H2East Pipeline
Humber to
Nottinghamshire

H2East Pipeline: Humber to Nottinghamshire

Powering Industry

Environmental Impact Assessment Scoping Report

EN0610001

Volume 1 (Chapters 1 to 7)

March 2026

Cadent
Your Gas Network

H2East Pipeline
Humber to
Nottinghamshire

EIA Scoping Chapters

Volume 1 (Chapters 1 to 7)

H_2 East Pipeline: Humber to Nottinghamshire

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Table of Contents

1 Introduction 1-1
1.1 Project Overview 1-1
1.2 The Applicant 1-2
1.3 Intention to apply for Development Consent 1-2
1.4 The Need for Environmental Impact Assessment (EIA) 1-3
1.5 Purpose of the Scoping Report 1-3
1.6 Competence 1-5
1.7 Other Assessments (Habitats Regulations and Flood Risk) 1-5
Habitat Regulation Assessment (HRA) 1-5
Water Framework Directive (WFD) 1-6
Flood Risk Assessment 1-7
1.8 Structure of the Scoping Report 1-7
1.9 References 1-8
2 The Project 2-1
2.1 Background to and Need for the Project 2-1
2.2 Consideration of Alternatives 2-3
Project Objectives 2-3
Strategic Alternatives 2-3
2.3 Summary of the Project Elements 2-6
2.4 Preferred Route Corridor Description 2-7
Section A: Immingham and North Killingholme 2-7
Section B: Immingham to Scunthorpe 2-8
Section C: Scunthorpe to High Marnham 2-8
Section D: High Marnham to Kirton and Newark 2-9
2.5 Design Envelope Approach for EIA Scoping 2-9
2.6 Project Components 2-10
Introduction 2-10
Pipeline infrastructure 2-10
Hydrogen Above Ground Installations (HAGIs) 2-11
Block Valve Installations 2-15
Cathodic Protection 2-16
Pipeline Marker Posts 2-16
Aerial Marker posts 2-16

2.7 Construction of the Project 2-17
Introduction 2-17
Pipeline Construction 2-17
Pipeline Crossings 2-21
Temporary Construction Compounds 2-33
HAGI and BVI Construction 2-34
Construction Hours 2-35
Construction Environmental Management Plan (CEMP) 2-35
Traffic and Transport Management 2-35
Material and Waste Management 2-35
Indicative Construction/ Project Programme 2-36
2.8 Operation and Maintenance 2-36
2.9 Decommissioning 2-36
Project Decommissioning 2-36
HAGI Decommissioning 2-37
2.10 References 2-38
3 Legislation, Policy and Guidance Overview 3-1
3.1 Introduction 3-1
3.2 Legislation 3-1
The Planning Act 2008 3-1
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) 3-1
The Planning and Infrastructure Act 2025 3-2
Habitats Regulations Assessment 3-2
Water Framework Directive (England and Wales) Regulations 2017 3-2
Biodiversity Net Gain – Environment Act 2021 3-3
3.3 National Planning Policy 3-3
National Policy Statements 3-3
Overarching National Policy Statement for Energy (EN-1) December 2025 3-3
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), November 2023. 3-4
National Planning Policy Framework (NPPF), February 2025 3-5
3.4 Local Planning Policy 3-6
3.5 Planning Guidance and Advice 3-11
3.6 References 3-12

4 The EIA Process 4-1
4.1 Introduction 4-1
4.2 Approach to EIA Scoping 4-1
Overarching Approach 4-1
4.3 Determining the Scope of the Assessment 4-2
Assessment Parameters 4-2
Technical Scope 4-3
Spatial Scope (Study Area) 4-3
Temporal Scope 4-3
Establishing Baseline Conditions 4-4
4.4 Assessment of Likely Significant Effects 4-4
Overview 4-4
Receptor Sensitivity 4-6
Magnitude of Change (Impact) 4-6
Determination of Significance 4-7
4.5 Environmental Measures and Monitoring 4-8
Construction Environmental Management Plan 4-10
Construction Traffic Management Plan and Public Access Management Plan 4-11
Landscape and Ecology Management plan(s) 4-11
Materials and Waste 4-11
Decommissioning Plan 4-12
4.6 Cumulative Effects Assessment 4-12
Inter-Project Effects 4-12
Intra-Project Effects 4-14
4.7 Transboundary Effects 4-14
4.8 Consultation and Engagement 4-15
Pre-Application Consultation 4-15
4.9 Assumptions and Limitations 4-17
4.10 Proposed structure of the ES 4-17
4.11 References 4-20
5 Biodiversity 5-1
5.1 Introduction 5-1
5.2 Assumptions and Limitations 5-2
5.3 Relevant Legislation, Policy and Technical Guidance 5-2
5.4 Consultation 5-7

5.5 Baseline Review....5-8
Study Area....5-8
Data Sources....5-10
Current Baseline....5-12
Future Baseline....5-28
Further Data Collection to be Undertaken....5-29
5.6 Assessment Methodology....5-29
Proposed Survey Methodology....5-30
Significance Evaluation Methodology....5-41
5.7 Scope of the Assessment....5-42
Key Receptors....5-42
Mitigation Commitments....5-43
Likely Significant Effects....5-47
Impacts Proposed to be Scoped Out....5-53
Cumulative Effects....5-56
Intra-Project Effects....5-56
Secondary Effects....5-56
Transboundary Effects....5-57
5.8 Conclusion....5-57
5.9 References....5-59
6 Historic Environment....6-1
6.1 Introduction....6-1
6.2 Assumptions and Limitations....6-1
6.3 Relevant Legislation, Policy and Technical Guidance....6-2
6.4 Consultation....6-6
6.5 Baseline Review....6-6
Study Area....6-6
Data Sources....6-8
Current Baseline – Archaeology....6-9
Current Baseline – Cultural Heritage....6-20
Future Baseline....6-21
Further Data Collection to be Undertaken....6-22
6.6 Assessment Methodology....6-23
Introduction....6-23
Significance Evaluation Methodology....6-24

6.7 Scope of the Assessment....6-26
Key Receptors....6-26
Mitigation Commitments....6-27
Likely Significant Effects....6-30
Impacts Proposed to be Scoped Out....6-33
Cumulative Effects....6-33
Intra-Project Effects....6-34
Secondary Effects....6-34
Transboundary Effects....6-34
6.8 Conclusion....6-35
6.9 References....6-36
7 Hydrology, Hydrogeology and Flood Risk....7-1
7.1 Introduction....7-1
7.2 Assumptions and Limitations....7-1
7.3 Relevant Legislation, Policy and Technical Guidance....7-2
7.4 Consultation....7-6
7.5 Baseline Review....7-7
Study Area....7-7
Data Sources....7-8
Current Baseline....7-9
Future Baseline....7-23
Further Data Collection to be Undertaken....7-24
7.6 Assessment Methodology....7-24
Introduction....7-24
Proposed Supporting Studies....7-24
Significance Evaluation Methodology....7-25
7.7 Scope of the Assessment....7-28
Key Receptors....7-29
Mitigation Commitments....7-29
Likely Significant Effects....7-33
Impacts Proposed to be Scoped Out....7-36
Cumulative Effects....7-37
Intra-Project Effects....7-38
Secondary Effects....7-38
Transboundary Effects....7-38

7.8 Conclusion 7-38
7.9 References 7-40

Tables

Table 1.1: Information provided under Regulation 10(3) of the EIA Regulations 1-5
Table 3.1: North East Lincolnshire Unitary Authority Development Plans and Policies 3-7
Table 3.2: North Lincolnshire Unitary Authority Development Plans and Policies ... 3-7
Table 3.3: West Lindsey District Council Development Plans and Policies 3-9
Table 3.4: Newark and Sherwood District Council Development Plans and Policies 3-9
Table 3.5: Bassetlaw District Council Core Strategy Development Plans and Policies 3-10
Table 4.1: Generic Guidelines for the Assessment of Sensitivity 4-6
Table 4.2: Generic Guidelines for the Assessment of Magnitude 4-7
Table 4.3: Generic classification of effect definitions 4-7
Table 4.4: Significance Evaluation Matrix 4-8
Table 4.5: Outline Structure for the ES 4-17
Table 5.1: Legislation, Policy and Guidance Applicable to Biodiversity. 5-3
Table 5.2: Desk Study Areas 5-9
Table 5.3: Sources of Biodiversity Data. 5-10
Table 5.4: Statutory Designated Sites within 10 km of the Scoping Boundary 5-12
Table 5.5: RSPB Reserves within 10 km of the Scoping Boundary 5-16
Table 5.6: Wildlife Trust Reserves within 2 km of the Scoping Boundary 5-16
Table 5.7: Percentage Presence of Broad Habitat Types 5-17
Table 5.8: Priority Habitats within Scoping Boundary plus 2 km 5-18
Table 5.9: Ancient Woodland Sites Scoping Boundary plus 2 km Study Area 5-21
Table 5.10: Ancient and Veteran Trees within Scoping Boundary plus 2 km 5-23
Table 5.11: Potentially Affected Protected and Priority Species 5-24
Table 5.12: Invasive and Non-native Flora Species 5-26
Table 5.13: Invasive and Non-native Fauna Species 5-27
Table 5.14: Additional Sources of Ecology and Nature Conservation Data 5-32
Table 5.15: Definitions of Magnitude of Change for Biodiversity. 5-41
Table 5.16: Relevant Commitments to Biodiversity 5-44

Table 5.17: Impacts Proposed to be Scoped in to the Project Assessment for Biodiversity (Project Phase Refers to Construction (C), Operation and Maintenance (O&M) and Decommissioning (D)). 5-48
Table 5.18: Impacts Proposed to be Scoped Out of the Project Assessment for Biodiversity. 5-54
Table 6.1: Legislation, Policy and Guidance Applicable to the Historic Environment 6-2
Table 6.2: Sources of Historic Environment Data 6-8
Table 6.3: Heritage Assets Within the Study Area 6-21
Table 6.4: Additional Sources of Historic Environment Data – Archaeology 6-22
Table 6.5: Additional Sources of Historic Environment Data – Heritage 6-23
Table 6.6: Definitions of Receptor Sensitivity 6-24
Table 6.7: Definitions of Magnitude of Change 6-25
Table 6.8: Definitions of Magnitude of Change 6-26
Table 6.9: Relevant Commitments to Historic Environment 6-28
Table 6.10: Impacts Proposed to be Scoped Into the Project Assessment for Historic Environment (Project Phase refers to Construction (C), Operation & Maintenance (O&M) and Decommissioning (D)). 6-31
Table 7.1: Legislation, Policy and Guidance Applicable to Hydrology, Hydrogeology and Flood Risk 7-2
Table 7.2: Sources of Hydrology, Hydrogeology and Flood Risk Data 7-8
Table 7.3: WFD Cycle 3 (2022) Water Bodies within Section A 7-11
Table 7.4: Designated Sites within Section A: Immingham and North Killingholme .. 7-12
Table 7.5: WFD Cycle 3 (2022) water bodies within Section B 7-15
Table 7.6: Designated Sites Within Section B: Immingham to Scunthorpe 7-16
Table 7.7: WFD Cycle 3 (2022) water bodies within Section C 7-19
Table 7.8: WFD Cycle 3 (2022) Water Bodies within Section D 7-22
Table 7.9: Designated Sites Within Section D: South of High Marnham 7-23
Table 7.10: Definitions of Receptor Sensitivity 7-25
Table 7.11: Definitions of Magnitude of Change 7-27
Table 7.12: Definitions of Significance of Effect 7-28
Table 7.13: Relevant Commitments to Hydrology, Hydrogeology and Flood Risk 7-30
Table 7.14: Impacts Proposed to be Scoped In to the Project Assessment for Hydrology, Hydrogeology and Flood Risk (Project Phase Refers to Construction (C), Operation and Maintenance (O&M) and Decommissioning (D)). 7-34

Table 7.15: Impacts Proposed to be Scoped Out of the Project Assessment for Hydrology, Hydrogeology and Flood Risk 7-36

Figures

Figure 1.1: EIA Scoping Boundary 1-9
Figure 2.1: 'East Coast Hydrogen' (ECH_2) Collaboration 2-2
Figure 2.2: Illustrative HAGI Layout 2-13
Figure 2.3: Example Natural Gas AGI 2-14
Figure 2.4: Example Natural Gas AGI 2-14
Figure 2.5: Typical Layout of a Working Width for Pipe Laying 2-18
Figure 2.6: Illustrative HDD Set-up 2-24
Figure 2.7: Illustrative Unguided Auger Bore Set-up 2-26
Figure 2.8: Illustrative Pipe Ramming Site Set-up 2-28
Figure 2.9: Illustrative Micro-tunnelling Site Set-up 2-30
Figure 2.10: Direct Pipe Site Set-up 2-32
Figure 2.11: Illustrative Compound Layout 2-34
Figure 2.12: Strategic Option Corridors 2-39
Figure 2.13: Route Corridor Options 2-40
Figure 2.14: HAGI Search Areas 2-41
Figure 5.1: Statutory Designated Sites and RSPB Reserves 5-63
Figure 5.2: Local Designations and Ecological Features 5-64
Figure 6.1: Designated Heritage Assets 6-37
Figure 6.2: Archaeology Assets 6-42
Figure 7.1: Main Rivers and Flood Zones 7-42
Figure 7.2: Surface Water Flood Risk and Source Protection Zones 7-47

1 Introduction

1.1 Project Overview

1.1.1 The H_2East Pipeline: Humber to Nottinghamshire (the Project) is a proposal by Cadent Gas Ltd (Cadent) (the Applicant) to construct, operate, maintain and decommission a hydrogen pipeline. The purpose of the Project is to transport low carbon hydrogen between hydrogen production facilities and high demand industrial users, providing an essential route to decarbonisation for industry and supporting economic prosperity through job creation/ retention and the attraction of inward investment to the east of England region.

1.1.2 The Applicant intends to apply for Development Consent for the Project under the Planning Act 2008. This will be sought through a Development Consent Order (DCO) granted by the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ).

1.1.3 The Project is part of a wider 'East Coast Hydrogen' (ECH_2) collaboration between Cadent Gas, National Gas and Northern Gas Networks (NGN). ECH_2 was established with the objective of identifying and ultimately delivering the network infrastructure required to support the deployment of low-carbon hydrogen, facilitating the decarbonisation strategies of energy generators and industrial users in the East Coast region.

1.1.4 Cadent's role and contribution to the ECH_2 project, focuses on the current Cadent distribution area south of the Humber to transport low carbon hydrogen to Cadent's industrial users with the primary focus being principally on those industrial users with the highest gas demand and, therefore, the largest current carbon emissions.

1.1.5 The Project includes the construction, operation, maintenance and decommissioning of approximately 150 km of new pipeline to distribute hydrogen to industrial users. Alongside the new pipelines, it is currently envisaged that 25 Hydrogen Above Ground Installations (HAGIs) or Block Valve Installations (BVIs) (described in **Chapter 2: The Project**) will be required to monitor, operate, maintain and inspect the network at key points along the proposed pipeline.

1.1.6 The pipeline would connect to newly constructed Hydrogen Production Plants at North Killingholme and High Marnham, and distribute this to industrial users located near Immingham, Scunthorpe, Kirton and Newark via Spurs that are typically smaller diameter pipelines that connect industrial users.

1.1.7 The location of the Project is illustrated by the Environmental Impact Assessment (EIA) Scoping boundary as shown in **Figure 1.1**. A full description of the Project is provided in **Chapter 2: The Project**.

1.1.8 This Scoping Report supports a request by the Applicant, under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations'), for a written Scoping Opinion from

the SoS for DESNZ, administered by the Planning Inspectorate (PINS) on behalf of the SoS, to inform the EIA for the Project.

1.1.9 This report has been written by technical specialists. Artificial Intelligence (AI) has been used in places to help improve the presentation and clarity of written text. All content in this report has been reviewed by the Project team to ensure that final wording is correct, and technical meanings have not been altered.

1.2 The Applicant

1.2.1 Cadent is the largest gas distribution company in the UK, owning, operating and maintaining a gas distribution network delivering gas to c.11 million homes, businesses and 40,000 industrial customers. Cadent feeds 188 power stations and connects 45 biomethane production plants and 14 compressed natural gas offtake sites. Cadent owns over 131,000 km of underground pipelines located throughout the North West, West Midlands, East Midlands, South Yorkshire, East of England and North London. Cadent's purpose is to keep people warm while protecting the planet, and is committed to delivering its services with safety, efficiency, and reliability, while driving positive change for its customers and the environment.

1.2.2 In line with this role, the Applicant is responsible for the following activities:

- Looking after the main gas pipe that supplies larger areas, as well as the smaller pipes branching off from it that takes gas to homes and businesses.
- Maintaining, repairing, and replacing gas pipes to ensure the safe and reliable flow of gas now and long into the future.
- Managing the National Gas Emergency Service for all gas customers in the UK. If something goes wrong, the Applicant is the first point of call to make sure it is dealt with calmly, quickly and safely.
- Connecting homes and renewable gas suppliers to its network.
- Working with local businesses to expand and develop its network.
- Providing extra care for those who might need it in a gas emergency.

1.2.3 The Applicant does not produce gas and does not own the gas that flows through its pipes. It is solely responsible for its transportation and distribution.

1.3 Intention to apply for Development Consent

1.3.1 The Project would be defined as a Nationally Significant Infrastructure Project (NSIP) under Part 14(1)(f) ('the construction of a pipe-line by a gas transporter') of the Planning Act 2008 (as amended) if it blended gas into the existing gas network. However, given ongoing regulatory uncertainty as to whether the Project will include blending into the existing gas network Cadent has requested a Section 35 direction for the Project to be treated as development of national significance.

1.3.2 The Applicant intends to submit an application for an order granting Development Consent under Section 37 of the Planning Act 2008 to PINS. The application will comprise details of all development proposals and will be accompanied by an Environmental Statement (ES) conforming to the EIA Regulations and other relevant policies and legislation.

1.4 The Need for Environmental Impact Assessment (EIA)

1.4.1 The purpose of EIA is to provide an independent assessment of a project's potential environmental impacts to enable decision makers, consultees and the public, to understand the potential Likely Significant Effects (LSEs) of the Project before making decisions on whether consent for the development should be granted.

1.4.2 An EIA is required under the terms of European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the LSEs of certain public and private projects on the environment (the 'EIA Directive'). The EIA Directive is transposed into UK law for NSIPs by the EIA Regulations.

1.4.3 EIA is mandatory for development projects defined under Schedule 1 of the EIA Regulations. Those development projects defined in Schedule 2 of The EIA Regulations only require EIA if they are likely to have significant effects on the environment by virtue of their nature, size or location. There are several key components to an EIA, including:

- **EIA Scoping** – to agree the scope, methods and approaches for the EIA studies;
- **EIA Consultation** – ongoing consultation with EIA consultees on the key issues and opportunities relating to the Project;
- **Project Design Evolution/ Optimisation** – feeding in EIA issues and mitigation requirements into the design as well as considering alternatives with respect to environmental issues;
- **Technical EIA Studies** – which include baseline surveys, identification of potential significant environmental effects and the development of mitigation measures; and
- **EIA Reporting** – the findings of the EIA will be presented in an Environmental Statement (ES).

1.4.4 The Project falls within the provisions of Schedule 1 (16)(a) as the pipeline for transporting hydrogen gas has a diameter of more than 800 millimetres and a length of more than 40 km. An EIA will therefore be prepared, and in line with Regulation 8(1)(b) of the EIA Regulations, the Applicant hereby provides notice that the application for a DCO will be accompanied by an ES.

1.5 Purpose of the Scoping Report

1.5.1 This Scoping Report sets out the proposed content, methodologies to be adopted and the anticipated LSEs that are proposed to be considered in the EIA.

1.5.2 It supports a request from the Applicant for a written Scoping Opinion from PINS, on behalf of the SoS, to inform the ES which will be submitted as part of the application for Development Consent.

1.5.3 The opinion of the SoS is being sought specifically on:

- The environmental topics that should be included in the EIA;
- The relevant components of the Project and the resultant LSE;
- Those effects not likely to be significant that do not need to be considered further;
- The approach to setting the study areas for each topic;
- The data that has been gathered (and will be gathered); and
- The assessment methods that will be used to determine LSE.

1.5.4 The approach to determining the environmental measures that could be incorporated into the Project to avoid, prevent, reduce or, if necessary, offset significant effects. A draft Register of Environmental Actions and Commitments (REAC) is provided alongside this scoping request. This sets out where the Applicant intends to rely on commitments as the basis for scoping matters out or refining the scope of assessment (see **Section 4.5** of **Chapter 4: The EIA Process)** The Scoping Report has been produced in accordance with the EIA Regulations, as well as having due regard to PINS 'Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements' (2020 (Updated 2025)). A list of other Advice Notes considered is provided in **Chapter 3: Legislation, Policy and Guidance Overview.**

1.5.5 The Scoping Report is focused on the key impacts likely to give rise to significant environmental effects. It identifies elements that are not considered necessary to assess further and which are proposed to be 'scoped-out', where it can be demonstrated the impact is not likely to have an effect. Each impact takes into account relevant environmental mitigation measures and commitments that the Project will adopt. Some impacts will not be assessed in detail within the EIA as they will be managed through embedded mitigation and recognised good practice delivered through management plans secured via the consent process. For example, an outline Construction Environmental Management Plan (oCEMP) will include a range of good practice measures for controlling impacts during construction of the Project. Further information on the oCEMP can be found in **Section 4.5.1** of **Chapter 4: The EIA Process**. The oCEMP will also include a number of topic specific environmental management plans which are likely to be provided as appendices to the oCEMP. This approach is in line with the general aim to undertake a proportionate EIA, as advocated by industry best practice and as set out in PINS Advice Note Seven.

1.5.6 **Table 1.1** lists the information that must be provided under Regulation 10(3) of the EIA Regulations, when requesting a Scoping Opinion, alongside where that information can be found in this EIA Scoping Report.

Table 1.1: Information provided under Regulation 10(3) of the EIA Regulations

Information required under Regulation 10(3) of the EIA Regulations	Location within this EIA Scoping Report
(a) a plan to sufficiently identify the land;	The location of the Project is illustrated by the EIA Scoping Boundary as shown in **Figure 1.1**.
(b) a description of the proposed development including its location and technical capacity;	A description of the Project and its location and technical capacity is provided in **Chapter 2: The Project.**
(c) an explanation of the likely significant effects of the development on the environment; and	The anticipated LSEs are set out in the topic **Chapters 5 to 16**.
(d) such other information or representations as the person making the request may wish to provide or make.	Where relevant, additional information is set out in the topic **Chapters 5 to 16**.

1.6 Competence

1.6.1 Regulation 14(4) of the EIA Regulations requires that an ES should be prepared by 'competent experts' and that the ES is accompanied by a statement outlining the relevant expertise or qualifications of such experts.

1.6.2 This EIA Scoping Report and the EIA for the Project are being undertaken by suitably qualified and experienced specialists (competent experts). This report has been produced and co-ordinated by environmental consultants who are members of the Institute of Sustainability and Environmental Professionals (ISEP) (formerly the Institute of Environmental Management and Assessment (IEMA)) EIA Quality Mark scheme. The Quality Mark requires its members to provide evidence of their EIA activities and adhere to certain commitments set out by ISEP. ISEP carry out an independent audit of those commitments each year by reviewing the ESs produced by Quality Mark members.

1.6.3 Details of the expertise and qualifications of the competent experts who have been responsible for preparing aspect specific chapters of this Scoping Report and further details of their expertise and qualifications will be provided in the ES.

1.7 Other Assessments (Habitats Regulations and Flood Risk)

1.7.1 The following additional assessments will be undertaken for the Project, due to their respective regulatory requirements. Although the assessments may not directly form part of the ES, where this is the case, they will be submitted as part of the application for Development Consent and referred to within the ES.

Habitat Regulation Assessment (HRA)

1.7.2 In England and Wales, the Habitats Directive (EC Directive 92/43/EEC), and elements of EU Wild Birds Directive (EC Directive 2009/147/EEC) are implemented in UK law under the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations').

1.7.3 The Habitat Regulations provide for the designation of sites in England that are important for protecting certain species and habitats. These sites are known as 'European Sites' and include Special Areas of Conservation (SACs) for habitats and species, candidate SACs (cSACs), Sites of Community Importance (SCI) and Special Protection Areas (SPAs) for birds. UK policy also requires other protected sites to be treated as if they are designated European Sites including proposed SACs (proposed SAC sites represent an earlier stage in the designation process than candidate sites), proposed SPAs and Ramsar sites.

1.7.4 The Habitats Regulations require that, where the possibility of a LSE on a European Site cannot be excluded (either alone or in combination with another plan or project), a competent authority (SoS) must undertake an Appropriate Assessment.

1.7.5 Initially, a screening exercise is undertaken to determine whether any European Sites are likely to be significantly affected by the Project, either alone or in combination with other plans and projects. If significant effects are likely, there will be a need for an Appropriate Assessment to be carried out. The screening, any Appropriate Assessment and any subsequent assessment form part of what is known as the Habitats Regulations Assessment (HRA) process. A preliminary HRA screening assessment is provided in **Appendix 5B**.

1.7.6 Given the proximity of the Project to several European sites (such as the Humber Estuary SAC, SPA and Ramsar Site), an HRA screening assessment will be prepared, consulted upon with Natural England and submitted with the application for Development Consent. This will provide sufficient information to decide whether the Project will lead to LSEs on European Sites. Where LSEs are identified, a detailed assessment will be provided to assess whether the proposals could result in adverse effects on the integrity of relevant European sites.

1.7.7 Whilst the over-arching objectives of EIA and HRA are similar, their scope, level of detail and terminology vary. As such, these processes will be undertaken and consulted upon separately. However, the scope presented within this EIA Scoping Report has been developed to ensure that the needs of these processes are coordinated.

Water Framework Directive (WFD)

1.7.8 The Water Environment (Water Framework Directive) Regulations 2017 (the 'WFD Regulations') transposes the Water Framework Directive (EC Directive 2000/60/EC) and aspects of the Groundwater Directive (EC Directive 2006/118/EC) into UK legislation and set out a series of objectives for waterbodies and groundwaters. These include improving the water environment to achieve good or high status, maintaining existing good or high status, and implementing mitigation to support the water environment at a catchment and waterbody scale.

1.7.9 The WFD Regulations require the Environment Agency in England to prepare River Basin Management Plans (RBMP) for each river basin district. Under

the WFD Regulations, the SoS will need to consider the implications of the Project, firstly in relation to the specific duty to have regard to a RBMP and supplementary plans, and secondly, in more general terms in relation to the UK's ability to comply with the WFD.

1.7.10 A WFD Screening Report will be produced to screen for potential construction and operational impacts of the Project upon the relevant WFD waterbodies. The WFD Screening Report will determine the need for a full WFD assessment. If required, the scope for a WFD assessment will be discussed with the Environment Agency.

Flood Risk Assessment

1.7.11 Flood Risk Assessment (FRA) reporting will be submitted with the application for Development Consent. The reporting will assess the flood risk both to and from the Project and demonstrate how that flood risk will be managed over the Project's lifetime, including the construction phase. The FRA will give due regard to potential future changes in risk due to climate change.

1.8 Structure of the Scoping Report

1.8.1 The Scoping Report is structured as follows:

- **Chapter 1: Introduction** sets out an overview of the Project, the background to the need for an EIA in relation to the Project, the structure of this Scoping Report, and other assessments to be undertaken.
- **Chapter 2: The Project** provides a background to and the need for the Project, a description of the surrounding land and its land uses alongside a description of the components of the Project and the main alternatives considered.
- **Chapter 3: Legislation, Policy and Guidance Overview** provides an overview of the legislation and policies that are relevant to the Project.
- **Chapter 4: The EIA Process** summarises the approach that has been taken to identify the scope of the EIA, including an introduction to the methods used.
- **Chapters 5 to 16** outline the proposed scope of the assessment for each technical topic, the baseline data collected, the approach to setting the study area and the proposed methodology for assessment.
- **Chapter 17: Summary** provides a summary of the scope of the assessment.

1.9 References

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460000 480000 500000 520000

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Section A

Section B

Section C

Section D

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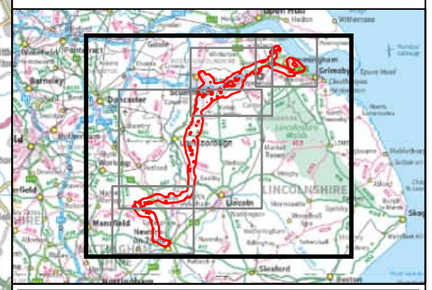
LEGEND

Scoping Boundary

Scoping Boundary Section Division



H2East Pipeline
Humber to
Nottinghamshire

Cadent
Your Gas Network

SCOPING REPORT

EIA SCOPING BOUNDARY OVERVIEW

FIGURE 1.1a

Scale: 1:260,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

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Kilometres

402.064333.00001.0025.0 EIA Scoping Boundary

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Section A

Section B

LEGEND

Scoping Boundary

Scoping Boundary Section Division

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Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

SECTION A: IMMINGHAM AND NORTH KILLINGHOLME

FIGURE 1.1b

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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Section A
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Scoping Boundary

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H_2East Pipeline
Humber to
Nottinghamshire

Cadent
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SCOPING REPORT

SECTION B:
IMMINGHAM TO SCUNTHORPE

FIGURE 1.1c

Scale: 1:80,000 @ A3

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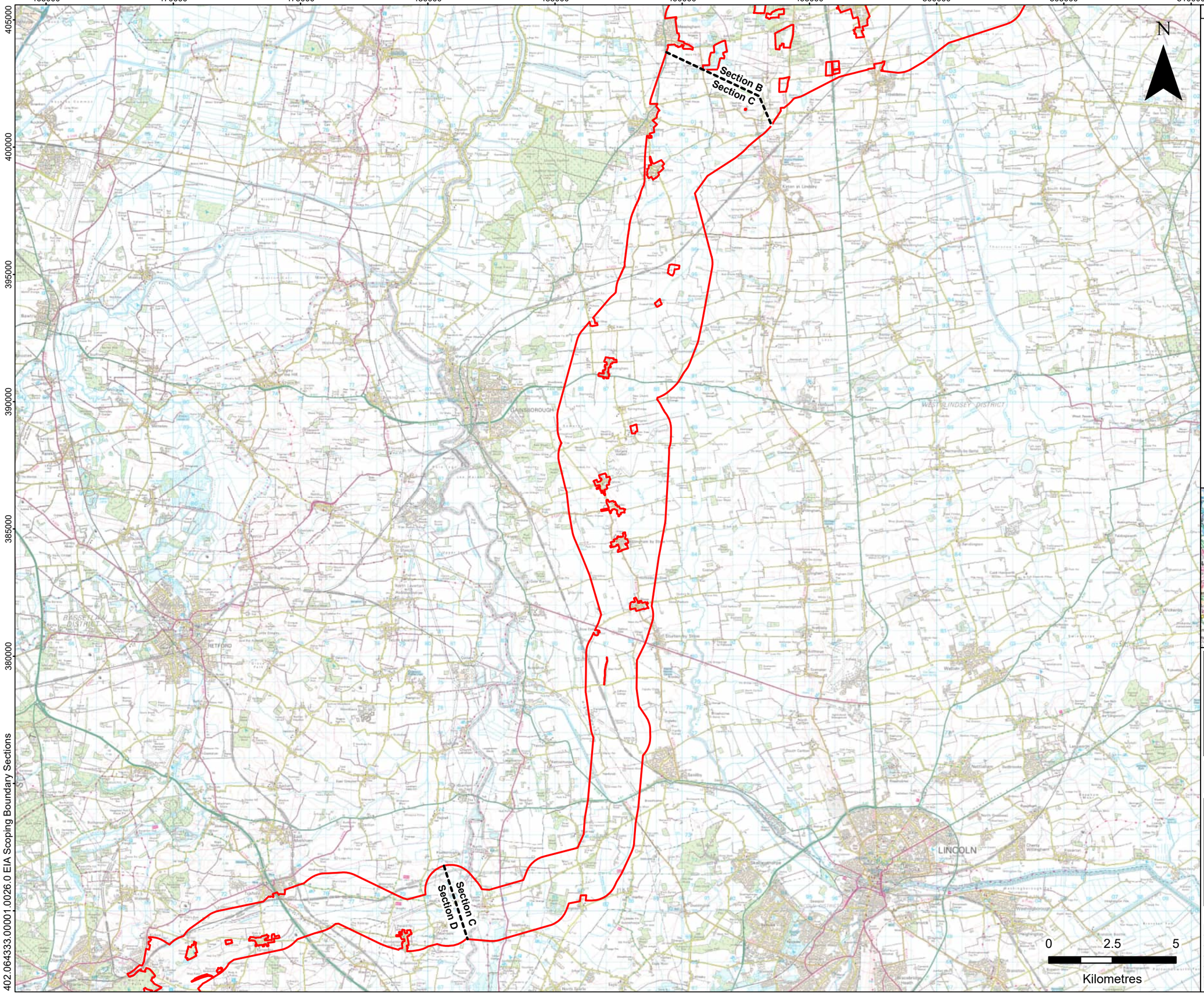
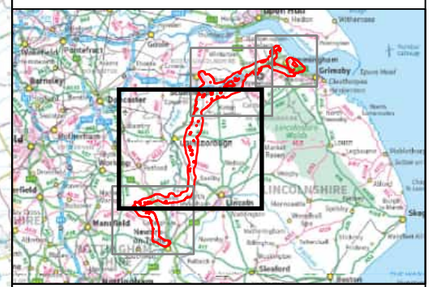


LEGEND

- Scoping Boundary
- Scoping Boundary Section Division



H₂East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

SECTION C: SCUNTHORPE TO HIGH MARNHAM

FIGURE 1.1d

Scale: 1:140,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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Section C
Section D

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LEGEND

Scoping Boundary

Scoping Boundary Section Division

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Kilometres

H2East Pipeline
Humber to
Nottinghamshire

Cadent
Your Gas Network

SCOPING REPORT

**SECTION D:
HIGH MARNHAM TO
KIRTON AND NEWARK**

FIGURE 1.1e

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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2 The Project

2.1 Background to and Need for the Project

2.1.1 The UK Government has set legally binding net-zero carbon dioxide (CO_2) emissions targets in response to the global climate emergency. This means that by 2050, any CO_2 emissions to the atmosphere must be offset by equivalent emissions removal.

2.1.2 Hydrogen can be produced using methods that have either zero, or minimal carbon emissions. Low carbon hydrogen can replace natural gas, and when combusted does not produce carbon dioxide emissions as there are no carbon elements contained within a hydrogen molecule. This means that hydrogen can have a central role in the UK's energy mix as it moves from an energy system that is heavily reliant on unabated burning of fossil fuels to a future system that has a large mix of energy technologies, such as renewables, nuclear, green gases, hydrogen and carbon capture, storage and utilisation.

2.1.3 Specific industrial and commercial sectors, plus power generation, have been identified as 'hard to abate sectors' in the UK's Hydrogen Strategy with hydrogen playing a leading role in decarbonisation. The Climate Change Committee (CCC) (2018) has stated that low carbon hydrogen can replace natural gas in parts of the energy system where electrification is not feasible or is prohibitively expensive, for example industrial heat processes and back-up power generation.

2.1.4 The Hydrogen Infrastructure Strategic Planning Policy Statement (2005) recognises that '*Low carbon hydrogen can support the decarbonisation of long duration dispatchable generation and hard-to-electrify parts of the UK industrial sector*

2.1.5 The Strategic Policy Statement goes on to state that *'a developing network should look to support demand expected from hard-to-decarbonise industrial and power users in or near large industrial cluster sites. This will likely entail the need for regional networks'*

2.1.6 On 20 June 2025 Ofgem issued a direction to Cadent following a re-opener request that Cadent had submitted pursuant to its gas transporter licence. In issuing the direction, Ofgem provided funding to Cadent to develop the Project and imposed project funding conditions pursuant to Cadent's gas transporter licence which regulate the development of the Project.

2.1.7 The Project is part of a wider 'East Coast Hydrogen' (ECH_2) collaboration between Cadent Gas, National Gas and Northern Gas Networks (NGN), as shown on **Figure 2.1**. ECH_2 was established with the objective of identifying and ultimately delivering the network infrastructure required to support the deployment of low-carbon hydrogen. The transport of hydrogen in the East Coast region provides a means for the industrial sector to decarbonise through use of hydrogen as part, or all of industrial energy needs, and to transition away from natural gas.

2.1.8 In addition to decarbonisation, the transport of low carbon hydrogen to industrial and power customers in the region provides an anchor for the sector as a whole, kick-starting the regional hydrogen economy, enabling the creation of high value jobs, sustaining the jobs and skill base of the industrial users, and protecting the heavy manufacturing sector. The Project will support economic prosperity through job creation/ retention and the attraction of inward investment to the east of England region.

Figure 2.1: 'East Coast Hydrogen' (ECH_2) Collaboration

2.2 Consideration of Alternatives

2.2.1 Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) states that an Environmental Statement (ES) should include: *"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

2.2.2 Whilst there is no statutory requirement to include an assessment of alternatives in support of a request for a Scoping Opinion, the Planning Inspectorate's Advice Note Seven recommends that a Scoping Report includes *"an outline of the reasonable alternatives considered and the reasons for selecting the preferred option*".

Project Objectives

2.2.3 Cadent established the following objectives to guide the development of the Project and to support the evaluation of Project alternatives. The Project aims to develop a degree of future proofing that will enable projects under development to be efficiently and logically connected to the Project. Therefore, Cadent will consider foreseeable future demand when considering the size and route of the Project. The Project objectives are as follows:

- Design a viable hydrogen project that connects production sources to industrial users within the Cadent East Midlands distribution footprint who have expressed an interest in being supplied hydrogen and are ready to connect within the timescales of the Project;
- Develop a project that meets the objectives of ECH$_2$ by helping to deliver a hydrogen network for decarbonising industrial users in the East Coast region;
- Enable future expansion by incorporating flexibility for phased development, and supporting efficient and progressive future rollout across the region;
- Provide resilience and security of supply, ensuring the network can operate reliably under varying demand and system conditions;
- Ensure safety and constructability, designing a pipeline system that can be built and operated in accordance with industry standards and best practice; and
- Balance environmental and community considerations with technical and economic performance, minimising impacts while delivering an optimal and cost-effective solution.

Strategic Alternatives

2.2.4 Several strategic alternatives have been considered and reviewed prior to the identification of the Project. The strategic alternatives were based on

identifying and considering possible pipeline connection scenarios between hydrogen production locations and industrial user demand clusters within Cadent's East Midlands distribution footprint.

2.2.5 Hydrogen production was the primary driver for defining strategic options, as the location of supply points determines the feasible entry points for a new transmission network. Three key production areas across the East Midlands distribution area were identified as forming the backbone of the network:

- Immingham, in the Humber area in North Lincolnshire;
- High Marnham, in Nottinghamshire; and
- Ratcliffe, south-west of Nottingham.

2.2.6 The hydrogen demand clusters identified across the East Midlands region comprised the following areas:

- North Lincolnshire towns of Immingham, Grimsby and Scunthorpe;
- South Yorkshire towns of Doncaster, Rotherham, and Barnsley and the city of Sheffield;
- The cities of Nottingham, Derby and Leicester; and
- Some more dispersed demand clusters in the central part of the study area in Nottinghamshire (e.g., Newark and Mansfield) and Derbyshire (e.g., Chesterfield)

2.2.7 Four strategic alternatives were identified and considered and are shown in **Figure 2.12**. A summary of the strategic options considered are provided in the following sections. The detailed findings of the Strategic Options Appraisal can be found in the H_2East Design Evolution Report (DER).

Strategic Option 1: Humber to Scunthorpe

2.2.8 This strategic option connects hydrogen production on the Humber at North Killingholme to industrial users in Immingham and Grimsby, before continuing west towards a demand cluster at Scunthorpe.

Strategic Option 2: Humber to South Yorkshire

2.2.9 This strategic option builds on Strategic Option 1 by continuing the connection westwards towards the south Yorkshire towns of Doncaster, Rotherham, Sheffield and Barnsley. Several industrial demand clusters are located here and there are a number of potential pipeline connection options available.

Strategic Option 3: Humber to Nottinghamshire

2.2.10 This strategic option also builds on Strategic Option 1, via a connection south from Scunthorpe towards hydrogen production at High Marnham and industrial demand in Newark and Kirton.

Strategic Option 4: Nottingham, Derby and Leicester

2.2.11 This Strategic Option is based on the development of a network from hydrogen production proposed at the former Ratcliffe power station. A

network extends north-east to Nottingham, west towards Derby and Burton upon Trent and south towards Leicester. Industrial users to the north of Nottingham would require a route that circumnavigated the city through less developed areas to the east of the city.

Preferred Strategic Alternative

2.2.12 Each of the strategic alternatives have been evaluated against criteria: that test the ability of the alternatives to align to the Project objectives, as set out earlier in this section. The criteria used to evaluate the strategic alternatives comprised hydrogen production and demand, operational considerations including future expansion, constructability, environmental and planning constraints and economic factors, such as approximate length, cost and hydrogen demand per km of pipeline.

2.2.13 Whilst each strategic alternative had some positive and some negative aspects when considered against the assessment criteria, Strategic Option 3 was selected as the preferred strategic option for the following reasons:

- Option 3 has the greatest hydrogen demand;
- Option 3 passes through largely flat and open agricultural land which will be easier and cheaper to construct a pipeline;
- Option 3 is able to avoid significant environmental designations and performs slightly better than Strategic Option 2 with respect to other environmental constraints, such as flood risk, best and most versatile land, and environmental designations; and
- Strategic Option 3 also provides the most flexibility for future expansion.

Route Corridor Alternatives and Evaluation

2.2.14 Within Strategic Option 3, a total of four corridors have been developed and investigated and are shown in **Figure 2.13**. Each Route corridor connects to hydrogen production at North Killingholme and High Marnham and industrial users at Immingham, Grimsby, Singleton Birch, Scunthorpe, Kirton and Newark.

2.2.15 The detailed findings of the Route Corridor Appraisal can be found in the H_2East Design Evolution Report.

2.2.16 The four route corridors have each been assessed using a set of evaluation criteria, based on considering operational factors, constructability, environmental and planning considerations, and factors influencing cost, such as length, number of HAGIs and the number and complexity of crossings.

2.2.17 The Route Corridor Appraisal generally found that there were no major constraints between the Humber and Nottinghamshire. In general, the flat topography and open agricultural land is consistent between all options considered. All options must also connect to hydrogen production at North Killingholme and High Marnham and industrial users at Immingham, Grimsby, Scunthorpe, Kirton and Newark. There are no significant differences in these connections between options, other than the approach into High Marnham and Newark which are both limited by nearby constraints.

2.2.18 The principal influence on route corridor options are the large areas of consented solar farms located between Gainsborough and Newark. There are also areas of flood risk, peat soils and some Grade 2 Best and Most Versatile (BMV) agricultural land.

2.2.19 Route Corridor Option 1 has been selected as the preferred corridor and is taken forward in this EIA Scoping Report. On balance it is the most direct route that avoids most of the constraints. The main reasons for selecting Route Corridor Option 1 are:

- Route Corridor Option 1 is the shortest route;
- Route Corridor Option 2 has a difficult approach into High Marnham and Newark due to consented solar developments;
- Route Corridor Option 3 is the longest and has a challenging approach into Newark which would require several complex and costly crossings through the River Trent Valley; and
- Route Corridor Option 4 would interact with a Registered Historic Park and Garden and consented solar developments, which presents few pipeline routing alternatives.

HAGI Siting

2.2.20 Search areas for Hydrogen Above Ground Installations (HAGIs) have been identified within the preferred route corridor and they have been considered in this EIA Scoping Report, shown on **Figure 2.14**. The locations of these search areas have been informed by the points on the pipeline network where spur line connections are required, with the search areas also being sited to avoid built development and key environmental and planning designations or constraints where possible. Block valves are subject to further design and risk assessment; therefore, no search areas have been identified at this stage. For further information on the HAGIs and block valves please refer to **Section 2.6**.

2.3 Summary of the Project Elements

2.3.1 The Project includes the construction, operation and maintenance and decommissioning of approximately 150 km of new pipeline to distribute low carbon hydrogen between producers and Industrial Users in the east of England. The pipeline would connect to newly constructed hydrogen production plants at North Killingholme and High Marnham and distribute low carbon hydrogen to industrial users located near Immingham, Scunthorpe, Kirton and Newark. The EIA Scoping boundary is shown in **Figure 1.1** of **Chapter 1: Introduction**.

2.3.2 The pipeline would vary in diameter along the route between approximately 4” and 42” and comprise Main Pipeline, that is typically larger diameter pipe used to distribute hydrogen across the network, and Spurs that are typically smaller diameter pipelines that connect end users. The pipeline would be buried along the entire route apart from Hydrogen Above Ground Installations (HAGIs) that are required at junction and connection points within the network

and Block Valve Installations (BVIs) used to isolate sections of the network. It is currently envisaged that approximately 25 HAGIs including BVIs would be required at points along the network, however, this is subject to further design review and includes industrial user connection HAGIs, which are likely to be within their own land

2.3.3 The pipeline would be constructed predominantly using open cut techniques and trenchless crossing techniques at key locations including motorways and major highways, rail, rivers (typically those classed as main rivers, but some may be ordinary watercourses) and large drainage channels. Major crossings would be engineered to minimise environmental and community impact. The potential impact of all techniques such as open cut and trenchless methods will be considered, and a reasonable worst case assessed in the ES.

2.4 Preferred Route Corridor Description

2.4.1 The following section provides a summary description of the preferred route corridor. A more detailed description of the corridor, the constraints that have influenced routing and siting, and the alternatives considered are provided in the Design Evolution Report (DER) and have been outlined previously in **Section 2.2** of this report.

2.4.2 The preferred route corridor has been sub-divided into the following sections (shown in **Figure 1.1 of Chapter 1: Introduction**) for the purpose of reporting in this Scoping Report:

- Section A: Immingham and North Killingholme
- Section B: Immingham to Scunthorpe
- Section C: Scunthorpe to High Marnham
- Section D: High Marnham to Kirton and Newark

2.4.3 The route sections are described below

Section A: Immingham and North Killingholme

2.4.4 This Section includes two of the Hydrogen Production Plants the Project will connect to. They will be located to the north of the Total Lindsey Oil Refinery site near North Killingholme. If required, a HAGI would be located to the north of North Killingholme to allow hydrogen from the two plants to be combined for distribution to the network via a single Main Pipeline running southwards between North Killingholme airport and the refinery. A further HAGI will be located between Ulceby and Habrough to connect with a westbound Main Pipeline towards Scunthorpe and a Main Pipeline connecting Industrial Users (Tronox, Lenzing and Knauf) located to the south east of Immingham. A HAGI is located in the area around Stallingborough and Healing from which Spurs branch off to connect Industrial Users located to the south east of Immingham.

2.4.5 A further HAGI may be required to the north east, from which Spurs can branch off. HAGIs will be required within the Hydrogen Producer and Industrial User sites.

2.4.6 In total Section A contains approximately 14 km of Main pipeline, 13 km of Spurs and eight HAGIs connecting four Industrial Users and two hydrogen producers.

Section B: Immingham to Scunthorpe

2.4.7 This section connects the HAGI search area located between Ulceby and Habrough to Scunthorpe via a Main Pipeline with the preferred route corridor broadly following the M180 motorway. A HAGI and Spur are required to connect to the Singleton Birch Industrial User that is located near Humberside Airport. The main pipeline may have to cross the M180 in places via trenchless crossings. One options is to stay north of the M180, running to the north of Brigg and Scawby, or alternatively to stay south of the M180. A more northerly option would pass through an area of woodland to the south east of Scunthorpe but avoid multiple crossings of the M180 and provide a shorter pipeline length. A pipeline route to the south of the M180, Brigg and Scawby could avoid areas of woodland but would result in a longer pipeline route and would have more crossings of the M180. The EIA Scoping boundary widens as it approaches the south of Scunthorpe to accommodate these route options. Further work will be undertaken to identify a preferred option for assessment in the ES.

2.4.8 A HAGI will need to be located to the south of Scunthorpe, from which Spurs will connect British Steel, Heidelberg Materials and Tayto Industrial Users located on the eastern side of the Town.

2.4.9 The length of Main Pipeline between Immingham and Scunthorpe (approximately 26km), requires a BVI containing isolating values located along the route. The precise location of this BVI will be determined through further design work. HAGIs will also be required within the Industrial User sites.

2.4.10 In total Section B contains approximately 26 km of Main pipeline, 22 km of Spurs, 8 HAGIs connecting 4 Industrial Users and a BVI.

Section C: Scunthorpe to High Marnham

2.4.11 From the HAGI search area located to the south of Scunthorpe, the preferred route corridor continues southwards towards High Marnham, passing to the east of Scotter and west of Kirton in Lindsey. The preferred route corridor continues southwards passing approximately 2 km to the east of Gainsborough and past the villages of Corringham, Heapham, Upton, Kexby and Willingham by Stow. The preferred route corridor turns westwards to the south-west of Saxilby passing to the south of Newton on Trent before crossing the River Trent and connecting to a Hydrogen Production Plant located to the north of the village of High Marnham.

2.4.12 The length of Main Pipeline between Scunthorpe and High Marnham (approximately 40 km), requires additional BVIs containing isolating values will be required at intervals along the route. The precise location of these will be determined through further design work. HAGIs will be required at the High Marnham site.

2.4.13 In total, Section C contains approximately 40 km of Main Pipeline, and a HAGI connecting the hydrogen production plant at High Marnham as well as three BVIs.

