolnshire Council (2024). Saved 2003 Local Plan Policies. [Online]. Available at: https://www.northlincs.gov.uk/planning-and-environment/planning-policy-the-north-lincolnshire-local-plan/#1593095254001-ec189f5a-67c8 [Accessed: December 2024].

Ref 11.43 H.M. Government (2017) Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, [Online]. Available at: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [Accessed: November 2024].

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com