Section D: High Marnham to Kirton and Newark

2.4.14 The last Section connects the HyMarnham Hydrogen Production Plant to Industrial Users at Kirton (Forterra), and Newark (British Sugar). The preferred route corridor extends westwards from High Marnham, passing to the north of Normanton on Trent and Egmanton with a HAGI required to provide a Spur to the Forterra site at Kirton. The Spur passes through a minerals extraction area. From this location, the Main Pipeline preferred route corridor heads in a south-easterly direction passing between Caunton and Norwell to connect to a HAGI located to the north-west of Newark. From here a Spur will connect the British Sugar Industrial User.

2.4.15 HAGIs will also be required within the two Industrial User sites.

2.4.16 In total, Section D contains approximately 28 km of Main Pipeline, 6 km of Spurs and four HAGIs connecting two Industrial Users.

2.5 Design Envelope Approach for EIA Scoping

2.5.1 At this stage of the Project, the precise locations and nature of the infrastructure (e.g., pipelines, HAGIs, Block Valve Installations, temporary construction compounds) and construction methods are to be confirmed. These will be determined through ongoing design work that will take place during pre-application. The likely construction techniques are described but the location and extent of construction elements, for example, the working area and construction compounds, are yet to be defined. Therefore, a 'design envelope' approach has been adopted for EIA Scoping, having regard to the Planning Inspectorate's Advice Note Nine (The Planning Inspectorate, 2018).

2.5.2 This approach, known as the 'Rochdale Envelope' Approach, is employed *"where the nature of the Proposed Development means that some details of the whole project have not been confirmed" and "flexibility is sought to address uncertainty."*

2.5.3 To retain flexibility, an EIA Scoping boundary has been defined to represent the maximum extent of development (as shown in **Figure 1.1 of Chapter 1: Introduction**) to incorporate all known elements of the Project that the Applicant will be seeking consent for as part of the application for Development Consent.

2.5.4 At this stage of the Project design the EIA Scoping boundary covers a wider area than is expected to be required for the Project. This is to allow design flexibility for the following reasons:

- To take account of ongoing engineering development;
- To allow for design changes in light of on-going environmental surveys and assessment; and

- To take account of feedback received through engagement, including through consultation events with the public, key stakeholder meetings and discussions with landowners.

2.5.5 The EIA Scoping Boundary was determined by taking into account factors including connection points to the future hydrogen production facilities at North Killingholme and High Marnham, connection points to the industrial users, interconnecting pipelines (Spurs), the Main Pipeline, BVIs and HAGIs.

2.5.6 Throughout the EIA, the design envelope approach will be used to allow meaningful assessments of the Project to proceed, whilst still allowing reasonable flexibility for future Project design decisions.

2.5.7 The Project design and boundary will be further refined through the EIA process as the Project design evolves through design, assessment and consultation activities. Draft Order Limits will be defined to establish the outer limits for the Project. The draft Order Limits will form the basis of the Project and the Development Consent Application.

2.5.8 The draft Order Limits, alongside any Limits of Deviation that will be applied for, will cover sufficient area and depth to enable the development to take place and allow the construction contractor reasonable room to alter the precise location of the pipeline route and other infrastructure (micro-siting). This flexibility is required so that later detailed design is able to account for localised variations found in ground conditions and thus will enable small changes to the route or location of construction activities within the draft Order Limits. The draft Order Limits will include all permanent features (including the pipeline, BVIs and HAGIs), biodiversity compensation and enhancement areas, and areas of planting for screening. It will also include all necessary temporary construction works including the working widths along the pipeline, temporary construction compounds (TCCs), trenchless crossing working areas, accesses and other temporary works, such as drainage works.

2.6 Project Components

Introduction

2.6.1 This section of the report describes the project components that will be constructed and for which development consent will be sought.

Pipeline infrastructure

2.6.2 The pipelines that make up the network would vary in diameter between approximately 4” and 42”. The two main types of pipeline materials that are expected to be used are Carbon Steel (CS) and Polyethylene (PE) pipes. The pipeline would be buried along the entire route apart from short sections within secure compounds at locations where approximately 25 HAGIs including BVIs are required.

2.6.3 Different sections of the network will operate at the following pressure levels:

- High Pressure (pressures above 7 barg)
- Intermediate Pressure (pressures between 2 barg and 7 barg)

- Medium Pressure (pressures between 75 mbarg and 2 barg)

Main Pipeline

2.6.4 The Main Pipeline will comprise sections of larger diameter pipe, typically up to 42” diameter that operates at High Pressure. Sections of Main Pipeline will distribute hydrogen across the network, connecting to HAGIs and BVIs. The Main Pipeline is typically constructed from CS.

Spurs

2.6.5 Spurs are typically smaller diameter sections of pipeline, ranging from 4” to 16”, that provide the connection between HAGIs and Industrial Users. Spurs can be High, Intermediate or Medium pressure. The pressure and diameter of each Spur is determined by the pressure and volume of hydrogen each Industrial User will require Spurs are typically constructed from either CS or PE.

Hydrogen Above Ground Installations (HAGIs)

2.6.6 Typically, a natural gas pipeline network will include Above Ground Installations (AGIs) to perform a number of critical activities during operation of the network. Hydrogen Above Ground Installations (HAGIs) will be required as part of the Project to provide connections to both hydrogen producers and Industrial Users, enabling monitoring, maintenance and inspection of the network during operation and maintenance.

2.6.7 The HAGI sites each represent a fenced compound at a number of locations along the route corridor containing different equipment, depending on the nature of the HAGI. HAGIs may be required at the following locations, pending further design work and discussion with Industrial Users:

- At some or all of the hydrogen production and Industrial User sites to enable connection to the network (12 locations);
- Wherever there is a junction in the network, such as where Spurs connecting the users branch away from the Main Pipeline (seven locations); and
- To facilitate potential future connection to National Gas’s (NGT) proposals for ‘Project Union’.

2.6.8 At this stage in the Project, the precise locations of HAGIs to provide equipment to facilitate connection to ‘Project Union’ have not been determined, however, they are expected to fall within the EIA Scoping Boundary.

2.6.9 The above ground components within HAGIs will be kept at a low level due to the nature of the equipment and to reduce visual impact. The permanent infrastructure will typically be approximately up to 4 m in height, with the exception of CCTV/ lighting masts that could be up to 6 m in height, subject to design review as the Project progresses. Other features include pressure reduction units, metering facilities, pigging facilities, instrumentation kiosks, block valves, fencing and general telecommunications equipment which will

vary on a site-by-site basis. These components are described in the following sections. The HAGIs will require connection to the local electrical distribution and telecommunication systems.

2.6.10 An illustrative layout for a HAGI is provided in **Figure 2.2**. Example photos of a typical AGI as part of the existing gas network is shown in **Figure 2.3**, and **Figure 2.4**.

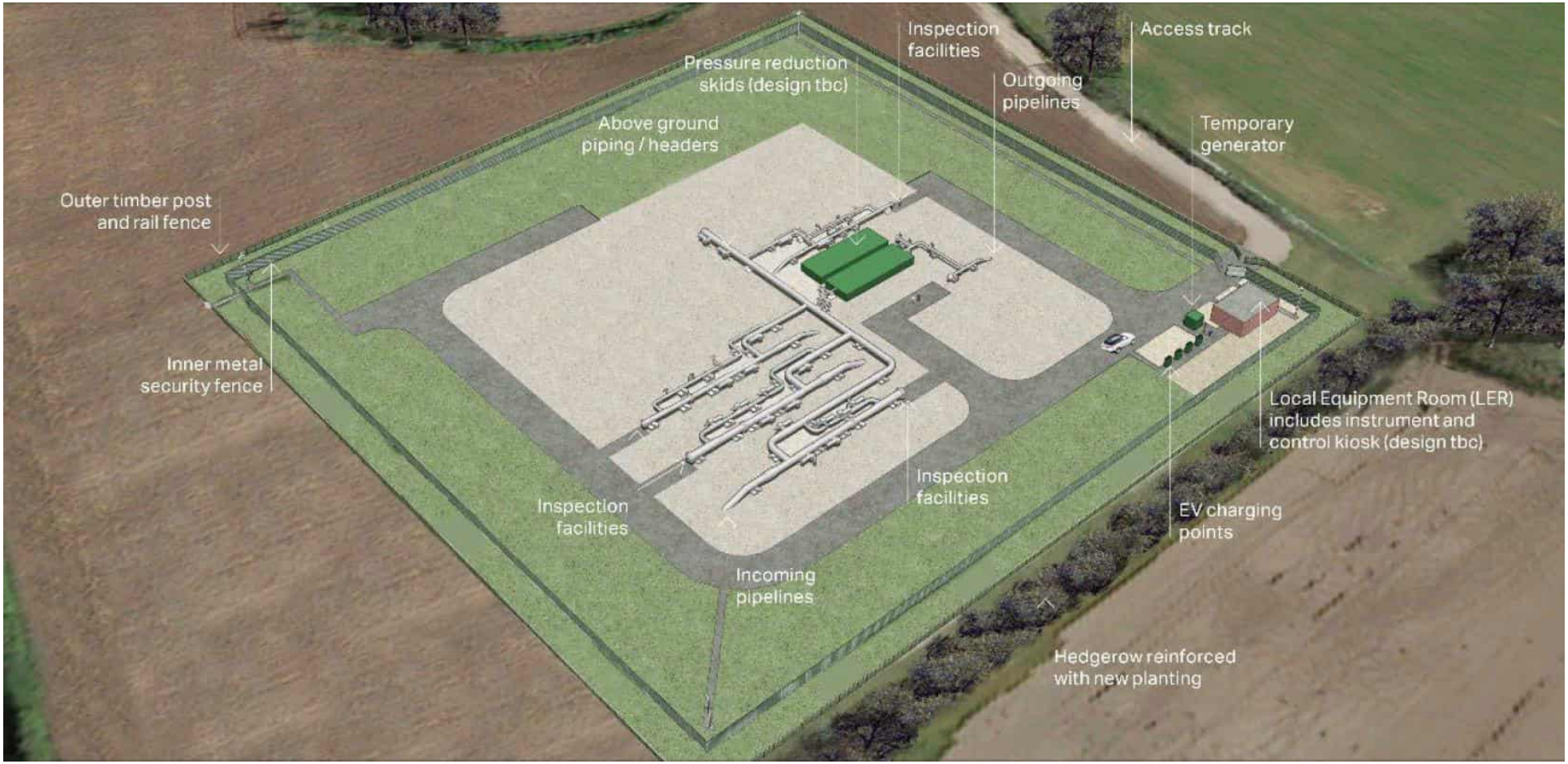

Figure 2.2: Illustrative HAGI Layout

Note: The figure illustrates the types of equipment typically required and the final equipment and layout at each HAGI will vary.

Figure 2.3: Example Natural Gas AGI

Figure 2.4: Example Natural Gas AGI

2.6.11 Security fencing is required around the HAGI which is typically up to 4 m in height (but can be up to 6 m in height dependant on location and further design). Access to the HAGI will be required from the nearest roads or access track. Within the HAGI site there will need to be adequate space for maintenance operative vehicles.

2.6.12 Further design work will identify the layout, sizing, access, equipment and security requirements for each HAGI location. An approximate area of 0.5 to 2 ha is anticipated for each HAGI depending on operational requirements and

location. Additional areas around the HAGI site may be required for mitigation, such as visual screening or planting for ecological purposes.

2.6.13 The HAGIs would generally be unlit except during maintenance or potential breakdown/ emergency requirements, at which point permanent task lighting mounted on columns would be switched on for the duration of the works.

Pressure Reduction Station

2.6.14 Located within the HAGI footprint, Pressure Reduction Stations (PRS) are used to control the flow of the pressure into the network and consists of above ground components including the pipework and valves. Above ground pipework (for PRSs as well as metering and inspection facilities) will vary in diameter with the maximum piping sizes approximately the same diameter as the adjacent buried pipeline, but many of the associated pipes will be smaller in diameter.

2.6.15 A typical PRS will be skid mounted i.e., mounted to a frame at the point of manufacture and delivered to site for connection.

Metering Facilities

2.6.16 Metering facilities are required for volume measurements of the hydrogen gas flow for control and fiscal purposes and will be located inside the HAGIs. As with a PRS, these consist of above ground pipework and components and can be skid-mounted (mounted to a frame). These would be located within the HAGI footprint.

Pigging Facilities

2.6.17 Pigging facilities support future in-line inspection and the cleaning of the pipeline network. The in-line inspection and cleaning is undertaken by passing a device known as an In Line Inspection (ILI) tool through the pipeline which is propelled by the flowing gas without interruption to the gas supply. The facilities include above ground pipework from which to launch and receive the ILI tool as well as operating equipment including valves. These would be located within the HAGI footprint.

Instrumentation and Control Kiosks

2.6.18 Instrumentation and Control kiosks, located within the HAGI compounds, will house the equipment that monitors key parameters (including the flow, pressure and temperature). Field instruments located on pipework will connect the equipment in the kiosk. Signals are sent to an Energy Control Centre via satellite link or similar. The kiosks are typically prefabricated Glass Reinforced Plastic units approximately 2 to 3 metres in height placed on a concrete base that is cast in situ.

Block Valve Installations

2.6.19 A Block Valve comprises a sectional isolation valve which can isolate a section of pipeline to limit any loss of gas released in the event of a repair, maintenance or a failure of the pipeline section. These will be located within a

BVI. These are smaller sites than the HAGIs described above comprising a sequence of buried and chambered valves normally with a fence and an access gate.

2.6.20 BVIs will be installed where the distance between two HAGIs is greater than 16 km along the Main Pipeline. The requirement for BVIs will be subject to further design and risk assessment therefore no search area has been identified at this stage. Such installations may be required at either side of some major crossings such as the River Trent.

2.6.21 The main valve will be in-line with the buried pipeline, and some ancillary valves and pipework will be above ground. The valve actuator will extend a short height (approximately 1.5 m) above ground. The valves may be operated remotely for which the necessary equipment on site will be housed in an instrumentation and control kiosk.

2.6.22 BVIs will be housed in a compound that is typically less than 0.5 ha in size, with fencing approximately 4 m high, an access track, facilities for turning vehicles. and an access gate. Access will be required for maintenance vehicles, typically Light Goods Vehicles (LGV). As with HAGIs, the BVIs will require connection to the local electrical distribution and telecommunication systems.

Cathodic Protection

2.6.23 A Cathodic Protection system will be required as part of the pipeline system. This protects the pipeline from corrosion by imposing a small electrical current, which inhibits the electrochemical process of corrosion.

2.6.24 Cathodic Protection test posts will be installed at regular intervals along the pipeline (approximately every 200 m to 2 km depending on location). These are housed within marker posts typically at selected road or footpath crossings and do not require any other above ground infrastructure such as a compound or kiosk.

Pipeline Marker Posts

2.6.25 Marker posts will also be required at crossings and field boundaries. Marker posts are small posts, with new posts typically made of plastic and approximately 1 m high. The 1 m tall marker posts are located along the pipeline route at field boundaries and crossing locations.

Aerial Marker posts

2.6.26 Aerial markers are required (to assist in ease of route identification) during aerial surveys of the pipeline and are typically 2 m high and made of plastic.

2.6.27 Aerial markers are permanent and are typically installed in changes of direction to facilitate aerial surveys.

2.7 Construction of the Project

Introduction

2.7.1 The following section provides an overview of the typical form and sequencing of construction for the pipeline, HAGIs and BVIs. The pipeline would predominantly be constructed by the open lay installation technique. This is most applicable to rural settings i.e., open fields. A range of options for trenchless solutions are identified and will be employed at crossing points where required. These crossing points will be refined during the design process.

Pipeline Construction

2.7.2 It is anticipated that the pipeline will predominantly be constructed by the open cut installation technique. A range of options are identified for the trenchless crossings and are described in the following Sections.

Construction Phasing

2.7.3 Pipeline construction is generally focused on the spring and summer months (March to September) with an aim to reduce impacts on agricultural land.

2.7.4 The works for trenchless crossings and pipelines in roads and construction of HAGIs and BVIs may occur outside the typical pipelaying season and throughout the year. The Applicant will work with consultees e.g., Statutory Environmental Bodies (SEBs) to determine the timing of sensitive works.

2.7.5 Once site preparation works have been undertaken, the installation of fabricated sections can typically advance at 150 m – 350 m per day depending on diameter and local conditions. In more congested areas, and when pipe diameter and weights are larger, progress is slower and the advance may be only tens of metres per day.

2.7.6 Pipe laying is normally planned to be complete by the autumn. Separate crews would be used to construct road, rail and watercourse crossings.

2.7.7 Work crews would be located at several locations at any one time and move forward as the work progresses. Equally, at times during the construction period there would be no active work at particular locations.

2.7.8 A number of works would be expected to occur in parallel, however, the exact phasing of the works has yet to be determined.

Pipeline Working Width

2.7.9 Pipelines are constructed within the pipeline “spread” or temporary working width which is a corridor of land extending along the route. Pipe laying can be likened to a production line with successive activities moving along the spread. Activities include site preparation, pipeline stringing, welding, inspection, laying and testing. Once complete, reinstatement would be undertaken across the temporary working width.

2.7.10 The pipeline will be a multi-diameter pipeline transportation network and each section of the network will have a specific working width. For a 42” pipeline

the working width would typically be expected to be up to 50 m. Pipeline working widths will be developed through design and the EIA process.

2.7.11 The working width is divided into work, transport and laydown areas. It typically comprises topsoil and subsoil laydown areas, the trench area, pipe string and construction equipment area and a track for through access of construction related personnel and vehicles. A typical cross-section is shown in **Figure 2.5**.

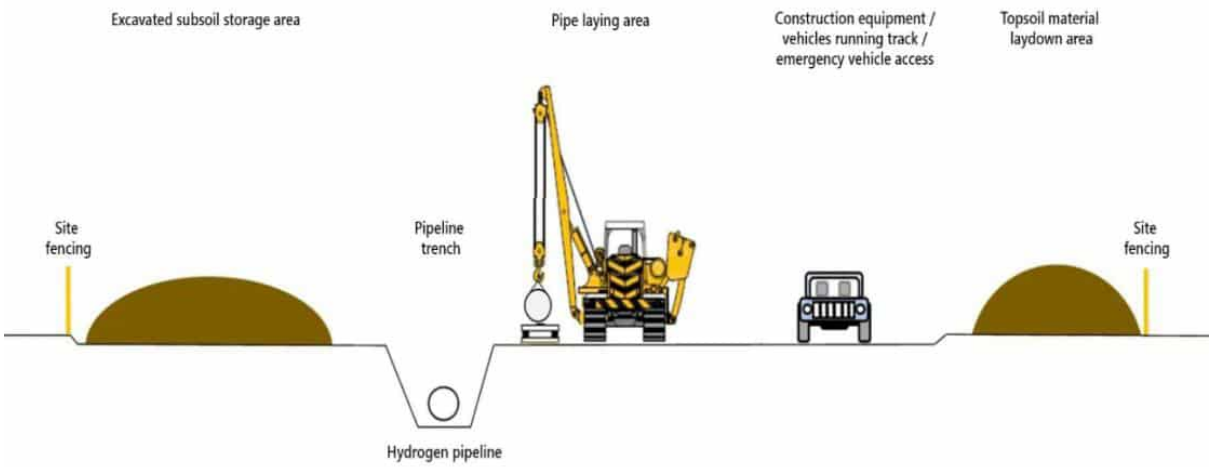

Figure 2.5: Typical Layout of a Working Width for Pipe Laying

2.7.12 The working width can widen further in localised areas, known as box out sections, where an increased working area is necessary for trenchless crossing techniques (used to cross features such as roads, railways, rivers and areas of woodland), where the pipeline route changes direction and before/ after sections of narrowed working width. This is to facilitate safe working, additional spoil storage and equipment laydown. Where Spurs are routed along the public highway, the construction working width is likely to remain within the highway boundary.

Site Preparation Works

2.7.13 Pre-Construction surveys will be undertaken including utilities and Unexploded Ordnance (UXO) checks, environmental and ground condition surveys alongside any remedial work in respect of any contamination or other adverse ground conditions. Works will also be undertaken to divert any existing services.

2.7.14 Site preparation works also include the erection of temporary fencing, the type of which would be determined based on key factors including security and land use, for example, demarcation fencing may be used in arable fields or where livestock is present, stock fencing appropriate to the type of livestock e.g., cattle, sheep, or deer. Where the surrounding land is publicly accessible,

then requirements will be enhanced for safety and security e.g., 2.4 m Heras fencing or similar. In addition, tree protection fencing may be required.

2.7.15 Any temporary site notices or advertisements would be placed alongside any other site safety requirements.

2.7.16 Site preparation works will also include any site clearance works, or demolition works (if required). The requirements for clearance will be location specific. During the development of the Project a key consideration will be to retain and protect any sensitive areas that cannot be avoided, including habitats and vegetation, where practicable. Specific requirements will be developed and outlined within an outline Construction Environment Management Plan (oCEMP) and outline Management Plans.

Ground Preparation

2.7.17 Once the site is secured, and the pipeline corridor has been cleared (e.g., vegetation such as hedgerows), ground preparation of the working width occurs with the formation of an access track as required and the formation of TCCs.

2.7.18 Temporary accesses would be determined in consultation with the local Highway Authority. Site access tracks would be based on the particular conditions at the access point. This can vary from stripping the topsoil to allow vehicles to run on the subsoil, to the use of bog mats or laying a thickness of crushed stone on a geotextile membrane.

2.7.19 Methods of construction will typically involve the removal and appropriate storage of topsoil (for later reinstatement). Some working areas may require the use of crushed stone potentially overlain on a reinforcing geotextile membrane if the ground conditions are soft. Where necessary, improvements to the existing public highway network may be undertaken to facilitate the safe access of construction plant and materials such as pipeline lengths.

2.7.20 Safe crossing points will be implemented where a Public Right of Way (PRoW) crosses the working width. Where necessary, a temporary closure and diversion will be put in place and signage provided. An outline Public Access Management Plan (oPAMP) will be developed, detailing the locations of crossings, closures/ diversions and the proposed method for their implementation.

2.7.21 Localised re-grading of the pipeline corridor may need to be carried out. Some levelling or cut and fill works may be required on a limited number of steep slopes or banks. Benching (terracing) may be required in a small number of locations where side slopes exist. Any required earthworks are not expected to need large amounts imported material. Some limited export and disposal of excavated material may be required, in relation to trenchless crossings. All suitable excavated materials will be reused in reinstatement and restoration of ground levels as far as is practically possible.

2.7.22 Topsoil will be stripped across the required working width area and stored at the edge of the works in accordance with industry good practice, to protect topsoil integrity for future reuse during reinstatement. The topsoil bunds will

typically be in the order of 2 m in height though may be higher subject to soil condition surveys to establish soil characteristics ensuring there is no excessive soil compaction and visibility restrictions. Topsoil bunds will be sited to avoid impeding areas of surface water flow and at required standoff distances from watercourses with gaps left between bunds to avoid waterlogging.

2.7.23 Other activities likely to be required include:

- Establishment of temporary compounds and facilities for site personnel;
- Development of temporary site drainage, sediment management and any necessary temporary watercourse crossings; and
- Creation of temporary accesses along the working width including opening field boundaries along the route.

Site Access

2.7.24 The construction working width will be accessed from public highways at a number of designated locations. Construction access points are still to be determined but they will be developed and outlined within an outline Construction Traffic Management Plan (oCTMP).

2.7.25 Construction plant, vehicles and deliveries will be made along designated and approved routes. Vehicles used during the construction process will use the haul road running alongside the pipeline construction trench.

2.7.26 Site accesses and the need for improvements to any access points (e.g., visibility splays, bell mouths and widening) will be subject to design and consultation with the appropriate Highways Authority. For example, this could include consultation on temporary traffic management measures (such as managed site access points and use of banksmen) that could reduce the extent of hedgerow removal for visibility splays.

2.7.27 In many cases there is no direct access currently available to the working areas from the local highway network; therefore, a temporary haul road may be required to provide suitable access to the working areas. The method of construction will depend on ground conditions and topography.

Fabrication

2.7.28 Line pipes will be brought to site and stored in stacks prior to deployment along the pipeline route, before being transported to their final location along the route, where they will be placed on wooden supports or skids adjacent to the line of the trench. This process is known as pipe stringing.

2.7.29 Line pipes would be lifted onto skids and the pipes welded to form a continuous string. All joints would be tested and, once tested, an anti-corrosion coating would be applied to the welded joints.

Trenching

2.7.30 The pipeline trench will generally be dug using mechanical excavators or trenching machines. The depth and width will vary depending on the pipeline

diameter and location but will be no shallower than 0.9 m over the top of the pipeline. The subsoil material excavated will be stored separately from the topsoil to avoid mixing.

2.7.31 It may be necessary to divert existing field drainage and also dewater trenches in the event that groundwater is present. The method of dewatering will be dependent on the ground conditions, however, it is likely to include the use of mobile pumps and the need to store, treat and discharge the water. The method of removal, storage and treatment will be subject to detailed investigation and form part of management plan or CEMP.

Pipe Laying

2.7.32 Welded pipe sections will be carefully lifted and lowered into the trench in a continuous operation using side booms, excavators or cranes dependent on the size of the pipeline. PE pipes may be lifted into position using lighter lifting equipment or may be pulled into the trench using a winch and rollers. Both PE and CS pipes can be pulled into the ground using trenchless methods. PE pipe may come to site in coils allowing much longer lengths of pipe that reduce the number of joints required.

2.7.33 The pipe will generally be laid on bedding material and covered in padding material. This will typically be soft fill and will serve to protect and minimise movement of the pipe. Backfilling will be undertaken using stored subsoil.

Testing

2.7.34 The internal bore of the pipeline will be cleaned using devices known as ILI tools which travel along the length of a pipeline (once it has been commissioned). The pipeline will be hydrostatically pressure tested. The water source will be confirmed in line with any licences or permits for abstraction or discharge if relevant. The pipeline will be further assessed by inspection equipment to ensure it is free of defects e.g., unacceptable dents, flat spots or areas of ovality. Final end to end drying and dew point testing will be undertaken.

Reinstatement

2.7.35 Reinstatement of the working width will involve the replacement and regrading of subsoil and topsoil. Subsoil will be ripped to relieve compaction and the removal of any debris. Topsoil will be reinstated to the former depth. Soil reinstatement will be subject to methods described within an outline Soil Management Plan (oSMP).

Pipeline Crossings

2.7.36 The number of crossings and the appropriate techniques will be determined during further design development and determined by factors including ground conditions and technical feasibility and any Protective Provisions with third parties. The following sections illustrate a number of techniques that will be considered. Alternative techniques may also be assessed and used. A crossing schedule will be developed and included within the application for Development Consent.

Open Cut Crossings

2.7.37 Open cut installation involves the excavation of a trench across the feature to be crossed and the installation of the pipeline in the trench. This method is typically used for third party utilities (subject to agreement), minor roads, tracks, small rivers and streams.

Trenchless Crossing Techniques

2.7.38 Trenchless crossing techniques will be used at a number of locations as an alternative methodology to open-cut trenching to cross significant environmental and physical features, such as main rivers, major drains, roads and railways.

2.7.39 Each trenchless crossing technique is characterised by the need for establishment of an entry and exit site. In order to assess a reasonable worst case, the typical footprint for each type of crossing will be established.

2.7.40 The layout and equipment used at each trenchless crossing varies and would include site fencing and potentially lighting to support 24-hour activities as required. Working areas include areas for activities such as pit/ shaft construction, excavated materials, soil processing plant, settlement pits (as required), drilling mud/ slurry processing, storage of materials and equipment, drilling rigs and ancillary equipment, generators, security and welfare facilities, temporary office, car parking, fuelling area and waste storage. Some larger equipment individual elements including storage tanks and cranes may be required during the works.

Horizontal Directional Drilling (HDD)

2.7.41 Horizontal Directional Drilling (HDD) is a construction technique whereby a bore is drilled and enlarged under a waterway or other designated area, and the pipeline or other utilities is pulled through the drilled underground bore. **Figure 2.6** provides an illustrative example of an HDD site set-up.

2.7.42 The HDD technique is typically used on longer trenchless crossings. HDD requires creation of an entry and exit pit on either side of the feature to be crossed and guiding a pilot hole along the pre-determined profile beneath the obstacle. The depth of the drilled profile can be set to minimise risk to the obstacle being crossed and maximise protection of the pipeline.

2.7.43 Once the pilot hole is complete the bore is enlarged in stages using reamers (drill heads) in soft ground or hole openers in hard ground to a diameter approximately 1.5 times greater than the diameter of the pipeline to be installed.

2.7.44 Excavation takes place by rotating a cutting head at the front of the drill string and pumping drilling fluid from the surface, through the drill string, to the cutting head.

2.7.45 During drilling, the bore is supported by drilling fluid which also performs functions such as drill bit cooling, lubrication and as a transport medium for the removal of drill cuttings. Settlement pits are used for the separation of excavated materials and recycling of drilling fluid.

2.7.46 When the bore has been enlarged to the required diameter the pipeline is pulled through using the drilling rig. A stringing site that is equivalent to the length of the HDD crossing is required to fabricate the product pipeline in a single length allowing the installation operation to be completed without interruption.

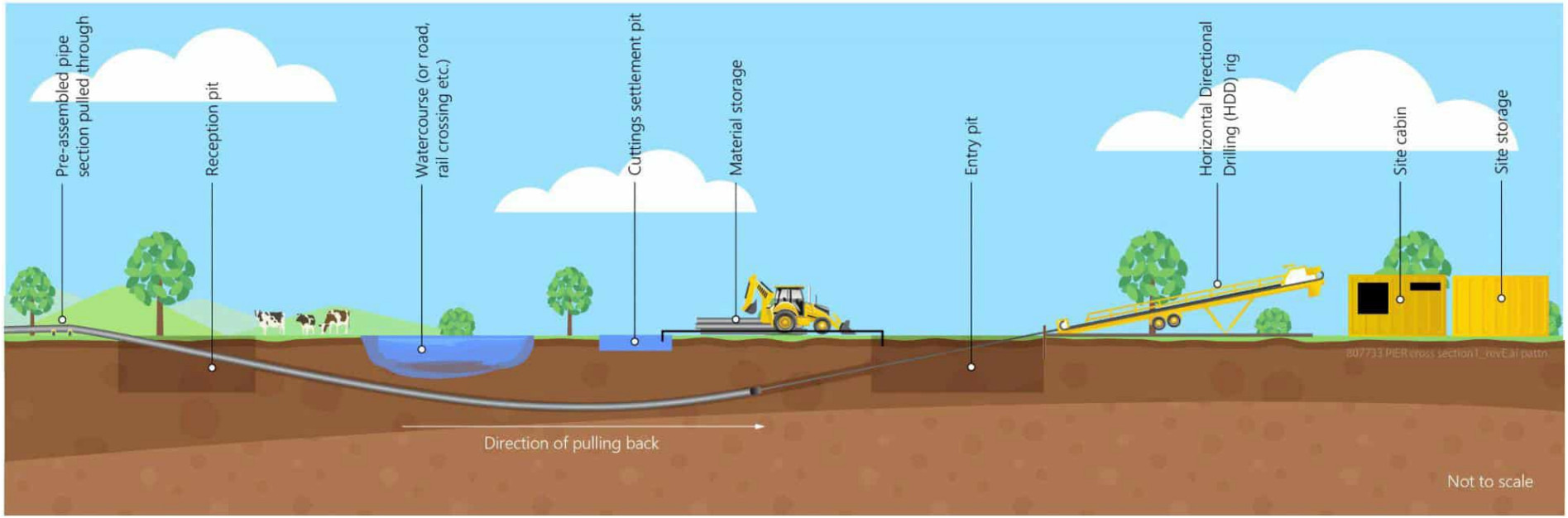

Figure 2.6: Illustrative HDD Set-up

Auger Boring

2.7.47 Auger bores are typically used for shorter trenchless crossings. Auger boring is the process of forming a horizontal bore by jacking the steel casing through the earth from temporary excavations either side of the crossing. Spoil is removed from inside the casing by means of a rotating auger. These rotating augers carry the spoil back through the casing to the main shaft for removal.

2.7.48 Excavation takes place by rotating a cutting head at the front of the pipe as it is pushed into the ground. Excavated material is removed from inside the pipe back to the drive pit. Following reception of the auger, the cutting head is removed, and the pipe is welded and pushed through to the reception pit. Auger bores can be unguided or guided. Each method generally follows the same excavation and pipe installation principles, but guided auger boring uses more accurate guidance systems.

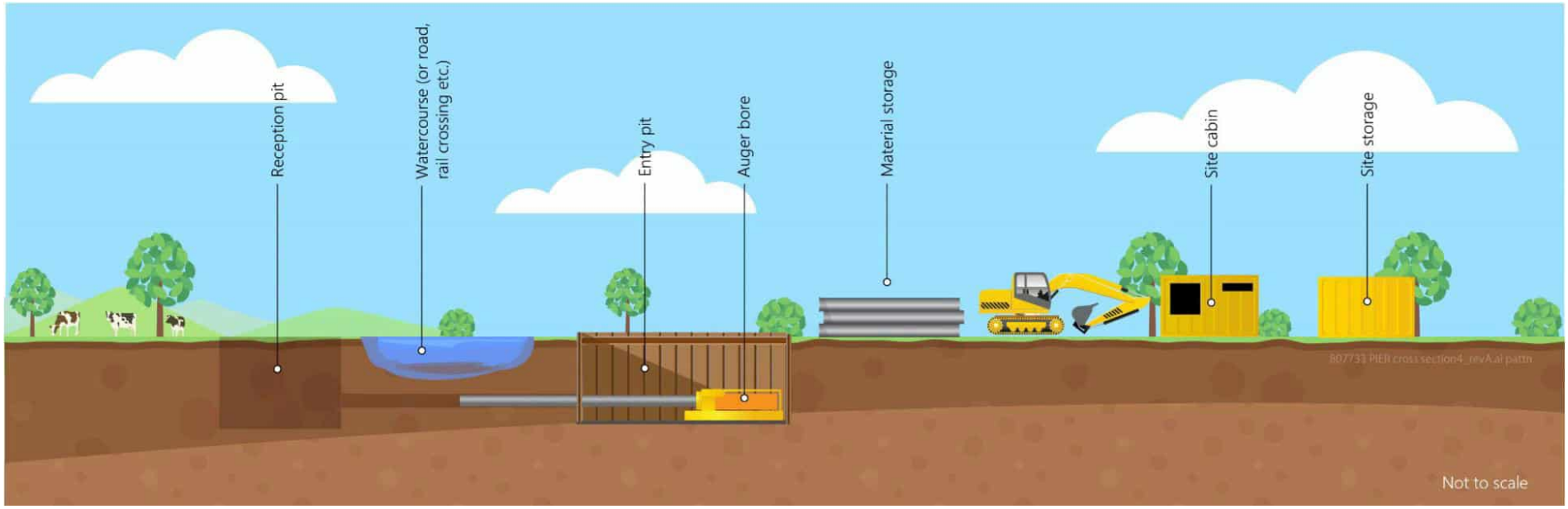

Figure 2.7: Illustrative Unguided Auger Bore Set-up

Pipe Ramming

2.7.49 This method involves a pneumatic piston or pneumatic blows to drive casing from the thrust pit to a reception pit at the other side of the crossing. Following ramming of the casing, the material is typically removed by inserting a plug into the thrust end of the casing and injecting compressed air to push the material out into the reception pit.

2.7.50 Once material is removed, the pipe is inserted using the same method as the cased auger method described above.

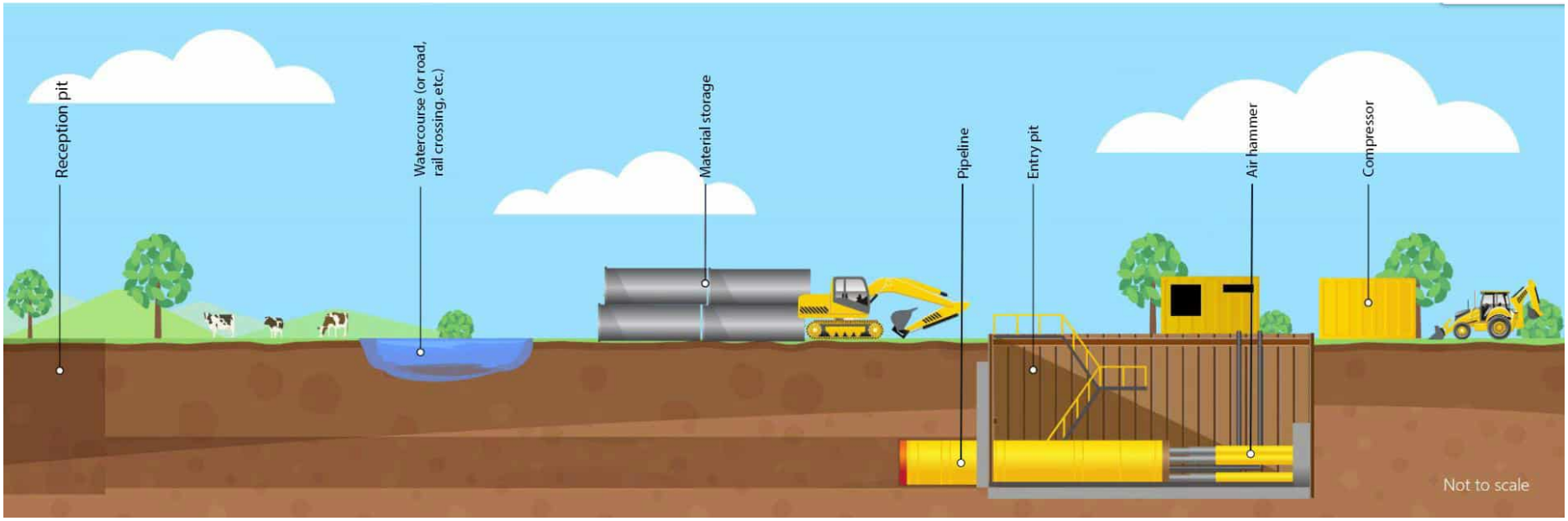

Figure 2.8: Illustrative Pipe Ramming Site Set-up

Micro-tunnelling

2.7.51 Micro-tunnelling can be used for short and longer crossings but generally requires a larger footprint including installation of entry pits or shafts and reception pits or shafts. A cutting tool/ machine provides the mechanical excavation, generally controlled remotely from an above ground compound. Excavated spoil is transported back to the surface at the entry shaft site for disposal.

2.7.52 A pre-cast concrete pipe is driven in behind the cutting machine using a hydraulic ram or jack placed within the entry shaft.

2.7.53 The line pipes are then welded into a string pipe and gradually pushed or pulled into the casing or, where space is limited, the pipe may be welded at the base of a pit/ shaft. Following pipeline installation inside the tunnel, the remaining space between the tunnel and installed pipeline is typically filled with grout.

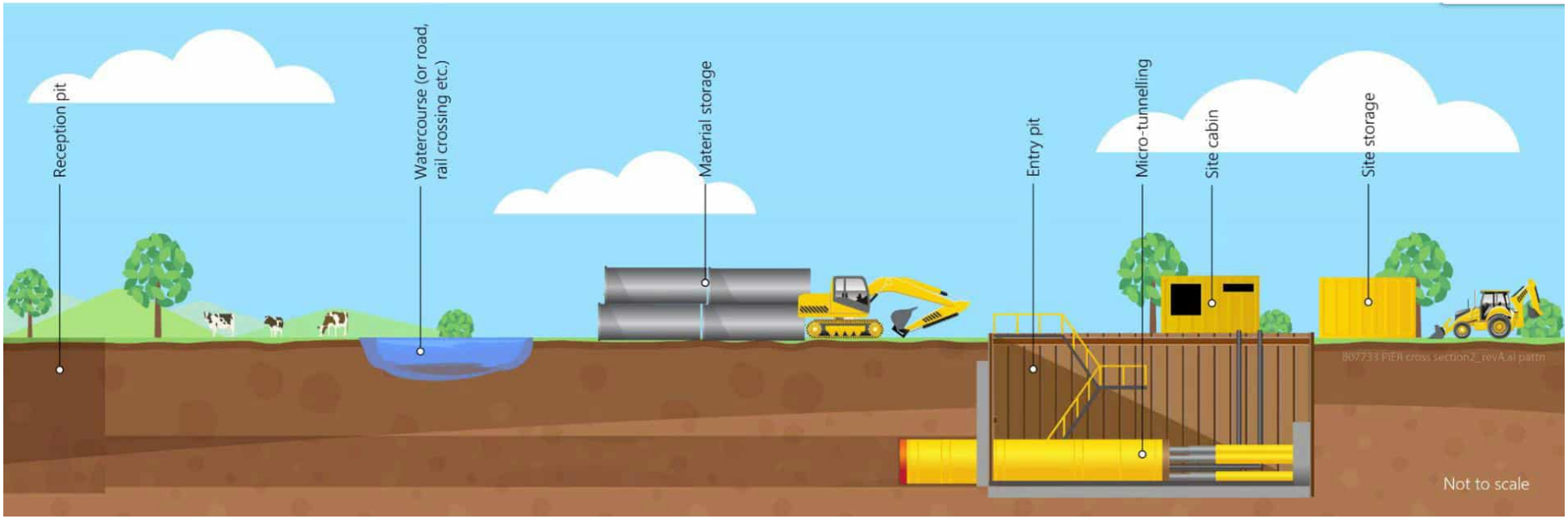

Figure 2.9: Illustrative Micro-tunnelling Site Set-up

Direct Pipe

2.7.54 Direct pipe can be applied to variable lengths of trenchless crossings. This technique is similar in its method and set up as described for micro-tunnelling. A cutting tool/ machine provides the mechanical excavation, generally controlled remotely from an above ground compound. However, the pipeline is installed directly into the ground behind the cutting machine as it passes through the ground, rather than being installed after the tunnelling is complete.

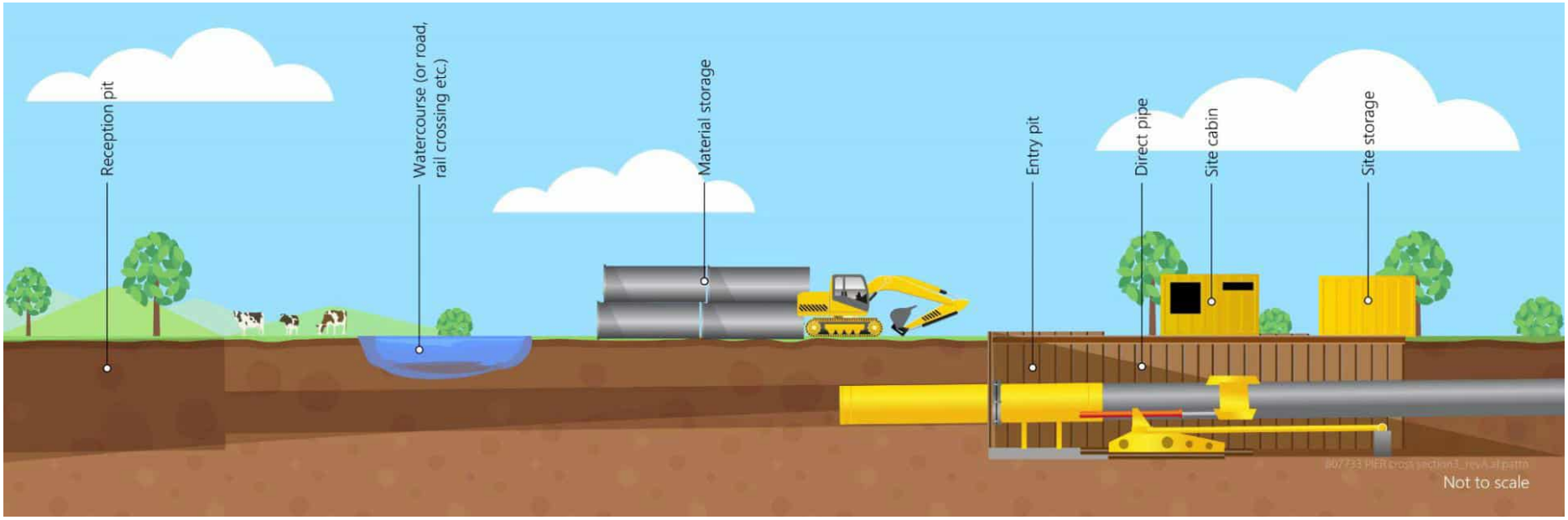

Figure 2.10: Direct Pipe Site Set-up

Temporary Construction Compounds

2.7.55 TCCs will be required along the preferred route for the duration of the enabling and installation works to support the construction of the pipeline, crossings, HAGIs and BVIs. The location and area required for temporary compounds will be subject to further design and route refinement. Key locations are likely to include the HAGI construction sites. An illustrative temporary construction compound layout for a HAGI site is shown in **Figure 2.11**.

2.7.56 The TCCs would typically include:

- Secure fencing and access for plant, vehicles and personnel;
- Hard surfacing and drainage;
- Temporary connections to utilities;
- Welfare facilities;
- Vehicle and plant storage, maintenance equipment and associated fuels;
- Storage for pipes in stacks, equipment and materials; and
- Lighting for security and task lighting for the winter months.

2.7.57 Once the pipeline has been constructed and reinstated, the TCCs themselves will be decommissioned and land reinstated to its former condition. Landscaping would be implemented through a construction landscaping scheme that would be prepared and delivered in accordance with requirements set out within the Development Consent Order (DCO).

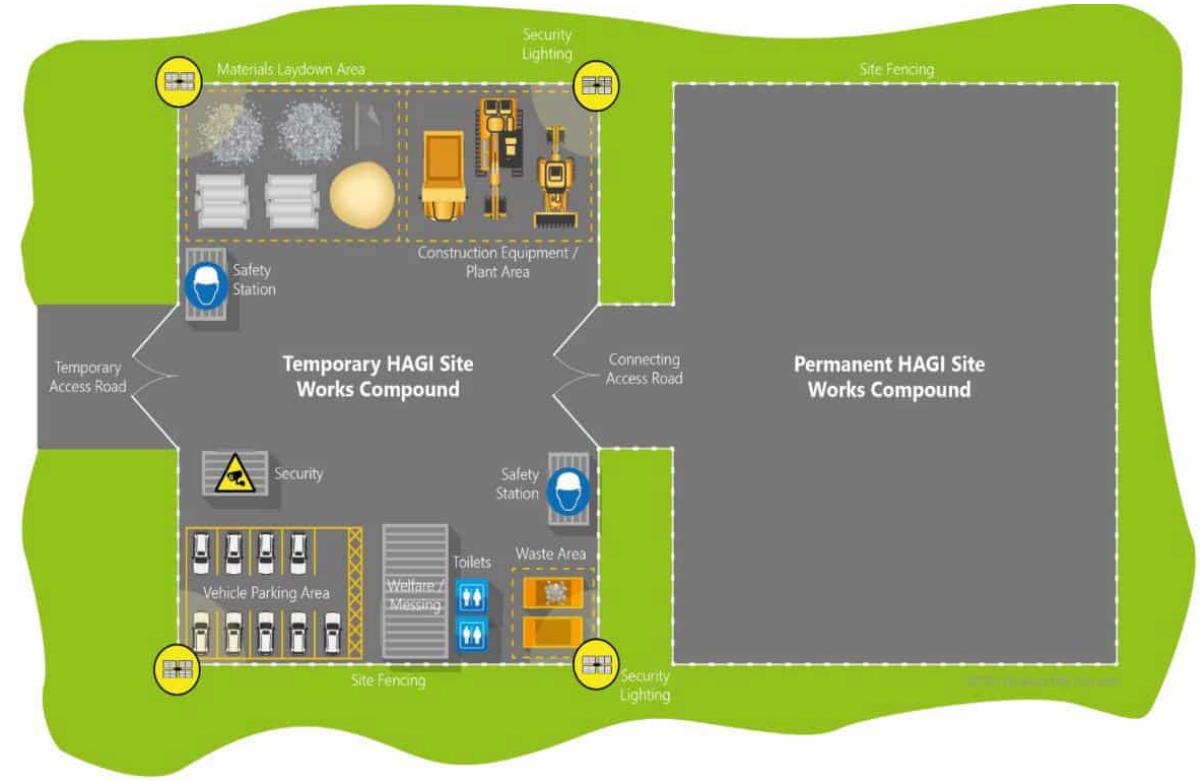

Figure 2.11: Illustrative Compound Layout

HAGI and BVI Construction

2.7.58 The construction site for a HAGI or BVI will typically include the necessary temporary works area to be co-located and will be up to approximately 2 ha in size (Pipeline TCCs areas are typically larger as they are required to accommodate large volumes of line pipe as well as accommodation of construction equipment and associated activities). The temporary works area will be adequate to accommodate all requirements described for temporary construction compounds description.

2.7.59 The typical site construction sequence will include:

- Site preparation, including establishment of TCCs and typical activities for pipeline construction described previously;
- Earthworks and civils, including establishment of concrete bases for permanent equipment;
- Installation of mechanical equipment and laying/connection of pipes;
- Installation of electrics, instrumentation and control equipment and kiosk; and
- Testing and commissioning.

2.7.60 Construction of a HAGI would typically take between 3-6 months and may be in progress at any point during the year, subject to any local constraints.

2.7.61 Reinstatement of temporary accesses, working areas and landscaping would be undertaken in accordance with a landscape scheme, prepared in accordance with requirements set out within the DCO.

Construction Hours

2.7.62 Typical construction hours would be 10 hours per day (08:00 to 18:00) from Monday to Saturday except for specific circumstances where longer working hours are required or where deliveries are required outside of these hours. Limited 24-hour working would be required for some activities such as trenchless crossings where they need to be completed as a continuous operation, as well as pipeline testing.

Construction Environmental Management Plan (CEMP)

2.7.63 A Construction Environmental Management Plan (CEMP) will set out the principles and procedures for the environmental management of the Project during construction. The CEMP will aim to describe how any potential adverse effects from the construction phase of the Project on the environment and local communities will be controlled and minimised as far as reasonably practicable. It will describe good industry practice for the management of the environment and will form the framework for more detailed construction mitigation plans.

2.7.64 The CEMP, in outline form (oCEMP), will be developed alongside the EIA process as a key construction mitigation document that will form part of the DCO. The oCEMP will then be finalised and approved as part of the discharge of DCO Requirements. The oCEMP will also include a number of topic specific environmental management plans which are likely to be provided as appendices to the oCEMP. These are listed in Chapter 4: EIA Process.

Traffic and Transport Management

2.7.65 The movement of materials, waste, construction workforce and plant require careful management with respect to transport movements. The Project will develop outline and detailed management measures prior to the commencement of construction works. A Construction Traffic Management Plan (CTMP) will be developed. This will set out how transport movements will be managed on the local highway network, routes for any larger vehicles, and details/ timings of any necessary road closures, if required. It will also set out details for managing abnormal indivisible loads, if required for the Project.

Material and Waste Management

2.7.66 The Project will require a range of materials (e.g. aggregate for access tracks, concrete) and will generate a range of wastes.

2.7.67 A strategy for the management of materials and waste will be developed for the Project and presented within an outline Materials Management Plan (oMMP) that will be provided with the application for Development Consent, either within the outline CEMP or as a management plan supporting the outline CEMP.

Indicative Construction/ Project Programme

2.7.68 Subject to the granting of the DCO in 2030, construction is anticipated to commence in 2030-31 and is envisaged to be completed by the end of 2034. The Project is expected to be fully operational by the end of 2035. Not all locations will be subject to construction works for the entire length of the Project construction phase. The exact construction programme at each specific location along the route is still being determined.

2.8 Operation and Maintenance

2.8.1 The HAGIs and BVIs will not be permanently manned, and it is envisaged the HAGIs will be electronically monitored remotely from an Energy Control Centre located off-site. HAGIs and BVIs will be operational 24 hours a day. Planned maintenance will be undertaken periodically on-site whilst exact requirements are still to be determined, it will typically include the following:

- Routine checks on a weekly basis requiring 1-2 personnel for a short period (approximately 1 hour).
- Planned periods of maintenance anticipated to be every 6 months with a duration of up to 2 days.
- Pipeline inspection operations requiring ten personnel for approximately one week and undertaken every 1 to 5 years, subject to further development for hydrogen pipelines. Inspection operations involve an internal examination of the pipe undertaken by an inspection ILI tool, which travels inside the pipeline from one HAGI to the next.
- Infrequent breakdown or urgent visits with access on a 24/7 basis if required.

2.8.2 Pipeline surveillance will typically be undertaken by helicopter, drone and/or vantage surveys so access onto private land is not normally required, unless a specific issue requires further investigation.

2.8.3 As described above, the inspection of the pipelines is undertaken internally via the pigging facilities at HAGI, without needing physical access to the buried pipeline route. It is anticipated that no pipeline maintenance would be required where excavation of the pipeline is required, unless a defect is identified that requires repair.

2.9 Decommissioning

Project Decommissioning

2.9.1 The design life of the pipeline and HAGIs (including BVIs) is 40 years but it is anticipated that the actual life of the pipeline could extend well over 40 years depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. It is reasonably expected that a statutory framework relating to the decommissioning of the Project will be developed and agreed with any approving bodies prior to any decommissioning. Similarly, technology and good practice would develop and provide new ways to undertake the process.

2.9.2 Decommissioning of the Project will likely involve removing the hydrogen and making it safe before leaving the pipeline in situ and avoiding removal and associated potential environmental effects. This would typically involve plugging the pipeline at intervals and stabilisation of major crossings including rail, road and watercourse crossings by grout filling where required. All above ground facilities including HAGIs would be removed. The sequence of decommissioning these elements would be the reverse of the construction sequence and would likely involve the application of similar construction plant and methods. All materials removed would be reused or recycled where possible or disposed of in accordance with relevant waste disposal requirements. Land would then be restored to its former use.

2.9.3 At the appropriate point in time, a Decommissioning Plan will be developed by the Undertaker. The Decommissioning Plan will be a live document which is updated and refined as appropriate. The Plan will address the relevant statutory requirements at the time, any extant commitments with landowners/ statutory authorities and take account of any developed technology and good practice at the time of decommissioning.

HAGI Decommissioning

2.9.4 It is envisaged that HAGIs will be removed by reversing the methods used for installation, with similar levels and types of equipment involved. Temporary decommissioning accesses may be required alongside compounds for the storage of equipment. HAGIs will be disconnected from the local electrical distribution and telecommunication systems, following which all electrical components will be removed. At this point, the site buildings and mechanical equipment will be dismantled, disconnected and removed from the HAGI site. For HAGIs, pipework will be removed to surface where it will be backfilled and capped.

2.9.5 Reinstatement of temporary accesses, compounds and landscaping will be undertaken in accordance with a landscape scheme, which will be defined in the decommissioning plan.

2.9.6 The decommissioning of the HAGIs is anticipated to take the same amount of time as construction, although this is indicative and may vary.

2.10 References

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400000 440000 480000 520000

400000 360000

N

LEGEND

- Study Area
- Hydrogen Producer
- Customer Demand Cluster
- Strategic Route Option 1
- Strategic Route Option 2
- Strategic Route Option 3
- Strategic Route Option 4

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

STRATEGIC CORRIDOR OPTIONS

FIGURE 2.12

Scale: 1:500,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	15/01/26

0 10 20
Kilometres

402.064333.00001.0068.0 Strategic Corridor Options

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460000 480000 500000 520000

420000 400000 380000

Section A
Section B
Section C
Section D

Option A-1
Option A-2
Option A-3
Option B-1
Option B-2
Option B-3
Option B-4
Option C-1
Option C-2
Option C-3
Option C-4
Option D-1
Option D-2
Option D-3

N

LEGEND

- Hydrogen Producer
- Potential Customer Location
- Option 1
- Option 2
- Option 3
- Option 4
- Section Division
- Urban Area

Isle of Man
SEA
ENGLAND
WALES

0 10 20
Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

ROUTE CORRIDOR OPTIONS

FIGURE 2.13

Scale: 1:250,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	15/01/26

402.064333.00001.0660.00 Route Corridor Options

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510000 515000 520000 525000

420000

415000

402.064333.00001.0073.0 HAGI Search Areas

A-I

A-II

A-III

B-I

Section A

Section B

LEGEND

Scoping Boundary

Scoping Boundary Section Division

HAGI Search Area

N

0 2.5 5

Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

HAGI SEARCH AREAS SECTION A

FIGURE 2.14a

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	CN	JS	MF	29/01/26

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490000 495000 500000 505000 510000

415000 410000 405000

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- HAGI Search Area

N

A-I

A-II

B-I

B-II

B-II

Section A
Section B

Section B
Section C

0 2.5 5
Kilometres

H₂East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

HAGI SEARCH AREAS SECTION B

FIGURE 2.14b

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	CN	JS	MF	29/01/26

402.064333.00001.0073.0 HAGI Search Areas

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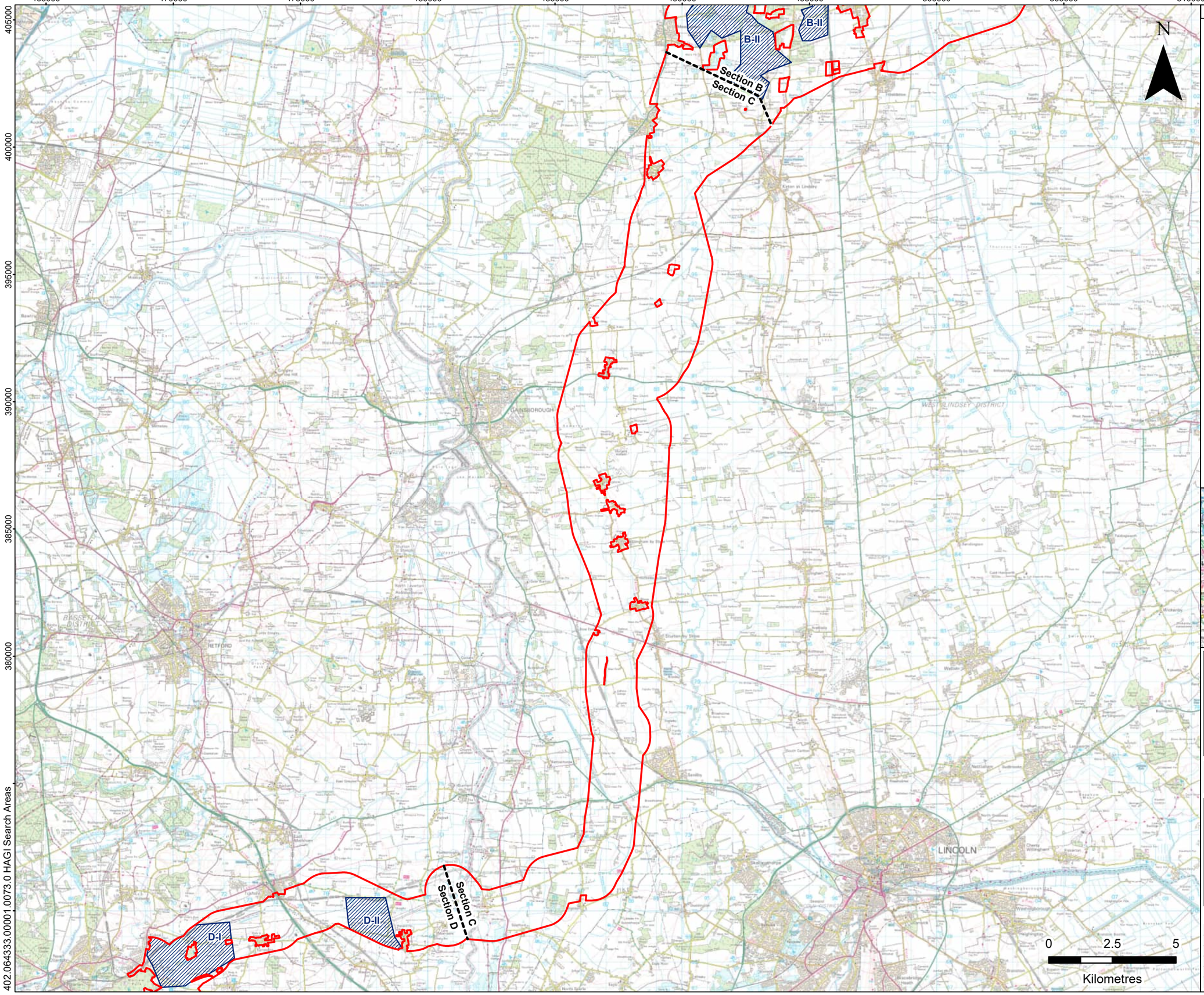
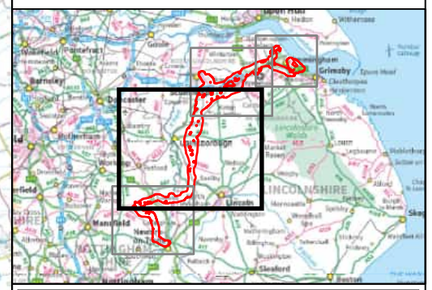


LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- HAGI Search Area



H₂East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

HAGI SEARCH AREAS SECTION C

FIGURE 2.14c

Scale: 1:140,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	CN	JS	MF	29/01/26

402.064333.00001.0073.0 HAGI Search Areas

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465000 470000 475000 480000 485000

370000 365000 360000

D-I D-II D-IV

Section C Section D

N

LEGEND

Scoping Boundary

Scoping Boundary Section Division

HAGI Search Area

0 2.5 5

Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

HAGI SEARCH AREAS SECTION D

FIGURE 2.14d

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	CN	JS	MF	29/01/26

402.064333.00001.0073.0 HAGI Search Areas

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3 Legislation, Policy and Guidance Overview

3.1 Introduction

3.1.1 This Chapter provides a summary of the key legislation and policy context that is relevant to the Project, and which informs the proposed scope for the Environmental Impact Assessment (EIA).

3.1.2 The full explanations of the relevant policy and legislation will be provided in the Environmental Statement (ES) and the Planning Statement, which will be produced to support an application for Development Consent under the Planning Act 2008. Key legislation that is relevant to specific topic areas is set out in the technical topic chapters (**Chapters 5** to **16**).

3.2 Legislation

The Planning Act 2008

3.2.1 The Planning Act 2008 (SI 2008 c.29) (as amended) is the primary legislation that establishes the statutory framework for applications for development consent of Nationally Significant Infrastructure Project (NSIPs) and the issue of a Development Consent Order (DCO).

3.2.2 Section 14 of the Planning Act 2008 (the 2008 Act) defines the types of development that constitute an NSIP that require Development Consent.

3.2.3 As outlined in **Chapter 1:** Introduction, The Project does not currently fall fully within the existing definition of an NSIP, and so the Applicant has submitted a request for a direction from the Secretary of State (SoS) under Section 35 of the Planning Act 2008. It is anticipated that the Project will be defined as a NSIP and, therefore, will apply for Development Consent as required by the Planning Act 2008 (as amended).

3.2.4 The Applicant intends to submit an application for a DCO under Section 37 of the Planning Act 2008 to the SoS.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

3.2.5 The Infrastructure Planning (EIA) Regulations 2017 (as amended) (the EIA Regulations) establish the legal framework for assessing the Likely Significant Effects (LSEs) of NSIPs under the Planning Act 2008. The EIA Regulations require that an EIA is undertaken for projects that fall within Schedule 1 or Schedule 2 development classifications, as well as setting out the procedures for screening and scoping and defining the content of an ES. As noted in **Chapter 1: Introduction,** the Project falls within the provisions of Schedule 1 (16)(a) as the pipeline for transporting hydrogen gas has a diameter of more than 800 millimetres and a length of more than 40 km.

3.2.6 The purpose of the EIA Regulations is to ensure that the LSEs of a proposed NSIP are identified, assessed and considered in decision-making. This assessment will be documented within the ES and submitted with the DCO.

The Planning and Infrastructure Act 2025

3.2.7 The Planning and Infrastructure Act (Ministry of Housing, Communities and Local Government, 2025) received Royal Assent on 18 December 2025 and is intended to accelerate the delivery of new homes and critical infrastructure in the UK. Of relevance to the Project, the key points in the Infrastructure Act are:

- Faster NSIP Consenting: aiming to speed up the approval process for critical infrastructure projects, including energy;
- Economic Growth: supporting the Government's goal of fast-tracking 150 major infrastructure projects by the end of this Parliament;
- Nature Recovery: introducing a strategic approach to nature recovery, balancing development with environmental sustainability; and
- Local Benefits: including provisions for a bill discount scheme for residents living near new electricity transmission infrastructure.

Habitats Regulations Assessment

3.2.8 As noted in **Chapter 1:** Introduction, The Habitats Regulations Assessment (HRA) is a statutory process under the Conservation of Habitats and Species Regulations 2017 (as amended). HRA Legislation ensures that projects do not adversely affect designated European Sites (Special Areas of Conservation, Special Protection Areas and Ramsar Sites), either alone, or in combination with other projects. The HRA process comprises three main stages: Screening, Appropriate Assessment, and a Derogation Stage. Although the HRA assessment process is separate to the EIA process, it is also iterative and focuses on avoiding or reducing LSEs through design and mitigation. Given the proximity of the Project to several European Sites, an HRA screening report will be prepared and submitted as part of the application for Development Consent as necessary.

Water Framework Directive (England and Wales) Regulations 2017

3.2.9 As noted in **Chapter 1: Introduction**, the Water Framework Directive (England and Wales) Regulations 2017 transposes the European Union's Water Framework Directive (WFD) into law for England and Wales; establishing a comprehensive framework for the protection and enhancement of all water bodies, including rivers, lakes, estuarine and coastal waters, and groundwater. The main purpose of the WFD is to protect and improve the quality of water bodies by setting environmental objectives, identifying mitigation measures and preventing deterioration.

3.2.10 A WFD Screening Report will be produced to determine the need for a full WFD assessment. If required, the scope for a WFD assessment will be discussed with the Environment Agency.

3.2.11 As with HRA, the WFD assessment process is separate to the EIA process and may not directly form part of the ES, although WFD assessment findings will be submitted as part of the application for Development Consent and referred to within the ES.

Biodiversity Net Gain – Environment Act 2021

3.2.12 The primary legislation for the statutory framework for Biodiversity Net Gain (BNG) is the Environment Act 2021 (HM Government, 2021a). The legislation sets out a mandatory BNG requirement for development to deliver an increase in biodiversity, using the Department for Environment, Food and Rural Affairs (DEFRA)'s Biodiversity Metric. The metric converts habitat characteristics, such as type, condition, distinctiveness and strategic significance, into standardised biodiversity units. The Applicant is awaiting further information from Government on how BNG will be applied to hydrogen pipelines and NSIPs.

3.3 National Planning Policy

National Policy Statements

3.3.1 National Policy Statements (NPS) set out the government's policy on nationally significant infrastructure development. They are the primary policy used by the SoS to examine and determine applications for NSIPs. The Department for Energy Security and Net Zero (DESNZ) published updated NPS documents in January 2004 and December 2025.

3.3.2 The two NPSs which relate to this Project are EN-1 and EN-4, as detailed in this section.

Overarching National Policy Statement for Energy (EN-1) December 2025

3.3.3 NPS EN-1 sets out the UK Government's overarching policy for major energy infrastructure. NPS EN-1 is underpinned by the principle that there will be a need for significant amounts of new large-scale energy infrastructure to meet the Government's energy objectives. It states at paragraph 2.1.1 that large-scale energy infrastructure "*will be required to ensure the UK can provide a secure, reliable and affordable supply of energy, while also meeting our decarbonisation targets*."

3.3.4 Part 3 of NPS EN-1 establishes the urgent need for nationally significant energy infrastructure whereby the government *"sees a need for significant amounts of new large-scale energy infrastructure to meet its energy objectives"* (Paragraph 3.1.1).

3.3.5 Section 3.4 'The need for new nationally significant gas infrastructure' states that *"in this section, gas, unless otherwise specified, includes natural gas, biomethane and hydrogen*".

3.3.6 Paragraphs 3.4.12 to 3.4.23 relate to the need for low carbon hydrogen infrastructure and paragraph 3.4.12 confirms the *"urgent need for all types of low carbon infrastructure to allow hydrogen to play its role in the transition to net zero".*

3.3.7 Hydrogen transmission infrastructure is explicitly identified in EN-1 (paragraph 3.4.23) as Critical National Priority (CNP) infrastructure. EN-1 (paragraph 3.3.63) further emphasises that the urgent need for CNP infrastructure to deliver security of supply and net-zero goals will generally outweigh residual impacts not capable of being addressed by application of the mitigation

hierarchy, in all but the most exceptional circumstances. Government strongly supports the delivery of CNP infrastructure, and it should be progressed as quickly as possible

3.3.8 Even for CNP projects, EN-1 requires clear evidence that the mitigation hierarchy has been applied and that any remaining effects are genuinely unavoidable (paragraph 4.2.24).

3.3.9 Paragraph 3.3.49 recognises that low carbon hydrogen is essential to achieve the Government's Clean Energy Superpower and Growth Missions and will be a crucial part of our future energy system. Paragraph 2.3.8 recognises that we will need to adapt existing networks or build new ones to integrate low carbon hydrogen into the system and enable the transport and storage of carbon dioxide. The Project comprises one such network.

3.3.10 Paragraph 4.1.3 states that, given the level and urgency of need for infrastructure covered by Part 3 of NPS-EN1, the decision maker should start with a presumption in favour of granting consent to applications for energy NSIPs. The presumption applies unless any more specific and relevant policies set out in relevant NPSs clearly indicate that consent should be refused, subject to the provisions of the 2008 Act.

3.3.11 EN-1 (paragraph 4.2.30) confirms that where development affects nationally important environmental or heritage designations—such as National Parks and, Sites of Special Scientific Interest (SSSIs), or designated heritage assets—the SoS will take as a starting point that CNP projects are capable of meeting the relevant policy tests, provided the benefits demonstrably outweigh any harm.

3.3.12 For internationally designated nature conservation sites (SACs and SPAs), impacts must be assessed under the Habitats Regulations. If adverse effects on site integrity cannot be ruled out, consent may only be granted if there are no feasible alternatives, Imperative Reasons of Overriding Public Interest (IROPI) and secured compensatory measures.

3.3.13 Section 5 considers generic impacts that arise from the development of all the types of infrastructure covered by the energy NPSs. These generic impacts cover a range of environmental topics, from air quality to water quality and resources. Policy guidance provided in EN-1 has been used to inform the scope of the environmental topics which are addressed later in this Scoping Report.

National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), November 2023.

3.3.14 NPS EN-4 sets out principles for the design, construction and routeing of major natural gas and oil pipelines, many of which are relevant to linear infrastructure more broadly, like hydrogen pipelines. While EN-1 provides the primary policy basis for hydrogen transmission projects, EN-4 offers useful guidance on matters such as safety considerations, pipeline alignment selection, interactions with environmental constraints, and construction practices.

3.3.15 NPS EN-4 relates to natural gas infrastructure and does not directly apply to hydrogen infrastructure projects. However, as stated in paragraph 1.6.6 of NPS EN-4, it may still be relevant to the SoS decisions on applications for such developments:

"The guidance that follows in this NPS has been drafted in respect of, and has effect only in relation to, natural gas infrastructure. It does not have effect for hydrogen infrastructure, but may be part of other matters which the Secretary of State thinks are important and relevant to their decision on applications for hydrogen infrastructure, in which case they would need to take it into account."

3.3.16 NPS EN-4 also acknowledges the role of clean hydrogen in decarbonising various sectors and highlights the need for infrastructure that can facilitate the production, storage, and transportation of hydrogen.

3.3.17 Of relevance to the EIA process are sections on site selection, pipeline safety, noise and vibration, biodiversity, landscape and visual, water quality and resources and soils and geology.

National Planning Policy Framework (NPPF), February 2025

3.3.18 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how they should be applied, and provides overarching principles for achieving sustainable development. Whilst it does not contain specific policies for NSIPs, Paragraph 5 states that the framework may be considered as *"important and relevant"* in the decision-making process in accordance with Section 104 of the Planning Act 2008, alongside other NPSs for major infrastructure.

3.3.19 Although NPSs are the primary policy for NSIPs; the NPPF can influence judgements on matters such as design, climate change resilience, biodiversity net gain and community engagement.

3.3.20 The framework focuses on a presumption in favour of sustainable development and to deliver this, the NPPF sets out the Government's economic, environmental and social planning policies for England and how these should be applied.

3.3.21 The NPPF is supported by the Planning Practice Guidance (PPG), which details specific planning and environmental topic guidance on areas within the EIA process, and provides a useful reference for defining scope, methodologies, and significance criteria within environmental assessments. The relevant content from both the NPPF and the PPG will be referenced and considered in the environmental topic chapters (**Chapters 5 to 16**) of the Scoping Report as required.

3.3.22 The Government has released an updated draft of the NPPF for consultation which closes in March 2026. The consultation draft expands the definition of renewable and low carbon energy to specifically include hydrogen. National decision-making policy W3 sets out that substantial weight should be given to the benefits of renewable and low carbon energy development (including hydrogen infrastructure) for improving energy security, supporting economic development and moving to a net zero future. That same policy also states

that Applicants should not be required to demonstrate the need for renewable or low carbon energy development.

3.4 Local Planning Policy

3.4.1 Whilst NSIPs are assessed against national policy, paragraph 4.1.12 of NPS EN-1 advises that the SoS should also consider environmental, social and economic benefits, and adverse impacts at a local level. Local planning policy contained within the Development Plans for the local authority areas can be material considerations and highlight local environmental sensitivities. Emerging policy may also be given weight, depending on their stage of preparation.

3.4.2 Paragraph 4.1.15 of NPS EN-1 confirms that where there is a conflict between national and local policy, the NPS policy will prevail.

3.4.3 The Project will include land within seven local authority areas, as listed below, and the relevant local planning policies are listed in **Table 3.1** to **Table 3.5. Appendix 3A** provides a further summary of the key policies which are specifically relevant to environmental topics discussed in **Chapters 5 to 16**.

- North East Lincolnshire Unitary Authority;
- North Lincolnshire Unitary Authority;
- West Lindsey District Council;
- Newark and Sherwood District Council;
- Bassetlaw District Council;
- Nottinghamshire County Council; and
- Lincolnshire County Council.

Table 3.1: North East Lincolnshire Unitary Authority Development Plans and Policies

Plan	Summary
North East Lincolnshire Local Plan 2013-2032 (adopted 2018)	The Plan sets out the Council's vision and strategy for development, including why, where and how the Borough will grow. The Plan is focused on growth, and aims to ensure North East Lincolnshire becomes a sustainable location in which people can live, work, and enjoy their recreation, both now and in the future. **Relevant Policies:** • Policy 5 – Development Boundaries • Policy 9 – Habitat Mitigation – South Humber Bank • Policy 11 – Skills and Training • Policy 31 – Renewable and Low Carbon Infrastructure • Policy 33 – Flood Risk • Policy 34 – Water Management • Policy 36 – Promoting Sustainable Transport • Policy 39 – Conserving and Enhancing the Historic Environment • Policy 40 – Developing a Green Infrastructure Network • Policy 41 – Biodiversity and Geodiversity • Policy 42 – Landscape • Policy 44 – Safeguarding Minerals and Related Infrastructure
North East Lincolnshire Local Plan Review – Draft Plan with Options – 2023	The current North East Lincolnshire Local Plan was adopted in 2018 and the Council is required to review the Local Plan within five years of its adoption. The Draft Plan with Options was published for formal consultation on 20 December 2023, with further consultation between December 2025 and February 2026 on employment and housing needs along with specific site allocations for employment and residential uses. The draft plan is programmed for adoption in 2028.Relevant Policies • Draft Policy 3 – Biodiversity Net Gain • Draft Strategic Policy 5 – Flood Risk • Draft Policy 6 – Skills and Training • Draft Strategic Policy 11 – Biodiversity and Geodiversity • Draft Strategic Policy 12 – Habitat Mitigation – South Humber Bank
Neighbourhood Plans	There are currently no designated Neighbourhood Forums or Neighbourhood Plans in preparation or adopted in North East Lincolnshire

Table 3.2: North Lincolnshire Unitary Authority Development Plans and Policies

Plan	Summary
North Lincolnshire Local Development Framework: Core Strategy (Adopted June 2011)	The North Lincolnshire Unitary Authority Core Strategy was adopted in June 2011 and sets out the long-term planning vision for the area up to 2026. The Core Strategy is a key part of the Local Development Framework and is used to make decisions on planning applications. The council is currently in the process of preparing a new single Local Plan (2020-2038/ extended to 2043) which, once adopted, will replace the 2011 Core Strategy and other existing planning documents. **Relevant Policies:** • Policy CS13 – Lifelong Learning and Skills

Plan	Summary
	• Policy CS16 – North Lincolnshire's Landscape, Greenspace and Waterscape • Policy CS18 – Sustainable Resource Use and Climate Change • Policy CS6 – Historic Environment • Policy CS17 – Biodiversity • Policy CS21 – Minerals
North Lincolnshire Local Plan Saved Policies – 2003	The 2003 Local Plan has been replaced by the Local Development Framework. However, several of the 2003 policies have been retained and are used in the decision-making process. The retained Local Plan policies should be referred to alongside the Local Development Framework Development Plan. **Relevant Retained Policies:** • Policy LC1 – Special Protection Areas, Special Areas of Conservation and Ramsar Sites • Policy LC7 – Landscape Protection • Policy M4 – Ancient Monuments and Archaeological Sites • Policy M5 – Best and Most Versatile Agricultural Land • Policy DS7 – Contaminated Land • Policy DS9 – Development of Land in the Vicinity of Established Hazardous Installations and Pipelines • Policy DS10 – New Hazardous Installations and Pipelines • Policy DS11 – Polluting Activities • Policy DS13 – Groundwater Protection and Land Drainage • Policy DS14 – Foul Sewage and Surface Water Drainage • Policy DS15 – Water Resources • Policy DS16 – Flood Risk • Policy LC2 – Sites of Special Scientific Interest and National Nature Reserves • Policy LC4 – Development Affecting Sites of Local Nature Conservation Importance • Policy LC5 – Species Protection • Policy LC6 – Habitat Creation • Policy LC12 – Protection of Trees, Woodland and Hedgerows • Policy LC13 – Parks, Gardens and Landscapes of Special Historic Interest • Policy HE2 – Development in Conservation Areas • Policy HE5 – Development affecting Listed Buildings • Policy HE8 – Ancient Monuments • Policy HE9 – Archaeological Evaluation • Policy DS21 – Renewable Energy
Neighbourhood Plans	There are no adopted Neighborhood Plans within the North Lincolnshire part of the EIA Scoping Boundary.

Table 3.3: West Lindsey District Council Development Plans and Policies

Plan	Summary
Central Lincolnshire Local Plan 2023 (Adopted April 2023)	The Central Lincolnshire Local Plan (CLLP) 2018-2040 was adopted by the Central Lincolnshire Joint Strategic Planning Committee (CLJSPC) on 13 April 2023 and replaces the 2017 version of the CLLP as the development plan for the City of Lincoln, West Lindsey, and North Kesteven District Councils. The aim of the Local Plan is to create places that are sustainable and attractive to live in. The Local Plan aligns with other plans and policies, such as economic, housing, and environmental strategies. **Relevant Policies:** • Policy S11 – Embodied Carbon • Policy S12 – Water Efficiency and Sustainable Water Management • Policy S14 – Climate Change • Policy S15 – Protecting Renewable Energy Infrastructure Development • Policy S16 – Wider Energy Infrastructure • Policy S21 – Flood Risk and Water Resources Flood Risk • Policy S47 – Accessibility and Transport • Policy S53 – Design and Amenity • Policy S54 – Health and Wellbeing • Policy S57 – The Historic Environment • Policy S59 – Green and Blue Infrastructure Network • Policy S60 – Protecting Biodiversity and Geodiversity • Policy S61 – Biodiversity Opportunity and Delivering Measurable Net Gains • Policy S66 – Trees, Woodland and Hedgerows • Policy S67 – Best and Most Versatile Agricultural Land
Neighbourhood Plans	The EIA Scoping Boundary includes land subject to the following adopted Neighbourhood Plans: • Corringham Neighbourhood Plan 2021 - 2036 • Hemswell and Harpswell Neighbourhood Plan 2022-2036 • Glentworth Neighbourhood Plan 2018-2036 • Scotton Neighbourhood Plan 2019-2036 • Scotter Neighbourhood Plan 2017 - 2036 • Willoughton Neighbourhood Plan 2017-2037

Table 3.4: Newark and Sherwood District Council Development Plans and Policies

Plan	Summary
Newark and Sherwood Amended Core Strategy (Adopted March 2019)	Newark and Sherwood's Amended Core Strategy Development Plan Document (DPD) sets out the key issues that the Council and its public and private sector partners need to address over the next twenty years in the district. The document is a key part of the Local Development Framework (LDF) and sets a vision, objectives and policies to help deliver development and change. The Amended Core Strategy should be read alongside the Allocations and Development Management DPD which sets out site allocations, designations and more detailed policies for determining planning applications and neighbourhood planning where they exist. **Relevant Policies:** • Core Policy 9 – Sustainable Design

Plan	Summary
	• Core Policy 10 – Climate Change • Core Policy 13 – Landscape Character • Policy DM9 – Protecting and Enhancing the Historic Environment • Policy DM10 – Pollution and Hazardous Materials
Newark and Sherwood Local Development Framework Allocations and Development Management Development Plan Document (Adopted July 2013)	The main purpose of the Allocations and Development Management Development Plan Document (A&DM DPD) is to allocate sufficient land for housing, employment, and retail, to meet the needs of Newark and Sherwood to 2026 and beyond. The document also sets out amendments to urban boundaries and village envelopes, retail boundaries, and sites requiring continued protection from development (open space and green infrastructure designations). It also includes a suite of Development Management policies to provide greater direction, help deliver specific allocations, and assist in the day-to-day assessment of planning applications. **Relevant Policies:** • Policy DM4 – Renewable and Low Carbon Energy Generation • Policy DM5 – Design • Policy DM8 – Development in the Open Countryside • Core Policy 14 – Historic Environment
Neighbourhood Plans	There are no adopted Neighbourhood Plans within the Newark and Sherwood District Council part of the EIA Scoping Boundary.

Table 3.5: Bassetlaw District Council Core Strategy Development Plans and Policies

Plan	Summary
Bassetlaw Local Plan 2020 – 2038 (Adopted May 2024)	The Bassetlaw Local Plan forms part of the Council's statutory development plan and will help shape the future of the District by guiding where and how development will come forward. Importantly, it allocates land for new homes and jobs, ensuring that development is built in suitable places to meet the needs of communities for education, health and transport. The Plan's policies will manage and direct new growth up until 2038, encouraging and enabling sustainable, well designed and high-quality new developments. It also strengthens the approach to the District's important open spaces, wildlife sites and heritage, helps manage flood risk and the impacts of climate change, and introduces innovative and locally distinctive policies which set a high bar for the creation of healthy, green and accessible places. **Relevant Policies:** • Policy ST1 – Bassetlaw's Spatial Strategy • Policy ST35 – Landscape Character • Policy ST37 – Green and Blue Infrastructure • Policy ST38 – Biodiversity and Geodiversity • Policy ST39 – Trees, Woodlands and Hedgerows • Policy ST40 – The Historic Environment • Policy 41 – Designated and Non-Designated Heritage Assets • Policy ST42 – Promoting Healthy, Active Lifestyles • Policy 46 – Protecting Amenity • Policy 47 – Contaminated and Unstable Land • Policy ST48 – Reducing Carbon Emissions, Climate Change Mitigation and Adaptation • Policy ST50 – Flood Risk and Drainage

Plan	Summary
	• Policy ST51 – Protecting Water Quality and Management • Policy ST52 – Transport Infrastructure
Neighbourhood Plans	The EIA Scoping Boundary includes land subject to the following adopted Neighbourhood Plans: East Markham Neighbourhood Plan 2016 – 2031 Tuxford Neighbourhood Plan – October 2016

3.5 Planning Guidance and Advice

3.5.1 The Planning Inspectorate (PINS) has published a series of advice pages that are intended to inform applicants, consultees, the public and others about a range of process matters in relation to the Planning Act 2008. The advice that is relevant to undertaking an EIA and preparing an application for Development Consent include:

- Nationally Significant Infrastructure Projects: Advice on the Preparation and Submission of Application Documents;
- Advice Note Ten: Habitats Regulations Assessment relevant to Nationally Significant Infrastructure Projects;
- Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements (Version 7);
- Advice Note Nine: Rochdale Envelope (Version 3);
- Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment;
- Nationally Significant Infrastructure Projects: Advice on Transboundary Impacts and Process;
- Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments;
- Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive;
- Nationally Significant Infrastructure Projects: Advice on EIA Notification and Consultation;
- Nationally Significant Infrastructure Projects: Commitments Register;
- Nationally Significant Infrastructure Projects: Advice on working with public bodies in the infrastructure planning process;
- Nationally Significant Infrastructure Projects: Advice on Preparing Applications for Linear Projects; and
- Planning Act 2008: Pre-application stage for Nationally Significant Infrastructure Projects.

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4 The EIA Process

4.1 Introduction

4.1.1 This Chapter outlines the overall approach to the Environmental Impact Assessment (EIA) for the Project. It outlines the overall assessment approach for determining and mitigating Likely Significant Effects (LSEs) and the tools that have been used to deliver proportionality in the EIA. Topic-specific assessment methodologies are outlined within topic **Chapters 5 to 16** of this Scoping Report.

4.2 Approach to EIA Scoping

Overarching Approach

4.2.1 The purpose of EIA is to provide a systematic analysis of the impacts of a proposed development in relation to the existing (baseline) environment. EIA is a process for identifying both beneficial and adverse LSE which may arise from the construction, operation and maintenance and decommissioning of a project.

4.2.2 The EIA process is reported within an Environmental Statement (ES) that is provided to inform the decision-making process for Development Consent to be granted, as to the environmental impact of the Project. The ES is prepared in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter 'the EIA Regulations'), and provides an overview of the LSE, including cumulative effects associated with the Project.

4.2.3 Schedule 4(4) of the EIA Regulations specifies that the ES should describe the:

> *"[…] factors […] likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape."*

4.2.4 Regulation 5(2) of the EIA Regulations requires the interaction between these factors to be considered. In addition, Regulation 5(4) requires an ES to consider:

> *"[…] the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development."*

4.2.5 The EIA process aims to be systematic, analytical, impartial, consultative and iterative allowing opportunities for environmental concerns to be addressed in the design and evolution of the Project. Typically, throughout the evolution of the design, a number of design iterations take place in response to

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environmental constraints identified during the EIA process, stakeholder engagement and consultation prior to the final design being submitted for approval.

4.2.6 The scoping process identifies the different methodologies used for the assessment, specific to each technical discipline and their consequent environmental aspects, as set out in topic **Chapters 5 to 16**.

4.3 Determining the Scope of the Assessment

4.3.1 The EIA scoping process involves identifying the people and environmental resources (known as 'receptors') which are likely to be significantly affected by the Project; and sets out the steps required to assess these potential significant effects. Scoping establishes the context for the EIA, setting out a proportional and robust approach to assessment, through initial evaluation and reporting of identified LSE in this Scoping Report. Scoping also allows early interaction with stakeholders and an opportunity to share information relating to a proposed development.

4.3.2 In line with the Planning Inspectorate (PINS) guidance and the Institute of Environmental Management and Assessment (IEMA) (now the Institute of Sustainability and Environmental Professionals (ISEP)) *Delivering Proportionate EIA* (2017), environmental aspects may be scoped out where appropriate, with clear justification provided. This ensures the assessment remains streamlined and proportionate, focusing on matters likely to result in LSEs, avoiding unnecessary assessment effort. Developing a more proportionate EIA will also enhance understanding of the key environmental impacts of the Project and ensure that key findings are accessible to decision-makers and the public, reducing potential confusion and undue delay.

4.3.3 The approach aligns with PINS *'Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements'* which provides practical guidance from EIA Scoping for refining assessments and determining the information required for the ES.

Assessment Parameters

4.3.4 PINS *'Advice Note Nine: Using the 'Rochdale Envelope''* provides guidance on the level of flexibility that can be included within a development consent application under the Planning Act 2008. It recognises that there may be certain parameters of the Project design that are not yet fixed, therefore, the EIA should evaluate the realistic worst-case parameters to ensure all LSE are properly assessed.

4.3.5 The Project design will continue to evolve, with refinements expected through to the detailed design stage. This requires maintaining a degree of flexibility within the application for development consent.

4.3.6 In accordance with PINS Advice Note Nine, a parameter-based approach will be applied where appropriate. This approach defines the envelopes within which the Project's construction, operation and decommissioning will occur.

4.3.7 The ES will set out clear parameters used for the EIA. These can include defined limits of deviation where flexibility is necessary. The parameters will be shown in the Application drawings (such as the Works Plans), and the draft application for Development Consent, representing the maximum extent within which the Project may be built or operated. Where such parameters are included in the draft application for Development Consent, the EIA will assess the realistic maximum values to ensure a robust 'worst-case' assessment. This is in accordance with PINS *'Advice on Preparing Applications for Linear Projects'* (2025).

Technical Scope

4.3.8 The technical scope of assessment for each environmental aspect is detailed in topic **Chapters 5 to 16** and addresses the scoped in and out impacts as part of the EIA. The technical scope characterises the baseline conditions (i.e. the current state of the environment in absence of the Project) and considers the potential effects on the environmental aspect from the construction, operation and maintenance, plus decommissioning of the Project.

Spatial Scope (Study Area)

4.3.9 The spatial scope of assessment for each environmental aspect refers to the geographical area over which predicted changes to the environment may occur, as a result of the construction, operation and maintenance and decommissioning of the Project. The spatial extent over which receptors may be affected will depend on both the nature of the potential effects and the location of the receptors which may be affected. It takes account of:

- The physical area of the Project;
- The nature of the baseline environment; and
- The manner and extent to which environmental effects may occur.

4.3.10 Each of the environmental topic chapters (**Chapters 5 to 16**) describes the Study Area to be considered, providing a clear explanation as to why the Study Area has been adopted.

4.3.11 The spatial scope of each assessment may be refined at later stages (such as in the ES) in response to consultation feedback or further assessments.

Temporal Scope

4.3.12 The temporal scope of assessment refers to the time period over which changes to the environment and the consequent effects due to the Project are predicted to occur. These consequences are typically defined as either being permanent or temporary:

- Permanent - these are effects that will remain even when the Project is constructed and operational, although these effects may be caused by environmental changes that are permanent or temporary.

- Temporary – these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes

4.3.13 Effects are defined as short term (lasts for up to 12 months); medium term (lasts for 1 - 5 years); long term (more than 5 years); **reversible long-term effects** (long-term effects, which last for the lifetime of the Project, but which cease once it has been decommissioned; and permanent effects (which cannot be reversed following decommissioning).

4.3.14 The assessment will have regard to the project programme and will evaluate the environmental effects of the Project during construction, operation and maintenance plus decommissioning. These effects will be compared to the situation prevailing before the Project is commenced (the current baseline), and to the situation that would prevail in the future without the Project (the projected future baseline).

4.3.15 Each topic chapter of the ES will define the baseline (current or future or both) against the relevant environmental effects of the Project. The baseline conditions to be assessed for each environmental aspect are outlined in topic **Chapters 5 to 16** of this Scoping Report. Where relevant, topic chapters provide further information on the time restriction elements within the Project programme that will be considered for their assessment.

Establishing Baseline Conditions

4.3.16 The baseline environment describes the existing environmental conditions within the Study Area at the time of assessment. LSE will be described in the ES in relation to the extent of changes to the baseline environment due to the construction, operation and maintenance and decommissioning of the Project.

4.3.17 Baseline conditions will be established using site surveys, desk studies, third-party data, and modelling. The ES will clearly state the age and validity of all data, following industry guidance. Older data may supplement new surveys, and sensitive information (such as protected species) will be provided in confidential appendices. Any limitations, such as restricted land access, will be reported.

4.3.18 The ES will also describe the future baseline, how conditions are expected to evolve without the Project, based on available evidence and knowledge. Where applicable, the future baseline will include other projects which are expected to be completed before the commencement of construction of the Project (see **Section 4.6** for further detail on identifying other projects for consideration in the assessment).

4.4 Assessment of Likely Significant Effects

Overview

4.4.1 The ES will set out the LSE for the construction, operation and maintenance and decommissioning phases of the Project. For consistency and to allow comparison between topics, the methodology described in this section will be

applied when preparing the ES. This methodology is designed to consider whether impacts arising from Project would have an effect on any environmental receptor. Assessments consider the magnitude of impacts and the sensitivity of receptors which could be affected, to classify the significance of effects.

4.4.2 Confusion can arise whilst reading an ES due to a lack of clarification around the words 'impact' and 'effect'. Throughout the EIA process for the Project, the term 'impact' will be used to define a change that is caused by a source. For example, trenchless crossing activities during construction (the source) results in increased levels of noise (the impact). Impacts can be direct, indirect, secondary, cumulative, inter-related or transboundary. They can also be beneficial, adverse or negligible. The term 'effect' is used throughout this assessment (and in the ES) to express the outcome of an impact, i.e. the increased levels of noise (impact) from trenchless crossing activities (source) has the potential to disturb nearby residential receptors (the effect).

4.4.3 Effects will be presented within the ES as 'significance of effect', which will take into account the magnitude of an impact in combination with the importance and/ or the sensitivity of the receptor or resource, in line with defined significance criteria.

4.4.4 The determination of whether an effect is significant is based upon professional judgement, with reference to the Project Description set out in **Chapter 2: The Project** and in accordance with each topic's industry guidance, where relevant. This will include consideration of:

- Magnitude and characteristics of change (impacts) from baseline conditions;
- Sensitivity and value of receptors;
- Duration and permanence of effects (short-, medium-, or long-term);
- Geographical extent and likelihood of occurrence;
- Compliance with relevant legislation, policy, and standards; and
- Inter-relationships and cumulative effects, informed by stakeholder engagement.

4.4.5 For each environmental aspect, the categories of resource or receptor sensitivity and magnitude of impact will be described or defined. The following sections, therefore, provide the generic criteria for the definition of resource or receptor sensitivity, magnitude of change and classification of effect.

4.4.6 The environmental topic chapters (**Chapters 5 to 16**) provide greater detail on the approach to the assessment and specific guidelines for the definition of impact magnitude and resource or receptor sensitivity and value. The approach to the assessment undertaken by each environmental aspect will broadly follow the approach set out in the following sections. Variations from this approach may be applicable to specific environmental aspects whereby professional judgment in the application of standards mandated by professional bodies (for example, the Institute of Ecology and Environmental

Management (IEEM) or the Landscape Institute) is applied. Where this is the case, further detail and justification will be provided.

Receptor Sensitivity

4.4.7 The sensitivity or value of a receptor generally reflects the importance of the asset, as determined by relevant legislation and policy, and refined through professional judgement. For example, receptors of high value, such as those related to landscape, biodiversity or the historic environment, are often designated at a national or international level, whereas lower value resources may only hold local significance. Receptor sensitivity can also be a function of its capacity to accommodate change and reflects its ability to recover if it is affected.

4.4.8 The way a receptor is used also influences its classification. For example, in visual amenity assessments, residential receptors are typically considered more sensitive than workplaces, as the environmental quality of the residential receptor is more likely to be an important part of that receptor's use.

4.4.9 Each topic chapter will present a 'Sensitivity/ Importance of the Receptor' table within the topic chapter. This table will present how sensitivity is defined for the topic's receptors. **Table 4.1** provides the generic criteria used to assess receptor or resource sensitivity.

Table 4.1: Generic Guidelines for the Assessment of Sensitivity

Value or Sensitivity of the Receptor	Guidelines
High	Feature or receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site or receptor (for example, designated features of international or national importance).
Medium	Feature or receptor has a very low capacity to accommodate the proposed form of change.
Low	Feature or receptor possesses key characteristics which contribute significantly to the distinctiveness and character of the site or feature (for example, designated features of regional or county importance).
Very Low	Feature or receptor has a low capacity to accommodate the proposed form of change.

Magnitude of Change (Impact)

4.4.10 The magnitude of change (impact) affecting each receptor as a result of the Project will be assessed on a scale ranging from 'minor' alternations or changes up to 'major' changes or the total or substantial loss of that receptor. For certain aspects, this will be determined using numerical thresholds set by the relevant technical guidance (such as air quality and noise standards). For others, determination of the magnitude of change will be a matter of professional judgment.

4.4.11 **Table 4.2** provides the generic guidelines used to assess magnitude of change.

Table 4.2: Generic Guidelines for the Assessment of Magnitude

Magnitude	Guidelines
High	Large scale changes over the whole development area and potentially beyond to key characteristics or features of the particular environmental impact's character or distinctiveness.
Medium	Medium scale changes over the majority of the development area and potentially beyond to key characteristics or features of the particular environmental impact's character or distinctiveness.
Low	Noticeable but small-scale changes over part of the development area and potentially beyond to key characteristics or features of the particular environmental impact's character or distinctiveness.
Very Low	Noticeable but very small-scale changes or barely discernible changes over a small part of the development area and potentially beyond, to key characteristics or features of the particular environmental impact's character or distinctiveness.

4.4.12 Each topic chapter will present a 'Magnitude of Change' table within the topic chapter. These tables will present how the magnitude of the identified impacts are defined based on the criteria in **Table 4.2**.

Determination of Significance

4.4.13 The significance of an effect, either adverse or beneficial, will be determined using a combination of the magnitude of the change that are likely to occur and the sensitivity of the receptor.

4.4.14 For most impacts, significance will be assessed using a matrix that combines receptor sensitivity and magnitude of change, along with applying professional judgement. Where topic-specific guidance requires particular criteria or scales for determining significance, these are set out within the relevant topic **Chapters 5** to **16** along with descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant. Effects can either be 'adverse' or 'beneficial.' The generic definitions that will be used to determine the level of significance are shown in **Table 4.3**.

Table 4.3: Generic classification of effect definitions

Magnitude	Guidelines
Major	Very large or large change in environmental or socio-economic conditions. Effects, both negative and positive, which are likely to be important considerations at a national to regional level because they contribute to achieving national or regional objectives, or which are likely to result in exceedance of statutory objectives or breaches of legislation.
Moderate	Intermediate change in environmental or socio-economic conditions. Effects that are likely to be important considerations at a regional or local level.
Minor	Small change in environmental or socio-economic conditions.

Negligible	No discernible change in environmental or socio-economic conditions. An effect that is likely to have a neutral or negligible influence.

4.4.15 The overarching significance matrix for the EIA is shown in **Table 4.4**. In summary:

- 'Major' effects are always considered significant;
- 'Moderate' effects can be significant, or not significant, depending on specific scenarios and professional judgement; and
- 'Minor' or 'Negligible' effects are not considered significant.

4.4.16 For aspects assessed as likely significant, the ES will explain the methodology and reference relevant standards and guidance.

Table 4.4: Significance Evaluation Matrix

		Magnitude of Change			
		High	**Medium**	**Low**	**Very Low**
Sensitivity of the Receptor	**High**	Major (significant)	Major (significant)	Moderate (potentially significant)	Minor (not significant)
	Medium	Major (significant)	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)
	Low	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)	Negligible (not significant)
	Very Low	Minor (not significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)

4.5 Environmental Measures and Monitoring

4.5.1 The ES will include a description of the "measures envisaged in order to avoid, prevent, or reduce and, if possible, offset likely significant adverse effects of the project on the environment", in accordance with Regulation 14(2)(c) of the EIA Regulations.

4.5.2 As part of the EIA process, each environmental topic will identify potential impacts and take into consideration environmental measures that the Project will adopt. This is an iterative process where potential impacts will be fed back into the design process to see if they can be mitigated, along with identifying any good practice steps that can be taken. These measures follow the mitigation hierarchy set out in IEMA's (now ISEP) *'Implementing the Mitigation Hierarchy from Concept to Construction'* (2024) which comprises Avoid, Prevent, Reduce and Offset. Where relevant, monitoring will also be proposed to check the implementation and effectiveness of proposed measures.

4.5.3 In addition, the Project will incorporate good practice and design commitments. These are then classified under the following three types of mitigation that will be identified and proposed in the ES:

- **Primary (inherent):** Referred to as 'embedded measures' are modifications to the location, design or operation of the Project made during the pre-application phase that are inherent to the Project design and do not require additional action to be taken (for example, avoiding national level ecology designations through routing and siting of the Project).
- **Secondary (foreseeable):** Referred to as 'additional measures'. Actions that will require further activity to achieve the anticipated outcome. Typically, these will be described within the topic chapters of the ES, but often they are secured through application for Development Consent requirements and/or management plans (for example, landscape planting around Hydrogen Above Ground Installation (HAGI) locations to reduce visual impact subject to the submission of a detailed planting scheme post-consent). Typically, a lot of the secondary mitigation are construction-related impacts and are often grouped together under an outline Construction Environmental Management Plan (oCEMP), and/or associated management plans.
- **Tertiary (good practice):** Actions that would occur with or without input from the EIA feeding into the design process. These are typically measures that will be undertaken to meet existing legislative requirements, and/or measures that are considered to be standard practices commonly used to manage environmental effects. These are referred to as 'good practice measures' and are also embedded within the design of the Project (so treated as an inherent part of the Project). Where appropriate, these measures will also be set out in the oCEMP and/or management plans that will accompany the ES (for example undertaking vegetation clearance works outside of breeding bird season), so these documents provide a record of the measures and monitoring to be employed by the Project.

4.5.4 Primary mitigation measures will be described in the Project Description Chapter of the ES, while secondary and tertiary measures will appear in the relevant topic chapters. The assessment of LSE will account for primary and tertiary mitigation. After assessing impacts, any additional measures (secondary mitigation) to further reduce adverse effects or enhance benefits will be detailed in the topic chapters, and residual effects will reflect these measures. The ES will also set out how these measures will be secured.

4.5.5 A Register of Environmental Actions and Commitments (REAC) will record all mitigation measures to enable tracking and monitoring beyond submission of the application for development consent. This includes mitigation relied upon to scope out issues from later EIA stages. In line with PINS guidance on Commitments Registers, a first iteration is provided alongside this scoping request setting out where the Applicant intends to rely on commitments as the basis for scoping matters out or refining the scope of assessment. This first

iteration is provided in **Appendix 4A: Draft Register of Environmental Actions and Commitments (REAC)**, that follows the template provided by PINS.

4.5.6 The draft REAC will be developed during pre-application with a final version submitted with the application as a separate appendix to the ES. The REAC will be a 'live' document that is updated throughout the NSIP planning process. Regular update and review will ensure that all commitments are up to date at the time the application is considered by the Secretary of State (SoS).

Construction Environmental Management Plan

4.5.7 The application for development consent will include an oCEMP (Comm G-01 in **Appendix 4A**, other commitment references are provided in the bullets below), that will outline the construction related environmental measures to be applied during construction of the Project, including details of any mitigation and how it will be managed and monitored through the construction phase. Approval of a final version of the CEMP prior to the commencement of construction will be controlled via a Requirement in the application for Development Consent.

4.5.8 The purpose of the CEMP will be to set out the construction related measures which will be taken to manage the potential environmental impacts during construction of the Project. The CEMP will contain measures to limit the disturbance from construction activities such as site preparation, material delivery and removal, works activities and site reinstatement as far as is reasonably practicable.

4.5.9 The oCEMP will also include a number of topic specific environmental management plans which are likely to be provided as appendices to the oCEMP that are currently anticipated to include the following, however, this will be reviewed and updated as necessary through the EIA process:

- Outline Noise and Vibration Management Plan (oNVMP) (Comm Nv-52) - Will set out the approach to minimising noise impacts and detail the methods that will be used.
- Outline Dust Management Plan (oDMP) (Comm Aq-53) - Will set out the approach to minimising dust emissions.
- Outline Surface Water Management Plan (oSWMP) (Comm Wa-54) - Will set out the approach to managing surface water to protect water quality and consider flooding during construction.
- Outline Soil Management Plan (oSMP) (Comm Sa-55) - Will set out the approach to retain soil condition and quality and allow effective re-instatement.
- Outline Materials Management Plans (oMMP) (Comm G-56) - Will set out the approach for how materials, including construction waste, will be handled, reused, or disposed of during a project to comply with regulations and promote sustainability.

- Outline Artificial Light Emissions Plan (oALEP) (Comm G-60) - Will set out the approach to minimising artificial light impacts and the methods that will be used.

4.5.10 The EIA will consider the CEMP and associated construction management plans as the mechanism for securing construction related measures through the DCO.

Construction Traffic Management Plan and Public Access Management Plan

4.5.11 All construction work will be undertaken in accordance with a Construction Traffic Management Plan (CTMP) (Comm Tr-58), that is likely to be separate from the CEMP. An outline CTMP will be provided with the application for Development Consent that sets out the principles to be followed when the final CTMP is finalised.

4.5.12 Construction will also be undertaken in accordance with a Public Access Management Plan (PAMP) (Comm Tr-59) that will set out the approach that will be taken to manage the potential impacts upon Public Rights of Way (PRoW) and Active Travel Routes (ATRs). An outline PAMP will be provided with the application for Development Consent that sets out the principles to be followed when the final PAMP is finalised.

Landscape and Ecology Management plan(s)

4.5.13 In addition to the oCEMP and associated construction management plans, the application for Development Consent will include proposals for managing measures to avoid, reduce, mitigate or compensate for potential impacts on landscape and biodiversity resources and measures intended to provide biodiversity benefit. This information will be presented within either a combined Landscape and Ecology Management Plan (LEMP) (Comm Lv-62), or separate plans for landscape and visual and biodiversity aspects. These will cover both construction and operational aspects of the Project.

Materials and Waste

4.5.14 The ES will provide a description of the broad types and quantities of materials required by the Project, along with a description of the waste types and quantities that are anticipated to be produced during construction. These figures will inform traffic generation estimates which will be further assessed within the Traffic and Transport ES Chapter. The ES will provide a list of waste management facilities within the surrounding area, setting out the types of waste that can be accepted and available capacity.

4.5.15 Materials and waste will be managed in accordance with best practice measures throughout lifetime of the Project.

4.5.16 Construction strategies will be implemented that will seek to maximise the reuse of excavated clean materials from the pipeline construction corridor where practicable and feasible. The outline Materials Management Plan (oMMP) (Comm G-56 will outline how excavated non-waste materials will be reused in line with the CL:AIRE (2011) Definition of Waste Code of Practice

(DoWCoP). The MMP will also include measures to minimise waste generation and ensure compliance with waste duty of care, licensing, and carrier registration requirements.

4.5.17 Operation and maintenance activities will be limited to occasional inspections and maintenance at HAGI locations, with appropriate environmental management measures implemented in line with the principles established for construction. Any waste generated during maintenance will be managed under the relevant waste management procedures, which will be confirmed prior to operation.

4.5.18 At the end of the Project's operational life, waste generated during decommissioning will be limited to the removal of HAGI infrastructure. The below ground pipeline infrastructure will remain in situ.

Decommissioning Plan

4.5.19 Impacts during decommissioning will be minimised through the implementation of a Decommissioning Plan (Comm G-51), that will be developed prior to decommissioning in accordance with the latest available guidance and legislation. The Plan will consider the potential for infrastructure to remain in-situ where appropriate. Decommissioning activities will include measures to mitigate flood risk, prevent pollution, and minimise ground disturbance.

4.6 Cumulative Effects Assessment

4.6.1 A Cumulative Effects Assessment (CEA) will be carried out for the Project, which will examine the result from the combined impacts of the Project with other developments on the same single receptor or resource as required under Paragraph 5(e) of Schedule 4 of the EIA Regulations and the interaction of environmental aspect effects occurring as a result of the Project in accordance with Regulation 5(2). Two types of effects will be considered:

- Inter-project effects: residual effects which arise as a result of the Project in combination with other large-scale developments or projects.
- Intra-project effects: residual effects which occur as a result of two or more environmental aspect effects which, when combined, result in a new or changed effects on a single receptor.

4.6.2 Where other developments are expected to be completed before Project construction and their effects are fully defined, these will be considered within the construction and operational assessments as part of the potential future baseline. The ES will clearly distinguish developments included in this future baseline from those considered in the CEA.

Inter-Project Effects

4.6.3 The EIA will follow the methodology for CEA as defined in the Planning Inspectorate's Advice on CEA. This four-stage approach is as follows:

1 Establish the Zone of Influence (ZoI) for the Project and identify a 'longlist' of 'other development';

2 Identify a 'shortlist' of 'other development' for the CEA;

3 Information gathering; and

4 Assessment.

4.6.4 The ZoI of the Project, within which any potential effects of the Project may combine with the effects arising from other developments, will be defined by the relevant technical discipline team and combined into a single area within which other development will be identified.

4.6.5 A Stage 1 'long list' of other developments will be developed and grouped into three tiers based on certainty, with Tier 1 being the most certain. This list will be refined in consultation with local planning authorities and key consultees. To keep the CEA proportionate, a shortlist will then be prepared, focusing on developments likely to generate impacts that could combine with the Project. Selection criteria will vary by discipline and consider scale, nature, and timing. The shortlist will also be agreed with relevant authorities and consultees. Before submitting the application for development consent, the cumulative development list and associated data will be fixed to allow completion of impact assessments for the ES.

4.6.6 At this stage of the Project, the Applicant is aware of the following large developments that have potential to form part of the Stage 1 'long list' and will be kept under review as the Project progresses:

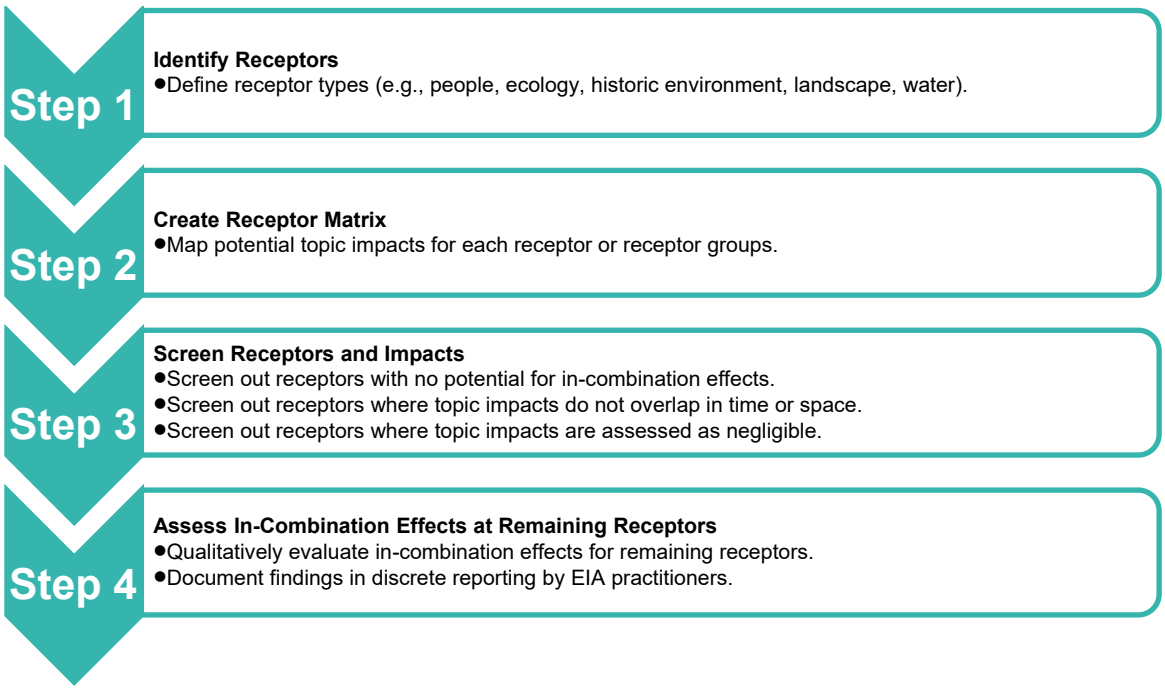
- National Gas, Project Union - Proposals for a national hydrogen network comprising re-purposed existing gas pipelines and new pipelines to connect industrial users and existing gas terminals. Project Union is being developed by National Gas, with the first phase is the network within the east coast of England region.
- Viking Carbon Capture and Storage (CCS) pipeline - comprises a new 55 km (approx.) onshore underground pipeline from Immingham to Theddlethorpe Gas Terminal. The proposed pipeline was granted a DCO in April 2025.
- Humber Carbon Capture Pipeline - a proposed onshore pipeline that would transport carbon dioxide produced by industrial projects in the Humber region to secure offshore storage under the North Sea.
- The STEP Fusion project - a proposed prototype fusion power plant located at the former West Burton Power Station site.
- A number of NSIP solar schemes:
  - Steeple Renewables Project (currently in Examination)
  - Great North Road Solar and Biodiversity Park (currently in Examination)
  - One Earth Solar (currently in Examination)

- West Burton Solar (A DCO was Granted in 2025 with a grid connection date of November 2028)
- Tillbridge Solar Project (A DCO was Granted in 2025 with a grid connection date of August 2028)
- Gate Burton Energy Park (A DCO was Granted in 2024 with a grid connection date of October 2029)
- Cottam Solar Project (A DCO was Granted in 2024 with a grid connection date of September 2029)

Intra-Project Effects

4.6.7 The assessment of intra-project effects involves identifying whether any of the individual non-significant environmental aspects could combine to create effects which are significant.

4.6.8 There is no statutory or standardised approach to the assessment of intra-project effects and instead should be conducted with reference to guidance and to professional judgement. The following approach is proposed for the Project:



4.6.9 The consideration of combines effects arising from the respective projects that form the East Coast Hydrogen' (ECH2) collaboration between Cadent Gas, National Gas and Northern Gas Networks (NGN) will be Inter-Projects assessment.

4.7 Transboundary Effects

4.7.1 Schedule 4, Paragraph 5 of The Town and Country Planning (EIA) Regulations 2017 requires an ES to consider the transboundary effects of a

development: *"The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development."*

4.7.2 Given the nature of the Project and its proposed location, significant transboundary effects are currently considered unlikely to occur. However, the transboundary screening matrix will be completed as detailed in PINS' Advice on Transboundary Impacts and Process, which sets out the procedures for considering significant transboundary effects for a project of this scale, and included within the ES.

4.8 Consultation and Engagement

4.8.1 This section sets out the proposed approach to consultation and engagement for the EIA. As part of the EIA, technical engagement will be undertaken with a range of statutory and non-statutory consultees.

4.8.2 The Planning and Infrastructure Act (Ministry of Housing, Communities and Local Government, 2025) received Royal Ascent on 18th December 2025 and amends the Planning Act 2008 and related regulations to remove the legal requirement for statutory consultation during the pre-application stage of the NSIP application process.

4.8.3 Although the legal requirement for statutory consultation is expected to be removed, the Applicant anticipates undertaking robust and high quality pre-application consultation. It is understood that further guidance will be provided by the UK Government regarding consultation, that the Applicant will review when available. The September 2025 Consultation on streamlining infrastructure planning indicates that further guidance will not provide a step-by-step process and, therefore, how consultation is undertaken will be for the Applicant to determine. If the legislative amendments under the Planning and Infrastructure Act 2025 are not introduced by the point at which the Applicant undertakes consultation then this will proceed with the law as it applies at that point in time.

4.8.4 The following sections set out the Applicant's current proposed approach for undertaking consultation, however, this will be kept under review as additional guidance emerges.

Pre-Application Consultation

4.8.5 Engagement will be undertaken to discuss a range of matters relating to the EIA including assessment and survey methodologies and results, assessment findings, proposed mitigation and likely EIA conclusions.

4.8.6 At this stage, it is anticipated that consultees will include the following organisations as a minimum:

- North East Lincolnshire Unitary Authority;
- North Lincolnshire Unitary Authority;

- West Lindsey District Council;
- Newark and Sherwood District Council;
- Bassetlaw District Council;
- Lincolnshire County Council;
- Nottinghamshire County Council;
- Natural England;
- Historic England;
- Environment Agency;
- Marine Management Organisation (MMO);
- National Highways;
- Internal Drainage Boards;
- Network Rail;
- Canal and River Trust;
- Lincolnshire and Nottinghamshire Wildlife Trusts;
- Royal Society for the Protection of Birds (RSPB);
- Landowners/land interests;
- Local communities; and
- Other key interest groups.

4.8.7 These stakeholders have been identified to align with the best practice as previously required in statutory consultation; to allow stakeholders and local communities to gain a better understanding of the Project and any potential effects identified, whilst also being given the opportunity to influence the design of the Project and help identify any appropriate mitigation measures. Many of the stakeholder will have valuable local knowledge that can be shared through the consultation process that can feed into the scheme design and preparation of assessments.

4.8.8 The Project will engage with stakeholders on a technical level to help refine the Project, to share and discuss survey/assessment findings as well as developing mitigations that can be incorporated within the EIA.

4.8.9 As consultation continues throughout the EIA process, agreed matters will be documented within the relevant topic chapters of the ES. Statements of Common Ground (SoCGs) and an issues tracker will be prepared with key stakeholders to record discussions and confirm areas of agreement. Draft SoCGs and issues tracker will be shared and updated as necessary to ensure stakeholder endorsement. Where required, these will inform Principal Areas of Disagreement Summary Statements (PADSS). All documents will be prepared in line with current PINS guidance at the time of submission.

4.9 Assumptions and Limitations

4.9.1 Where relevant, assumptions and limitations for each environmental impact are detailed in each of the topic chapters (**Chapters 5** to **16**).

4.9.2 For the purpose of the EIA, it is assumed that any repair and replacement works undertaken during the operation and maintenance phase will be localised construction activities occurring within the same area where construction occurred. These works will be significantly smaller in scale, duration or spatial extent compared to the construction phase activities and so will result in effects that are less than, or equal to, the effects predicted for construction. Therefore, the operations and maintenance phase does not consider repair and replacement activities as these will have been assessed in the construction phase.

4.10 Proposed structure of the ES

4.10.1 The ES will accompany the application for Development Consent and will broadly follow the same order of chapters that are presented in this Scoping Report, though acknowledging that changes may need to be made to address the requirements of the Scoping Opinion as design requirements evolve.

4.10.2 An indicative outline structure for the ES is set out in **Table 4.5.**

Table 4.5: Outline Structure for the ES

ES Section	Likely Content
Non-Technical Summary (NTS)	The NTS, as a standalone document, will provide a concise description of the EIA process and its findings in a manner that is easily understood by the general public.
Introduction	The Introduction is likely to provide: • An overview of the project; • Summary of the applicant and EIA Project Team and competency details; • The purpose of the ES; • The structure of the ES; and • A brief summary of other relevant assessments and documents.
Legislation and Policy	The Legislation and Policy chapter will detail the legislative context for the Project on an international, national and local scale. Other relevant guidance and policies are to be included for a comprehensive policy review.
EIA Methodology	The EIA Methodology Chapter is likely to outline the following: • The EIA Process; • EIA Terminology; • EIA Scoping; • Stakeholder Engagement; • Identification of Baseline Conditions; • Overview of Assessment Methodology; • Approach to Significance Evaluation; • Development of environmental measures; and

ES Section	Likely Content
	• Approach to CEA.
Site Selection/ Alternatives/ Design Evolution	The Site Section/ Alternatives/ Design Evolution Chapter will detail the alternatives considered and environmental reasons for the choice of preferred options.
Project	The Project chapter will likely outline: • A description of the Project and its surroundings; • Development proposals (including a location and development description, development timescales and programme); • Embedded mitigation and management measures; and • A description of the type and quantities of materials used by the Project and the type and quantities of waste generated by the Project.
Environmental Topic Chapters	The technical topics are currently expected to be as follows: • Air Quality • Biodiversity • Noise and Vibration • Climate Change and Greenhouse Gas Emissions • Major Accidents and Disasters • Landscape and Visual • Population and Communities • Ground Conditions • Agriculture and Soils • Archaeology and Cultural Heritage • Traffic and Transport • Water Environment Each topic chapter will provide the following information: • Relevant topic specific legislation and guidance. • Consultation and engagement. • Baseline description (current and future). • Scope of the assessment. • Embedded environmental measures. • Assessment methodology. • Assessment of effects. • Cumulative effects (inter-project effects) assessment. • Limitations and assumptions.
Cumulative Assessment	The CEA will detail the intra-project impacts that occur as a result of two or more environmental aspect impacts acting together (i.e. combined), to result in a new or changed impacts on a single receptor.
Summary of Residual Significant Effects	This section summarises the residual significant environmental effects remaining after the implementation of mitigation measures.
Supporting Annexes	The ES will be followed by supporting documents, for example:

ES Section	Likely Content
	• Flood Risk Assessments; • Ecology Survey Reports; • Transport Assessments; • Noise Monitoring and Modelling Data; • Desk Based Assessment (Heritage and Archaeology); and • Land Quality Risk Assessments.

4.11 References

IEMA (2017), 'Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice'. Institute of Environmental Management and Assessment. Available at: https://www.iema.net [Accessed: December 2025].

IEMA (2024), 'Implementing the Mitigation Hierarchy from Concept to Construction'. Institute of Environmental Management and Assessment. Available at: https://www.iema.net [Accessed: December 2025].

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Statutory Instrument 2017 No. 572, Regulation 10. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents [Accessed: December 2025].

PINS (2025), 'Advice Note Nine: Using the 'Rochdale Envelope''. The Planning Inspectorate. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope [Accessed: December 2025].

PINS (2025), 'Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements'. The Planning Inspectorate. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/12/Annex1_advice_note_7.pdf [Accessed: December 2025].

Planning and Infrastructure Act 2025. GOV.UK. Available at: https https://www.legislation.gov.uk/ukpga/2025/34/enacted [Accessed: January 2026].

PINS (2025) Nationally Significant Infrastructure Projects: Advice on Preparing Applications for Linear Projects. Available at https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-preparing-applications-for-linear-projects [Accessed: December 2025].

PINS (2025) Nationally Significant Infrastructure Projects: Commitments Register. Available at https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-commitments-register [Accessed: December 2025].

PINS (2025) Nationally Significant Infrastructure Projects: Advice on Transboundary Impacts and Process. Available at https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-transboundary-impacts-and-process [Accessed: December 2025].

PINS (2025) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Available at https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment [Accessed: January 2026].

5 Biodiversity

5.1 Introduction

5.1.1 The assessment will describe the Likely Significant Effects (LSE) on terrestrial and aquatic biodiversity, including protected sites, habitats and species, that may arise from the construction, operation and maintenance and decommissioning of the Project, full details of which are set out in **Chapter 2: The Project.**

5.1.2 This Chapter outlines the approach for assessing Biodiversity within the Environmental Impact Assessment (EIA). It explains the methodology, data sources and baseline conditions that will inform the assessment. It also identifies the LSE to be considered, how these will be evaluated, and the environmental measures and commitments influencing the scope of the assessment. Finally, it lists the potential effects proposed to be excluded from further assessment.

5.1.3 There are interrelationships between the potential effects on biodiversity and other environmental topics. Therefore, this chapter of the Scoping Report should be read alongside the following chapters:

- **Chapter 7: Hydrology, Hydrogeology and Flood Risk** which assesses the potential impacts relating to the water environment which can influence aquatic and riparian habitats;
- **Chapter 8: Landscape and Visual** which considers the potential landscape and visual effects that may affect biodiversity features such as woodland, hedgerows and habitat connectivity;
- **Chapter 9: Air Quality** which considers the likelihood of resulting effects on air quality receptors, including ecological receptors;
- **Chapter 10: Noise and Vibration** which considers the effects of noise and vibration on nearby noise-sensitive receptors, which may include ecological receptors;
- **Chapter 11 Traffic and Transport** which considers construction traffic movements, which may affect ecological receptors;
- **Chapter 12: Ground Conditions** which considers impacts relevant to biodiversity such as the disturbance of historic contamination and the potential for pollutants to enter the ground;
- **Chapter 13: Agriculture and Soil Resources** which considers soil degradation and loss which may influence habitat suitability for species;
- **Chapter 15: Major Accidents and Disasters** which considers potential major accident scenarios which may affect habitats or species; and
- **Chapter 16: Climate Change** which considers impacts on greenhouse gas emissions and climate which could affect biodiversity receptors.

5.2 Assumptions and Limitations

5.2.1 Please refer to **Chapter 2: The Project** for the parameters on which this Scoping Report is based, alongside a description of the Project.

5.2.2 The proposed assessment approach set out in this Scoping Report chapter is based on readily available desk study data and habitats identified using Ordnance Survey (OS) maps and aerial imagery, along with records from the Greater Lincolnshire Nature Partnership (GLNP) and the Nottinghamshire Biological and Geological Records Centre (NBGRC). It is, therefore, limited by the resolution and availability of this data.

5.2.3 To address this limitation, 'reasonable worst-case' assumptions regarding ecological features potentially present within the Scoping Boundary will be made when scoping LSEs. This is based on the information already collated, including desk study data, professional knowledge of the species/ features ecology, habitat preferences, and distribution to inform our judgement on the likely presence, numbers and distribution.

5.2.4 Following Scoping, a comprehensive and proportionate baseline data gathering exercise and an ecological walkover will then be undertaken as part of the EIA.

5.3 Relevant Legislation, Policy and Technical Guidance

5.3.1 This Section describes the legislation, key national policy (as set out in National Policy Statements) and local policy and guidance that is specific to the Biodiversity environment, as summarised in **Table 5.1. Chapter 3: Legislation, Policy and Guidance Overview** of the Scoping Report provides detail on the overarching legislation and guidance applicable to the Project and the requirement for EIA.

5.3.2 **Appendix 3A** presents the National Planning Policy Framework (NPPF) and local policies which are specifically relevant to Biodiversity Assessment. A list of the local policy documents and policies reviewed in the preparation of the Chapter, is set out in **Table 5.1**. The relevant parts of these policies are set out in full in **Appendix 3A**. The Environmental Statement (ES) will demonstrate compliance with the relevant legislation, policy and guidance.

5.3.3 The Project acknowledges the Government's ongoing consultation on the implementation of Biodiversity Net Gain (BNG) for Nationally Significant Infrastructure Projects (NSIPs). As the final guidance and secondary legislation underpinning the NSIP BNG framework are not yet available, the Project will continue to monitor the development of this policy area. Current indications are that the formal guidance and detailed requirements for NSIP BNG are expected to be published in Summer 2026. Once the guidance is available, the Project will review it in full and consider the implications for the assessment, design development and any future BNG approach. Any updates necessary to reflect the published guidance will be incorporated into the EIA and subsequent Development Consent application documents.

Table 5.1: Legislation, Policy and Guidance Applicable to Biodiversity.

Source, Author and Year	Context
Legislation	
Wildlife and Countryside Act (WCA) 1981	The WCA 1981 is the principal mechanism for the legislative protection of wildlife in England. Amongst other things, it makes provision to prohibit certain methods of killing or taking wild animals; to amend the law relating to protection of certain mammals; to restrict the introduction of certain animals and plants; and to amend the law relating to nature conservation, the countryside and National Parks. The WCA 1981 is the primary legal mechanism in England for implementation of the Birds Directive, the Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention'), 1979, the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), 1979 and the Ramsar Convention, 1971.
National Parks and Access to the Countryside Act 1949.	Provides of the foundational frameworks for designation of National and Local Nature Reserves.
Natural Environment and Rural Communities (NERC) Act 2006	The NERC Act, enacted in March 2006, makes provision about bodies concerned with the natural environment and rural communities, and to make provision in connection with wildlife, Sites of Special Scientific Interest (SSSI), National Parks and the Broads. Specifically, Section 40 of the Act sets out the duty to conserve and enhance biodiversity which applies to most public authorities. The NERC Act also places a duty on the Secretary of State to maintain list of species and habitats which are regarded as being of principal importance for the conservation of biodiversity in England. These Habitats of Principal Importance (HPI) and Species of Principal Importance (SPI) (also known as priority species and habitats) are used to guide decision makers when implementing their duties, to have regard for biodiversity and conservation.
Protection of Badgers Act 1992	The Protection of Badgers Act 1992 consolidates the Badgers Act 1973, the Badgers Act 1991 and the Badgers (Further Protection) Act 1991. The Act provides legal protection for badgers by making it illegal to kill or injure a badger, disturb a badger while occupying a sett, or to damage or obstruct a badger sett.
Regulation on the Prevention and Management of the Introduction and Spread of Invasive Alien Species, 2014.	A regulation of the European Parliament and of the Council of 22 October 2014 to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species and to take all appropriate measures to ensure the conservation of the habitats of the wild flora and fauna species.
Salmon and Freshwater Fisheries Act 1975	The Salmon and Freshwater Fisheries Act 1975 provides legal provisions to protect spawning, fish, fish spawn, spawning areas and juvenile fish from harm or disturbance. It also includes provisions that make it an offence to impede or obstruct fish migration. The Act mainly relates to salmon and trout, but also affords limited protections to lamprey, shad and smelt.
The Conservation of Habitats and Species Regulations 2017	The Conservation of Habitats and Species Regulations, enacted in November 2017, transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

Source, Author and Year	Context
	(hereafter 'the Habitats Directive') and elements of Directive 2009/147/EC on the conservation of wild birds (hereafter 'the Birds Directive') in England. These Regulations aim to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Regulations provide for the designation and protection of 'European sites', the protection of 'European species', and the adaptation of planning and other controls for the protection of European Sites. Under the Regulations, competent authorities have a general duty to have regard to the EC Habitats Directive. It also provides legal protection of animals listed on schedule two and plants on schedule five of the legislation. The Regulations are amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 following the UK's withdrawal from the EU. These changes, allow for new administrative and regulatory arrangements and the creation of a national site network comprising the protected sites already designated under the Nature Directives, and any further sites designated under these Regulations.
The Eels (England and Wales) Regulations 2009	The Eels (England and Wales) Regulations 2009 includes legal provisions to avoid actions that impede or obstruct eel migration or passage.
The Environment Act, 2021	The Environment Act (enacted in November 2021) makes provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; about water; about nature and biodiversity; and for conservation covenants. The Act makes it mandatory for the vast majority of development projects, to deliver a 10% Biodiversity Net Gain (BNG) as a requirement of their consent. The rules and requirements surrounding BNG for Nationally Significant Infrastructure Projects (NSIPs) are set to come into effect from May 2026.
The Hedgerow Regulations, 1997	The Hedgerow Regulations 1997 protects 'important' hedgerows and those described in Regulation 3, from damage or destruction. An 'important' hedgerow is defined within the regulations and must meet several criteria relating to age, wildlife, historical and/or archaeological value.
National Policy	
Overarching National Policy Statement for Energy (EN-1)(2025)	The Overarching NPS for Energy (EN-1) establishes the government's need and policy framework for major energy infrastructure in England. It requires that developers: • identify and assess potential impacts on habitats, protected species (including birds), and ecological networks; • apply the precautionary principle where impact uncertainties exist; and • apply the mitigation hierarchy and, therefore, demonstrate first avoidance, followed by mitigation, and only as a last resort, compensation for any significant residual harm.

Source, Author and Year	Context
	It also mandates consideration of cumulative effects on designated sites (European sites, SSSIs) and migratory bird populations, and expects provision of measures such as buffer zones, sensitive timing of construction, and habitat creation or enhancement to maintain or improve biodiversity. Given that the Project is identified as a Critical National Priority (CNP), the public-benefit case associated with the Project will form an important part of this balancing exercise under EN-1.
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2024)	EN-4 complements EN-1 by providing technology-specific guidance for gas supply infrastructure and gas and oil pipelines. While EN-4 does not set out detailed biodiversity requirements itself, it directs applicants to the generic impact policies in EN-1, which include the assessment and mitigation of effects on designated sites, priority habitats, protected species, and ecological networks. Accordingly, developers must address direct, indirect, and cumulative ecological impacts of pipeline corridors, maintain ecological connectivity, and implement appropriate mitigation measures such as sensitive construction practices, habitat restoration, and long-term ecological management, in line with EN-1's biodiversity provisions.
National Planning Policy Framework (NPPF), Department for Levelling Up, Housing and Communities, December 2025	The NPPF sets out the Government's national policy for conserving and enhancing the natural environment. It requires planning decisions to protect and enhance valued landscapes and biodiversity, minimise impacts on habitats and species, and secure measurable net gains for biodiversity wherever possible, guided by the mitigation hierarchy. Section 15 'Conserving and enhancing the natural environment' requires that planning policies and decisions should contribute to and enhance the natural environment by: *a) "protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);* *b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;* *c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;* *d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs; and* *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*

Source, Author and Year	Context
	f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. (Paragraph 187).
Local Plan Documents and Policies	
North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018)	Policy 9 Habitat Mitigation – South Humber Bank Policy 5 Development Boundaries Policy 31 Renewable and Low Carbon Infrastructure Policy 40 Developing a Green Infrastructure Network Policy 41 Biodiversity and Geodiversity
North East Lincolnshire Local Plan Review with Options Dec 2023	Draft Strategic Policy 11 Biodiversity and Geodiversity Draft Policy 3 Biodiversity Net Gain Draft Strategic Policy 12 – Habitat Mitigation – South Humber Bank
North Lincolnshire Local Plan Saved Policies (Adopted May 2003)	Policy LC1 Special Protection Areas, Special Areas of Conservation and Ramsar Sites LC2 Sites of Special Scientific Interest and National Nature Reserves LC4 Development Affecting Sites of Local Nature Conservation Importance LC5 Species Protection LC6 Habitat Creation LC12 Protection of Trees, Woodland and Hedgerows
North Lincolnshire Local Development Framework: Core Strategy (Adopted June 2011)	Policy CS17 Biodiversity
Central Lincolnshire Local Plan (Adopted April 2023)	Policy S53: Design and Amenity Policy S60 Protecting Biodiversity and Geodiversity Policy 61 Biodiversity Opportunity and Delivering Measurable Net Gains Policy S66 Trees, Woodland and Hedgerows
Bassetlaw District Local Plan May 2024	Policy ST37 Green and Blue Infrastructure Policy ST38 Biodiversity and Geodiversity Policy ST39 Trees, woodlands and hedgerows
Newark and Sherwood Amended Core Strategy DPD adopted March 2019	Core Policy 12 Biodiversity and Green Infrastructure Policy DM10 Pollution and Hazardous Materials
Newark and Sherwood Allocations and Development Management DPD adopted July 2013	Policy DM5 Design Policy DM7 Biodiversity and Green Infrastructure
Guidance	

Source, Author and Year	Context
British Standards Institution (BSI) Group British Standard (BS) 42020 Biodiversity: Code of Practice for Planning and Development 2013	The BSI BS 42020 Biodiversity: Code of Practice for Planning and Development 2013 provides clear recommendations and guidance to ensure that actions and decisions taken at each stage of the planning process are informed by sufficient and appropriate ecological information.
CIEEM Advice Note on the Lifespan of Ecological Reports and Surveys 2019	The CIEEM Advice Note on the Lifespan of Ecological Reports and Surveys 2019 provides guidance on the validity of ecological data. It is important that planning decision are based on up-to-date ecological reports and survey data.
CIEEM Good Practice Guidance for Habitats and Species v3.0, 2021	Provide references for standard survey methods.
CIEEM Guidelines for Preliminary Ecological Appraisal 2017	The CIEEM Guidelines for Preliminary Ecological Appraisal (PEA) 2017 provide guidance to set out the appropriate approach to undertaking PEAs and the appropriate application of such assessments within the planning process.
CIEEM Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK, 2020	Provides guidelines and best practice approach to undertaking desk studies.
CIEEM/CIRIA. Biodiversity Net Gain: Good Practice Principles for Development: A practical guide, 2019.	Provides guidance on the integration of BNG and Ecological Impact Assessment (EcIA)
Institute of Environmental Assessment (IEA) Guidelines for Baseline Ecological Assessment 1995	The IEA Guidelines for Baseline Ecological Assessment provide guidance that is relevant to the assessment of LSEs on biodiversity.
The Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal 2018 (as amended)	The CIEEM Guidelines for EcIA2018 (as amended) have been developed to promote good practice in assessment of LSEs on biodiversity in terrestrial, freshwater, coastal and marine environments in the UK and Ireland.

5.4 Consultation

5.4.1 In respect of Biodiversity, initial discussions have taken place with the Environment Agency, Natural England and the Local Planning Authorities, with further consultation to be undertaken following the formal EIA scoping process. The aim of this further consultation will be to seek clarification on further details of the assessment, to discuss findings and to reach agreement on issues prior to submission of the application. This may also include discussion on details of survey and assessment methods, including the specification and extent of survey requirements within the Study Area and the requirement for Habitat Regulations Assessment (HRA), in addition to seeking local knowledge to complement information and species/ habitat records obtained during the desk study.

5.4.2 Consultation will be undertaken and recorded throughout the pre-application stages of the Project, with the following key consultees:

- County Ecologists for Lincolnshire and Nottinghamshire;
- Environment Agency;
- Hull University[1];
- Lincolnshire Wildlife Trust (LWT);
- Natural England;
- Nottinghamshire Wildlife Trust; and
- Royal Society for the Protection of Birds (RSPB).

5.4.3 Consultation will be reviewed throughout the assessment process. Additional consultees such as local or specialist groups will be contacted should a requirement to consult with other bodies arise. Engagement with the key consultees will continue post submission.

5.5 Baseline Review

Study Area

5.5.1 Data used to inform this Scoping assessment is from desk-based sources only, relating to terrestrial, coastal and freshwater habitats (not including marine), with field studies programmed to commence in Spring/ Summer 2026. The Study Area encompasses the area over which all desk-based data was gathered to inform the Biodiversity Scoping assessment presented in this Chapter. The Study Area for Biodiversity includes the Scoping Boundary plus a 10 km buffer for statutorily designated sites, and the Scoping Boundary plus a buffer of 2 km for non-statutorily designated sites, priority habitats and protected paragraph 5.5.14.

Spatial Scope

5.5.2 At this stage of the Project design, the Scoping Boundary covers a wider area than is required for the Project. The Project design will be further refined and evolve through the EIA process as the project undertakes further design, assessment and consultation activities. The draft Order Limits will be defined that will establish the limits for the Project, covering sufficient area to enable the development to take place.

5.5.3 The Scoping Boundary, therefore, includes some designated sites and priority habitat parcels that the Project will seek to avoid (or utilise trenchless crossing techniques to avoid direct impacts upon). The Scoping Boundary is, therefore, closer to some designated sites and priority habitats than the draft Order Limits is likely to be once detailed studies of pipeline routes has been concluded.

[1] Hull University is currently undertaking research on functionally linked land for birds around the Humber SPA and Ramsar.

5.5.4 The desk-based study included a search for internationally important sites: Special Areas of Conservation (SACs), Special Protected Area (SPAs) and Ramsar Sites; nationally important sites: Site of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs); and locally important sites: Local Nature Reserves (LNRs) and Local Wildlife Sites (LWSs). It also included local record centre data for species records, including a search for invasive species and for protected and priority species in the following groups: amphibians, reptiles, birds and mammals. **Table 5.2** outlines the desk Study Areas for ecological features used for the purpose of this Scoping Report. The desk Study Areas are defined according to standardised and best practice guidelines from CIEEM (CIEEM, 2020). As the Scoping Boundary is refined down, the Study Areas for the EIA will be refined to the set distances from the draft Order Limits.

Table 5.2: Desk Study Areas

Study Area	Ecological Features
Scoping Boundary plus 10 km	Local Nature Reserves (LNR) National Nature Reserves (NNR) Ramsar RSPB Reserves Site of Special Scientific Interest (SSSI) Special Areas of Conservation (SAC) Special Protected Areas (SPA)
Scoping Boundary plus 2 km	Ancient and veteran tree records Ancient woodland Important Plant Areas (IPA) Invasive and non-native species records Local Wildlife Sites (LWS) Priority habitats Protected and priority flora and fauna species records Wildlife Trust Reserves
Scoping Boundary only	Broad habitat mapping

5.5.5 The Study Areas are hereafter referred to as indicated in **Table 5.2**.

5.5.6 The Study Areas identified for the purpose of Scoping will differ from those used for the EIA. As the Project design is refined and the draft Order Limits are established, the subsequent desk-based studies will be tailored to the specific ecological receptors and their potential connectivity within the local landscape. The receptor specific Study Areas proposed for the EIA are set out within the proposed survey methodology section, within **Section 5.6**.

Temporal Scope

5.5.7 The assessment will consider the construction, operation and maintenance and decommissioning phases of the Project. As noted in **Chapter 2: The Project**, the design life of the pipeline, Hydrogen Above Ground Installations (HAGIs), Block Valve Installations (BVIs) and other above ground infrastructure is 40 years, but it is anticipated that the actual life of the Project

could extend over 40 years depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. Any long term impacts during construction, operation and maintenance will remain for the lifetime of the Project. The majority of ecological impacts will result from vegetation clearance and site operations during the construction and decommissioning phases. In contrast, during the operation and maintenance phase, impacts from maintenance activities are anticipated to be relatively minimal and primarily localised around the above ground infrastructure. Therefore, extending the lifespan of the pipeline and related infrastructure beyond 40 years will not affect the overall findings of the assessment.

5.5.8 The Study Areas should be regarded as preliminary at this stage and will be reviewed and amended in response to the refinement of the Project design, the identification of additional impact pathways, and, where appropriate, in response to feedback from consultation. These refinements are expected to reduce the extent of the Study Areas as the Project progresses, whilst still reflecting recognised good practice. If the Study Area is required to be extended, a full assessment of any additional areas will be undertaken.

5.5.9 All data used to inform this Scoping assessment was obtained between October and December 2025.

5.5.10 For designated sites and habitats, the current records were obtained, including any proposals for new designated sites. For species, all records (of whatever age) up to the present were obtained, reviewing older records to assess their validity, and their relevance to objectives to restore biodiversity.

Data Sources

5.5.11 The data sources that have been used to inform this Chapter of the Scoping Report are presented within **Table 5.3**. The desk Study Areas are defined according to standardised and best practice guidelines from CIEEM (CIEEM, 2020). These data sources will be taken forward and used to inform the EIA, alongside any additional site-specific data that will be collected for the Project, and any other general data sources which are identified.

Table 5.3: Sources of Biodiversity Data.

Source, Author and Year	Summary	Coverage of the Desk Study Area
LERC Search Summary Report, Greater Lincolnshire Nature Partnership (GLNP) (December 2025)	Non-statutory designated sites (LWS), spatial extent and citations. Protected[2] and priority species[3], location and record details.	Scoping Boundary plus 2 km (Lincolnshire)

[2] These were species listed on Wildlife and Countryside Act Sch 1, 5 and 8, Habitats Regulations Sch 2, 4 and 5, Habitats Directive Annex II, IV and V, Birds Directive Annex I and Regularly Occurring Migratory Species, and Convention on Migratory Species Appendix I and II, plus all other Wild Birds and badger.

[3] These were species listed as priority species in England.

Source, Author and Year	Summary	Coverage of the Desk Study Area
LERC Data, Nottinghamshire Biological and Geological Research Centre (NBGRC) (December 2025)	Non-statutory designated sites (LWS), spatial extent and citations. Protected and priority species, location and record details.	Scoping Boundary plus 2 km (Nottinghamshire)
Natural England	Citations for statutory designated sites, including reasons for designation.	Scoping Boundary plus 10 km
Joint Nature Conservation Council (JNCC).	SAC and SPA citation details including qualifying interest features, conservation objectives, standard data forms.	Scoping Boundary plus 10 km
MAGIC (Multi-Agency Geographic Information Centre)	SPAs, potential SPAs, SACs, possible SACs, Ramsar Sites, proposed Ramsar sites, SSSIs, NNRs, LNRs and Impact Risk Zones, spatial extent and citations.	Scoping Boundary plus 10 km
	Priority Habitat Inventory for grasslands, heathlands, wetland, woodland and other habitats, type and spatial extent. Ancient woodland. Great Crested Newt (GCN) pond surveys, location of GCN breeding ponds. GCN survey licence returned, locations of GCN breeding ponds. Granted European Protected Species Licences, location and species. Important Plant Areas (Plantlife GB). Priority species layers.	Scoping Boundary plus 2 km
RSPB	RSPB reserve locations and details, including qualifying features and conservation objectives.	Scoping Boundary plus 10 km
Living England Habitat Map (Phase 4)	A desk-based habitat mapping exercise using Master Map to identify broad habitat types.	Scoping Boundary.
Woodland Trust Ancient Tree Inventory	Records of ancient and veteran trees	Scoping Boundary plus 2 km
North East Lincolnshire Local Plan 2013-2032	LNR site information	Scoping Boundary plus 10 km
	LWS site information	Scoping Boundary plus 2 km
North Lincolnshire Local Plan (2024)	LNR site information	Scoping Boundary plus 10 km
	LWS site information	Scoping Boundary plus 2 km

Source, Author and Year	Summary	Coverage of the Desk Study Area
Central Lincolnshire Local Plan 2023.	LNR site information	Scoping Boundary plus 10 km
	LWS site information	Scoping Boundary plus 2 km
Bassetlaw Local Plan 2020-2038	LNR site information	Scoping Boundary plus 10 km
	LWS site information	Scoping Boundary plus 2 km

Current Baseline

5.5.12 Distances in the receptor tables throughout this Section are based on the Scoping Boundary, which represents a wider area of search than the draft Order Limits. As the Project design is refined, the draft Order Limits are expected to cover a smaller area than the Scoping Boundary, meaning that many receptors are likely to be located further away than the distances currently identified.

5.5.13 The Scoping Boundary has been divided into the following Sections, as shown in **Figure 5.2,** for the purpose of reporting in this Scoping Report:

- Section A: Immingham and North Killingholme;
- Section B: Immingham to Scunthorpe;
- Section C: Scunthorpe to High Marnham; and
- Section D: High Marnham to Kirton and Newark.

5.5.14 Detailed descriptions of each Section are provided in **Chapter 2: The Project.**

Statutory Designated Sites

5.5.15 **Table 5.4** lists the statutory designated sites within or adjoining the 10 km Study Area. Sites located within, or adjoining, the Scoping Boundary are shown as '0 m' in **Table 5.4**. Several Statutory Designated Sites will be more than 10 km away from the Project, and many are likely to be located further from the draft Order Limits than the distances shown in **Table 5.4**.The progression of the Project design will avoid locating infrastructure and construction activities within statutory designated sites (or will use mitigation techniques to avoid direct impacts to statutory designated sites). **Figure 5.1** provides the locations of international, national and local statutory designations (and RSPB Reserves discussed in **Section 5.5.20**) within 10 km of the Scoping Boundary.

Table 5.4: Statutory Designated Sites within 10 km of the Scoping Boundary

Site Name and Type	Distance from Scoping Boundary (m)	Compass Direction
Section A: Immingham and North Killingholme		
Humber Estuary - 2000480 SSSI	0	ENE
Humber Estuary Ramsar	0	ENE

Site Name and Type	Distance from Scoping Boundary (m)	Compass Direction
Humber Estuary SAC	0	E
Humber Estuary SPA	0	E
North Killingholme Haven Pits SSSI	293	NNW
Freshney Parkway LNR	2,177	SE
Bradley and Dixon Woods LNR	4,832	SE
Swallow Wold SSSI	5,364	S
Weelsby Woods Park LNR	5,735	ESE
Cleethorpes Country Park LNR	7,822	ESE
Lincolnshire Coronation Coast NNR	8,238	ESE
Cleethorpes LNR	8,251	ESE
Section B: Immingham to Scunthorpe		
Ashbyville LNR	0	W
Castlethorpe Tufas SSSI	0	WSW
Cleatham Quarry SSSI	0	SW
Manton and Twigmoor SSSI	0	WSW
Manton Stone Quarry SSSI	0	SW
Messingham Sand Quarry SSSI	0	WSW
Wrawby Moor SSSI	0	NE
Kirmington Pits SSSI	56	ENE
Cliff Farm Pit SSSI	369	SW
Frodingham LNR	1,150	WNW
Brumby Wood LNR	1,322	WNW
Sawcliffe LNR	1,453	WNW
Risby Warren SSSI	1,557	NW
Broughton Alder Wood SSSI	1,619	WNW
Broughton Far Wood SSSI	1,838	NW
Atkinson's Warren LNR	2,036	WNW
Phoenix Parkway LNR	2,607	WNW
Silica Lodge LNR	2,727	W
Conesby Quarry LNR	2,906	WNW
Phoenix LNR	3,131	WNW
Conesby (Yorkshire East) Quarry SSSI	3,151	NW
South Ferriby Chalk Pit SSSI	8,200	N
Waters Edge LNR	9,620	NNE
Nettleton Top LNR	9,661	SE
Section C: Scunthorpe to High Marnham		

Site Name and Type	Distance from Scoping Boundary (m)	Compass Direction
Scotton Beck Fields SSSI	518	N
Spalford Warren SSSI	519	SSW
Scotton Common SSSI	1,005	N
Messingham Heath SSSI	1,052	N
Doddington Clay Woods SSSI	1,593	S
Theaker Avenue LNR	2,079	NW
Scotton and Laughton Forest Ponds SSSI	2,307	N
Besthorpe Warren SSSI	3,178	SSW
Lea Marsh SSSI	3,205	W
Owlet LNR	3,556	NNW
Laughton Common SSSI	3,844	NNW
Tuetoes Hills SSSI	4,096	NNW
Whisby Nature Park LNR	5,168	S
Cliff House SSSI	5,188	NE
Swanholme Lakes LNR	6,937	SSE
Swanholme Lakes SSSI	6,938	SSE
Ashton's Meadow SSSI	7,443	SW
Mother Drain, Misterton SSSI	7,612	NW
Owston Ferry Castle LNR	7,997	NNW
Hewson's Field SSSI	9,714	NW
Chesterfield Canal SSSI	9,913	W
Cross O'Cliff Orchard LNR	9,950	SSE
Section D: High Marnham to Kirton and Newark		
Kirton Wood, Notts. SSSI	0	NW
Laxton Sykes SSSI	0	NW
Wellow Park SSSI	0	WNW
Devon Park Pastures LNR	1,208	SSE
Bevercotes Park SSSI	1,422	NW
Eakring and Maplebeck Meadows SSSI	2,008	WSW
Mather Wood SSSI	2,183	SSW
Farndon Ponds LNR	2,198	S
Birklands West and Ollerton Corner SSSI	3,113	WNW
Sherwood Heath LNR	3,123	WNW
Birklands and Bilhaugh SSSI	3,661	WNW
Cockglode and Rotary Wood LNR	3,815	WNW
Redgate Woods and Mansey Common SSSI	3,959	WSW

Site Name and Type	Distance from Scoping Boundary (m)	Compass Direction
Rufford Country Park LNR	3,976	W
Birklands and Bilhaugh SAC	3,980	WNW
Besthorpe Meadows SSSI	4,160	E
Roe Wood SSSI	4,408	SW
Southwell Trail LNR	4,546	SW
Thoresby Lake SSSI	5,099	WNW
Sherwood Forest NNR	5,405	WNW
Gamston and Eaton Woods and Roadside Verges SSSI	5,636	N
Clumber Park SSSI	6,874	NW
Treswell Wood SSSI	7,407	N
Newhall Reservoir Meadow SSSI	8,649	SW
Castle Hill Wood SSSI	8,930	N
Welbeck Lake SSSI	9,515	WNW
Vicar Water Nature Reserve LNR	9,713	W
Clipstone Heath SSSI	9,803	W
The Bottoms LNR	9,811	WNW

Non-Statutory Designated Sites

5.5.16 Non-statutory sites include Local Wildlife Sites (LWS), RSPB Reserves, Wildlife Trust managed nature reserves and Important Plant Areas within the 2 km Study Area.

Local Wildlife Sites

5.5.17 Due to the large number of LWSs returned in the data search, only a brief summary of the number of sites within each section of the pipeline has been included. The full list of non-statutory designated sites within the Scoping Boundary and within 2 km Study Area can be found in **Appendix 5A**, with the locations of designated sites and is illustrated in **Figure 5.2.**

5.5.18 The desk study identified that:

- Section A: Immingham and North Killingholme has 24 LWSs;
- Section B: Immingham to Scunthorpe has 71 LWSs;
- Section C: Scunthorpe to High Marnham has 70 LWSs, and,
- Section D: High Marnham to Kirton and Newark has 104 LWSs within the Scoping Boundary and within the 2 km Study Area.

5.5.19 The progression of the Project design will avoid locating infrastructure and construction activities within LWS (or will use trenchless crossing techniques to avoid direct impacts to Statutory Designated Sites). Several LWS will be more than 2 km away from the draft Order Limits and many are likely to be

located further away from the draft Order Limits than the distances shown in **Appendix 5A**.

RSPB Reserves

5.5.20 **Table 5.5** lists the five RSPB Reserves identified within 10 km of the Scoping Boundary, within Section B, Section C and Section D. No reserves were identified within the Scoping Boundary and there are no reserves within 10 km of Section A

5.5.21 RSPB Reserves up to 10 km have been included to account for the high mobility of some bird species.

5.5.22 Once the draft Order Limits are defined, several of the reserves will be more than 10 km away from the Project and many are likely to be located further from the draft Order Limits than the distances given in the table. **Figure 5.1** illustrates the locations of the five RSPB Reserves identified.

Table 5.5: RSPB Reserves within 10 km of the Scoping Boundary

RSPB Reserve Name	Distance from Scoping Boundary (m)	Compass Direction
Section B: Immingham to Scunthorpe		
Blacktoft Sands	9,520	NW
Section C: Scunthorpe to High Marnham		
Beckingham Marshes	4,343	WNW
Section D: High Marnham to Kirton and Newark		
Langford Lowfields	3,680	ESE
Sherwood Forest	5,179	WNW
Budby South Forest	5,531	WNW

Wildlife Trust Reserves

5.5.23 **Table 5.6** lists the Wildlife Trust Reserves within 2 km around the Scoping Boundary. Two reserves were identified within the Scoping Boundary (shown as '0 m' in the table). The progression of the Project design will avoid locating infrastructure and construction activities within Wildlife Trust Reserves sites (or will use trenchless crossing techniques to avoid direct impacts to statutory designated sites). Several reserves are likely to be located further from the draft Order Limits than the distances shown in **Table 5.6**.

Table 5.6: Wildlife Trust Reserves within 2 km of the Scoping Boundary

Wildlife Trust Reserve Name	Distance from Scoping Boundary (m)	Compass Direction
Section B: Immingham to Scunthorpe		
Messingham Sand Quarry	0	WSW
Clapgate Pits	2,174	NW

Section C: Scunthorpe to High Marnham		
Scotton Common	25	N
Spalford Warren	519	SSW
Section D: High Marnham to Kirton and Newark		
Kirton Wood	0	NW

Habitats

5.5.24 The proportion of habitats, derived from Natural England's 'Living England' dataset, in the Scoping Boundary is provided in **Table 5.7**. Land within the Scoping Boundary is predominantly arable and agricultural, comprising arable fields and, to a lesser extent, grasslands divided by hedgerows and ditches. Woodlands are predominantly broad-leaved and mixed, with small pockets of coniferous woodland also occasionally present. Water habitats include lakes and ponds, river, streams and drainage ditches. Habitats occurring at below 0.5% of the Scoping Boundary will be reviewed further once the draft Order Limits have been defined to determine whether they fall within the final Project area.

5.5.25 These broad habitat types have also been applied to evaluate the potential presence of protected and priority species that may be supported by these habitats.

Table 5.7: Percentage Presence of Broad Habitat Types

Habitat Type	Cover within Scoping Boundary (%)
Arable and Horticultural	59.65
Acid, Calcareous, Neutral Grassland	17.39
Fen, Marsh and Swamp	7.57
Improved Grassland	4.20
Broadleaved, Mixed and Yew Woodland	4.11
Built-up Areas and Gardens	3.02
Coniferous Woodland	1.58
Unclassified	0.72
Water	0.62
Bracken	0.41
Coastal Sand Dunes	0.36
Bare Ground	0.21
Bare Sand	0.04
Dwarf Shrub Heath	0.04
Scrub	0.01

Important Plant Areas

5.5.26 Important Plant Areas (IPAs) have been reviewed using an accessible online database (Plantlife, Great Britain) within the Scoping Boundary plus 2 km Study Area. No Important Plant Areas fall within this Study Area.

Priority Habitats

5.5.27 The priority habitats (area-based) that are located within the Scoping Boundary plus 2 km, are listed in **Table 5.8**. These habitats are derived from MAGIC data.

5.5.28 In addition to these habitats, the same area includes the following priority habitat types (these are yet to be quantified and therefore are not included within **Table 5.8**):

- Arable field margins;
- Hedgerows;
- Ponds; and
- Rivers.

Table 5.8: Priority Habitats within Scoping Boundary plus 2 km

Main Habitat Type	Parcel Count		Area (Ha)		Percent Cover (For Each Section)	
	Within Scoping Boundary	Within 2 km Buffer	Within Scoping Boundary	Within 2 km Buffer	Within Scoping Boundary	Within 2 km Buffer
Section A: Immingham and North Killingholme						
Coastal and floodplain grazing marsh	8	49	20.70	130.82	0.49	1.46
Coastal saltmarsh	1	8	0.39	6.74	0.01	0.08
Deciduous woodland	52	88	164.65	195.51	3.88	2.18
Good quality semi-improved grassland	15	9	22.54	3.38	0.53	0.04
Lowland calcareous grassland	1	1	1.21	0.55	0.03	0.01
Lowland fens	1	1	5.88	9.10	0.14	0.10
Lowland meadows	2	13	0.03	296.08	<0.01	3.29
Mudflats	11	32	3.35	10.80	0.08	0.12
No main habitat but additional habitats present	-	2	-	0.12	-	<0.01
Reedbeds, Coastal saltmarsh	-	12	-	17.26	-	0.19
Saline lagoons	1	3	0.05	0.49	<0.01	0.01
Traditional orchard	8	49	20.70	130.82	0.49	1.46
Total	**100**	**267**	**239.50**	**801.67**	**5.67**	**8.95**

Main Habitat Type	Parcel Count		Area (Ha)		Percent Cover (For Each Section)	
	Within Scoping Boundary	Within 2 km Buffer	Within Scoping Boundary	Within 2 km Buffer	Within Scoping Boundary	Within 2 km Buffer
Section B: Immingham to Scunthorpe						
Coastal and floodplain grazing marsh	9	2	35.37	47.09	0.32	0.36
Deciduous woodland	255	285	611.67	721.50	5.48	5.46
Good quality semi-improved grassland	7	5	22.83	7.22	0.20	0.05
Lowland calcareous grassland	2	11	5.73	18.17	0.05	0.14
Lowland dry acid grassland	21	9	54.85	73.68	0.49	0.56
Lowland fens	5	8	0.22	6.91	<0.01	0.05
Lowland heathland	19	23	20.45	36.54	0.18	0.28
Lowland meadows	-	4	-	28.98	-	0.22
No main habitat but additional habitats present	103	42	124.74	47.43	1.12	0.36
Purple moor grass and rush pastures	3	8	11.45	4.66	0.10	0.04
Traditional orchard	8	5	10.44	1.58	0.09	0.01
Total	**432**	**402**	**897.75**	**999.49**	**8.04**	**7.53**
Section C: Scunthorpe to High Marnham						
Coastal and floodplain grazing marsh	11	4	66.98	47.34	0.61	0.31
Deciduous woodland	109	203	160.78	458.20	1.45	2.95
Good quality semi-improved grassland	8	10	14.64	44.05	0.13	0.28
Lowland calcareous grassland	3	5	2.47	3.27	0.02	0.02
Lowland dry acid grassland	1	13	1.51	61.37	0.01	0.40
Lowland fens	-	3	-	0.74	-	<0.01
Lowland heathland	-	8	-	35.96	-	0.23
No main habitat but additional habitats present	14	81	4.90	93.18	0.04	0.60
Ponds	1	-	0.19	-	<0.01	-
Purple moor grass and rush pastures	-	3	-	25.18	-	0.16
Traditional orchard	21	24	5.10	3.44	0.05	0.02

Main Habitat Type	Parcel Count		Area (Ha)		Percent Cover (For Each Section)	
	Within Scoping Boundary	Within 2 km Buffer	Within Scoping Boundary	Within 2 km Buffer	Within Scoping Boundary	Within 2 km Buffer
Total	**168**	**354**	**256.57**	**772.73**	**2.32**	**4.98**
Section D: High Marnham to Kirton and Newark						
Deciduous woodland	7	12	50.50	133.08	0.80	1.00
Coastal and floodplain grazing marsh	91	196	205.18	522.13	3.26	3.90
No main habitat but additional habitats present	17	7	19.13	10.17	0.30	0.08
Good quality semi-improved grassland	6	1	1.38	12.58	0.02	0.09
Traditional orchard	10	23	6.25	38.22	0.10	0.29
Lowland meadows	-	1	-	0.51	-	<0.01
Purple moor grass and rush pastures	24	51	6.35	11.83	0.10	0.09
Total	**155**	**291**	**288.79**	**728.52**	**4.58**	**5.46**

5.5.29 The most extensive and widespread priority habitat across all sections of the pipeline route is deciduous woodland, which has the potential to support a range of protected and notable fauna and flora species.

5.5.30 Within Section A, there is also a higher percentage of mudflats and coastal/ grazing marsh, likely due to proximity to the coast. These habitats support a range of wetland species and are an important resource for wintering and breeding birds. However, the extent of these habitats decreases further to the west and south, throughout Section B, Section C and Section D.

5.5.31 Across all of the pipeline sections the priority habitat 'no main habitat but additional habitats present' covers a relatively large number of parcels. This Natural England Priority Habitat Inventory (England) category identifies priority habitat may be present within a habitat parcel, but its extent may be less than the minimum mapping unit, or it may not be accurately mappable.

5.5.32 Regarding **Table 5.8**, the number of habitat types, number of habitat parcels, and the extent of the area within each habitat will all reduce as the design progresses and the Project area is reduced from the extent presented in the Scoping Boundary.

5.5.33 Moreover, given the relatively small proportion of the Scoping Boundary that is covered by priority habitats (as shown in **Table 5.8**), and the generally small size of ponds, it is expected that direct effects can be avoided through route selection or refinement and the use of trenchless crossing techniques. Indirect effects are possible and will, if necessary, be mitigated for by following standard and best practice construction methods set out in a Construction and Environmental Management Plan (CEMP).

5.5.34 The main priority habitats that are likely to be directly or indirectly affected by the Project are expected to be:

- Arable field margins;
- Hedgerows; and
- Rivers.

5.5.35 The impacts on these habitats will be mostly temporary, relating to the pipeline and associated construction areas, and will be reinstated, where possible, once the pipeline is installed.

Ancient Woodland

5.5.36 There are a number of areas of Ancient Woodlands within the Scoping Boundary plus the 2 km Study Area. These are a subset of the Deciduous Woodland priority habitat. Those within or adjoining to the Scoping Boundary are shown as 0 m distant in **Table 5.9**.

Table 5.9: Ancient Woodland Sites Scoping Boundary plus 2 km Study Area

Woodland Name	Distance from Scoping Boundary (m)	Compass Direction
Section A: Immingham and North Killingholme		
Alder Wood	0.00	W
Unnamed	0.00	WSW
Unnamed	0.00	WSW
Unnamed	917.95	SW
Section B: Immingham to Scunthorpe		
Gadbury And Lundimore Woods	0.00	W
Unnamed	0.00	ENE
Unnamed	0.00	ENE
Far Wood	82.00	WNW
Brumby Wood	1,321.65	WNW
Section C: Scunthorpe to High Marnham		
Thurlby/Caistors Woods	0.00	W
Willoughton Wood	0.00	NW
Bass/Park Springs Woods	252.00	WNW
Birch Wood	595.39	NW
Lea Wood	980.72	WNW
Unnamed	1,013.63	SSW
Blybro Spring Woods	1,016.42	NW
Unnamed	1,093.49	SSW
Stag Wood	1,117.45	WSW

Woodland Name	Distance from Scoping Boundary (m)	Compass Direction
Whites Wood	1,172.78	NW
Wharton Wood	1,189.45	NNW
Fox Holt	1,474.07	S
Little Sale	1,595.70	S
Burton Wood	1,600.97	SW
Unnamed	1,815.37	S
Old Hag Wood	1,847.37	S
Unnamed	1,906.39	W
Strunch Hill	1,926.74	S
Section D: High Marnham to Kirton and Newark		
Broadwaters Wood	0.00	SE
High Wood	0.00	WSW
Kirton Wood	0.00	NW
Laxton Middle Wood	0.00	W
Laxton Wood	0.00	W
North Wood	0.00	N
Norton Wood	0.00	NW
Park Wood	0.00	S
Wellow Park	0.00	WNW
Worner Wood	0.00	SSE
Brunk Wood	16.86	SSW
Unnamed	154.25	S
Egmanton Wood	165.66	NNW
Unnamed	316.44	NNE
Lady Wood	681.01	N
Spring Wood	805.97	S
East Park Wood	898.09	NNW
Cheveral Wood	1,027.60	SSW
Bevercotes Park	1,177.65	NW
Carlton Wood	1,532.39	E
Unnamed	1,900.96	SSW
Unnamed	1,913.07	SSW
Unnamed	1,948.43	SSW

5.5.37 Routing will prioritise avoiding habitats that are highly valuable or difficult to replace, such as ancient woodland and important hedgerows. The Project will

utilise trenchless techniques to minimise impacts to these areas. Once the draft Order Limits are refined, several areas of Ancient Woodland will be located more than 2 km away, and most will be further away from the draft Order Limits than the distances given in the table.

5.5.38 Moreover, given the relatively small proportion of ancient woodland parcels listed in **Table 5.9,** it is anticipated that direct effects can be avoided through route selection or refinement, and the use of trenchless crossing techniques. Indirect effects are possible and, if necessary, will be mitigated by following standard and best practice construction methods set out in a CEMP.

Ancient and Veteran Trees

5.5.39 There are a number of ancient and veteran trees within the Scoping Boundary plus 2 km Study Area. These are listed in **Table 5.10**. Those adjoining or within the Scoping Boundary are shown as 0 m distance in the table.

Table 5.10: Ancient and Veteran Trees within Scoping Boundary plus 2 km

Ancient Tree Inventory ID	Species	Distance from Scoping Boundary (m)	Compass Direction
Section A: Immingham and North Killingholme			
41687	Common Walnut	1,541	SE
41686	Common Walnut	1,550	SE
Section B: Immingham to Scunthorpe			
210379	Large Leaved Lime	0	SW
215727	Atlas Cedar	0	SW
215755	Common Sycamore	0	SW
246317	Common Hawthorn	0	NE
253567	Common Ash	0	SSW
253569	Common Ash	0	SSW
274117	Sweet Chestnut	0	SW
253572	Common Ash	45	SSW
253571	Common Ash	61	SSW
245427	Apple	76	NE
246316	Pedunculate Oak	82	NE
260891	Common Beech	84	SW
237010	Pedunculate Oak	134	NE
141862	Wych Elm	1,212	W
Section C: Scunthorpe to High Marnham			
235744	White Willow	0	N
235745	White Willow	0	N
226171	Crack Willow	2	SSW

Ancient Tree Inventory ID	Species	Distance from Scoping Boundary (m)	Compass Direction
226178	Crack Willow	31	SSW
260460	Cherry Plum	76	S
233165	Wild Black Poplar	850	S
256278	Common Lime	1,598	SSW
256285	Common Lime	1,598	SSW
256284	Common Lime	1,604	SSW
256286	Common Lime	1,606	SSW
256287	Common Lime	1,607	SSW
256230	Common Lime	1,609	SSW
256231	Common Lime	1,611	SSW
260454	Wild Apple	1,809	SE
260456	False Acacia	1,835	SE
Section D: High Marnham to Kirton and Newark			
158983	Sweet Chestnut	0	SSE
183882	Field Maple	4	WNW

5.5.40 Given the agricultural nature within the Scoping Boundary, mostly large fields, it is probable that there will be a relatively small number of ancient and veteran trees within it, direct effects will be avoided through route selection or refinement and the use of trenchless crossing techniques that will seek to avoid ancient and veteran trees where practicable. Indirect effects are possible and, if necessary will be mitigated for by following standard and best practice construction methods set out in a CEMP.

Protected and Priority Species

5.5.41 Protected species with existing records within 2 km of the Scoping Boundary that may be affected by the Project are listed in **Table 5.11**. In assessing the broad habitat types, certain species have been excluded if they are not known to depend on these habitats, indicating that their populations are unlikely to be affected by the Project.

Table 5.11: Potentially Affected Protected and Priority Species

Common Name	Scientific Name	WCA/BA	HD	BD	Priority
Farmland Birds					
Barn Owl	*Tyto alba*	1			
Cetti's Warbler	*Cettia cetti*	1			
Corn Bunting	*Emberiza calandra*				P
Grey Partridge	*Perdix perdix*				P
Hobby	*Falco subbuteo*	1			

Common Name	Scientific Name	WCA/BA	HD	BD	Priority
Kingfisher	*Alcedo atthis*	1		I	
Lapwing	*Vanellus vanellus*				P
Linnet	*Linaria cannabina*				P
Marsh Harrier	*Circus aeruginosus*	1		I	
Red Kite	*Milvus milvus*	1		I	
Reed Bunting	*Emberiza schoeniclus*				P
Skylark	*Alauda arvensis*				P
Song Thrush	*Turdus philomelos*				P
Starling	*Sturnus vulgaris*				P
Tree Sparrow	*Passer montanus*				P
Yellow Wagtail	*Motacilla flava*				P
Yellowhammer	*Emberiza citrinella*				P
Wintering Birds					
Barnacle Goose	*Branta leucopsis*			I, ROMS	
Black-tailed Godwit	*Limosa limosa*			ROMS	P
Curlew	*Numenius arquata*			ROMS	P
Dark-bellied Brent Goose	*Branta bernicla bernicla*			ROMS	P
Golden Plover	*Pluvialis apricaria*			I, ROMS	
Lapwing	*Vanellus vanellus*			ROMS	P
Snipe	*Gallinago gallinago*			ROMS	
Fish					
European Eel	*Anguilla anguilla*				P
River Lamprey	*Lampetra fluviatilis*		II, V		P
Brook lamprey	*Lampetra planeri*		II		
Sea Lamprey	*Petromyzon marinus*		II		P
Atlantic Salmon	*Salmo salar*		II		P
Brown/Sea Trout	*Salmo trutta*				P
Amphibians					
Common Toad	*Bufo bufo*	5			P
Common Frog	*Rana temporaria*		V		
Great Crested Newt	*Triturus cristatus*	5	II, IV		P
Reptiles					
Common Lizard	*Zootoca vivipara*	5			P
Grass Snake	*Natrix Helvetica*	5			P
Slow worm	*Anguis fragilis.*	5			P
Bats					

Common Name	Scientific Name	WCA/BA	HD	BD	Priority
Barbastelle	*Barbastella barbastellus*	5	II, IV		P
Brown long-eared bat	*Plecotus auritus*	5	IV		P
Common pipistrelle	*Pipistrellus pipistrellus*	5	IV		
Daubenton's bat	*Myotis daubentoniid*	5	IV		
Leisler's bat	*Nyctalus leisleri*	5	IV		
Nathusius' pipistrelle	*Pipistrellus nathusii*	5	IV		
Natterer's bat	*Myotis nattereri*	5	IV		
Noctule bat	*Nyctalus noctula*	5	IV		P
Soprano pipistrelle	*Pipistrellus pygmaeus*	5	IV		P
Whiskered bat	*Myotis mystacinus.*	5	IV		
Mammals					
Badger	*Meles meles*	BA			
Brown hare	*Lepus europaeus*				P
European Polecat	*Mustela putorius*		V		P
Harvest Mouse	*Micromys minutus*				P
Hazel Dormouse	*Muscardinus avellanarius*	5	IV		P
Hedgehog	*Erinaceus europaeus*				P
Otter	*Lutra lutra*	5	II, IV		P
Water vole	*Arvicola amphibius*	5			P

Invasive Non-native Flora Species

5.5.42 Invasive and non-native flora species within 2 km of the Scoping Boundary that will be considered as part of the assessment as are listed in **Table 5.12** below.

Table 5.12: Invasive and Non-native Flora Species

Common Name	Scientific Name
Butterfly-Bush	*Buddleja davidii*
Canadian Waterweed	*Elodea canadensis*
Common Cord-Grass	*Spartina anglica*
Curly Waterweed	*Lagarosiphon major*
False-Acacia	*Robinia pseudoacia*
Floating Pennywort	*Hydrocotyle ranunculoides*
Giant Hogweed	*Heracleum mantegazzianum*
Giant-Rhubarb	*Gunnera tinctoria*
Himalayan Balsam	*Impatiens glandulifera*

Common Name	Scientific Name
Italian Alder	*Alnus cordata*
Japanese Knotweed	*Reynoutria japonica*
Japanese Rose	*Rosa rugosa*
Least Duckweed	*Lemna minuta*
Montbretia	*Crocosmia potsii x aurea*
Nuttall's Waterweed	*Elodea nuttallii*
Parrot's Feather	*Myriophyllum aquaticum*
Russian-Vine	*Fallopia baldschuanica*
Small Balsam	*Impatiens parviflora*
Swamp Stonecrop/ New Zealand Pigmyweed	*Crassula helmsii*
Variegated Yellow Archangel	*Lamistrum galeobdolon subp. argentatum*
Wall Cotoneaster	*Cotoneaster horizontalis*
Water Fern	*Azolla filiculoides*
Winter Heliotrope	*Petasites fragrans*

Invasive Non-native Fauna Species

5.5.43 Invasive and non-native flora species within 2 km of the Scoping Boundary that will be considered as part of the assessment are listed in **Table 5.13** below.

Table 5.13: Invasive and Non-native Fauna Species

Common Name	Scientific Name
Mammals	
American Mink	*Neovison vison*
Black Rat	*Rattus rattus*
Grey Squirrel	*Sciurus carolinensis*
Reeves' Muntjac	*Muntiacus reevesi*
Birds	
Barnacle Goose	*Branta leucopsis*
Canada Goose	*Branta canadensis*
Crane	*Grus grus*
Egyptian Goose	*Alopochen aegyptiaca*
Eurasian Eagle-Owl	*Bubo bubo*
Golden Pheasant	*Chrysolophus pictus*
Mandarin Duck	*Aix galericulata*
Red-Crested Pochard	*Netta rufina*
Ring-Necked Parakeet	*Psittacula krameri*
Ruddy Duck	*Oxyura jamaicensis*

Common Name	Scientific Name
Crustaceans	
Chinese Mitten Crab	*Eriocheir sinensis*
Crangonyx pseudogracilis	*Crangonyx pseudogracilis*
Demon Shrimp	*Dikerogammarus villosus*
Molluscs	
American Slipper Limpet	*Crepidula fornicata*
Asian Clam	*Corbicula fluminea*

Future Baseline

5.5.44 The baseline environment is not static and will exhibit some degree of change over time, with or without the Project in place. Therefore, when undertaking impact assessments, it is necessary to place any potential impacts in the context of the envelope of change that might occur naturally (i.e., in the absence of the Project) over the lifetime of the Project.

5.5.45 The future baseline will consider anticipated changes over the Project design life. The design life of the pipeline and HAGIs (including BVIs) is 40 years but it is anticipated that the actual life of the Project could extend well over 40 years, depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. The majority of ecological impacts will result from vegetation clearance and site operations during the construction and decommissioning phases. In contrast, during the operation and maintenance phase, impacts from maintenance activities are anticipated to be relatively minimal and primarily localised around the above ground infrastructure. Therefore, extending the lifespan of the pipeline and related infrastructure beyond 40 years will not affect the overall findings of the assessment. The future baseline will consider a worst-case scenario in terms of the Project design life.

5.5.46 Baseline ecological conditions could evolve in the future as a result of land use policy, environmental improvements and development pressures. There may also be some changes to the baseline over time as a result of natural variation and weather events, such as habitats becoming drier through progressive years associated with the warming climate.

5.5.47 Climate change is also predicted to result in complex changes to biodiversity, such as an alteration in the range and distribution of some species. The number, species, and distribution of invasive and non-native species is also likely to increase.

5.5.48 The above events and trends have the potential to alter the baseline conditions and will be considered where detailed, quantifiable information is available. This will take account of other, known developments in the local area, which are considered in the assessment of cumulative effects (see Cumulative Effects in **Section 5.7.13**). Where quantifiable information is not available, it has been assumed that the baseline conditions recorded to inform the assessment will remain largely unaltered given the lifetime of the Project.

5.5.49 Any potentially relevant changes to the baseline will be reviewed during the EIA process and, should any likely instances be identified, the implications will be considered on a case-by-case basis within the EIA. A description of the potential future baseline will also be provided in any future environmental reporting.

Further Data Collection to be Undertaken

5.5.50 Information from the data sources outlined in **Section 5.5.11** may be re-requested as needed, to ensure that new records are captured and that the most current and accurate data is used at critical stages of the development consent application process. This includes informing the preparation of the ES.

5.5.51 Any additional desk-based and field-based studies necessary to support and inform the application process are detailed in **Table 5.14**.

5.6 Assessment Methodology

5.6.1 The EIA will follow the overarching methodology outlined in **Chapter 4: The EIA Process**. While those principles provide the foundation for this assessment, this Chapter explains how they will be applied and, where necessary, adapted to address the specific requirements of Biodiversity assessment in the ES.

5.6.2 The assessment methodology for Biodiversity will be aligned with the standard industry guidance provided by principally by CIEEM, but also and other organisations such as IEA and BSI (see **Section 5.3** and **Table 5.1**). The assessment will be based on:

- The results of the desk-based study and field surveys. Whilst field surveys have not yet been undertaken prior to Scoping, the results will be provided through the consultation process and within the ES once completed;
- Relevant published information (for example, the ecology, status, distribution, and sensitivity to environmental changes of ecological features, where this information is available);
- Technical engagement with Natural England and other key consultees; and
- Professional knowledge of ecological processes and functions.

5.6.3 For each ecological feature to be scoped in, effects will be assessed against the predicted future baseline conditions during the construction, operation and maintenance, and decommissioning phases of the Project. Throughout the assessment process, findings on LSEs will be used to inform the need for any additional baseline data collection, the identification of embedded environmental measures and secondary mitigation to include in the Project or to deliver enhancements. Measures to comply with relevant policies and legislation will be included. The results of the assessment will influence the final Project design, including construction methods and timing.

5.6.4 For each LSE, the spatial extent of the assessment will encompass both the area occupied by the ecological feature in question, and the surrounding area likely to be influenced by Project related environmental changes. For

example, if part of a designated biodiversity site is located within the ecological area of impact, an assessment will be made of the effects on the designated site as a whole. For any protected or notable species occurring within an impact area where the Project has the potential to significantly affect them, the assessment will consider the entire area used by the affected individuals or species population, for example, foraging or breeding territories. The decision to look at affected individuals or species population is made on a case-by-case basis and depends on relevant legislation, best practice guidance, local populations and the mobility of individuals through the landscape.

5.6.5 For each ecological feature, the assessment will address the effects of construction and operation and maintenance in combination. As the Project progresses and more ecological data is collected (through desk-based study, field survey and/ or consultation), an ongoing scoping exercise will be undertaken to identify which ecological features have the potential to be significantly affected by the Project. Each scoped-in ecological feature will then be subject to further assessment work that addresses how it is likely to be affected by the Project.

Proposed Survey Methodology

5.6.6 Further baseline data collection will consist of a programme of desk based and field surveys as outlined in **Table 5.14** (following discussion and agreement from Natural England). This programme will be regularly reviewed in light of the results of the surveys, ongoing consultation and the evolution of the design of the Project.

5.6.7 Additional data sources will be obtained and reviewed at a later stage of the EIA. These data sources will be taken forward and used to inform the EIA. The most up to date standard guidelines will be used for surveys with the current references provided in the table. The future desk-study will follow best practice and recognised standards, with the Study Area buffer further tailored to adequately consider the ecological receptors and their potential connectivity across the local landscape. It will include the following, with distances measured from the draft Order Limits (the extent of the draft Order Limits will be set out in the ES):

- Designated sites (SPAs, Ramsar sites, SSSIs, NNRs, LNRs) with qualifying or special interest birds with very large home ranges, specifically pink-footed geese and other geese species, and records for these species up to 20 km from the draft Order Limits;
- Designated sites including SPAs, Ramsar sites, SSSIs, NNRs, LNRs and RSPB Reserves with qualifying or special interest that includes other wide-ranging birds, such as other wildfowl, gulls, cormorants, waders, herons and raptors, and records of these species, up to 10 km from the draft Order Limits;
- Designated sites (SACs, Ramsar sites, SSSIs, NNRs, LNRs) with qualifying or special interest comprising highly mobile species, specifically the Otter and Barbastelle Bat. Records and EPSL returns of the same species up to 6 km from the draft Order Limits;

- Designated sites (SACs, SSSIs, NNRs, LNRs) with qualifying or special interest comprising all other bat species. Records of the same species and EPSL returns for all other bat species up to 4 km from the draft Order Limits;
- All other designated sites, all other species records, European Protected Species licence returns for GCN, priority habitats, ancient woodland and ancient/ veteran trees up to 2 km from the draft Order Limits; and
- Designated sites and habitats which are connected hydrologically via surface water or groundwater to the Project, (and so the distance between them can vary).

5.6.8 Data collation will be expanded from that undertaken for the Scoping assessment to include also:

- Ancient and veteran trees, taking from the ancient tree inventory;
- Other taxonomic groups such as invertebrates, fish and plants;
- Other conservation designations (nationally rare etc.) as provided by the JNCC;
- The habitats and species listed as the qualifying/special interest of designated sites within the Zone of Influence of the Project; and
- Invasive non-native species.

5.6.9 The surveys detailed in **Table 5.14** will commence in 2026 to inform the assessment of LSE on ecological features. The proposed field survey programme is based on the results of the initial desk study, industry guidance and the nature of the Project and its likely impacts. The field surveys will not encompass the whole Scoping Boundary and respective parts of the Study Area; survey extents will instead be defined in accordance with relevant best practice and technical guidance for each survey type. This is because as the design evolves, the potential environmental changes will become refined allowing for a more targeted survey programme to take place to inform the Assessment. As such, baseline surveys will be carried out within an appropriate buffer of likely working areas along the pipeline network, once the pipeline corridor has been defined.

5.6.10 Data not available within the current scoping baseline Study Area (e.g. UK Habitat Classification mapping) will be added at the next stage of the assessment. Similarly, data currently within the scoping baseline Study Area will be excluded from assessment where it will lie outside of the draft Order Limits Study Area in the future. Data to be included in the next stage of the assessment will be collected according to the Study Areas outlined in **Table** 5.14**.**

Table 5.14: Additional Sources of Ecology and Nature Conservation Data.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
Further Desk Study focusing on the draft Order Limits Study Area (if required, to ensure the assessment is informed by a current desk-based data set in case of potential unforeseen changes routing).	Desk study parameters determined following guidelines in: • CIEEM (2020) Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK. Chartered Institute of Ecology and Environmental Management, Winchester. • Chartered Institute of Ecology and Environmental Management (CIEEM) (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition., Winchester. • CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater,	Standard methodology followed. Attainment and analysis of desk study data. Information to be used to guide the scope of further survey work as well as to inform the ecological impact assessment.	Any season. 2026 and/or 2027.	Designated sites (SPAs, Ramsar sites, SSSIs, NNRs, LNRs) with qualifying/special interest birds with very large home ranges specifically pink-footed geese and other geese species, and records for these species up to 20 km from the draft Order Limits). Designated sites including SPAs, Ramsar sites, SSSIs, NNRs, LNRs and RSPB Reserves with qualifying/ special interest that includes other wide-ranging birds, such as other wildfowl, gulls, cormorants, waders, herons and raptors, and migratory fish, and records of these species, up to 10 km from the draft Order Limits. Designated sites (SACs, Ramsar sites, SSSIs, NNRs, LNRs) with qualifying/special interest comprising highly mobile species, specifically otter and barbastelle bat. Records and EPSL returns of the same species up to 6 km from the draft Order Limits. Designated sites (SACs, SSSIs, NNRs, LNRs) with qualifying/special interest comprising all other bat species. Records of the same species and EPSL returns for all other bat species up to 4 km from the draft Order Limits. All other designated sites. All other species records, and European Protected Species licence returns for GCN. Habitats of Principal Importance, ancient woodland and ancient and veteran trees up to 2 km from the draft Order Limits.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
	Coastal and Marine version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester. Other species-specific guidelines, if available.			Designated sites and habitats which are connected hydrologically via surface water or groundwater to the Project, any distance.
Initial Habitat Mapping (Desk-based)	UKHab Ltd (2023) UK Habitat Classification Version 2.0	Assessment of habitat types using OS Mastermap Topography and OS Vector Map Local datasets. Mapping of all broad habitat types to include cropland, grassland, rivers and lakes (including ditches, streams and ponds), urban (including buildings), woodland (>25m^2), trees, hedgerows and shrub and sparsely vegetated land. Habitats mapped to Level 2, and Level 3 where possible.	Any season. Late 2025/ early 2026.	Within the Scoping Boundary
UK Habitat Classification Survey (Field-based)	UKHab Ltd (2023) UK Habitat Classification Version 2.0	Standard methodology followed. Classification of terrestrial and aquatic habitats. Habitats recorded to Level 4 and Level 5, where possible. Secondary codes used where necessary. The survey will be extended to consider the suitability of habitats to support protected and priority species.	May to September 2026 and 2027; other seasons possible. One visit to each habitat parcel. Data collected from more than one location where necessary (e.g. for larger or more complex habitat parcels)	Within the Order Limits

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
Important Hedgerow Assessment	Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London.	Standard methodology followed. Governed by the Hedgerow Regulations 1997. Survey to determines if a hedgerow has ecologically important using criteria including physical dimensions, species composition, structural features and connectivity. (A separate assessment is carried out to determine historical importance.)	May to September 2026 and/ or 2027. One visit to each hedgerow.	Within the draft Order Limits
Botany Survey	Rodwell, J.S. (2006) NVC Users' Handbook, JNCC, Peterborough, ISBN 978 1 86107 574 1.	National Vegetation Classification surveys of woodland, grassland and heathland habitats. Used to systematically identify, map, and assess plant communities. Surveys to be focussed on ecologically valuable habitats that are difficult to protect, enhance and create such as high distinctiveness and irreplaceable habitats and some priority habitats.	Mid-March to April 2026 and/ or 2027 for Woodland. June to July 2026 and/ or 2027 for Grassland. August to September 2026 and/ or 2027 for Heathland (if present). One visit to each habitat parcel.	Within the draft Order Limits; focus on ecological valuable habitats such as high distinctiveness and irreplaceable habitats (if present) and priority habitats.
Invertebrate Survey	Dobson, J.R. (2011). Phase I for Bugs? A Tested Methodology for Rapid Preliminary Assessment of Invertebrate Habitat Potential by Non-specialists. Presented at IEEM/Royal Entomological Society Conference: EIA and the Planning System - Will Insects Survive?	Use of habitat mapping and UK Hab data to evaluate associated habitats and resources, assemblage types and habitat fidelity scores. Broad habitat types and habitat information will also be assessed to identify the potential Species Assemblage Types (SATs) likely to be associated which are an indicator of Invertebrate Assemblages of Importance. Targeted field surveys will only be undertaken if the	May to September 2026 and/ or 2027. One visit to each habitat parcel to assess potential. If detailed surveys are undertaken, four survey visits at each site, spread through the survey season.	Within the draft Order Limits; habitats with potential to support protected and priority species, or important invertebrate assemblages only (if present).

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
	Dobson, J.R. and Fairclough, J. (2021). Rapid Assessments of the Potential Value of Invertebrate Habitats: Applications for Planning and Nature Conservation ('Phase I for Bugs'). In Practice 112; pp. 44-48. Buglife (2015) Good planning practice for invertebrates: surveys. Buglife, Peterborough. Drake C.M, Lott D.A, Alexander K.N.A and Webb J. (2007). Natural England Research Report NERR005 Surveying terrestrial and freshwater invertebrates for conservation evaluation. Natural England, Peterborough.	potential for important species assemblages is identified. Where this is the case, four survey visits will be undertaken at each site, spread through the survey season. The survey will focus on key groups of invertebrates.		
Habitat Suitability Index Assessment for Great Crested Newt	ARG UK Advice Note 5 (2010): Great Crested Newt Habitat Suitability Index Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus).	Standard methodology followed. Habitat suitability index considering 10 parameters including: waterbody location, waterbody area, waterbody drying, water quality, shade, presence of waterfowl, presence of fish; waterbody count; terrestrial habitat and macrophytes.	Ideally May to September 2026 and/ or 2027 to include macrophytes. Where surveyed outside this season, a precautionary approach will be taken to macrophyte scoring.	Ponds and suitable ditches within draft Order Limits and up to 250 m from the draft Order Limits.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
	Herpetological Journal 10(4), 143-155			
eDNA for Great Crested Newt	Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R. A., Foster, J., Wilkinson, J., Arnett, A., Williams, P., & Dunn, F. (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt Defra Project WC1067 Appendix 5. Oxford: Freshwater Habitats Trust	Standard methodology followed. Use of eDNA kits to take water samples around the edge of a waterbody.	April to June 2026 and/ or 2027.	Ponds and suitable ditches within draft Order Limits and up to 250 m from the draft Order Limits.
Reptile Habitat Suitability Survey (Desk based)	Brady, L.D. and Phillips. (2012) Developing a 'Habitat Suitability Index' for Reptiles. ARC Research Report 12/06.	Desk based assessment using UKHab survey data. Habitat suitability index considering 11 parameters: size of area, vegetation structure, sun exposure, aspect, topography, surface substrate, disturbance, connectivity to further habitat mosaics of potentially suitable habitat within 250m, prey abundance, hibernation habitat potential and refuge opportunities.	Following completion of UKHab dataset in 2026.	Within the draft Order Limits
Reptile Survey	Froglife (1999) Froglife Advice Sheet 10: reptile survey. Froglife, London.	Seven visits to survey for reptile presence/ absence using refugia, in suitable grassland habitats only (not arable field margins)	May to September 2026 and/or 2027.	Within the draft Order Limits, suitable grassland habitats only.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
			Seven visits in suitable weather conditions.	
Humber Estuary: Initial Wintering Bird Survey 2025/ 2026	Based on the non-breeding survey method prescribed within: Bird Survey & Assessment Steering Group. (2025). Bird Survey Guidelines for assessing ecological impacts, Natural England (2021): Passage and wintering bird surveys for functionally linked land associated with the Humber Estuary and/or Lower Derwent Valley designated sites (Version 1.1)	Counts of birds from pre-determined survey points. Survey conducted both from a vehicle and on foot. Focus on the Humber Region of the Study Area.	October 2025 to March 2026, with two visits undertaken per month at varying tidal states. The need for spring/ autumn passage surveys will be confirmed as results emerge.	The Scoping Boundary plus a buffer of 400 m, within 10 km of the Humber. Undertaken from publicly accessible areas.
Farmland Breeding Bird Surveys	Based on: British Trust for Ornithology (2025). Breeding Bird Survey methods	Transect surveys with 40% of route covered. A total of eight transects per 20 km which totals 60 transects across the entire route. Two visits per transect, based on temporary nature of impacts, homogeneity of habitat and reinstatement commitments.	Early April to late June 2026 or 2027.	Transects to follow the route alignment where possible and record species within 100 m of the transect, extending up to 250 m for any birds detected beyond 100 m.
Farmland Wintering Bird Survey 2026/ 2027	Based on: British Trust for Ornithology (2025) Winter Bird Survey Recording	Transect surveys with 40% of route covered. A total of eight transects per 20 km which totals 60 transects across the entire route. Two visits per transect, based on temporary	November 2026 to February 2027, within core winter period.	Transects to follow the route alignment where possible and record species within 100 m of the transect, extending up to 250 m for any birds detected beyond 100 m.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
		nature of impacts, homogeneity of habitat and reinstatement commitments.		
Bat Roosts – Preliminary Ground Level Tree Assessment	Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London. Mitchell-Jones, A.J. & McLeish, A.P. (2012) The Bat Workers' Manual. Pelagic Publishing, Exeter	Assessing a trees suitability to support roosting bats, including hibernation suitability, through inspection of potential roosting features.	Surveys can be conducted at any time of year, ideally November 2026 to March 2027 when there are no leaves on deciduous trees.	Within the draft Order Limits, plus 30 m either side.
Bat Roosts – Climb and Inspect Survey of Trees	Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London.	Preferred method for further survey of potential bat roosts. To be used where a tree is safe and accessible for climbing. A single visit to search to inspect potential roost features in trees with climbing or the use of equipment such as ladders. Within the draft Order Limits, plus 30 m Climb and inspect surveys used where tree is accessible and safe to climb.	May to September 2026 and/ or 2027.	Within the draft Order Limits, plus 30 m either side.
Bat Roosts - Emergence Survey of Trees	Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London.	An alternative survey method to be used where climb and inspect surveys are not possible. Up to three visits to a tree are required depending on the value of potential roosting features present.	May to September 2026 and/ or 2027 (with at least 2 out of 3 visits to any one tree conducted between May and August.	Within the draft Order Limits, plus 30 m either side.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
	Mitchell-Jones, A.J. & McLeish, A.P. (2012) The Bat Workers' Manual. Pelagic Publishing, Exeter			
Bat Activity – Automated Surveys	Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London. Mitchell-Jones, A.J. & McLeish, A.P. (2012) The Bat Workers' Manual. Pelagic Publishing, Exeter	Static bat detectors left in situ for a minimum of five consecutive nights per season (spring, summer and autumn) at hedgerows, ditches and other suitable habitat that is bisected by the route.	April to October 2026 and/ or 2027	Within the draft Order Limits
Water Vole and Otter Initial Habitat Suitability Assessment	Habitat preferences for both water vole and otter were adapted from those listed within The Water Vole Mitigation Handbook (Dean, M., Strachan, R., Gow, D., Andrews, R. (2016) The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Editors Matthews, F and Chanin, C. The Mammal Society, London).	An assessment of ditches, streams and ponds connected to watercourses for their potential to support water vole and otter. Aimed to focus the secondary presence/ absence surveys. To be undertaken in conjunction with the extended UK Hab survey.	Ideally, April to September 2026 and/ or 2027, although could be undertaken at any time of year.	Within the draft Order Limits, plus 250 m both upstream and downstream for bisected watercourses.
Water Vole Presence/ Absence Survey	Strachan, R., Moorhouse, T. and Gelling, M. (2011) Water Vole Conservation Handbook. 3rd Edition.	Standard methodology followed. Where accessible, both banks of a waterbody searched for water vole field signs. Two surveys undertaken	Mid-April to September 2026 and/ or 2027, with a focus on mid-April to the	Within the draft Order Limits, plus 250 m both upstream and downstream for bisected watercourses.

Study/ Survey	Guidance Reference	Methodology	Potential Timing of Study or Survey	Coverage of Study/ Survey
	WildCRU, University of Oxford	for those watercourses evaluated to offer good habitat suitability.	end of May and September.	
Otter Presence/ Absence Survey	Chanin, P. (2003) Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. English Nature, Peterborough.	Standard methodology followed. Where accessible, both bank of a waterbody search for otter field signs and habitat features. Two surveys undertaken for those watercourses evaluated to offer good habitat suitability.	Ideally, mid-April to the end of May, and September 2026 and/ or 2027, although could extend through summer months.	Within the draft Order Limits, plus 250 m both upstream and downstream where watercourses within the buffer zone are connected to watercourses within the draft Order Limits.
Badger Survey	Harris, S., Cresswell, P. & Jefferies, D.J. (1989). Surveying Badgers. The Mammal Society.	Standard methodology followed. Survey for evidence of badger including setts, foraging pits, footprints, dung pits or latrines and mammal paths. Where setts are encountered, the sett type (main, annexe, outlier, subsidiary) and status will be determined, if possible.	Any time of year in 2026 and/ or 2027, with a focus on autumn to early spring if possible.	Within the draft Order Limits, plus 30 m either side.

Significance Evaluation Methodology

Sensitive Ecological Receptors

5.6.11 The ecological features to be included in the assessment are those listed in **Section 5.7** plus any others that are determined to be important following the studies and surveys described in **Section 5.4.3.**

5.6.12 In the CIEEM methodology, ecological features are evaluated in accordance with a geographic scale, which is as follows (adapted from CIEEM):

- International and European;
- National (England);
- Regional (East Midlands);
- County (Lincolnshire, Nottinghamshire);
- River Basin District (Humber);
- Local (relevant local authority area);
- Site (not valued at the scales above but still contributing biodiversity within the draft Order Limits); and
- Negligible.

5.6.13 Therefore, each ecological feature identified in the baseline will be assigned a value in accordance with this scale.

Magnitude of Change

5.6.14 When describing significant effects on ecological features, whether these are beneficial or adverse, the following characteristics are used:

- Extent – the spatial or geographical area over which the environmental change may occur;
- Magnitude – the size, amount, intensity or volume of the environmental change;
- Duration – the length of time over which the environmental change may occur;
- Frequency – the number of times an environmental change may occur;
- Timing – the periods of the day/year/season during which an environmental change may occur; and
- Reversibility – whether the environmental change can be reversed through restoration actions or regeneration.

5.6.15 Magnitude may either be described as a beneficial or adverse change.

Table 5.15: Definitions of Magnitude of Change for Biodiversity.

Magnitude	Description
High	The change permanently (or over the long-term) affects the conservation status of a habitat/ species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/ species population, a large

Magnitude	Description
	area of habitat or large proportion of the wider species population is affected. For designated sites, integrity is compromised. There may be a change in the level of importance of the ecological feature in the context of the Project.
Medium	The change permanently (or over the long term) affects the conservation status of a habitat/ species reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/ species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a change in the level of importance of this ecological feature in the context of the Project.
Low	The quality or extent of designated sites or habitats or the sizes of species' populations, experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability, and they are not expected to result in any permanent change in the conservation status of the species/ habitat or integrity of the designated site. The change unlikely to modify the evaluation of the ecological feature in terms of its importance.
Very Low	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats/ species, ecological features or the integrity of designated site.
Negligible	A change, the level of which is so low, that it is not discernible on designated sites or habitats or the size of species' populations, or changes that balance each other out over the lifespan of a project and result in a neutral position.

Significance of Effect

5.6.16 CIEEM defines a significant effect as one *"that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general"*. This definition will therefore be applied to the assessment of effects for biodiversity. Conservation objectives include broad objectives for biodiversity and specific objectives for designated sites, European protected species and birds. They include those set out in legislation and national and local nature conservation policy.

5.7 Scope of the Assessment

5.7.1 The approach to EIA follows the principles set out in **Chapter 4: The EIA Process**. This Chapter outlines how those principles will be applied and, where necessary, adapted to address the specific requirements of Biodiversity assessment.

Key Receptors

5.7.2 The key receptors (important Ecological Features that have been identified with potential for LSE) within the Biodiversity Study Areas and that are set out in the Baseline (**Section 5.5**) will be as follows (if present):

- Statutory designated sites and the qualifying/special interest features of those designations (including SACs, SPAs, Ramsar, SSSIs, NNRs and LNRs);
- Non-statutory designated sites (including Wildlife Trust and RSPB Reserves and Local Wildlife Sites);
- Habitats listed in Annex I of the Habitats Directive where these occur outside SACs;
- Section 41 Priority Habitats, Nottinghamshire Biodiversity Action Plan (BAP) Habitats and Lincolnshire Biodiversity Action Plan Habitats;
- Important hedgerows;
- Ancient woodland, and ancient and veteran trees;
- Rivers and streams;
- Populations of rare arable weeds, and protected, priority and other plants with a conservation designation.
- Populations of protected and priority mammal species including bats, badger, otter, water vole, brown hare, hedgehog and harvest mouse;
- Wintering, migrating and breeding bird populations and assemblages;
- Populations of protected and priority amphibian species;
- Populations of protected and priority reptile species;
- Fish populations;
- Populations of protected, priority and other invertebrates with a conservation designation and notable invertebrate assemblages; and
- Invasive, non-native species of flora and fauna.

5.7.3 The key receptors (Important Ecological Features) will be those identified within the Study Area, for which there is an impact pathway between the Project and the receptor.

5.7.4 In addition, the LSEs of the Project on biodiversity overall will be described.

Mitigation Commitments

5.7.5 As part of the early Project design process, several primary commitments are proposed to avoid and reduce the potential for effects through the Project design evolution. These commitments are considered to be embedded mitigation inherent to the Project design.

5.7.6 In addition, a range of tertiary commitments would be implemented through legislative requirements or standard industry practice. These commitments are proposed to eliminate or reduce (where avoidance is not possible) the potential for effects on the environment.

5.7.7 Further detail on the role of Mitigation Commitments, as part of a proportionate EIA approach, is provided within **Chapter 4: The EIA Process**. A full description of the Mitigation Commitments identified so far is provided in **Appendix 4A: Draft Register of Environmental Actions and Commitments (REAC)**. Mitigation Commitments will be secured by

requirements in the DCO or in relevant management plans which would also be secured by requirements within the DCO. Those of relevance to Biodiversity which have been identified at this stage in the process are described in **Table 5.16**.

5.7.8 Additional Mitigation Commitments will be identified through the EIA process as required and will be taken into account when looking at residual effects.

Table 5.16: Relevant Commitments to Biodiversity

ID	Commitment Proposed	Description
Comm G-01	Construction Environment Management Plan (CEMP)	The DCO application will include an outline CEMP, that will outline the construction related environmental measures to be applied during construction of the Project, including details of any mitigation and how it will be managed through the construction phase. Approval of a final version of the CEMP prior to the commencement of construction will be controlled via a Requirement in the draft DCO. The purpose of the outline CEMP will be to set out the measures which will be taken to manage the potential adverse environmental impacts of the construction of The Project and limit the disturbance from construction activities such as site preparation, material delivery and removal, works activities and site reinstatement as far as is reasonably practicable.
Comm Ec-02	Vegetation Removal	Vegetation, including riparian vegetation, would be retained where possible. Suitable methods will also be used to ensure features with potential to support legally protected species are removed sensitively.
Comm Ec-03	Habitat Connectivity	Maintaining habitat connectivity: Habitat connectivity would be retained wherever possible by maintaining links within and to green corridors such as hedgerows and watercourses.
Comm Ec-04	Habitat Reinstatement	Habitat and land reinstatement: All land disturbed as part of the construction phase and thereafter not required as part of the Project during operation , will be reinstated to its existing land use where appropriate and practicable' as soon as possible following the completion of construction in each area.
Comm Ec-05	Habitat Reinstatement	Wherever possible, areas of temporary habitat loss will be reinstated back to the type of habitat affected.
Comm Ec-06	Habitat Reinstatement at watercourse crossings	Habitat will be re-instated to pre-works condition or better following the removal of temporary bridges and culverts.
Comm Ec-07	Construction Traffic Speed Limits	Construction traffic speed limits: Speed limits will be imposed on all construction haul roads and access tracks (not public highways) to minimise the risk of road traffic collisions with fauna such as badgers, otters, bats, barn owls and reduce dust impacts.
Comm Ec-08	Pre-Construction ecology surveys	Pre-construction update surveys: pre-construction update surveys will be undertaken for designated sites, protected, priority and notable species and habitats where relevant and necessary.

ID	Commitment Proposed	Description
Comm Ec-09	Screening of pumps	Screening of pumps: Where pumping, intakes will be screened with a suitably sized pump guard screen to avoid the entrapment of fauna.
Comm Wt-15	Management of subsurface flow pathways	All subsurface infrastructure will be designed to minimise disruption to existing subsurface flow pathways to avoid any localised increases in groundwater flooding risk and changes to the availability of water resources.
Comm Wt-16	Timing of works	Pipeline construction is generally focused on the spring and summer months (March to September). The works for trenchless crossings, pipelines in roads and construction of HAGIs or BVIs may occur outside the typical pipelaying season and throughout the year.
Comm Wt-17	Diversion and reinstatement of existing drainage networks	To minimise impacts on surrounding agricultural land particular care will be taken to ensure that the existing land drainage regime is not compromised as a result of construction. . If required, any damage will be repaired and existing drainage reinstated such that existing drainage regimes will not be compromised. Existing land drainage systems will be maintained and diverted as necessary during construction and reinstated on completion.
Comm Wt-18	Refueling, inspection and maintenance	Plant and machinery used during the construction and operation phases will be maintained to minimise the risks of oils leaks or similar. Drip trays will be available when re-fuelling plant and machinery and the availability of spill kits will contain small spillages in line current legislation
Comm Aq-22	Avoiding sensitive sites	Where practical, sensitive sites will be avoided when siting temporary construction compounds and permanent project infrastructure. Sensitive sites to be considered include European Sites, SSSIs, Ancient Woodland, Local Nature Reserves, Local Geological/ Geodiversity Sites, Listed Buildings, Scheduled Monuments and areas of potential contamination.
Comm Aq-23	Best practice air quality management measures	Best practice air quality management measures will be applied as informed by IAQM guidance on the Assessment of Dust from Demolition and Construction.
Comm Gr-27	Unexpected contamination protocol	Prior to construction, an unexpected contamination protocol will be developed in line with Environment Agency 2023 guidance (Land Contamination Risk Management ((LCRM)) to minimise the potential risks to human health, ecological receptors and controlled waters from any unexpected ground contamination. The protocol will take into account the requirements for risk assessment, the use of Personal Protective Equipment (PPE) and adoption of best practice methods during construction.
Comm Gr-28	Hydrocarbon contamination	In areas where there is a potential for hydrocarbon residues from run-off/ isolated leakages, surface water drainage measures included in the CEMP will be provided to capture hydrocarbons prior to discharge, for example use of hydrocarbon interceptors.

ID	Commitment Proposed	Description
Comm Gr-29	Drilling Fluids	Environmentally hazardous drilling fluids, or those containing groundwater hazardous substances, will not be used during trenchless crossings.
Comm Sa-31	Trenchless Crossings	Where appropriate major crossings of rivers/ canals, large IDB drains, major roads (primarily A Road and Motorways),rail crossings, buried high voltage cables, gas pipelines and other sensitive environmental constraints will typically be constructed using trenchless techniques, in agreement with third party asset owners whereas for more minor crossings (such as minor roads or smaller watercourses) open cut crossings would typically be employed. The crossing methodology will be assessed on a case by case basis.
Comm Ec-50	Avoidance of ponds	During construction, ponds will be avoided through route amendments, trenchless crossings or micro-siting of the pipeline working area, access and TCCs where practical.
Comm G-51	Decommissioning Plan	A Decommissioning Plan will be developed prior to decommissioning in accordance with the latest available guidance and legislation. The Plan will consider the potential for below ground infrastructure to remain in-situ where appropriate. Decommissioning activities will include measures to mitigate flood risk, prevent pollution, and minimise ground disturbance. The decommissioning plan will set out management measures to ensure activities that are undertaken are ALARP and remaining decommissioned assets are left in a safe condition.
Comm Nv-52	Noise and Vibration Management Plan	All construction work will be undertaken in accordance with a Noise and Vibration Management Plan (NVMP) secured as part of the CEMP. An outline NVMP will be provided with the application for development consent, either within the outline CEMP or as a management plan supporting the outline CEMP, that sets out the principles to be followed when the final NVMP is finalised.
Comm G-56	Materials Management Plan	All construction work will be undertaken in accordance with a Materials Management Plan (MMP) included as part of the CEMP. An outline MMP will be provided with the application for development consent, either within the outline CEMP or as a management plan supporting the outline CEMP, that sets out the principles to be followed when the final MMP is finalised. The outline MMP will set out the principles where excavated non-waste materials will be reused. The MMP will also include measures to minimise waste generation and ensure compliance with waste duty of care, licensing, and carrier registration requirements.
Comm Gc-57	Pollution Prevention and Emergency Incident Response Plan	All construction work will be undertaken in accordance with Pollution Prevention and Emergency Incident Response measures that will be included within the CEMP.
Comm Gc-60	Artificial Light Emissions Plan	All construction work will be undertaken in accordance with an Artificial Lighting Management Plan (ALMP) secured as part of the CEMP. An outline ALMP will be provided with the application for development consent, either within the outline

ID	Commitment Proposed	Description
		CEMP or as a management plan supporting the outline CEMP, that sets out the principles to be followed when the final ALMP is finalised. Where appropriate, the lighting design will account for the potential effects on ecology by taking measures to minimise lighting usage, minimise light spill (e.g., through use of shield lights), and locate lighting in the most appropriate locations. The principles of lighting design will be detailed at the time of application and informed by current and relevant guidance such as the Bat Conservation Trust and Institution of Lighting Professionals Guide to Artificial Lighting at Night (BCT and LLP, 2023).
Comm Ec-61	Invasive Non-Native Species Management Plan	All construction work will be undertaken in accordance with Invasive Non-Native Species Management Plan (INNSM) measures that will be included within the CEMP. These will set out the principles to be followed when the final CEMP is finalised The CEMP will set out measures for invasive species control and biosecurity measures to avoid the spread of non-native invasive species and infested materials will be applied, in accordance with Natural England, Environment Agency, Defra (2022) guidance.
Comm LV-62	Landscape and Ecological Management Plan	The application will include a strategy and proposals for managing measures to avoid, reduce, mitigate or compensate for potential impacts on landscape and biodiversity resources and measures intended to provide biodiversity benefit during construction and operational phases of the Project. This information will be presented within either a combined Landscape and Ecology Management Plan, or separate plans for Landscape and Visual and Biodiversity aspects. These will cover both construction and operation and maintenance aspects of the Project, and include management and monitoring to check all mitigation planting survives to fulfil its landscape, visual and biodiversity role.

Likely Significant Effects

5.7.9 A range of potential impacts on ecological receptors and biodiversity have been identified from the desk- based review undertaken for Scoping, which may occur during the construction, operation and maintenance and decommissioning phases of the Project.

5.7.10 The potential impacts that have been identified as having the potential for a LSE at this time, and which are scoped into the assessment, are outlined in **Table 5.17.** The potential for LSEs has been identified on the basis that primary and tertiary Mitigation Commitments have been applied.

Table 5.17: Impacts Proposed to be Scoped in to the Project Assessment for Biodiversity (Project Phase Refers to Construction (C), Operation and Maintenance (O&M) and Decommissioning (D)).

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
BIO-01	Introduction and spread of non-native species.	C; D	Comm Ec-61	All infrastructure	The movement of construction machinery, vehicles, and personnel can spread invasive, non-native species of flora and fauna in both aquatic and terrestrial habitats and could result in habitat degradation and changes in food availability.
BIO-02	General noise and vibration causing disturbance and displacement.	C; D	None applied	All infrastructure	The movement of construction machinery, vehicles, and personnel, and other construction activity can cause noise/ vibration and subsequent disturbance to species and could result in changes in food availability. Testing of pipeline prior to commissioning may also cause noise and vibration.
BIO-03	Noise and vibration causing disturbance and displacement in aquatic habitats due to using trenchless techniques under watercourses.	C; D	None applied	All infrastructure	Trenchless techniques can cause noise and vibration in aquatic environments and subsequent disturbance to habitats and species, including changes in food availability. Testing of pipeline prior to commissioning may also cause noise and vibration.
BIO-04	Construction dust impacts on biodiversity.	C; D	Comm Aq-22 Comm Aq-23	All infrastructure	Construction activities may contribute to airborne particulate matter and fugitive dust. The deposition of fugitive dust has the potential to cause adverse effects on e.g. designated sites, priority habitats and protected / priority species, including habitat degradation and changes in food availability.
BIO-05	Air pollution from construction	C; D	Comm Aq-22 Comm Aq-23	All infrastructure	Construction vehicle and machinery emissions may contribute to increased emissions of the pollutants,

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
	vehicles and machinery impacts on biodiversity.				PM10, PM2.5 and NO2 which has the potential to cause ecological impacts on e.g. designated sites, priority habitats and protected/ priority species, including habitat degradation and changes in food availability.
BIO-07	Changes in water quantity (hydrological regime) e.g. ground water dependent terrestrial ecosystems.	C; O&M, D	Comm Wt-15 Comm Wt-17	All infrastructure	Changes to surface water runoff patterns which could directly or indirectly affect surface hydrology and flooding. Construction activities such as trenching, soil stripping, and installation of drainage systems can alter local hydrology, leading to changes in groundwater levels and soil moisture regimes. Changes in water quantity can affect biodiversity, including habitats, designated sites, species populations, potentially resulting in habitat degradation and changes in food availability.
BIO-08	Changes in watercourse hydromorphology arising from watercourse crossings and sedimentation.	C	Comm Ec-02 Comm Ec-06 Comm Wt-15	Watercourse crossings where trenchless techniques not used	Modification of watercourses and sedimentation can change river and stream hydromorphology with effects on aquatic biodiversity, potentially resulting in habitat degradation.
BIO-09	Permanent habitat loss and damage.	C; D	Comm Ec-02 Comm Ec-04 Comm Ec-05 Comm Ec-06 Comm Ec-08	HAGIs and BVIs	Site clearance and subsequent construction of HAGIs and BVIs will result in permanent loss of habitats and reduce food availability for e.g. protected and priority species.
BIO-10	Temporary habitat loss and damage.	C; D	Comm Ec-02 Comm Ec-04 Comm Ec-05 Comm Ec-06	All infrastructure	Site clearance and site activities e.g. vehicle, machinery and people movements during the installation of the pipeline can cause temporary habitat loss and temporary or permanent damage to habitats, including soil

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
			Comm Ec-08		compaction, erosion and degradation. May reduce food availability.
BIO-11	Habitat fragmentation, i.e. splitting a habitat parcel into two or more parts, during construction.	C	Comm Ec-03 Comm Ec-04 Comm Ec-05	All infrastructure	The creation of temporary working widths, access tracks, and temporary construction compounds along the pipeline corridor may (temporarily) fragment habitat parcels, such as grasslands, reducing the number of species supported in each part and reducing their resilience to existing pressures and construction related impacts. Could result in habitat degradation and changes in food availability.
BIO-12	Habitat and species isolation, i.e. reducing connections between habitat parcels and species populations, and impeding animal movements, during construction.	C	Comm Ec-03 Comm Ec-04 Comm Ec-05	All infrastructure	The creation of temporary working widths, access tracks, and temporary construction compounds along the pipeline corridor may (temporarily) isolate habitats by severing linear features, such as hedgerows, field margins, and riparian zones, that connect them. Similarly, it may (temporarily) isolate two populations of the same species, preventing interchange of individuals. Fencing and physical barriers associated with construction sites may impede the movement of individuals between their breeding, foraging, and refuge habitats.
BIO-13	Injury, death, disturbance of e.g. protected and priority species.	C; D	Comm Ec-02 Comm Ec-08 Comm Wt-16	All infrastructure	Site activities (e.g. vegetation clearance) can lead to the direct mortality and disturbance of, for example, protected and priority species.
BIO-14	Pollution of waterbodies and watercourses with adverse	C	Comm G-01 Comm Wt-18 Comm Gr-27 Comm G-56	All infrastructure	Reduction in water quality. Construction activities such as soil stripping, excavation, and stockpiling within the pipeline working width and temporary compounds can expose bare ground, increasing the risk of sediment-laden run-off during rainfall events. If uncontrolled, this

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
	effects on biodiversity.		Comm Gr-28 Comm Gr-29 Comm Sa-31		run-off can enter adjacent watercourses, ponds, and drainage systems, elevating turbidity and depositing fine sediments that smother aquatic habitats. This can reduce oxygen availability, impair fish spawning grounds, and disrupt macroinvertebrate communities, leading to a decline in water quality and ecological function. The risk is heightened near trenchless crossing sites where slurry or drilling fluids may also contribute to pollution if containment fails. Could result in habitat degradation and changes in food availability.
BIO-15	Loss of roosting, breeding (including nest sites), foraging, hibernating or resting sites.	C; D	Comm Ec-02 Comm Ec-04 Comm Ec-05 Comm Ec-06 Comm Ec-08	All infrastructure	Construction of the pipeline and associated infrastructure will require clearance of vegetation, removal of trees, hedgerows, and ground cover, as well as soil stripping and excavation within the working width and temporary compounds. These activities can result in the loss of roosting sites for bats, resting sites for otter, breeding areas (including nest sites) for birds and amphibians, foraging grounds for mammals and invertebrates, and hibernation sites for reptiles and amphibians.
BIO-16	Light pollution arising from construction or security lighting used at working areas with adverse effects on biodiversity.	C; D	Comm Gc-60	Above ground infrastructure, including temporary construction compounds, trenchless crossing sites, HAGI and BVI locations.	Lighting can spill onto adjacent habitats, altering natural light regimes. Artificial illumination can disrupt nocturnal species such as bats, moths, and other invertebrates by affecting foraging behaviour, navigation, and predator-prey dynamics. It may also disturb roosting birds and mammals, reducing habitat suitability. Continuous or high-intensity lighting during night-time works exacerbates these impacts. Operational phase impacts scoped out as HAGIs and BVIs would generally be unlit except during maintenance or potential breakdown/emergency requirements, which would use temporary directional task lighting. Could

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
					result in habitat degradation and changes in food availability.

Impacts Proposed to be Scoped Out

5.7.11 On the basis of the baseline information currently available, the Project Description outlined in **Chapter 2: The Project**, and the good practice Mitigation Commitments outlined in **Table 5.16**, potential impacts which are unlikely to result in LSE are proposed to be scoped out of the assessment. These effects are presented in **Table 5.18** with justification for why they should be scoped out, plus where relevant reference to the Mitigation Commitments which will be applied. This approach aligns with NSIP - Advice Note Seven: Environmental Impact Assessment (PINS, 2020) as described in **Chapter 4: The EIA Process**.

Table 5.18: Impacts Proposed to be Scoped Out of the Project Assessment for Biodiversity.

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Justification
BIO-04	Shading of vegetation can cause changes in species composition.	O&M	None applied	All above ground infrastructure	Scoped out because all above ground infrastructure outlined in **Chapter 2: The Project** are limited in height, located away from watercourses and will have safety zone around them separating equipment from surrounding vegetation. The rest of the infrastructure is below ground.
BIO-17	Designated sites, ancient woodlands, priority habitats where there is no impact pathway.	C; O&M; D	None applied	All infrastructure	Designated sites, ancient woodlands, Annex I habitats and priority habitats without an impact pathway will be scoped out of the assessment. This will include those outside the zone potentially affected by noise, vibration, light and dust arising from construction activity and which are not hydrologically or ecologically connected to the construction corridor and do not have mobile species as qualifying/special interest. Hydrological and ecological connections and the range of the relevant mobile species will be carefully examined for sites and habitats further away and scoped out if no connection exists.
BIO-18	Permanent habitat loss and damage.	C; O&M; D	None applied	Pipeline marker posts	Pipeline marker posts will require only a very small above-ground footprint during operation. While occasional vegetation management may be required to maintain visibility, such activities would be infrequent and could be confined to a localised area.

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Justification
BIO-19	Habitat and species isolation, i.e. reducing connections between habitat parcels and species populations, and impeding animal movements, during decommissioning.	D	Comm G-51	All infrastructure	It is assumed that the buried pipeline will be left in situ at decommissioning, with only the above-ground infrastructure removed. These above-ground structures are located within the centre of large arable fields and therefore loss of habitat connectivity or species isolation is unlikely. Their removal will not fragment habitats or impede species movement. As such, no loss of habitat connectivity or species isolation is anticipated.

Cumulative Effects

5.7.12 **Chapter 4: The EIA Process** details how potential cumulative effects will be assessed through a Cumulative Effects Assessment (CEA) and gives examples of the projects, which are likely to be included in that assessment.

5.7.13 Significant cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time, concentrated in a location or affect the same receptor such as a designated site.

5.7.14 For example, cumulative effects may occur when habitat loss or fragmentation from proposed or consented (but not yet constructed) schemes affect the same habitat types as the Project. Similarly, when multiple projects act in combination with the Project, they have the potential to significantly increase pollution, noise and human activity. Together, these pressures may result in a cumulative impact on biodiversity.

Intra-Project Effects

5.7.15 The assessment of intra-project effects from multiple impacts from the construction, operation/ maintenance or decommissioning of the Project, will be considered for Biodiversity. It will include consideration of project lifetime effects and receptor led effects in line with the approach outlined in **Chapter 4: The EIA Process**.

Secondary Effects

5.7.16 Secondary effects are effects on one receptor group that may influence another receptor group. Potential secondary effects between Biodiversity receptors and the following sections will be reviewed, and a qualitative assessment (drawing on expert judgement) will be undertaken if deemed necessary and presented in the EIA:

- The availability of water and its quality have a profound effect on terrestrial and aquatic ecosystems. The assessment of water quality and quantity is presented in **Chapter 7: Hydrology, Hydrogeology and Flood Risk**.
- Changes to landscape character and visual features may indirectly influence biodiversity. For example, the removal or alteration of landscape elements such as woodland, hedgerows or vegetative screening may reduce habitat connectivity or expose species to increased disturbance. The landscape and visual assessment is presented in **Chapter 8: Landscape and Visual**.
- Air pollution (such as dust deposition and vehicle emissions) generated by the Project have the potential to adversely affect flora and fauna health and the composition of vegetation communities. These effects may result in long-term impacts to local wildlife and biodiversity. The air quality assessment is presented in **Chapter 9: Air Quality**.
- Construction noise could disturb wildlife, particularly during sensitive periods such as breeding or nesting. The cumulative effect of noise, combined with habitat disruption, may result in more significant impacts on

local ecosystems and biodiversity. The noise and vibration assessment is presented in **Chapter 10: Noise and Vibration**.

- Construction traffic from road traffic movements generated by the Project has the potential to affect the local wildlife and biodiversity. An increase in traffic movement can result in habitat isolation and adversely affect wildlife movement patterns. The traffic and transport assessment is presented in **Chapter 11: Traffic and Transport**.
- Disturbance of soils and underlying geology, including the mobilisation of historic contamination, may result in pollutants entering soil or water pathways, posing risks to habitats and species. Ground instability or soil compaction can also affect the viability of habitats. Consideration of these risks is presented in **Chapter 12: Ground Conditions**.
- Soil degradation, loss, or compaction associated with construction activities can reduce soil quality, affecting the suitability of land to support habitats and species. Changes in soil structure or nutrient content may influence vegetation communities and, indirectly, the wildlife they support. These aspects are considered in **Chapter 13: Agriculture and Soil Resources**.
- Major incidents that could result in the accidental releases of contaminants, fires, or extreme events, could have secondary consequences for ecological receptors. These potential impacts are considered in **Chapter 15: Major Accidents and Disasters**.
- The Project's greenhouse gas emissions and potential climate-related effects may influence biodiversity receptors over the longer term. Climate-related changes such as altered temperature regimes, increased frequency of extreme weather events, or changes in hydrological conditions could affect species resilience and habitat suitability. These potential impacts are discussed in **Chapter 16: Climate Change**.

Transboundary Effects

5.7.17 There is the potential for transboundary effects on ecological receptors, specifically on highly mobile species such as migratory birds that breed or overwinter abroad.

5.7.18 Designated sites or habitats that have the potential to support a large population of migratory birds within the Study Area will be fully assessed within the EIA. Data gathered during the desk-based study and the field studies will inform this assessment. The potential impacts of all stages of the Project on these species will then be scoped in or out of the EIA.

5.7.19 It is anticipated that such impacts will be avoided through careful infrastructure placement and mitigation measures set out in **Table 5.16**.

5.8 Conclusion

5.8.1 The Biodiversity Scoping Chapter has provided an overview of the legislative and policy background for the Project, as well as setting out the principal

guidance and ecological survey methodologies which will be adopted to inform the Biodiversity ES Chapter.

5.8.2 The Study Areas used in this Scoping Chapter have been defined based on the geographical extent over which the Project is likely to result in significant ecological and ornithological impacts. The Study Areas include the Scoping Boundary plus 10 km for international and statutory designated sites, the Scoping Boundary plus 2 km for non-statutory sites, priority habitats, protected and notable flora and fauna species and invasive non-native species, and the Scoping Boundary itself for broad habitat mapping.

5.8.3 As the Project design develops and the draft Order Limits are defined, the Study Areas will be adapted to include 20 km, 10 km, 6 km, 4 km, 2 km and within the draft Order Limits boundaries.

5.8.4 Biodiversity receptors within the Scoping Study Areas have been identified using desktop analysis, review of relevant data sets from various sources including records centres, online resources and local plans, and review of aerial photographs.

5.8.5 The Biodiversity receptors scoped in to the assessment include statutory and non-statutory designated sites with an impact pathway, priority habitats with an impact pathway, and protected and notable flora and fauna species.

5.8.6 The identification of Biodiversity receptors will be further refined through consultation, additional desktop data and data collected through field surveys during 2026 and 2027.

5.9 References

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460000 480000 500000 520000 540000

420000 400000 380000

Humber Estuary SPA

Humber Estuary SAC

Humber Estuary Ramsar

Birklands & Bilhaugh SAC

N

0 10 20

Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 10 km Buffer
- Special Protection Area (SPA)
- Ramsar
- Special Area of Conservation (SAC)
- National Nature Reserve (NNR)
- Sites of Special Scientific Interest (SSSI)
- RSPB Reserve
- Local Nature Reserve (LNR)

NOTES

Nationally Designated Sites are not Labelled due to Scale

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

STATUTORY DESIGNATED SITES AND RSPB RESERVES

FIGURE 5.1

Scale: 1:320,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0059.0 Ornithology Designated Sites

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510000 515000 520000 525000

420000

415000

LWS361
LWS943
LWS163
LWS695
LWS933
LWS721
LWS126
LWS666
LWS950
LWS414
LWS465
Section A
Section B
LWS4826
LWS4827
LWS4828
LWS745
LWS747
LWS3230
LWS766
LWS117
LWS675
LWS676
LWS746
LWS4830
LWS515
LWS512
41687
41686
LWS299
LWS659
LWS298

0 2.5 5
Kilometres

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- Local Wildlife Site (LWS)

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Coastal Saltmarsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Calcareous Grassland
- Lowland Fens
- Lowland Meadows
- Mudflats
- Ponds
- Reedbeds
- Reedbeds, Coastal Saltmarsh
- Saline Lagoons
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION A

FIGURE 5.2a

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0042.0 Local Des and Ecological Features

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495000 500000 505000 510000

415000

410000

402.064333,00001.0042.0 Local Des and Ecological Features

LWS951 LWS721 LWS4165 LWS4166 LWS4160 LWS4826 LWS4827 LWS4828 LWS685 LWS673 LWS946 LWS939 LWS940 LWS938 LWS266 LWS969 LWS1017 LWS4407 LWS255 LWS252 LWS250 LWS258 LWS254 LWS944 LWS569 LWS256 237010 245427 246316 246317 LWS4158 LWS494 LWS253 LWS327 LWS515 LWS4159 LWS512 LWS323 LWS34 LWS117 253567 253569 253571 253572 LWS952 LWS689 LWS52 LWS4647 LWS49 LWS276 LWS277 215755 215727 210379 260891 LWS806 LWS423 LWS1055 LWS570 LWS267 LWS339 LWS4156

Clapgate Pits

Section A
Section B

Roxby Carrs, Saxby All Saints, Saxby Wold, Bonby Carrs, Appleby, Appleby Carrs, Worlaby, Worlaby Carrs, Elsham Wolds, Broughton, Broughton Carrs, Wrawby, Wrawby Moor, Brigg, Barnetby le Wold, Kirmington, Great Limber, Scawby, Scawby Brook, Hibaldstow, Howsham, Owmby, Grasby, North Kelsey, North Kelsey Moor, Humberside International Airport

0 2.5 5
Kilometres

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- Local Wildlife Site (LWS)
- Wildlife Trust Reserve

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Calcareous Grassland
- Lowland Dry Acid Grassland
- Lowland Fens
- Lowland Heathland
- Lowland Meadows
- Purple Moor Grass and Rush Pastures
- Reedbeds
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION B

FIGURE 5.2b

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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485000 490000 495000 500000

410000 405000

N

LWS4108 LWS4153 LWS4484 LWS4336 LWS685 LWS673 LWS4739 LWS302 Clapgate Pits LWS946 LWS939 LWS938 141862 LWS122 LWS647 LWS940 LWS266 LWS969 LWS1017 LWS15 LWS767 LWS4407 LWS406 LWS915 LWS116 LWS106 LWS52 LWS4647 LWS689 LWS49 LWS276 LWS277 LWS806 LWS955 LWS407 LWS79 LWS4155 LWS121 LWS339 LWS518 LWS519 Messingham Sand Quarry LWS520 LWS4156 274117 Section B Section C LWS657 LWS937 LWS177 LWS945 LWS169 LWS4213 LWS4756 LWS468 Scotton Common LWS466 LWS4214 LWS4212 LWS692 LWS211 LWS469

253567 253569 253571 253572 LWS952 215755 215727 210379 260891 LWS570 LWS267

0 2.5 5 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- Local Wildlife Site (LWS)
- Wildlife Trust Reserve

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Coastal Saltmarsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Calcareous Grassland
- Lowland Dry Acid Grassland
- Lowland Fens
- Lowland Heathland
- Lowland Meadows
- Mudflats
- Ponds
- Purple Moor Grass and Rush Pastures
- Reedbeds
- Reedbeds, Coastal Saltmarsh
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION B TO SECTION C

FIGURE 5.2c

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0042.0 Local Des and Ecological Features

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480000 485000 490000 495000

395000

390000

LWS692
Scotton Common
LWS211
LWS469
LWS872
LWS70
LWS717
LWS875
LWS44
LWS472
LWS138
LWS802
LWS629
LWS4102
235744
235745
LWS826
LWS4746
LWS4767
260460
260454
260456

N

0 2.5 5
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- RSPB Reserve
- Local Wildlife Site (LWS)
- Wildlife Trust Reserve

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Calcareous Grassland
- Lowland Dry Acid Grassland
- Lowland Fens
- Lowland Heathland
- Lowland Meadows
- Mudflats
- Purple Moor Grass and Rush Pastures
- Reedbeds
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION C

FIGURE 5.2d

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0042.0 Local Des and Ecological Features

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475000 480000 485000 490000

380000

375000

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LWS811 LWS809 LWS548 LWS810 LWS807

256278 256230 256231 256285 256286 256284 256287

233165

1/94 2/653 5/141 5/143 5/139 5/142 5/137 2/654 5/140 2/837

2/655 2/486

2/656 226178 5/133 5/3437 5/2171 226171 Section C Section D

2/835 5/319 2/836 2/652 5/138

LWS4109 LWS758 LWS293 LWS429

5/2227 2/444 5/2170 1/87 2/832 5/134 2/834 5/2262 5/205

5/2332 5/396 2/830 5/3468

2/613 2/482 2/651 2/831 1/88 Spalford Warren Houcham

5/167 5/166 2/799 5/201 5/2228 2/825 5/200

0 2.5 5 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- Local Wildlife Site (LWS)
- Wildlife Trust Reserve

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Calcareous Grassland
- Lowland Dry Acid Grassland
- Lowland Fens
- Lowland Heathland
- Lowland Meadows
- Purple Moor Grass and Rush Pastures
- Reedbeds
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION C TO SECTION D

FIGURE 5.2e

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0042.0 Local Des and Ecological Features

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465000 470000 475000 480000

375000 370000 365000

N

Section C
Section D

Kirton Wood
Spalford Warren

NEWARK AND SHERWOOD DISTRICT

0 2.5 5
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- RSPB Reserve
- Local Wildlife Site (LWS)
- Wildlife Trust Reserve

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Dry Acid Grassland
- Lowland Dry Acid Grassland, Lowland Heathland
- Lowland Fens
- Lowland Fens, Reedbeds
- Lowland Heathland
- Lowland Meadows
- Purple Moor Grass and Rush Pastures
- Reedbeds
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION D

FIGURE 5.2f

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0042.0 Local Des and Ecological Features

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470000 475000 480000 485000

360000

355000

N

LEGEND

- Scoping Boundary
- Scoping Boundary 2 km Buffer
- Ancient Tree Inventory (ATI)
- Ancient Woodland
- RSPB Reserve
- Local Wildlife Site (LWS)

Priority Habitat Inventory

- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Good Quality Semi Improved Grassland
- Lowland Fens
- Lowland Heathland
- Lowland Meadows
- Ponds
- Reedbeds
- Traditional Orchard
- No Main Habitat but Additional Habitats Present

NOTES

Ecology Designations only Labelled within 2 km Buffer of Scoping Boundary.

0 2.5 5

Kilometres

H₂East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

LOCAL DESIGNATIONS AND ECOLOGICAL FEATURES SECTION D

FIGURE 5.2g

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0042.0 Local Des and Ecological Features

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6 Historic Environment

6.1 Introduction

6.1.1 The Historic Environment assessment, covering both archaeology and cultural heritage, will consider the Likely Significant Effects (LSEs) on designated and non-designated archaeological and built heritage receptors that may arise from the construction, operation and maintenance and decommissioning of the Project, full details of which are set out in **Chapter 2: The Project.**

6.1.2 This Chapter outlines the approach for assessing the Historic Environment within the Environmental Impact Assessment (EIA). It explains the methodology, data sources, and baseline conditions that will inform the assessment. It also identifies the LSE to be considered, how these will be evaluated, and the environmental measures and commitments influencing the scope of the assessment. Finally, it lists the potential effects proposed to be excluded from further assessment.

6.1.3 There are interrelationships between the potential effects on Historic Environment and other environmental topics. Therefore, this Chapter of the Scoping Report should be read alongside the following Chapters:

- **Chapter 5: Biodiversity** which considers habitat features such as woodland, hedgerows, grassland and watercourses can form part of the historic landscape and contribute to the setting of heritage assets;
- **Chapter 8: Landscape and Visual** which considers the potential landscape and visual effects of the Project, and which will reference a Zone of Theoretical Visibility (ZTV) which will be utilised for the prediction of impacts to heritage receptors;
- **Chapter 10: Noise and Vibration** which considers the effects of noise and vibration from the Project on nearby noise-sensitive receptors, which may include heritage receptors; and
- **Chapter 13: Agriculture and Soil Resources** which considers soil disturbance, stripping, compaction and changes to agricultural land management that has the potential to affect buried archaeological remains and historic field systems.

6.1.4 The Historic Environment Environmental Statement (ES) Chapter will be supported by the archaeological assessment within a Desk-Based Assessment (DBA) and a heritage assessment within a Heritage Statement (HS), which will provide a sufficient level of information to understand the likely significant heritage impacts. Assets above, at and below ground will be considered.

6.2 Assumptions and Limitations

6.2.1 Please refer to **Chapter 2: The Project** for the parameters on which this Scoping Report is based on alongside a description of the Project.

6.2.2 The baseline provides a summary of the most sensitive heritage receptors and an appropriate spatial and temporal scope. It is not a comprehensive baseline for the Historic Environment and further detailed baseline information will be obtained, as described in this Chapter. A detailed baseline will also be provided in the ES.

6.3 Relevant Legislation, Policy and Technical Guidance

6.3.1 This Section describes the legislation, key national policy (as set out in National Policy Statements), local policy and guidance that is specific to the Historic Environment, summarised in **Table 6.1. Chapter 3: Legislation, Policy and Guidance Overview** of the Scoping Report provides detail on the overarching legislation, policy and guidance applicable to the Project and the requirement for EIA.

6.3.2 **Appendix 3A** presents the National Planning Policy Framework (NPPF) and local policies, which are specifically relevant to the Historic Environment. A list of the local policy documents and policies reviewed in the preparation of the Chapter, is set out in **Table 6.1**. The relevant parts of these policies are set out in full in **Appendix 3A**. The ES will demonstrate compliance with the relevant legislation, policy and guidance.

Table 6.1: Legislation, Policy and Guidance Applicable to the Historic Environment

Source, Author and Year	Context
Legislation	
Ancient Monuments and Archaeological Areas Act 1979	The Act sets out that sites considered to be of national importance are required to be compiled in a Schedule of Monuments. These sites are accorded statutory protection. The Act sets out conditions whereby Scheduled Monument Consent (SMC) is required for works to a scheduled monument. This Act also provides for the designation of Areas of Archaeological Interest in which statutory provisions for access to construction sites for carrying out archaeological works apply.
Planning (Listed Buildings and Conservation Areas) Act 1990	The Act covers the registration of Listed Buildings (buildings that are seen to be of special architectural or historic interest) and the designation of Conservation Areas (areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance). It sets out the conditions under which a Listed Building Consent would be required. The Act sets out at Sections 66 and Section 72 the duties of Local Planning Authorities (LPAs) to give great weight to the desirability of preserving Listed Buildings and their settings and the character of Conservation Areas in planning decisions. The Section 66 and Section 72 duties are set out in the Infrastructure Planning (Decisions) Regulations 2010.
Infrastructure Planning (Decisions) Regulations 2010	These regulations require decision-makers to have regard to the desirability of preserving a Scheduled Monument or its setting; Listed Buildings, any features which contribute to their special interest and their settings and to have

Source, Author and Year	Context
	regard for the desirability of preserving the character and appearance of Conservation Areas. These duties supersede Sections 66 and 72 of the Planning Act (Listed Buildings and Conservation Areas) 1990 in determining Development Consent Order (DCO) applications.
The Hedgerow Regulations 1997	These regulations set out criteria to be used to determine the importance of hedgerows and protect important hedgerows from removal. Selection criteria include heritage-based considerations.
Burial Act 1857	It is generally an offence to remove human remains from a place of burial without a licence from the Secretary of State and in accordance with any conditions attached to the licence.
Protection of Military Remains Act 1986	This Act sets out specific protections for aircraft which have crashed or vessels which have sunk or been stranded whilst in military service. It sets out a general prohibition on any disturbance or removal of such remains without a licence granted by the Secretary of State.
Transport and Works Act 1992	Section 17 of the Transport and Works Act 1992 alters the procedure for obtaining listed building consent when a proposal is connected to a Transport and Works Order. Clause 43 of the Planning and Infrastructure Act 2025 would substitute the existing Section 17 of the Transport and Works Act 1992 to enable a Transport and Works Order to explicitly dispense with certain heritage-related consents such as Listed Building Consent or Scheduled Monument Consent where these are included within the Order's terms. However, Clause 43 is not yet in force, and no commencement date has been confirmed.
Planning and Infrastructure Act 2025 – Provisions not yet in force	Section 55 of the Act introduces requirements confirming that heritage receptors are referenced as a category requiring special regard, consistent with wider planning law. Section 55(1) comes into force on 18 February 2026. Section 55(2) has no confirmed commencement date. These provisions therefore do not yet form part of the legislative context for EIA Scoping. However, given their future incoming use, they are included here for reference.
National Policy	
Overarching National Policy Statement for Energy (EN-1) 2025	EN-1 provides comprehensive guidance on managing the impacts of energy infrastructure projects on archaeology and cultural heritage with Paragraph 5.9.11 emphasising the importance of assessing the LSEs of proposed developments on all heritage assets, including those above, at, and below the surface of the ground. 5.9.12 goes on to state that the ES should ES the applicant should provide a description of the significance of the heritage assets affected by the proposed development, including any contribution made by their setting. In line with EN-1 the Project will consult with the Historic Environment Records (HER) and assess heritage assets using expertise

Source, Author and Year	Context
	where necessary according to the proposed development's impact. Paragraph 5.9.13 highlights the necessity of conducting appropriate desk-based assessments and, where such desk-based research is insufficient to properly assess the interest, a field evaluation It also stresses the importance of considering direct, indirect, cumulative, temporary, or permanent impacts, including those from noise, vibration, and light (Paragraph 5.9.14). Paragraphs 5.9.18 to 5.9.22 set out considerations for mitigation including where harm to heritage assets is unavoidable, mitigation measures such as recording and dissemination must be secured, with requirements included in the DCO. Paragraphs 5.9.23 to 5.9.37 set out considerations for determining applications by the Secretary of State, stating decision making should give great weight to the conservation of designated heritage assets, with any harm requiring clear and convincing justification. Substantial harm to Grade II assets should be exceptional, and wholly exceptional for assets of the highest significance. Where substantial harm or loss occurs, it must be outweighed by public benefits or meet strict criteria. Less than substantial harm must also be weighed against public benefits. Given that this Project is identified as a Critical National Priority (CNP), the public-benefit case associated with the Project will form an important part of this balancing exercise under EN-1.
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) 2024	EN-4 reiterates EN-1 confirming that the ES must set out any effects on heritage assets and the wider Historic Environment.
National Planning Policy Framework (NPPF) 2025	Section 16 of the NPPF relates to Conserving and Enhancing the Historic Environment and states that an applicant should describe the significance of any heritage assets affected, including any contribution made by their setting. Great weight should be given to the conservation of designated heritage assets and where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.
Local Plan Documents and Policies	
North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018)	Policy 5 Development Boundaries Policy 31 Renewable and Low Carbon Infrastructure Policy 39 Conserving and Enhancing the Historic Environment

Source, Author and Year	Context
North East Lincolnshire Local Plan Review with Options Dec 2023	Draft Strategic Policy 2 Development Boundaries Draft Strategic Policy 7 Renewable and Low Carbon Infrastructure Draft Strategic Policy 13 Good Design in New Developments Draft Strategic Policy 14 Conserving and enhancing the Historic Environment
North Lincolnshire Local Plan Saved Policies (Adopted May 2003)	LC13 Parks, Gardens and Landscapes of Special Historic Interest HE2 Development in Conservation Areas Policy HE5 Development affecting Listed Buildings Policy HE8 Ancient Monuments Policy HE9 Archaeological Evaluation
North Lincolnshire Local Development Framework: Core Strategy (Adopted June 2011)	Policy CS6: Historic Environment
Central Lincolnshire Local Plan (Adopted April 2023)	Policy S57 The Historic Environment
Bassetlaw District Local Plan May 2024	Policy ST40 The Historic Environment Policy 41 Designated and Non-Designated Heritage Assets
Newark and Sherwood Amended Core Strategy DPD adopted March 2019	Policy DM9 Protecting and Enhancing the Historic Environment
Newark and Sherwood Allocations and Development Management DPD adopted July 2013	Core Policy 14 Historic Environment
Guidance	
Chartered Institute for Archaeologists' (CIfA) Standard and guidance for archaeological desk-based assessment 2020	Sets out standards to produce archaeological desk-based assessments.
Historic England's Good Practice Advice in Planning Note 2 (GPA 2): Managing Significance in decision-taking in the Historic Environment 2015	This document provides guidance and information to assist in implementing Historic Environment policy and ensuring compliance with NPPF fundamentals.
Historic England's Good Practice Advice in Planning Note 3 (GPA 3): The Setting of Heritage Assets 2017	Sets out guidance on managing change within the settings of heritage assets. The document sets out five steps to follow to ensure an appropriate level of assessment is achieved.
Historic England's Statements of Heritage Significance: Analysing Significance in Heritage Assets 2019	This Historic England advice note covers the NPPF requirement for applicants for heritage and other consents to describe heritage significance to help LPAs to make decisions on the impact of proposals for change to heritage assets.
Historic England's Conservation Principles: Polices and Guidance for	Sets out principles for the assessment of heritage significance and its management.

Source, Author and Year	Context
the Sustainable Management of the Historic Environment 2008	
Planning Practice Guidance: Historic Environment 2019	This guidance provides advice on the conservation and enhancement of the Historic Environment.

6.4 Consultation

6.4.1 In respect of Historic Environment, initial discussions have taken place with the LPAs, with further consultation following the formal EIA scoping process. The aim of this further consultation will be to seek clarification on further details, to discuss findings and to reach agreement on issues prior to submission of the application for development consent. Where required, this will also include discussion on details of survey and assessment methods.

6.4.2 Consultation will be undertaken and recorded throughout the pre-application stages of the Project with the following key consultees:

- Bassetlaw District Council;
- Historic England;
- Lincolnshire County Council;
- Newark and Sherwood District Council;
- North East Lincolnshire Unitary Authority;
- North Lincolnshire Unitary Authority;
- Nottinghamshire County Council; and
- West Lindsey District Council.

6.4.3 Consultation will be reviewed throughout the assessment process. Additional consultees such as local or specialist groups will be contacted should a requirement to consult other bodies arise. Engagement with the key consultees will continue post submission.

6.5 Baseline Review

Study Area

6.5.1 The Study Area encompasses the area over which all desk-based data was gathered to inform the Historic Environment (both Archaeology and Cultural Heritage) Scoping assessment presented in this Chapter.

6.5.2 The Study Area for Historic Environment Scoping is shown in **Figure 6.1** and **Figure 6.2**. This equates to a 1 km buffer around the Scoping Boundary. This is the standard best practice maximum Study Area to assist in determining archaeological potential. Given the scale of above ground infrastructure and the topography of the area, a 1 km Study Area is also considered to be sufficient to assess the potential presence or absence of designated heritage assets which may be affected by setting change. Any heritage assets located

outside this area that are identified through stakeholder or consultation responses will be considered further as required.

Spatial Scope

6.5.3 The spatial scope for assessment during construction will be defined by the Study Area as described above and refined through consultation with key stakeholders. This will be confined to a maximum 1 km Study Area around the draft Order Limits for the assessment of archaeological and heritage impacts.

6.5.4 In respect to heritage and due to the buried nature of the Main Pipeline, the spatial scope of assessment during the operation and maintenance phase will be confined to a maximum 1 km Study Area around the Hydrogen Above Ground Installations (HAGIs), Block Valve Installations (BVIs), cathodic protection and pipeline marker posts. The requirement for BVIs will be subject to further design and risk assessment. Therefore, BVI search areas have not been identified at this stage. The areas associated with BVIs will be defined and considered once the locations are confirmed. The Study Area may be refined following the selection of HAGI and BVI locations and consideration of topography and the ability of surrounding heritage receptors to accommodate setting change without significance being affected. Any refinements will be discussed through consultation with key stakeholders.

Temporal Scope

6.5.5 The assessment will consider the construction, operation and maintenance and decommissioning phases of the Project. As noted in **Chapter 2: The Project,** the design life of the pipeline, HAGIs and BVIs is 40 years but it is anticipated that the actual life of the Project could extend over 40 years depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. Any long term (reversible) impacts to heritage assets through setting change during operation and maintenance will remain unchanged for the lifetime of the Project should this be in excess of 40 years. Temporary works associated with the construction phase are included within the assessment throughout.

6.5.6 Potential disturbance to archaeological remains may occur during site preparation works and during the construction phase only. No additional disturbance to archaeological remains would be predicted during the operation and maintenance, and decommissioning phases. The buried Pipeline will be left *in situ* such that no further ground disturbance would be caused and the ground disturbance associated with the decommissioning of all above ground facilities including the HAGIs, BVIs and pipeline marker posts would not extend beyond the construction footprint.

6.5.7 The significance of heritage assets is derived from their archaeological, architectural, artistic or historic interests. Setting is not an interest itself but can contribute towards an understanding and appreciation of an interest. Temporary change to the setting of heritage assets which may affect their significance may occur during the construction phase. Long term (reversible) change over the lifetime of the Project affecting the significance of heritage assets may occur during the operation and maintenance phase through the presence of above ground infrastructure. Temporary change to the setting of

heritage assets which may affect their significance may occur during the decommissioning of above ground infrastructure as per the construction phase albeit additional assets may be affected if new assets have been designated in the interim period.

6.5.8 Consequently, in respect to impacts to potential archaeological remains, site preparation works and the construction phase only is scoped into assessment. In respect to potential impact to heritage assets through setting change, construction, operation and maintenance and decommissioning phases are scoped into the assessment.

6.5.9 The Study Area should be regarded as preliminary at this stage and will be reviewed and amended in response to the refinement of the Project design, the identification of additional impact pathways, and, where appropriate, in response to feedback from consultation, to ensure that there is sufficient data on which to conduct the assessment. These refinements are expected to reduce the extent of the Study Area as the Project progresses, whilst still reflecting recognised good practice.

Data Sources

6.5.10 The data sources that have been used to inform this Chapter of the Scoping Report are presented within **Table 6.2**. These data sources will be taken forward and used to inform the DBA supporting EIA, alongside any additional site-specific data that will be collected for the Project as set out in **Table 6.4**.

Table 6.2: Sources of Historic Environment Data

Source, Author and Year	Summary	Coverage of the Study Area
North East Lincolnshire Council Historic Environment Record (HER) 2025	Data for known archaeological sites, monument, findspots and events within the North East Lincolnshire Council authority area.	Full coverage of the Study Area.
North Lincolnshire Council HER 2025	Data for known archaeological sites, monument, findspots and events within the North Lincolnshire Council authority area.	Full coverage of the Study Area.
Lincolnshire County Council HER 2025	Data for known archaeological sites, monument, findspots and events within the Lincolnshire County Council authority area.	Full coverage of the Study Area.
Nottinghamshire County Council HER 2025	Data for known archaeological sites, monument, findspots and events within the Nottinghamshire County Council authority area, including other local authorities within the historic county of Nottinghamshire.	Full coverage of the Study Area.
Historic England's National Heritage List for England (NHLE) 2025	Data for designated heritage receptors, i.e., Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, and Registered Battlefields.	Full coverage of the Study Area.

Source, Author and Year	Summary	Coverage of the Study Area
Historic England's Aerial Photo Explorer 2025	A collection of available historic aerial photographs.	Full coverage of the Study Area.
Historic England's Aerial Archaeology Mapping Explorer 2025	Mapped and digitised earthworks and other features identified as archaeological or historical in origin.	Full coverage of the Study Area.

Current Baseline – Archaeology

6.5.11 The following four Sections of the Scoping Boundary have been considered separately to support the baseline reporting:

- Section A: Immingham and North Killingholme;
- Section B: Immingham to Scunthorpe;
- Section C: Scunthorpe to High Marnham; and
- Section D: High Marnham to Kirton and Newark.

6.5.12 At the Scoping stage, an initial review of the Historic Environment data outlined in the table above was undertaken. The data has been drawn from a wide range of sources, including reports of archaeological fieldwork, books, journal articles, historical maps, aerial photographs, geophysics and Light Detection and Ranging (LiDAR) data, national lists and registers, academic work and field observations from antiquarian and modern archaeologists. While this data is reliable, it is not a comprehensive record of all archaeological remains. The HER datasets for the area are extensive, and not every individual record has been described within this Scoping Report. Instead, the information has been synthesised to identify the general archaeological character and potential of the Scoping Boundary, identifying broad themes in respect to the potential presence of archaeological remains which may be affected by ground disturbance caused by the construction of the Project. Archaeology asset locations are shown in **Figure 6.2**.

Section A: Immingham and North Killingholme

Early Prehistoric (500,000 Before Common Era (BCE) – 800 BCE)

6.5.13 The earliest evidence of human activity within the northernmost Section of the Scoping Boundary dates to the prehistoric period. This evidence comprises findspots including flint artefacts and faunal remains.

6.5.14 The faunal remains comprise deer antlers which were found in a submerged forest bed during the excavation of Immingham Dock, located at the northern edge of the Scoping Boundary, in the 20th century (HER no.: MNL845).

6.5.15 The flint artefacts have either been recorded through fieldwalking activities or through intrusive archaeological fieldwork. These artefacts span the early prehistoric period, for example the Palaeolithic (500,000 BCE – 10,000 BCE), the Mesolithic (10,000 BCE – 4,000 BCE), the Neolithic (4,000 BCE – 2,000 BCE) and Bronze Age (2,000 BCE – 800 BCE) periods (HER no.: MNL3922,

MNL3923, MNL3924, MNL4193, MNL4194, MNL4195, MNL4197, MNL4198, MNL4200, 19798, 19800, 19802, 19803, 19832, 20125, 20439 and 20440).

6.5.16 There are several undated cropmarks recorded within the HER in the northern Section of the Scoping Boundary. These cropmarks were predominantly recorded through the study of historic aerial photographs via the National Mapping Programme (NMP). The cropmarks include a curvilinear ditched enclosure (HER no.: MNL4674) to the north of the A1173, an enclosure (HER no.: MNL4124) to the west of the A1173, and several further such cropmarks to the west of the A1173 and south of the A180 (HER no.: MNL202, MNL1234, MNL1828, MNL1829, MNL3914, MNL3915, MNL3916, MNL2379 and MNL4366). These undated remains have been tentatively dated as possibly being prehistoric, but they may also date to a later period.

6.5.17 There are small pockets of deep peat identified within this Section and such deposits have paleoenvironmental potential. These pockets of peat are very limited and are illustrated in **Figure 13.2a** in **Chapter 13: Agriculture and Soil Resources**.

Late Prehistoric to Roman (800 BCE – 410 Common Era (CE))

6.5.18 There is evidence of Iron Age (800 BCE – 43 CE) and Roman activity (43 CE – 410 CE) within the northern Section of the Scoping Boundary. This evidence comprises findspots, including pottery, coins and metalwork, and evidence of settlement remains.

6.5.19 Archaeological fieldwork has recorded Iron Age or Roman features within the Scoping Boundary. Around the Immingham area, several features have been recorded following geophysical surveys and trial trenching which were undertaken as part of the Viking Carbon Capture and Storage (CCS) pipeline project. This fieldwork was predominantly undertaken between 2024 and 2025. An extensive arrangement of ditches, many of which define several small enclosures that are likely to have been associated with past settlement, were recorded in an area to the east of Keelby Road (HER no.: MNL2689). Trial trenching undertaken to the west of Keelby Road recorded a Roman ditch, along with pottery (HER no.: MNL5062). A geophysical survey and trial trenching c.170 m north of the Scoping Boundary, and to the south of the A180, identified a series of ditches, gullies, postholes, and a spread of material including pottery spanning between the 1st century BCE to the mid-1st century CE (HER no.: MNL4950). Just to the west of these features, a 2024 geophysical survey recorded a group of linear and curvilinear anomalies, with strong magnetic signals, consistent with infilled cut features such as ditches (HER no.: MNL4951).

6.5.20 An Iron Age enclosure was identified through geophysical survey and trial trenching ahead of improvement works to the A160, A180 and the Brocklesby Interchange (HER no.: MNL2504). Just to the east of the Iron Age enclosure, a Roman enclosure dating from the 2nd to 4th centuries CE was also recorded (HER no.: MNL185).

6.5.21 A possible Roman settlement was identified through a geophysical survey in 2023 on a parcel of land north of the A180 and north-west of A1173 (HER no.:

MNL4973). Trial trenching was undertaken in 2024 which recorded both Roman and possible prehistoric features.

6.5.22 Cropmarks attributed to the prehistoric or Roman period have also been recorded. Three conjoined enclosures were recorded c. 500 m south of the Scoping Boundary and to east of Stallingborough Road (B1210) (HER no.: MNL2535).

6.5.23 In the East Halton or North Killingholme area, further Iron Age or Roman features have been recorded within the Scoping Boundary. An Iron Age enclosure was detected by aerial photography and a geophysical survey to the north-west of Rosper Road, which was confirmed by trial trenching (HER no.: 20441). Further evidence of Iron Age or Roman settlement and/ or agricultural features have been recorded within the Scoping Boundary (HER no.: 1496, 1611, 1623, 20143, 20145, 20430, 20709, 21335, 22603, 22604 and 22605).

6.5.24 The findspots have been recorded throughout the Scoping Boundary and wider Study Area. These finds have been found through fieldwalking, metal detecting, and archaeological fieldwork, and comprise pottery, metalwork, and coins (HER no.: MNL834, MNL1227, MNL1827, MNL1906, MNL2118, MNL2140, MNL2376, MNL2378, MNL3921, MNL3925, MNL3926 and 16396).

Early Medieval to Medieval (410 – 1539)

6.5.25 Evidence for early medieval (410 – 1066) activity within the northern Section of the Scoping Boundary and Study Area is predominantly recorded in placename evidence and historical documentation, i.e., Domesday Book. This includes the historical settlements of Habrough (HER no.: MNL205), Immingham (HER no.: MNL287), Stallingborough (HER no.: MNL371), and Keelby (HER no.: MLI53780). It is probable that much of the northern Section of the Scoping Boundary existed within either the agricultural hinterland of these settlements or within marginal or waste land. This would be assessed at EIA.

6.5.26 The only remains dating to the early medieval periods comprise a limited number of artefacts recorded within the Study Area. Within the Scoping Boundary, a single piece of early medieval pottery was recovered to the south of the A180, west of Keelby Road, and east of Roxton Farm, during fieldwalking (HER no.: MNL4199). Approximately 1 km south of the Scoping Boundary, and just to the west of the village of Keelby, early medieval artefacts were recorded by a metal detectorist, with many damaged through ploughing (HER no.: MLI81205). The HER records a possible Anglo-Saxon cemetery at this location; however, there is very little evidence to support this theory.

6.5.27 The settlements of Habrough and Immingham continued to grow into the medieval period, and findspots of pottery and coins have been found in Immingham (HER no.: MNL1009, MNL1222, and MNL1223). Pottery, along with a chess piece, has also been recorded within Habrough (HER no.: MNL201, MNL1225, MNL1226 and MNL2117). Furthermore, medieval deposits (HER no.: MNL2287), trackways (HER no.: MNL2101), and possible

salterns (HER no.: MNL4105 and MNL4673) have also been recorded within Immingham.

6.5.28 The medieval period saw the establishment of a settlement at Roxton (HER no.: MNL286) which was mentioned in 14th century documents. The remains of a former moated site are located on the eastern edges of the Deserted Medieval Village (DMV) (HER no.: MNL283). Furthermore, another moated site is located on the northern edges of the historic settlement of Habrough (HER no.: MNL2373). During the medieval period, moated sites were usually connected with the pattern of landscape organisation, with nucleated villages or villages or hamlets dispersed across the landscape, usually being associated with extensive open fields. Based on the location of DMVs and ridge and furrow in the area, it is probable that much of the northern Section of the Scoping Boundary existed within an open field agricultural system.

6.5.29 Remnants agricultural field systems have been recorded throughout the northern Section of the Scoping Boundary and Study Area. These field systems predominantly comprise ridge and furrow which have been recorded through historic aerial photographs or the NMP (HER no.: MNL2234, MNL2235, MNL2238, 10746, 20098, 26165 and 26174). The ridge and furrow have been tentatively dated to the medieval or post-medieval periods.

6.5.30 The site of the medieval priory of Nun Cotham (HER no.: MLI54214), which was established in the 12th century before being dissolved in 1539, is located partially within the Scoping Boundary to the south-west of Roxton Wood. To the south of the priory is the possible remains of Coton or Coatham DMV (HER no.: MLI50017).

Post-medieval (1539 – 1900)

6.5.31 The land within the northern Section of the Scoping Boundary and Study Area would have been predominantly in agricultural use throughout much of the post-medieval period. This is evidenced by the numerous post-medieval farmsteads and farm outbuildings which are recorded throughout the Scoping Boundary and Study Area. For example, Mauxhall Farm (HER no.: MNL2452), Little London Farm (HER no.: MNL2454), Greenland's Farm (HER no.: MNL1895), Stallingborough Top Farm (HER no.: MNL2453), Roxton Farm (HER no.: MNL1881), and New Farm (HER no.: MNL1819).

6.5.32 Throughout the post-medieval period there was a sustained growth of the settlements of Immingham, Stallingborough, Healing, and Habrough. This period also saw the expansion of road and railway networks. The HER records the Cleethorpes to Barton branch of the Manchester, Sheffield and Lincoln Railway (HER no.: MNL1302), which was opened in 1848 with the Cleethorpes extension added in around 1863.

Modern (1900 – Present)

6.5.33 The north-eastern area of the Scoping Boundary and Study Area is occupied by Immingham Dock. The dock (HER no.: MNL272) was built between 1906 and 1912 to take larger vessels which could not enter the Grimsby Docks. The Dock is now the busiest port on the Humber, but little remains of the original Edwardian structures. To support the Dock, a large complex of

railway lines and sidings (HER no.: MNL3039) were integrated into the Dock, which branched off the main line

6.5.34 During the Second World War (1939 – 1945) the Port was strategically important as it was used as a naval base throughout the War, serving as the Royal Navy's headquarters for the Humber. As such, several defences were constructed within the surrounding area of the Port, including the Scoping Boundary. These defences included anti-aircraft batteries (HER no.: MNL1522, MNL1524 and MNL1525), a monitoring post (HER no.: MNL1901), anti-landing obstacles (HER no.: MNL4640, MNL4641, MNL4655 and MNL4679), a barrage balloon mooring site (HER no.: MNL4684), and a searchlight (HER no.: MNL2322).

Section B: Immingham to Scunthorpe

Early Prehistoric (500,000 BCE – 800 BCE)

6.5.35 The earliest evidence of human activity recorded within the Scoping Boundary and Study Area between Immingham and Scunthorpe comprises recovered findspots from both the Mesolithic (10,000 BCE – 4,000 BCE) and Neolithic (4,000 BCE – 2,000 BCE) periods. The Mesolithic finds consist of flint artefacts (HER no.: MLI50759, MLI51288 and MLI98502), whereas finds from the Neolithic comprise polished axes and flints (HER no.: MLI50619, MLI50760, MLI51275, MLI51291, MLI51336, MLI51349, MLI51351, MLI51358, MLI52435, MLI52502, MLI52600, MLI52609, MLI52766, MLI52770, MLI52781, MLI53646 and MLI80312).

6.5.36 A possible prehistoric routeway, known as Barton Street, is located towards the northern edge of the Study Area between Immingham and Scunthorpe (HER no.: MLI116141). Some evidence of Bronze Age activity is evidenced by the recovery of Bronze Age pottery from the Kettleby Thorpe DMV (HER no.: MLI53644).

6.5.37 A possible prehistoric settlement, comprising enclosures and pits, was recorded by the NMP to the south of the A1084 and immediately east of the B1434 (HER no.: MLI53662).

6.5.38 In this Section, any peat, which has paleoenvironmental potential, is patchy and its depth highly variable, as illustrated in **Figure 13.2a** in **Chapter 13: Agriculture and Soil Resources**. As demonstrated, these areas of peat are very limited and can be avoided, as per Comm Wt-15.

Late Prehistoric to Roman (800 BCE – 410 CE)

6.5.39 A series of features have been recorded on agricultural land to the north of Bigby High Road (A1084). These features comprise an Iron Age or Roman settlement (HER no.: MLI89512 and MLI97736). An undated enclosure (HER no.: MLI53661) is located just to the south-west and an updated hollow way is located just to the east (HER no.: MLI53660) of the settlement. Iron Age finds have also been recorded in this area, which have included bridle bits, three gold torques, and part of a bracelet (HER no.: MLI53647).

6.5.40 Elsewhere within the Scoping Boundary, fragments of Roman pavements, roofing tile, amphora, coins (HER no.: MLI53639) and a lead spindle whorl have been recorded (HER no.: MLI53643).

Early Medieval to Medieval (410 – 1539)

6.5.41 The only evidence for early medieval activity within the Scoping Boundary and Study Area between Immingham and Scunthorpe comprises a findspot consisting of Saxon pottery (HER no.: MLI53642) which were recovered from the Kettleby DMV.

6.5.42 At the northern area of the Scoping Boundary between Immingham and Scunthorpe is the site of the former Abbey of St Mary and St Martial at Newsham (HER no.: MLI50005). The Abbey comprised a Premonstratensian monastery which was founded in 1143 and dissolved in 1536. The remains of the Abbey consist of several earthworks. The DMV of Newsham (HER no.: MLI53762) is also recorded at this location, and the decline and abandonment of the village is linked to the abbey's reduction dissolution.

6.5.43 A further DMV is located within the Scoping Boundary at Kettleby Thorpe, Bigby (HER no.: MLI50279). A small, moated site and a set of fishponds was also associated with the village of Kettleby Thorpe (HER no.: MLI50277). To the south-west of Kettleby Thorpe are the remains of the Kettleby DMV (HER no.: MLI53641). The village is first recorded in 1066, and in 1086 two manors are recorded. Thereafter, and throughout the later medieval period, Kettleby is subsumed with Kettleby Thorpe. Like Kettleby Thorpe, Kettleby also had a moated site (HER no.: MLI50278), which is now occupied by a later post-medieval house (HER no.: MLI53663). A deer park is also recorded at Kettleby (HER no.: MLI50396), although only documented in the 17th century, it is probable that it was established earlier than this in the medieval period, as the main period for the creation of deer parks was between the 13th and 14th centuries.

6.5.44 As above, remnant agricultural field systems are recorded throughout the Scoping Boundary and Study Area between Immingham and Scunthorpe. These field systems comprise ridge and furrow (HER no.: MLI50086, MLI53668 MLI53768 and MLI53770), remnant earthworks (HER no.: MLI53664, MLI53665, MLI53771 and MLI53774), and enclosures (HER no.: MLI53656). Two hollow ways, attributed to the medieval period, are also recorded (HER no.: MLI50085 and MLI53659).

6.5.45 Several sherds of pottery have also been recorded within the Study Area (HER no.: MLI50014, MLI53650 and MLI85626).

Post-medieval (1539 – 1900)

6.5.46 The land within the Scoping Boundary and Study Area would have been predominantly in agricultural use throughout much of the post-medieval period. This is evidenced by the presence of Bridge Farm (HER no.: MLI116754), Priory Farm, (HER no.: MLI116756), and Bentley Farm (HER no.: MLI116763).

6.5.47 Brocklesby Park occupies a large area of land at the northern edge of the Scoping Boundary and Study Area between Immingham and Scunthorpe

(HER no.: MLI50084). The Park surrounds the house extending mainly to the north, west and south. Little is known about the early landscaping of the park; however, it is known that Capability Brown was asked in 1771 and 1772 to propose alterations to the Park. Elements of his work is evident within the park boundary.

Modern (1900 – present)

6.5.48 A Second World War Prisoner of War camp was located within the Scoping Boundary and immediately to the south of the A1084. It was constructed to house some 750 prisoners, and consisted of a tented camp, guards' compound, prisoners' compound, prisoners' garden plots, recreation ground and a sewage disposal works (HER no.: MLI88523). The area has now been developed into a modern residential development.

Section C: Scunthorpe to High Marnham

Early Prehistoric (500,000 BCE – 800 BCE)

6.5.49 The earliest evidence of human activity within the northern Section of the Scoping Boundary dates to the prehistoric period. This activity comprises findspots including flint artefacts and axes (HER no.: MLI50061, MLI50062, MLI50741, MLI50757, MLI50758, MLI50759, MLI50760, MLI51275, MLI51291, MLI51288, MLI51341, MLI51349, MLI51351, MLI51358, MLI52600, MLI52609, L4719 and L4728). These prehistoric findspots date between the Mesolithic and Neolithic periods.

6.5.50 There have been several cropmarks identified within the Scoping Boundary between Scunthorpe to High Marnham, which were recorded either through the NMP or a study of satellite imagery. These cropmarks comprised possible enclosures, trackways, and a cursus (HER no.: MLI50370, MLI51348, MLI52554, MLI53735, MLI53743, MLI53744, MLI53862, MLI53868, MLI53869, MLI53871, MLI53872, MLI53873, MLI53874, MLI53875, MLI53876, MLI53877, MLI53879, MLI54039, MLI54040, MLI126902, L4707, L4726, L4727, L6235 and L10632). These undated remains could possibly date to the prehistoric period, but they may also date to a later period.

Late Prehistoric to Roman (800 BCE – 410 CE)

6.5.51 A Roman settlement was discovered at Abbey Farm (HER no.: MLI54147) during an archaeological watching brief in 1997. The settlement is believed to have been occupied between the 1st and 4th centuries CE. Roman building material, along with sherds of pottery, were recovered from fields to the east of Temple Farm during fieldwalking (HER no.: MLI50739). The concentration of finds has been interpreted as a possible Roman settlement. A further settlement was discovered during archaeological work on a gas pipeline to the south of Marton Road in Stow (HER no.: MLI84314). The settlement comprised a small rural settlement or farmstead. A Roman building to the south-west of Sturton by Stow was discovered in 1928 (HER no.: MLI50566), when a portion of a mosaic floor was found during ploughing. The mosaic could indicate that the building was a Roman villa.

6.5.52 Elsewhere within the Scoping Boundary and Study Area, sherds of pottery and other finds, have been discovered (HER no.: MLI50762, MLI50936, MLI51012, MLI51269, MLI51273, MLI51276, MLI51278, MLI51340, MLI51356, MLI52782, MLI52821, MLI54033, L4721, L4730, L8724 and L8728).

6.5.53 Till Bridge Lane (A1500) follows the course of a Roman road which linked Ermine Street to the crossing of the river Trent at Marton (HER no.: MLI50575). The Fosse Dyke is also located within the Scoping Boundary (HER no.: MLI52273). The Dyke is generally accepted, among some historians and archaeologists, as being an artificial canal of Roman construction, although there is no absolute proof that it is Roman.

Early Medieval to Medieval (410 – 1539)

6.5.54 Several findspots dating to the early medieval period have been recorded within the Scoping Boundary and Study Area between Scunthorpe to High Marnham. These finds comprise a glass bead (HER no.: MLI51350), a hoard of 100 Late Saxon coins (HER no.: MLI51477), a silver penny (HER no.: MLI52438), and pottery (HER no.: MLI81898, MLI83322 and MLI124922). Furthermore, a possible early medieval settlement was believed to have existed on land west of the River Eau (HER no.: MLI51277). The possible settlement site was identified through the spread of pottery recovered from this area in the mid-20th century.

6.5.55 There are several present-day settlements which can trace their origins back to the early medieval period within the Scoping Boundary and Study Area. These include Yawthorpe (HER no.: MLI51344), Scotter (HER no.: MLI53864), Aisby (HER no.: MLI51345), Upton (HER no.: MLI51368), Northorpe (HER no.: MLI50632), Scotton (HER no.: MLI51283), Sturgate (HER no.: MLI51359), Springthorpe (HER no.: MLI51360).

6.5.56 The early medieval origins of Scotter are further attested by the possible presence of two Anglo-Saxon cemeteries in Scotter (HER no.: MLI50050 and MLI50054).

6.5.57 As above, within the Scoping Boundary and Study Area between Scunthorpe to High Marnham, there is evidence of Deserted Medieval Villages (DMVs). These include Dunstall (HER no.: MLI54223), Southorpe (HER no.: MLI54224), Heapham (HER no.: MLI50515 and MLI51366), Kexby (HER no.: MLI50919), Northorpe (HER no.: MLI51293), Somerby in Corringham (HER no.: MLI51334), Gorwick (HER no.: MLI52514), South Ingleby (HER no.: MLI50535), and Gilby (HER no.: MLI50534). A medieval settlement at Huckerby is also believed to have existed, although there is a lack of medieval documentation, the village was a separately tithable hamlet in the mid-19th century (HER no.: MLI51011). Also, medieval pottery has been recovered from the area.

6.5.58 There are also several shrunken medieval villages within the Scoping Boundary and Study Area. Shrunken medieval villages differ to deserted ones as they are still usually occupied by a few dwellings. Examples of shrunken medieval villages include Castle Dyke, Northorpe (HER no.: MLI50517), Thorney (HER no.: M4709), and Normanby by Stow (HER no.: MLI52445).

6.5.59 At Stow there are the remains of a medieval deer park (HER no.: MLI50418) and a Bishop's Palace with associated water features (HER no.: MLI54199). A later medieval deer park is also found at Ingleby Hall (HER no.: MLI50391).

6.5.60 Moated sites are another feature within the Scoping Boundary and Study Area between Scunthorpe to High Marnham. Such sites are recorded at Somerby Hall, Corringham (HER no.: MLI50286), Ingleby Grange, South Ingleby (HER no.: MLI50306), site near Sykes Farm, Saxilby (HER no.: MLI50307), Southorpe (HER no.: MLI50303), and Scotton (HER no.: MLI51281 and MLI51282).

6.5.61 There is also a monastic grange, located at the north-western corner of Ingleby township, which was a grange called Aldhagh, and was part of the holdings of the Augustinian priory of Nocton Park (HER no.: MLI52793).

6.5.62 The settlements listed above were surrounded by agricultural fields, boundaries and associated features (HER no.: MLI52046, MLI52447, MLI52506, MLI52555, MLI52556, MLI52557, MLI52558, MLI52614, MLI52615, MLI52616, MLI52794, MLI52789, MLI53861, MLI53878, MLI53880, MLI53941, MLI53943, MLI54077, MLI54081, MLI88701, MLI98184, MLI98185, MLI98186, MLI54003, MLI54016, MLI54022, MLI54034, MLI54038, MLI54044, MLI54079, MLI54156, MLI54252, MLI54253, MLI54270, MLI52843, MLI124827, MLI50068, MLI80070, MLI98428, MLI80326, MLI116079, MLI116080, MLI116081, MLI125581, and MLI125593).

6.5.63 Medieval findspots comprising pottery, metalwork, and other such features have also been recorded within the Scoping Boundary and Study Area (HER no.: MLI50763) MLI51263, MLI51270, MLI51274, MLI124923, MLI50044, and L8725).

Post-medieval (1539 – 1900)

6.5.64 The land within the Scoping Boundary and Study Area is likely to have been predominantly in agricultural use throughout much of the post-medieval period. This is evidenced by the numerous post-medieval farmsteads recorded within the HER.

Modern (1900 – present)

6.5.65 Much of the land within the Scoping Boundary and Study Area has continued to be in agricultural use into the present day. There are, however, several records in the HER relating to buildings or features relating to the Second World War. These include searchlight batteries and gun emplacements (HER no.: MLI54037 and MLI80678) and Nissen huts (HER no.: MLI98429).

Section D: South of High Marnham

Early Prehistoric (500,000 BCE – 800 BCE)

6.5.66 The earliest evidence of human activity within the northern Section of the Scoping Boundary dates to the prehistoric period. This activity comprises findspots including flint axes and flint artefacts (HER no.: L4099, L4185, L4220, L5717, L5762, L5801, L6217, L6218, L9026, L11116, L11344,

L11345, L11856 and L11982). These prehistoric findspots date between the Mesolithic and Neolithic periods.

6.5.67 Aerial photography from 1995 identified a cropmark comprising a large circle with an entrance to the south of Holly Farm and north of Holme Lane (HER no.: M8596). The aerial photography study interpreted this cropmark as a possible Neolithic henge.

6.5.68 There have also been several other cropmarks identified within the Scoping Boundary These cropmarks comprised possible enclosures, ring ditches, ditches, and linear features (HER no.: L2958, L2982, L3041, L4176, L4251, L4253, L4254, L4343, L4344, L4702, L6053, L6144, L8327, L8595, L9935, L9936, L9937, L9948, L9953, L9955, L9588, L10615 and L10616). These undated remains could possibly date to the prehistoric period, but they may also date to a later period.

6.5.69 To the north of Cocking Hill and on Laxton Common there are five round mounds within a copse (HER no.: M4098, L8583, L8584, L8585, L8586, and L9404). Due to their form and proximity to one another it is probable that these mounds could comprise a Bronze Age barrow cemetery.

Late Prehistoric to Roman (800 BCE – 410 CE)

6.5.70 Several Iron Age or Roman settlements have been recorded within the Scoping Boundary. These include settlements at Marnham (HER no.: M4255 and M8641), at South Muskham (HER no.: M2966, M2967 and M2968), which also contained Roman pottery (HER no.: L11145) and a nearby farmstead (HER no.: M8330), at Kelham (HER no.: M2959, M8317 and M8320), and at Lamb's Close, Kelham (HER no.: M3030), which consisted of ditches (HER no.: L11343) and Roman finds (HER no.: L8402).

6.5.71 A possible Roman villa site is also located at Fiddler's Baulk, Laxton (HER no.: M18121). At this location there have been extensive traces of Roman finds, including pot, metalwork, and building materials (HER no.: L4154, L4226, L5152 and L5154).

6.5.72 Undated enclosures have been recorded within the Scoping Boundary at Ossington (HER no.: L4252), where Roman finds have also been recorded (HER no.: L9024), and this could indicate the enclosures date to the Roman period.

6.5.73 Roman activity within the Scoping Boundary is also confirmed by the presence of a Roman coin hoard (HER no.: L4629), which was located near Westwood Farm, Tuxford (HER no.: L4629). Other Roman findspots have been recorded throughout the Scoping Boundary (HER no.: L5153, L11858 and L11980).

Early Medieval to Medieval (410 – 1539)

6.5.74 Early medieval or Anglo-Saxon settlements have been recorded through archaeological features within the park at Kelham Hall (HER no.: MNT27613, MNT27614, MNT27615, MNT27616, MNT27617 and MNT27618). Several other undated features have also been recorded within the park.

6.5.75 Other early medieval settlement can be found in the Scoping Boundary in the form of a shrunken village at Skegby, Marnham (HER no.: M18130 and L10009), and several moated sites. Remains of moated sites are located at Laxton (HER no.: M4158), Gaddick Hill, Egmanton (HER no.: M4168), and Norwell Woodhouse (HER no.: M4184).

6.5.76 There are several areas within the Scoping Boundary where possible medieval agricultural features, for example, ridge and furrow, field boundaries, lynchets, and enclosures, are recorded (HER no.: L4350, L6580, L6582, L6588, L6590, L6596, L6631, L6632, L7841, L9405, L9702, L9940 and L9954).

6.5.77 A monastic grange is also located within the Scoping Boundary which consists of the remains of Dean Hall, Caunton (HER no.: M5637). The grange belonged to the preceptory of Newland in Yorkshire.

6.5.78 The deer park at Wellow Park (HER no.: MNT26703) originates to the medieval period, with King Henry III giving a buck and eight fallow does to stock the park.

6.5.79 Medieval findspots comprising pottery, metalwork, and other such features have also been recorded within the Scoping Boundary (HER no.: L9025, L11859 and L11347).

Post-medieval (1539 – 1900)

6.5.80 The town of Newark-on-Trent was an important town during the British Civil Wars (1642 – 1651) as two major roads passed through it, the Great North Road and The Fosse Way. The town was under Royalist control and was besieged three times, with the town surrendering to a Scottish army in 1646. The remains of siege work, and other associated earthworks, are located within the Scoping Boundary. The headquarters for the Scots army was located to the east of the A617 and west of the Great North Road (A616) (HER no.: M3124). Further earthworks are located at South Muskham or Muskham Bridge (HER no.: L2980, M2980, L3129 and M3129), Newark (HER no.: M3037), and Crankley Point (HER no.: L3608, M3608, L3609, M3609, L3610, M3610 and L8470).

6.5.81 Several post-medieval parks are located within the Scoping Boundary or partially within the Scoping Boundary, and these include Averham Park (HER no.: MNT26653), Kelham Hall (HER no.: MNT26671), and Ossington Hall (HER no.: MNT26679).

6.5.82 The land within the Scoping Boundary and Study Area would have been predominantly in agricultural use throughout much of the post-medieval period. This is evidenced by the numerous post-medieval farmsteads recorded within the HER.

6.5.83 Railway features have been identified within the Study Area. These include signal boxes (HER no.: M6691, M8852, L8852, L8848, M8848), stations (HER no.: M6768, L6768), engine sheds (HER no.: L8849 and M8849), and railway works (HER no.: L6758 and M6758).

Modern (1900 – present)

6.5.84 The Second World War airfield of Royal Air Force (RAF) Ossington is located within the Scoping Boundary (HER no.: L10557 and L10566). There are also instances of other Second World War defence infrastructure located within the Scoping Boundary, for example a pillbox in the park at Kelham Hall (HER no.: L10524).

Current Baseline – Cultural Heritage

6.5.85 All designated heritage assets within 1 km of the Scoping Boundary have been identified and are shown in **Figure 6.1.**These are tabulated within **Appendix 6A**. Each designated asset was reviewed in accordance with Historic England's Historic Environment Good Practice Advice in Planning Note 3 (2017) to determine potential effects through setting change. The justification behind the selection of designated assets for potential effects through setting change is set out for each designated asset in **Appendix 6A**.

6.5.86 Potential receptors are those which comply with one or more of the following criteria:

- Assets which hold historic interest which may be evidenced through an agricultural backdrop which may experience change as a result of the Project during the construction and/ or the operation and/ maintenance and decommissioning phases – such as farmhouses and windmills;
- Assets which may benefit from designed views or other important views which allow for the appreciation of architectural, artistic or historic interest and which may experience change as a result of the Project during the construction and/or the operation and/ maintenance and decommissioning phases – such as country houses, churches and conservation areas;
- Assets which may may interact with other assets such that inter-visibility and connectivity is important to understand historic and archaeological interest, and which may be affected by intervening activity associated with the Project during the construction and/ or the operation/ and maintenance and decommissioning phases – such as barrows, moated sites or civil war feature;
- Assets whose archaeological interest is evidenced through an understanding of topography or geography, which may be affected by the Project during the construction and/ or the operation/ maintenance and decommissioning phases – such as moated sites; and
- Assets whose archaeological interest may be evidenced through associated archaeological remains, which may be affected by the Project during the construction and/ or the operation/ and maintenance phases – such as moated sites, barrows and occupation sites located within or immediately adjacent to the Scoping Boundary.

6.5.87 The specific designated assets whose significance may be adversely affected by setting change during the construction phase or the operation and maintenance phase and decommissioning phase are set out below. This is a worst-case list based on project infrastructure and construction activities (that

will ultimately be defined by the draft Order Limits), being located anywhere within the Scoping Boundary.

6.5.88 On the confirmation of the draft Order Limits, the list of heritage assets requiring assessment will be refined to include only those located within 1 km of the draft Order Limits. This represents a narrowing from the wider Study Area used to identify assets at the Scoping stage. Only assets within 1 km buffer of the draft Order Limits will be taken forward for detailed assessment, unless stakeholders specifically request the inclusion of additional assets outside of this area.

Table 6.3: Heritage Assets Within the Study Area

Route Section	Scheduled Monuments	Listed Buildings	Conservation Areas	Registered Parks and Gardens
A	5	7	0	1
B	10	45	2	1
C	6	36	2	0
D	15	42	6	0

Future Baseline

6.5.89 The baseline environment is not static and will exhibit some degree of change over time, with or without the Project in place. Therefore, when undertaking impact assessments, it is necessary to place any potential impacts in the context of the envelope of change that might occur naturally (i.e., in the absence of the Project) over the lifetime of the Project.

6.5.90 The future baseline will consider anticipated changes over the Project's design life. The design life of the pipeline and HAGIs (including BVIs) is 40 years but it is anticipated that the actual life of the Project could extend over 40 years depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. Any long term (reversible) impacts identified to heritage assets through setting change would continue over any extended timeline. Any new receptors in a future baseline would be restricted to assets added to the Statutory Lists albeit it would be notable that any such receptors would have been added to the list with the visible above ground infrastructure of the Project already forming part of their setting. In this instance it would be reasonable to assume that the Project had not significantly affected their heritage significance and that additional impacts would be limited.

6.5.91 Below ground archaeological receptors are not expected to substantially change unless changes to their environment occur through human intervention or natural actions. Further archaeological remains may be discovered through archaeological investigations where committed developments are implemented within the draft Order Limits.

6.5.92 With regards to built heritage receptors, they also have the potential to change, both in terms of setting changes (caused by other committed developments) or due to decay to their fabric.

6.5.93 Any potentially relevant changes to the baseline would be reviewed during the EIA process and, should any likely instances be identified, the implications will be considered on a case-by-case basis within the EIA. A description of the potential future baseline will also be provided in any future environmental reporting.

Further Data Collection to be Undertaken

6.5.94 Additional data sources not practically included at Scoping due to the size of datasets and potential for abortive work, that will be obtained and reviewed at a later stage of the EIA within the DBA and HS are presented in **Table 6.4** and **Table 6.5.** These data sources will be taken forward and used to inform the DBA, HS and the EIA.

Table 6.4: Additional Sources of Historic Environment Data – Archaeology

Source	Summary	Coverage of Study Area
Archaeological Evaluation Fieldwork	Magnetometer geophysical survey.	A phased evaluation covering areas within the draft Order Limits
Field Observations	Archaeologists will undertake a targeted walkover exercise to ground truth recorded assets identified from the HER and map regression.	Draft Order Limits
Historical aerial photography, Historic England (1940s onwards)	Review of the historic aerial photography to record crop marks shown on photographs held at Historic England's archive in Swindon.	Draft Order Limits
National LiDAR programme, Environment Agency (2017-2025)	LiDAR interpretation to record the presence of the earthworks of potential archaeological origin. This will be reviewed alongside a review of the historic aerial photography set out above.	Draft Order Limits
Local archives	Historic map regression.	Draft Order Limits
Online sources	Websites such as the Genealogist website will be accessed to review Tithe Mapping and other sources to evidence the archaeological baseline.	Draft Order Limits
Portable Antiquity Scheme (PAS)	Database of all recorded archaeological finds recorded through the PAS scheme.	Full coverage of Study Area

6.5.95 The Project will follow a staged approach whereby preliminary desk studies will be undertaken, which include a DBA, HS, and an assessment of aerial photography and LiDAR, to establish the baseline.

6.5.96 Following the review and analysis of the desk studies a phased programme of non-intrusive geophysical (magnetometer) surveys will be undertaken. The geophysical surveys will firstly target areas of higher archaeological sensitivity, and those areas expected to accommodate above ground

infrastructure, plus those areas which did not respond greatly to the aerial photography and LiDAR assessment.

6.5.97 Specific methodologies for any non-intrusive surveys will be provided to consultees for agreement. The results of the surveys will be fed into the assessment to allow for a comprehensive assessment of the significance of effects and allow for design adjustments, where appropriate and feasible.

6.5.98 The requirement and approach for intrusive archaeological investigation, alongside the timing of these investigations, will be informed by the desk study and available geophysical survey results and discussed with relevant consultees via technical engagement.

6.5.99 Significant assessment of the four Sections of the Study Area has already been undertaken, due to the large amount of proposed development the localities have experienced over the past ten years. This data will be assessed as part of the baseline study.

Table 6.5: Additional Sources of Historic Environment Data – Heritage

Source	Summary	Coverage of Study Area
Tithe Mapping	Tithe Mapping will be reviewed where necessary to ascertain historic landholdings and the potential for impact to farmhouses through changes to historic context.	Designated farmsteads within 1 km of the defined draft Order Limits.
Historic Environment Record Data	HER data that has not been reviewed at Scoping for Heritage will be reviewed at EIA to identify non-designated heritage assets of a built heritage nature or non-designated earthworks or other assets which could be adversely affected by setting change. This dataset will include Historic Landscape Character data where available.	Within 1 km of the defined draft Order Limits.
Field Observations	Publicly accessible areas within the setting of heritage assets will be accessed where necessary to understand how potential change may affect assets. Access within the draft Order Limits, particularly to proposed HAGI and BVI locations may also be made to understand inter-visibility with assets.	The setting of heritage assets located within 1 km of the defined draft Order Limits.
Chapter 5: Biodiversity	Hedgerows identified within Chapter 5 will be reviewed for qualification as important under the historic criteria of the Hedgerow Regulations 2017.	Within the draft Order Limits.

6.6 Assessment Methodology

Introduction

6.6.1 The EIA will follow the general overarching methodology outlined in **Chapter 4: The EIA Process**. While those principles provide the foundation for this

assessment, this Chapter explains how they will be applied and, where necessary, adapted to address the specific requirements of the Historic Environment assessment in the ES.

Significance Evaluation Methodology

6.6.2 The significance level attributed to each effect will be assessed based on the sensitivity of the affected receptor and the magnitude of change resulting from the development. The level of significance is then determined by the combination of receptor sensitivity and magnitude of change.

Sensitivity of Receptor

6.6.3 The NPPF, Planning Practice Guidance (PPG), and Historic England's Statements of Heritage Significance: Analysing Significance in Heritage Assets, Historic England Advice Note 12, define the significance of cultural heritage receptors by their archaeological, architectural, artistic and historical interests. In general EIA terminology, the sensitivity of a receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. In heritage terms, sensitivity relates to the nature of heritage assets as a non-renewable resource. A high sensitivity is representative of an asset's designated status which reflects its rarity on a national scale. Designated status infers the prevalence of a given asset and, therefore, the potential for that particular type of asset when viewed as a group to accommodate loss. The designated or non-designated status of an asset is therefore used to infer the sensitivity or importance of an asset in **Table 6.6**.. The determination of sensitivity (significance) is based on statutory designation and professional judgement.

6.6.4 The criteria for receptor sensitivity used in this Chapter are outlined in **Table 6.6.**

Table 6.6: Definitions of Receptor Sensitivity

Sensitivity	Description
Very high	• World Heritage Sites
High	• Scheduled Monument • Grade I and II* Listed Buildings • Registered Battlefields • Grade I and Grade II* Registered Parks and Gardens • Non-designated receptors of national importance
Medium	• Grade II Listed Buildings • Conservation Areas • Non-designated receptors of regional importance
Low	• Locally Listed Buildings • Non-designated receptors of local importance
Negligible	• Receptors compromised by poor preservation and/or contextual association, or very common archaeological features/ buildings of little or no interest

Magnitude of Change

6.6.5 The magnitude of impact upon the Historic Environment is determined by defining the severity of the likely impact as set out in **Table 6.7**. Impacts can be direct, for example the loss of archaeological remains through the construction phase, or indirect, for example through a change of setting to a heritage receptor arising from visual intrusion during the operation and maintenance phase. Magnitude of change may be either beneficial or adverse.

Table 6.7: Definitions of Magnitude of Change

Magnitude		Description
Major	Adverse	Total loss of receptor and/ or quality and integrity of the receptor. Severe damage to key characteristics, features or elements of the receptor.
	Beneficial	Large scale or major improvement of receptor quality. Extensive restoration, major improvement of attribute quality.
Moderate	Adverse	Loss of receptor, but not adversely of receptor quality. Partial loss of/ damage to key characteristics, features or elements.
	Beneficial	Benefit to, or additional of, key characteristics, features or elements. Improvement of attribute quality.
Minor	Adverse	Some measurable change in attributes.
	Beneficial	Minor benefit to, or addition of, key characteristics, features or elements. Some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change		No loss or alteration of characteristics features or elements. No observable impact in either direction.

Significance of Effect

6.6.6 The predicted significance of effect will be determined through a standard method of assessment based on professional judgement, considering both the sensitivity (significance) of a receptor (**Table 6.6**) and the magnitude of change (**Table 6.7**), as depicted in **Table 6.8**.

6.6.7 The effect's significance is determined by correlating the potential magnitude of the impact and sensitivity of the receptor, as defined in the matrix presented at **Table 6.8**. The final assessment for each effect is based upon professional judgement, after taking likelihood into consideration. Effects assessed as Major will be considered significant and reported as such in the ES. Effects assessed as Moderate will be considered potentially significant at this stage of the EIA process and will be subject to further investigation during

the assessment process, following refinement of design information. Effects assessed as Minor or Negligible are generally deemed to be not significant in EIA terms

6.6.8 This evaluation will be based on professional judgement and undertaken on a precautionary basis, ensuring that uncertainty is addressed conservatively.

Table 6.8: Definitions of Magnitude of Change

Sensitivity	Magnitude of change				
	No change	Negligible	Minor	Moderate	Major
Very high	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
High	Neutral	Slight	Slight/ Moderate	Moderate/ Large	Large/ Very Large
Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight

6.7 Scope of the Assessment

6.7.1 The general approach to EIA follows the principles set out in in **Chapter 4: The EIA Process**. This Chapter outlines how those principles will be applied and, where necessary, adapted to address the specific requirements of the Historic Environment assessment. However, whilst this has informed the approach that has been used in this Historic Environment Chapter, it is necessary to set out how this methodology will be applied and adapted as appropriate, to address the specific needs of the Historic Environment assessment.

Key Receptors

6.7.2 Initial Historic Environment receptors that could be significantly affected will be identified on the basis of their heritage significance or sensitivity and the magnitude of change to that significance to which they are exposed as a result of the Project.

6.7.3 Individual receptors of an archaeological nature within the Historic Environment Study Area have not been identified at Scoping due to the early stage of the design, though a development of this type has the potential to affect all archaeological remains through:

- Direct disturbance of archaeological remains during site preparation works and construction activities within the working width; and
- Indirect disturbance to archaeological remains through potential dewatering of waterlogged deposits.

6.7.4 The following principle will be used to identify archaeological receptors for assessment:

- Archaeological receptors within the footprint of site preparation works and the working areas associated with construction will be assessed for direct and in-direct effects.

6.7.5 In respect to designated heritage assets that may be affected through setting change, during the construction, operation and maintenance and decommissioning phases, the assessment at EIA will be restricted to designated assets listed within **Appendix 6B** that are located within 1 km of the draft Order Limits. The principles for asset selection within this subset are set out in Paragraph 6.5.86.

6.7.6 Non-designated heritage assets potentially sensitive to setting change will be identified from a review of HER data and correlation with the principles as set out in Paragraph 6.5.86.

6.7.7 Proportionate individual or grouped statements of significance will be provided for all heritage assets considered to be potentially adversely affected by setting change. These will be provided in proportion to the significance of the asset and the scale and nature of proposed change. For example, highly graded designated assets potentially subject to long term (reversible) setting change (affecting significance) during the operation and maintenance phase will be subject to a more detailed significance statement than a non-designated heritage asset potentially subject to temporary setting change (affecting significance) during the construction or decommissioning phases. It being noted in all instances that change does not necessarily equate to harm.

6.7.8 All designated assets potentially affected by long term (reversible) or temporary setting change will be provided with individual statements of significance in acknowledgement of their designated status. All non-designated assets potentially affected by long term (reversible) setting change will also be provided with individual statements of significance. All non-designated assets potentially affected by temporary change will be assessed in groups according to their type, in acknowledgement of their lesser significance and the nature of the impact. This will avoid unnecessary repetition in respect to assets of lesser significance and potential impacts of lesser significance.

6.7.9 Other assets considered will comprise hedgerows important under the historic criteria of the Hedgerow Regulations 2017. These will be considered for temporary effects during construction and long term (reversible) effects during operation and maintenance phase. Effects to the Historic Landscape Character (HLC) will also be considered for the operation and maintenance phase.

Mitigation Commitments

6.7.10 As part of the early Project design process, several primary commitments are proposed to avoid and reduce the potential for effects through the Project design evolution. These commitments are considered to be embedded mitigation inherent to the Project design.

6.7.11 In addition, a range of tertiary commitments would be implemented through legislative requirements or standard industry practice. These commitments

are proposed to eliminate or reduce (where avoidance is not possible) the potential for effects on the environment.

6.7.12 Further detail on the role of Mitigation Commitments, as part of a proportionate EIA approach, is provided within **Chapter 4: The EIA Process**. A full description of the Mitigation Commitments identified to date is provided in **Appendix 4A: Draft Register of Environmental Actions and Commitments (REAC).** Mitigation Commitments will be secured by requirements in the DCO or in relevant management plans which would also be secured by requirements within the DCO. Those of relevance to Historic Environment which have been identified at this stage in the process are described in **Table 6.9.**

6.7.13 Additional Mitigation Commitments will be identified through the EIA process as required and will be taken into account when looking at residual effects.

Table 6.9: Relevant Commitments to Historic Environment

ID	Commitment Proposed	Description
Comm G-01	The DCO application will include an outline CEMP, that will outline the construction related environmental measures to be applied during construction of the Project, including details of any mitigation and how it will be managed through the construction phase. Approval of a final version of the CEMP prior to the commencement of construction will be controlled via a Requirement in the draft DCO. The purpose of the outline CEMP will be to set out the measures which will be taken to manage the potential adverse environmental impacts of the construction of The Project and limit the disturbance from construction activities such as site preparation, material delivery and removal, works activities and site reinstatement as far as is reasonably practicable.	To minimise the impacts during the construction phase on human and environmental receptors, including archaeological and heritage receptors, where possible.
Comm Ar-10	An Outline Written Scheme of Investigation (OWSI) will be produced. This will set out the overarching research aims and approach to evaluation and mitigation will be set out in a Outline Written Scheme of Investigation (OWSI).	This OWSI will act as an overarching document setting out the general aims and broad methodologies for all archaeological investigations to be undertaken in accordance with the DCO. All Written Schemes of Investigations for archaeological investigations will be subordinate to the OWSI. All WSIs stemming from the OWSI will be subject to agreement by the relevant local authorities in consultation with Historic England.
Comm Ar-11	Off easement construction routes to use existing access will be constructed, as far as practicable at identified locations of historic environment, to minimise disturbance or compaction of archaeological remains and	To avoid impact to archaeological remains and to minimise setting change that could affect the

ID	Commitment Proposed	Description
	to reduce perceptual change within the setting of heritage assets	significance of heritage assets, where possible.
Comm Ar-12	Where practicable, trackway would be used for off easement access, where areas of archaeological potential have been identified, to avoid or minimise disturbance or compaction of archaeological remains.	As above.
Comm Wt-13	The pipeline will where practicable be completely buried underground (with the exception of above ground infrastructure) and the ground will be suitably reinstated.	To minimise the presence of above ground infrastructure which could affect heritage assets through setting change, where possible.
Comm Wt-15	All subsurface infrastructure will be designed to minimise disruption to existing subsurface flow pathways to avoid any localised increases in groundwater flooding risk and changes to the availability of water resources.	To avoid alterations to localised water tables that may be providing good anaerobic preservation conditions for organic or deposits with paleoenvironmental potential.
Comm Lv-19	Minimising the visibility of activity within temporary construction compounds, where practicable. Achieved by utilising existing vegetation as screening where possible or by attaching a plain heras fence cover (woven mesh material or similar) to create visual screening on sensitive boundaries. In some locations temporary earthwork bunds may be an appropriate measure and are subject to iterative design evolution	To provide screening to minimise any effects to heritage assets through setting change, where possible.
Comm Lv-20	Minimisation of hedgerow and tree loss.	To reduce the potential effect to hedgerows important under the historic criteria of the Hedgerow Regulations 2017.
Comm Lv-21	Where temporary loss of hedgerow occurs within existing hedgerows, we will seek to enhance these areas where practicable, using a species mix containing at least five woody plant species. Hedgerow planting requirements will be determined through assessment and further studies as the Project develops.	To offset the potential effect to hedgerows important under the historic criteria of the Hedgerow Regulations 2017, where possible.
Comm Aq-22	Where practical, sensitive sites will be avoided when siting temporary construction compounds and permanent project infrastructure. Sensitive sites to be considered include European Sites, SSSIs, Ancient Woodland, Local Nature Reserves, Local Geological/ Geodiversity Sites, Listed Buildings, Scheduled Monuments and areas of potential contamination.	To avoid physical impact to designated heritage assets, where possible.

ID	Commitment Proposed	Description
Comm Pc-37	The Project design will aim to avoid all World Heritage Sites, National Nature Reserves and Registered Parks and Gardens, and to minimise interaction with other tourist and recreational facilities.	To avoid physical impact to designated heritage assets, where possible.
Comm Lv-62	The application will include a strategy and proposals for managing measures to avoid, reduce, mitigate or compensate for potential impacts on landscape and biodiversity resources and measures intended to provide biodiversity benefit during construction and operational phases of the project. This information will be presented within either a combined Landscape and Ecology Management Plan, or separate plans for Landscape and Visual and Biodiversity aspects. These will cover both construction and operation and maintenance aspects of the Project and include management and monitoring to check all mitigation planting survives to fulfil its landscape, visual and biodiversity role	To ensure the longevity of screening provided to minimise any effects to heritage assets through setting change.

Likely Significant Effects

6.7.14 A range of potential impacts on Historic Environment receptors have been identified from the desk based review undertaken for Scoping which may occur during the construction, operation and maintenance and decommissioning phases of the Project.

6.7.15 The potential impacts that have been identified as having the potential for a LSE at this time, and which are scoped into the assessment, are outlined in **Table 6.10.** The potential for LSEs have been identified on the basis that primary and tertiary Mitigation Commitments have been applied.

Table 6.10: Impacts Proposed to be Scoped Into the Project Assessment for Historic Environment (Project Phase refers to Construction (C), Operation & Maintenance (O&M) and Decommissioning (D)).

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
HE-01	Direct Impacts - groundworks causing the removal/truncation of buried archaeological remains.	C	Comm Ar-10 Comm Ar-11	Land Disturbance (earthworks, excavation) for pipeline, HAGIs, BVIs and Temporary Construction Compounds (TCCs).	Construction of the pipeline and associated infrastructure will involve ground disturbance through excavation, trenching, and site preparation within the working width and temporary compounds. These activities have the potential to damage or completely remove buried archaeological features, artefacts, and deposits. Such remains are often irreplaceable and provide important evidence of past human activity, settlement patterns and cultural heritage.
HE-02	Land Disturbance (earthworks, excavation) for pipeline, HAGIs, BVIs and TCCs causing direct impact to archaeological remains.	C	Comm Wt-15	Land Disturbance (earthworks, excavation) for pipeline, HAGIs, BVIs and TCCs.	Construction activities such as trenching, soil stripping, and installation of drainage systems can alter local hydrology, leading to changes in groundwater levels and soil moisture regimes. These changes may accelerate the deterioration of buried archaeological remains, particularly organic materials that rely on stable waterlogged conditions for preservation. Lowering the water table can cause desiccation and oxidation of deposits, while increased water flow may erode or wash away fragile remains.
HE-03	Loss of hedgerows, classed as important under the historic criteria of the hedgerow regulations.	C; O&M	Comm Lv-20 Comm Lv-21	All Infrastructure	Construction of the pipeline and the associated infrastructure may require the partial removal of hedgerows important under the historic criteria. Construction impacts may be temporary if hedgerows are to be reinstated. Permanent effect would persist if hedgerows are permanently breached.

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
HE-04	Long term reversible loss of historic landscape character.	O&M	Comm Wt-13 Comm Lv-20 Comm Lv-21	HAGIs, BVIs and pipeline	Construction of the pipeline and associated infrastructure may affect historic landscape character through the permanent removal of field boundaries or through the addition of elements which are out of character with the elements that hold historic interest. The potential alteration to the field morphology of an area or the general character of a historic landscape classification may affect significance.
HE-05	Temporary effects to heritage assets through temporary setting change arising from construction or decommissioning activity.	C; D	Comm Lv-19	All infrastructure	Construction and decommissioning activities, including the establishment of working widths, temporary compounds, and movement of plant and machinery, can introduce visual, noise, and activity-related intrusion into the surroundings of heritage assets. These changes may affect the way assets are experienced and understood, diminishing their archaeological, historic, artistic or architectural significance. Although temporary, such changes can be significant where the appreciation of the significance of an asset is affected.
HE-06	Long term reversible effects to heritage assets through long term setting change.	O&M	Comm Wt-13 Comm Lv-20	HAGIs, BVIs, marker posts	The introduction of above ground infrastructure such as HAGIs, fencing, and associated access tracks may alter the visual and spatial context of heritage assets within the surrounding landscape. These changes may affect how assets are experienced and understood, diminishing their archaeological, historical, artistic or architectural value. These changes will persist throughout the operational life of the Project, potentially resulting in a long-term reduction in the significance of affected assets.

Impacts Proposed to be Scoped Out

6.7.16 On the basis of the baseline information currently available, the Project Description outlined in **Chapter 2: The Project**, and the good practice Mitigation Commitments outlined in **Table 6.9**, potential impacts which are unlikely to result in LSE are proposed to be scoped out of the assessment. These effects are presented in **Table** with justification for why they should be scoped out, plus where relevant reference to the Mitigation Commitments which will be applied. This approach aligns with Nationally Significant Infrastructure Project (NSIP) - Advice Note Seven: Environmental Impact Assessment (Planning Inspectorate (PINS), 2020) as described in **Chapter 4: The EIA Process**.

Table 6.11: Impacts Proposed to be Scoped Out of the Project Assessment for Historic Environment

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Justification
HE-07	Direct Impacts - groundworks causing the removal/ truncation of buried archaeological remains.	O&M; D	None applied	Land Disturbance (earthworks, excavation) for pipeline, HAGIs, BVIs and TCCs.	No disturbance to archaeological remains would be predicted during the decommissioning and operation and management phase. The buried Pipeline will be left in situ such that no further ground disturbance would be caused and the ground disturbance associated with either the decommissioning and operation and management. All above ground facilities including the HAGIs would not extend beyond the construction footprint.

Cumulative Effects

6.7.17 **Chapter 4: The EIA Process** details how potential cumulative effects will be assessed through a Cumulative Effects Assessment (CEA) and gives examples of the projects which are likely to be included in that assessment.

6.7.18 The CEA for the Historic Environment will consider whether the Project, in combination with other proposed developments, could result in significant cumulative effects on Historic Environment receptors. The assessment will include desk-based research and consultation with stakeholders to identify relevant potential projects with which there could be interactions within the Historic Environment.

6.7.19 In terms of archaeological sites in general, cumulative impacts will principally arise where each development removes individual areas of preserved archaeological remains resulting in a gradual erosion and fragmentation of the total archaeological resource of the region. Development would contribute to

the cumulative physical loss of archaeological remains from development in general within the region.

6.7.20 In respect to heritage assets, in-common receptors i.e. receptors identified as being affected by the Project and any other foreseeable project may experience cumulative effects through setting change.

Intra-Project Effects

6.7.21 The assessment of intra-project effects from multiple impacts from the construction, operation and maintenance or decommissioning of the Project will be considered for the Historic Environment. It will include consideration of project lifetime effects and receptor led effects in line with the approach outlined in **Chapter 4: The EIA Process**.

Secondary Effects

6.7.22 Secondary effects are effects on one receptor group that may influence another receptor group. Potential secondary effects between Historic Environment and the following Chapters will be reviewed, and a qualitative assessment (drawing on expert judgement) will be undertaken if there is potential for LSE to occur and presented in the EIA:

- Habitat features such as woodland, hedgerows, grassland and watercourses (as considered in **Chapter 5: Biodiversity**) form part of the historic landscape and may contribute to the setting of heritage assets; changes to these features therefore have the potential to affect the historic environment;
- Changes to landscape character and visibility (as considered within **Chapter 8: Landscape and Visual)** have the potential to influence how heritage assets and historic landscapes are experienced, including effects identified through the ZTV;
- Noise and vibration generated during construction or operation (as considered in **Chapter 10: Noise and Vibration**) have the potential to affect the use of heritage assets and their settings; and
- Soil disturbance, stripping, compaction and changes in agricultural land management (as considered within **Chapter 13: Agriculture and Soil Resources**) have the potential to affect buried archaeological remains and the integrity of historic field systems.

Transboundary Effects

6.7.23 At this stage it is not anticipated that transboundary effects relating to the Historic Environment would arise. This is because the potential impacts on designated and non-designated archaeological and built heritage receptors are localised in nature, as outlined in **Section 6.5**. It is therefore proposed that transboundary effects are scoped out of the Historic Environment assessment.

6.8 Conclusion

6.8.1 This Historic Environment Scoping Chapter has considered the potential effects of the Project on the Historic Environment, including designated and non-designated heritage/ archaeological receptors. This Chapter has identified, through an early review of Historic Environment data, that the Study Area contains a range of receptors whose significance derives from their archaeological, historical, architectural and artistic values, associated with past land use and settlement activity.

6.8.2 On the basis of the baseline information currently available, there is potential for effects on archaeological remains arising from ground-disturbing works and on the heritage receptors through setting change as a result of construction and operation and maintenance activities. The disturbance of archaeological remains during the decommissioning phase has been scoped out of the assessment.

6.8.3 It is proposed that the ES will include a proportionate assessment of effects on the historic environment, supported by an archaeology DBA and, where necessary, an archaeological field evaluation to refine the understanding of archaeological potential and significance. The ES will also be supported by an HS to consider effects on the significance of heritage assets and their settings, in accordance with relevant legislation, national policy and best practice guidance.

6.9 References

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510000 515000 520000 525000

420000

415000

Section A

Section B

1007813

1103729

1007815

1008044

1103701

1016858

1204608

1005206

1359800

1008686

1020423

1346978

Brocklesby Park Registered Park and Garden

Great Coates Conservation Area

0 2.5 5

Kilometres

N

LEGEND

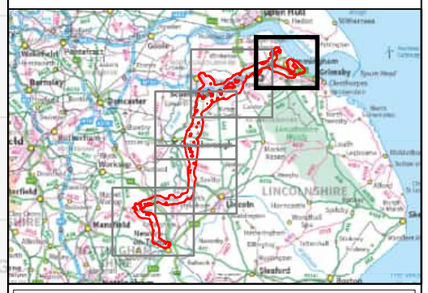
- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Listed Building (Grade)

- I
- II
- II*
- Scheduled Monument
- Conservation Area
- Registered Park and Garden

NOTES

Heritage Designations referenced within the Scoping Report have been labelled.



H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

DESIGNATED HERITAGE ASSETS SECTION A

FIGURE 6.1a

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0007.0 Designated Heritage Assets

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490000 495000 500000 505000 510000

415000 410000 405000

402.064333.00001.0007.0 Designated Heritage Assets

N

Section A
Section B
Section C

New Frodingham, Scunthorpe Conservation Area
Brigg Conservation Area
Scawby Conservation Area

1016427 1204608 1016858 1281128 1016430 1005206 1476203 1016426 1083726 1281035 1016429 1083683 1346518 1005221 1083709 1007729 1013627 1165912 1165812

Brocklesby Park Registered Park and Garden

0 2.5 5
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Listed Building (Grade)

- I
- II
- II*
- Scheduled Monument
- Conservation Area
- Registered Park and Garden

NOTES

Heritage Designations referenced within the Scoping Report have been labelled.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

DESIGNATED HERITAGE ASSETS SECTION B

FIGURE 6.1b

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

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480000 485000 490000 495000 500000

405000 400000 395000 390000

402.064333.00001.0007.0 Designated Heritage Assets

Scawby Conservation Area
1346518
1005221
1083709
Section B
Section C
1007729
1013627
1165912
1165812
1016794
1004996
1016795
1064162
Springthorpe Conservation Area
1016920
1064048
Kirton in Lindsey
GAINSBOROUGH
WEST LINDSEY DIST

N

0 2.5 5
Kilometres

LEGEND

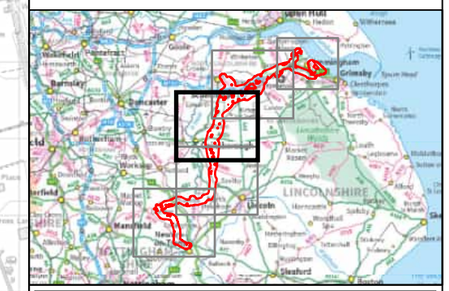
- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Listed Building (Grade)

- I
- II
- II*
- Scheduled Monument
- Conservation Area
- Registered Park and Garden

NOTES

Heritage Designations referenced within the Scoping Report have been labelled.



H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

DESIGNATED HERITAGE ASSETS SECTION C

FIGURE 6.1c

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

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480000 485000 490000 495000 500000

385000 380000 375000

1019229 1302452 1045689 1046053 1276534

Section C Section D

Willingham by Stow Conservation Area

Saxilby, by Bridge Street Conservation Area

South Clifton Conservation Area

N

LEGEND

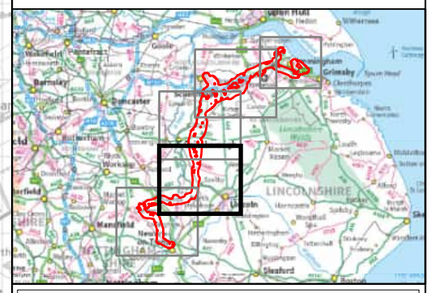
- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Listed Building (Grade)

- I
- II
- II*
- Scheduled Monument
- Conservation Area
- Registered Park and Garden

NOTES

Heritage Designations referenced within the Scoping Report have been labelled.



0 2.5 5

Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

DESIGNATED HERITAGE ASSETS SECTION C

FIGURE 6.1d

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0007.0 Designated Heritage Assets

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465000 470000 475000 480000 485000

370000 365000 360000

Section C
Section D

Tuxford Conservation Area
Kirton Conservation Area
Egmanton Conservation Area
Laxton Conservation Area
Kneesall Conservation Area
Norwell Conservation Area
Caunton Conservation Area
South Clifton Conservation Area
Winthorpe Conservation Area
Kelham Conservation Area
Averham Conservation Area
Newark Conservation Area

1156898
1009123
1009296
1156553
1008188
1009152
1045689
1302452
1046053
1276534
1179422
1019870
1369972
1046003
1017620
1016049
1016047
1016050
1045982
1016046
1016152
1016051
1302213
1046008
1016048
1003474
1017402

NEWARK AND SHERWOOD DISTRICT

N

0 2.5 5
Kilometres

LEGEND

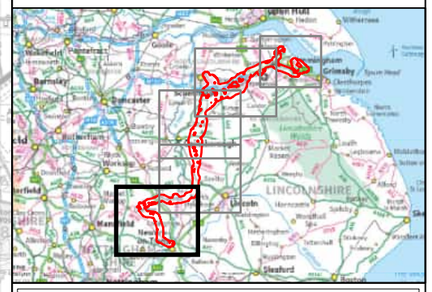
- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Listed Building (Grade)

- I
- II
- II*
- Scheduled Monument
- Conservation Area
- Registered Park and Garden

NOTES

Heritage Designations referenced within the Scoping Report have been labelled.



H₂East Pipeline
Humber to
Nottinghamshire

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SCOPING REPORT

DESIGNATED HERITAGE ASSETS SECTION D

FIGURE 6.1e

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0007.0 Designated Heritage Assets

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516000 518000 520000 522000 524000

416000 414000 412000

N

MNL3039 MNL272 MNL845 MNL3039 MNL3039 MNL4673 MNL1522 MNL287 MNL2101 MNL2238 MNL1222 MNL4684 MNL4679 MNL2117 MNL2373 MNL4641 MNL4674 MNL287 MNL1223 MNL1901 MNL4124 MNL2238 MNL1009 MNL2287 MNL4640 MNL1827 MNL287 MNL2238 MNL4951 MNL2238 MNL2376 MNL2238 MNL4950 MNL4973 MNL287 MNL2452 MNL2234 MNL2238 MNL834 MNL3915 MNL3923 MNL3924 MNL2235 MNL2235 MNL4200 MNL2235 MNL1302 MNL3925 MNL3922 MNL2234 MNL286 MNL283 MNL4199 MNL4198 MNL371 MNL2238 MNL1881 MNL2235 MNL2238 MNL1234 MNL2235 MNL2238 MNL3921 MNL2235 MNL3921 MNL2454 MNL5062 MNL1906 MNL1525 MNL1895 MNL4366 MNL2689 MNL2235 MNL2235 MNL2453 MNL3914 MNL2235 MLI81205 MNL2235 MLI53780 MNL2535

Immingham CP STALLINGBOROUGH CP KEELBY CP HEALING CP

Immingham Dock Oil Storage Depots Navigational Arch Oil Storage Depot Industrial Estate Great Coates Healing Little London Stallingborough

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.

H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION A

FIGURE 6.2a

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

402.064333.00001.0008.1 Archaeology Assets

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510000 512000 514000 516000 518000

422000 420000 418000

402.064333.00001.0008.1 Archaeology Assets

N

LEGEND

Scoping Boundary

Scoping Boundary Section Division

Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Line

Historic Environment Record (HER) Area

Other Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Line

Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.

H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION A

FIGURE 6.2b

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

0 1 2 Kilometres

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508000 510000 512000 514000 516000

416000 414000 412000

N

LEGEND

Scoping Boundary

Scoping Boundary Section Division

Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Line

Historic Environment Record (HER) Area

Other Historic Environment Records

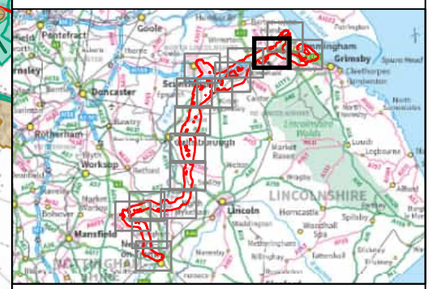
Historic Environment Record (HER) Location

Historic Environment Record (HER) Line

Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.



H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION A TO SECTION B

FIGURE 6.2c

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

0 1 2 Kilometres

402.064333.00001.0008.1 Archaeology Assets

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500000 502000 504000 506000 508000

414000 412000 410000

402.064333.00001.0008.1 Archaeology Assets

N

MLI116754 MLI50396 MLI53644 MLI50279 MLI50278 MLI53639 MLI53663 MLI53643 MLI50277 MLI53660 MLI53642 MLI53647 MLI53641 MLI97736 MLI53664 MLI53661 MLI53659 MLI53665 MLI80312 MLI116756 MLI88523 MLI53662

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.

H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION B

FIGURE 6.2d

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

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496000 498000 500000 502000 504000

410000 408000 406000

402.064333.00001.0008.1 Archaeology Assets

MLI116754 MLI50396 MLI53644 MLI50279 MLI50278 MLI53639 MLI53663 MLI53643 MLI50277 MLI53660 MLI53642 MLI53647 MLI53641 MLI97736 MLI53664 MLI53661 MLI53659 MLI53665 MLI80312 MLI116756 MLI88523 MLI53662 MLI116763 MLI53656

N

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.

H2East Pipeline
Humber to
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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION B

FIGURE 6.2e

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

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488000 490000 492000 494000 496000

412000 410000 408000

N

LEGEND

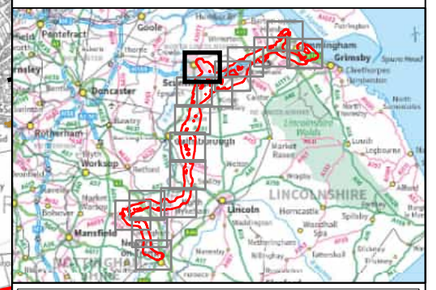
- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.



H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION B

FIGURE 6.2f

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

0 1 2 Kilometres

402.064333.00001.0008.1 Archaeology Assets

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492000 494000 496000 498000

406000 404000 402000

Section B
Section C

MLI126902
MLI53874
MLI53872
MLI53873
MLI53877
MLI53871
MLI53876
MLI53875
MLI50760
MLI50762
MLI50763
MLI50759
MLI51276
MLI50370
MLI53744
MLI50758

MESSINGHAM CP
SCAWBY CP
MANTON CP
HIBALDSTOW CP
KIRTON IN LINDSEY CP
REDBOURNE CP
LINCOLNSHIRE

Kirton in Lindsey
Hibaldstow
Redbourne

0 1 2
Kilometres

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION B

FIGURE 6.2g

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

402.064333.00001.0008.1 Archaeology Assets

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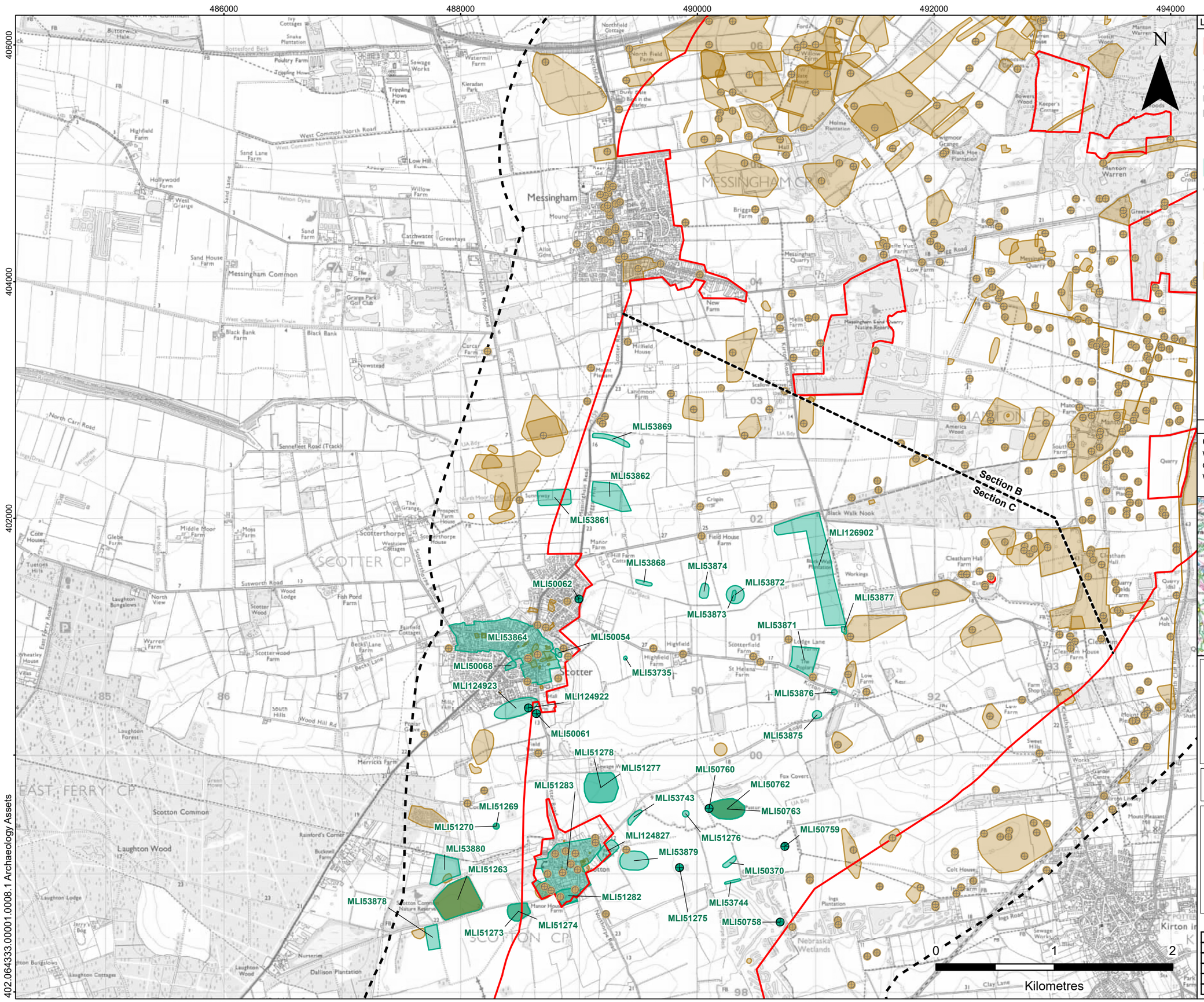


LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

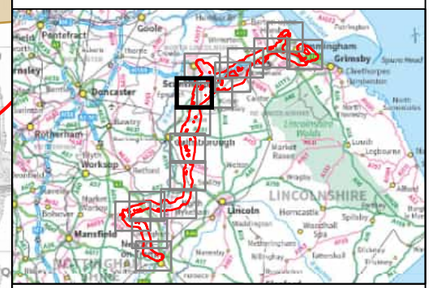
- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.



H2East Pipeline
Humber to
Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION B TO SECTION C

FIGURE 6.2h

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

402.064333.00001.0008.1 Archaeology Assets

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484000 486000 488000 490000 492000

398000 396000 394000

LAUGHTON CP
NORTHORPE CP
GRAYINGHAM CP
PILHAM CP
CORRINGHAM CP
BLYBOROUGH CP
HEMSWELL CP

MLI51291 MLI51293 MLI50632 MLI50757 MLI54003 MLI125581 MLI52843 MLI50517 MLI54079 MLI54147 MLI54081 MLI50303 MLI54077 MLI54224 MLI51288 MLI98185 MLI54039 MLI54040 MLI51012 MLI54223 MLI51011 MLI50739 MLI50741 MLI125593 MLI50534 MLI88701 MLI51345 MLI98184 MLI98186 MLI53943 MLI53941 MLI50936 MLI54038 MLI51344 MLI51477 MLI51340 MLI51348 MLI51341 MLI80678 MLI51358 MLI51356 MLI54034 MLI50286

Laughton Bungalows, Laughton Cottages, Laughton Wood, Nurseries, Dallison Plantation, Park House Farm, Burial Ground, Laughton, Hall Farm, Church Road, Laughton Back, Mount Pleasant Farm, Dring Lane, Northorpe Beck, Kingscliffe Farm, Northorpe, Low Farm, Grange Farm, Northorpe Hall, The Park, Cold Harbour, Prewpe Hall Farm, Sewage Works, Blue Bell Farm, Blyton Grange, Airfield (disused), Blyton Gate, Willow Tree Farm, Sandbeck Farm, Brook Farm, The Fields Farm, Grange Farm, Top Farm, Old Hall Farm, Blyton, Ash Tree Cottage, Catchwater Farm, Carr Lane, Poplar Farm, Oak Tree Farm, Lineside Farm, Pilham Lane Farm, Pilham, Home Farm, Station Farm, Pilham Hall, Glebe Farm, The Station House, Wharton, The Hall, Yew Tree Farm, Manor Farm, Beck Farm, Northfield Farm, Duckles Wood, Wharton Wood, Corringham Scrogs, Windy Ridge, Westfield Farm, Hall Farm, Mill Farm, The Cottage, Corringham Grange Farm, Corringham, Birch Wood, Horsby Wood, Woodhouse Farm, Somerby Wood, Brickhill Wood, Staplegate House, White's Wood, Gainsborough Road Covert, Southorpe Lane, Swinedyke Cottage, Southorpe Farm, Hebrand Dillam of Southorpe (site of), Blyton Level Crossing, Bonsdale Farm, Dunstall, Huckerby Gorse, Huckerby Covert, Huckerby Farm, Huckerby Bungalows, Blyborough Covert, Horsebeck, Sewage Works, Willoughton, Willoughton Grange, Willoughton Manor, Northfield, Whitleather, Southfield Lane, Middle Street, Patchett, Low Farm, Trafalgar Farm, Graysingham Lodge, Springfield Farm, Bell Farm, Gainsborough Road, Whitehoe Farm, White Hoe, White Hoe Farm, Meadow Farm, Gravel, Cliff View, Ivy House Farm, Red House Farm, Blyborough Hall, Westbeck Lane, Hemswell, Spring Hills, Manor House Farm, Hemswell Lane, Hemswell Grange, Harpswell Lane, Harpswell Low Farm, Harpswell Grange, Magin Moor Cottages, Ancliff Farm, Tealkers Farm, Park Farm, Yawthorpe, Yawthorpe Park Covert, Home Farm, Brown's Holt, Corringham Windmill, Corringham Beck (Drain), Corringham Beck, Aisby Beck, Aisby, Aisby House Farm, Moscar Farm, Northfield Farm, Hall Farm, Staplegate House, Seware Works, Sturgate Road, Corringham Road, Gainsborough Road, Todd Lane, Pilham Lane, Aisby Lane, Station Road, Laughton Road, Blyton Level Crossing, Kirton Road, Carr Lane, Lineside, Pilham Lane, Todd Lane, Aisby Lane, Southfield Lane, Middle Street, Clay Lane, Graysingham Low Road, Gainsborough Road, Corringham Road, Sturgate Road, Seware Works, Westbeck Lane, Harpswell Lane, Hemswell Lane, Kirton Road, Laughton Road, Blyton Level Crossing, Gainsborough Road Covert, Southorpe Lane, Swinedyke Cottage, Southorpe Farm, Hebrand Dillam of Southorpe (site of), Blyton Level Crossing, Bonsdale Farm, Dunstall, Huckerby Gorse, Huckerby Covert, Huckerby Farm, Huckerby Bungalows, Blyborough Covert, Horsebeck, Sewage Works, Willoughton, Willoughton Grange, Willoughton Manor, Northfield, Whitleather, Southfield Lane, Middle Street, Patchett, Low Farm, Trafalgar Farm, Graysingham Lodge, Springfield Farm, Bell Farm, Gainsborough Road, Whitehoe Farm, White Hoe, White Hoe Farm, Meadow Farm, Gravel, Cliff View, Ivy House Farm, Red House Farm, Blyborough Hall, Westbeck Lane, Hemswell, Spring Hills, Manor House Farm, Hemswell Lane, Hemswell Grange, Harpswell Lane, Harpswell Low Farm, Harpswell Grange, Magin Moor Cottages, Ancliff Farm, Tealkers Farm, Park Farm, Yawthorpe, Yawthorpe Park Covert, Home Farm, Brown's Holt, Corringham Windmill, Corringham Beck (Drain), Corringham Beck, Aisby Beck, Aisby, Aisby House Farm, Moscar Farm, Northfield Farm, Hall Farm, Staplegate House, Seware Works, Sturgate Road, Corringham Road, Gainsborough Road, Todd Lane, Pilham Lane, Aisby Lane, Station Road, Laughton Road, Blyton Level Crossing, Kirton Road, Carr Lane, Lineside, Pilham Lane, Todd Lane, Aisby Lane, Southfield Lane, Middle Street, Clay Lane, Graysingham Low Road, Gainsborough Road, Corringham Road, Sturgate Road, Seware Works, Westbeck Lane, Harpswell Lane, Hemswell Lane

N

0 1 2
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

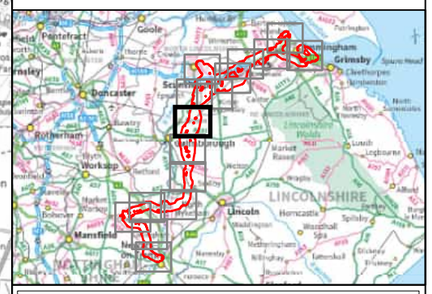
- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.



H2East Pipeline
Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION C

FIGURE 6.2i

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

402.064333.00001.0008.1 Archaeology Assets

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484000 486000 488000 490000 492000

390000 388000 386000

402.064333.00001.0008.1 Archaeology Assets

MLI50286 MLI51334 MLI51336 MLI51358 MLI51356 MLI54034 MLI51360 MLI51349 MLI51359 MLI51351 MLI54044 MLI54156 MLI51350 MLI54033 MLI51366 MLI54253 MLI81898 MLI98428 MLI98429 MLI51368 MLI80070 MLI50919 MLI54016 MLI54252 MLI54022 MLI52046 MLI84314 MLI52445 MLI52438 MLI80326

GAINSBOROUGH SPRINGTHORPE CP HEAPHAM CP UPTON CP KEXBY CP KNAITH CP WILLINGHAM CP GATE BURTON CP STOW CP

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

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0 1 2 Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION C

FIGURE 6.2j

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

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484000 486000 488000 490000 492000

382000 380000 378000

402.064333.00001.0008.1 Archaeology Assets

N

MLI80326 MLI54270 MLI52506 MLI52502 MLI52447 MLI52447 MLI50575 MLI52435 MLI54199 MLI50575 MLI50566 MLI52514 MLI50418 MLI52782 MLI52555 MLI52793 MLI52557 MLI52558 MLI50044 MLI52554 MLI52556 MLI98502 MLI52794 MLI52770 MLI50391 MLI50619 MLI50535 MLI50306 MLI50307 MLI52821 MLI52789 MLI52600 MLI116080 MLI52615 MLI116079 MLI52781 MLI52616 MLI52609 MLI52614 MLI116081 MLI52273 MLI52766

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Line
- Historic Environment Record (HER) Area

NOTES

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H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION C

FIGURE 6.2k

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25
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480000 482000 484000 486000 488000

374000 372000 370000

L4702 L4730 L4721 L8728 L4726 L10632 L4727 L4707 L8725 MLI52273 MLI52766 L4728 M4709 L4350 L4253 L4343 L10616 L4344 L4254 L6053 L9948 M8641 M8596 L8595 L4176

Section C
Section D

NEWTON ON TRENT CP
NORTH CLIFTON CP
SOUTH CLIFTON CP
WIGSLEY CP
THORNEY CP
HARBY CP
SPALFORD CP
BROADHOLME CP

Dunham on Trent
Newton on Trent
Ragnall
Fiskerton
Fledborough
North Clifton
South Clifton
High Marnham
Thorney
Drinsey Nook
Saxilby Moor
North Harby
Spalford
Wigsley
Eagle
North Scarle

LEGEND

Scoping Boundary

Scoping Boundary Section Division

Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Line

Historic Environment Record (HER) Area

Other Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Area

NOTES

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0 1 2 Kilometres

H2East Pipeline
Humber to
Nottinghamshire

Cadent
Your Gas Network

SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION C

FIGURE 6.2I

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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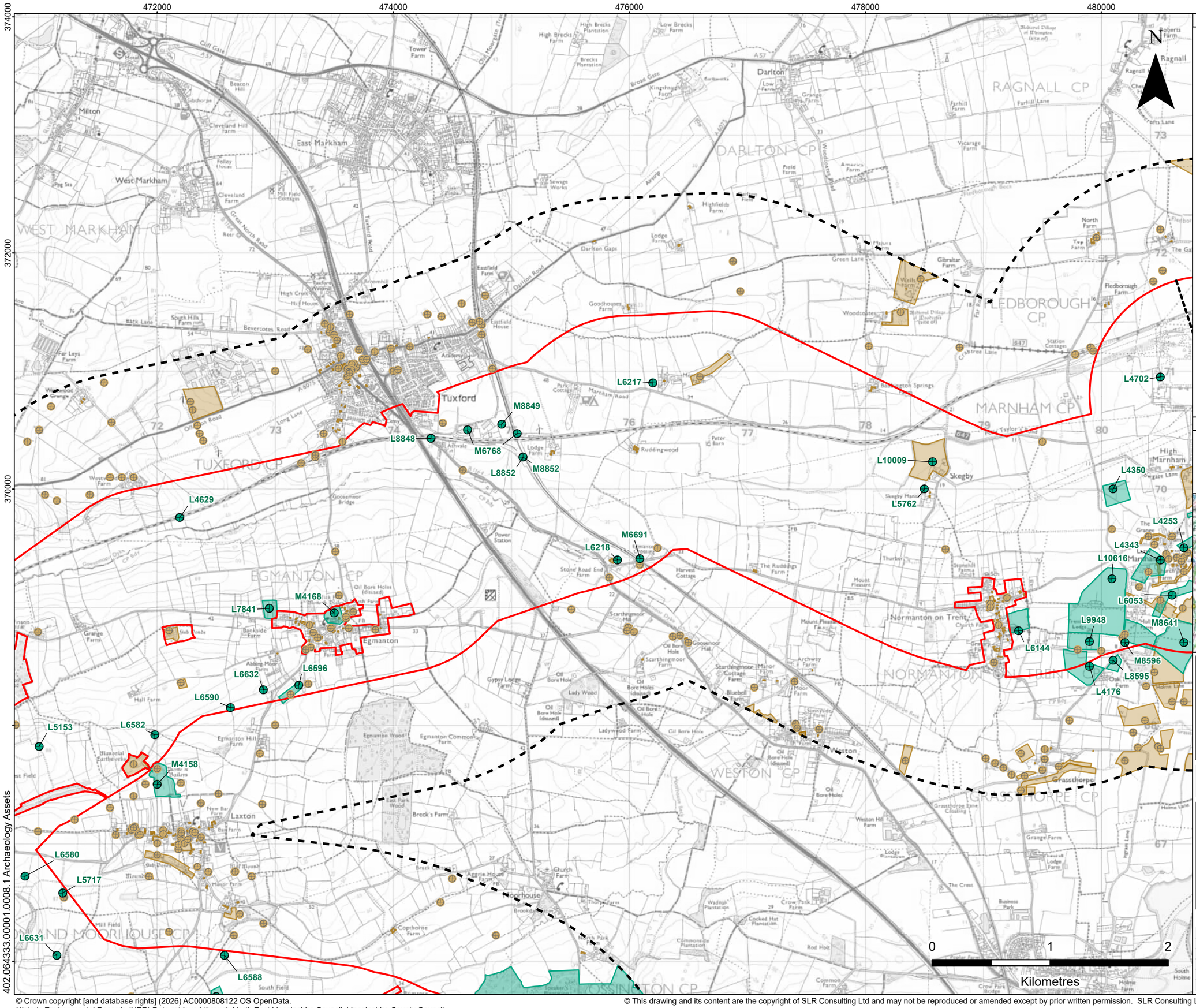

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

NOTES

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H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION D

FIGURE 6.2m

Scale: 1:30,000 @ A3

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468000 470000 472000 474000 476000

370000 368000 366000

402.064333.00001.0008.1 Archaeology Assets

N

WALESBY CP
TUXFORD CP
EGMANTON CP
KIRTON CP
WELLOW CP
LAXTON AND MOORHOUSE CP
OMPTON CP
KNEESALL CP
OSSINGTON CP

Tuxford
Egmanton
Laxton
Wellow
Kneesall
Ossington

L6217 M8849 L8848 M6768 L8852 M8852 L4629 M6691 L6218 L11982 M4168 L7841 L6632 L6596 L6590 L5153 L6582 L11980 M4158 L8583 L8584 L9405 M4098 L9404 L8585 L8586 M18121 L5154 L4154 L4226 L6580 L5717 L6631 L6588 L4099 L4251 L10566 L9953 L9954 L9024 L9026 L4252 L9025 L4185 L9588 L9936 L4220

MNT26703 MNT26679

0 1 2 Kilometres

LEGEND

Scoping Boundary

Scoping Boundary Section Division

Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Area

Other Historic Environment Records

Historic Environment Record (HER) Location

Historic Environment Record (HER) Area

NOTES

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION D

FIGURE 6.2n

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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02	CLIENT REVIEW 1	DB	JS	MF	28/01/26

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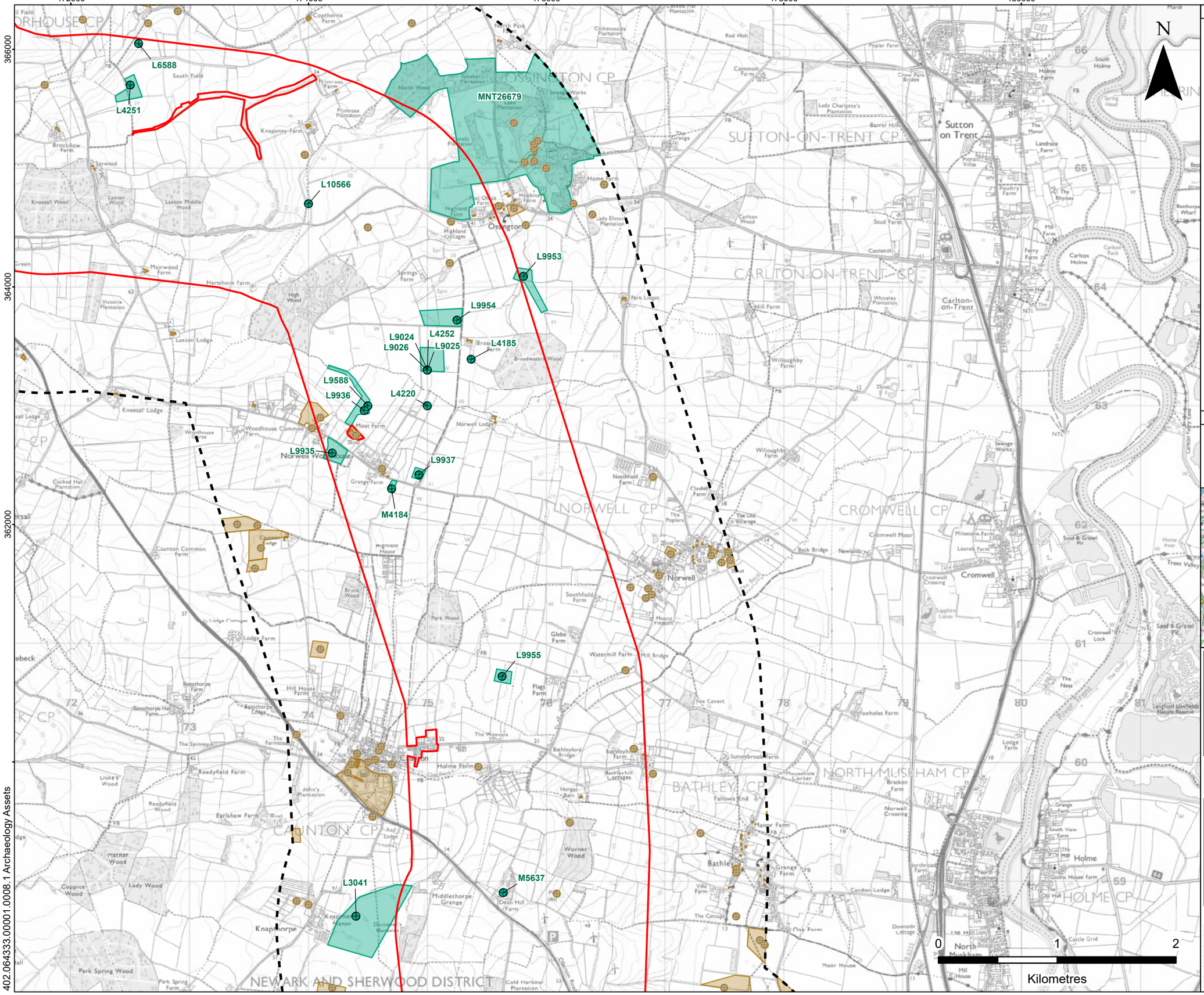


LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

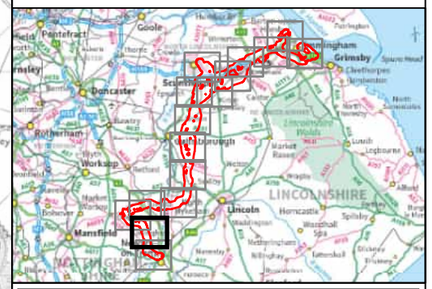
- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

NOTES

Only Historic Environment Records data referenced within the Scoping Report has been labelled. Only one label has been used for multiple HER Locations within the same area with the same reference.



H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION D

FIGURE 6.2o

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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402.064333.00001.0008.1 Archaeology Assets

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474000 476000 478000 480000 482000

360000 358000 356000

L3041 M5637 L11145 L8327 M2966 L11116 M2968 M8330 MNT26653 M2959 M8320 MNT27613 MNT27614 L11345 MNT27615 MNT27618 L2982 MNT27616 L11347 L10524 L2958 M3124 L9702 L8402 L11344 M3030 L11343 MNT26671 L2980 M3129 M3037 L5801 L8470 M3609 L3610 M3608

NEWARK AND SHERWOOD DISTRICT

BATHLEY CP NORTH MUSKHAM CP CLAYPOLE CP HOLME CP SOUTH MUSKHAM CP KELHAM CP STAYTHORPE CP UPTON CP ROLLESTON CP NEWARK-ON-TRENT WINTHORPE CP LANGFORD

Knapthorpe Middlethorpe Grange Muskham Wood Muskham Woodhouse Cheveral Wood Averham Park Farm Keelham Hills Farm Gorse Hill Spring Wood Farm Micklebarrow Hill Upton Cliffe Farm Staythorpe Rolleston Rolleston Station Norwood Farm Fiskerton Station Fiskerton Hill Farndon Bathley Holme North Muskham Winthorpe Langford Newark-on-Trent

N

0 1 2 Kilometres

402.064333.00001.0008.1 Archaeology Assets

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 1 km Buffer

Referenced Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

Other Historic Environment Records

- Historic Environment Record (HER) Location
- Historic Environment Record (HER) Area

NOTES

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H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

ARCHAEOLOGY ASSETS SECTION D

FIGURE 6.2p

Scale: 1:30,000 @ A3

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7 Hydrology, Hydrogeology and Flood Risk

7.1 Introduction

7.1.1 The Hydrology, Hydrogeology and Flood Risk Assessment will consider the Likely Significant Effects (LSEs) on the water environment and flood risk sensitive receptors that may arise from the construction, operation and maintenance and decommissioning of the Project, full details of which are set out in **Chapter 2: The Project.**

7.1.2 This Chapter of the Scoping Report outlines the approach for assessing Hydrology, Hydrogeology and Flood Risk within the Environmental Impact Assessment (EIA). It explains the methodology, data sources, and baseline conditions that will inform the EIA. It also identifies the LSEs to be considered, how these LSEs will be evaluated, and the environmental measures and commitments influencing the scope of the assessment. Finally, it lists the potential effects proposed to be excluded from further assessment.

7.1.3 There are interrelationships between the potential effects on Hydrology, Hydrogeology and Flood Risk and the other environmental topics. Therefore, this Chapter of the Scoping Report should be read alongside the following Chapters:

- **Chapter 5: Biodiversity,** which includes consideration of the LSEs of the Project on water dependent and ecologically sensitive receptors;
- **Chapter 12: Ground Conditions,** which considers the LSEs of the Project on geology, ground conditions and land quality, including the effects on groundwater from the potential mobilisation of contaminants present on site, as well as the potential impact to human health receptors from spill and leakages from plant and machinery; and
- **Chapter 13: Agriculture and Soil Resources,** which considers the LSEs of the Project on agricultural land and soil quality. It considers potential loss of land from agricultural production, impacts on soil resources such as damage, degradation, and erosion.

7.2 Assumptions and Limitations

7.2.1 Please refer to **Chapter 2: The Project** for the parameters on which this Scoping Report is based, alongside a description of the Project.

7.2.2 This Chapter is based on the EIA Scoping Boundary and the publicly available third-party data outlined in **Table 7.2**, which is considered reliable by the industry and is therefore assumed to be accurate at the time of reporting. While reasonable efforts have been made to verify this information, including cross referencing of different datasets, site walkovers will be undertaken after Scoping to inform the assessment.

7.2.3 At the time of writing, initial consultation with all statutory consultees has commenced with the Environment Agency (EA), Natural England (NE) and Local Planning Authorities. Any feedback received from these or any other consultees will be incorporated prior to completion of the Environmental Statement (ES).

7.2.4 The Project components considered in this Chapter includes the below ground pipeline infrastructure, and all above ground infrastructure; which includes Hydrogen Above Ground Installations (HAGIs), Block Valve Installations (BVIs), Cathodic Protection monitoring points and pipeline marker posts.

7.3 Relevant Legislation, Policy and Technical Guidance

7.3.1 This Section describes the legislation, key national policy (as set out in National Policy Statements), local policy and guidance that is specific to Hydrology, Hydrogeology and Flood Risk, summarised in **Table 7.1. Chapter 3: Legislation, Policy and Guidance Overview** of the Scoping Report provides detail on the overarching legislation, key policy and guidance applicable to the Project and the requirement for EIA.

7.3.2 **Appendix 3A** presents the National Planning Policy Framework (NPPF) and local policies which are specifically relevant to Hydrology, Hydrogeology and Flood Risk. A list of the local policy documents and policies reviewed in the preparation of the Chapter, is set out in **Table 7.1**. The relevant parts of these policies are set out in full in **Appendix 3A**.
The ES will demonstrate compliance with the relevant legislation, policy and guidance.

Table 7.1: Legislation, Policy and Guidance Applicable to Hydrology, Hydrogeology and Flood Risk

Source, Author and Year	Context
Legislation	
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (UK Government 2025)	The Water Environment (Water Framework Directive) (England and Wales) transposes and implements the requirements of The Water Framework Directive (WFD) (2000/60/EC) (European Parliament and Council, 2000) and The Groundwater Directive (GWD) (2006/118/EC, including amendments to Annex II detailed under Directive 2014/80/EU). The WFD provides the foundation for the protection of the UK's water environment. The WFD seeks to protect all elements of the water cycle and to enhance the quality of groundwater, surface waters, estuaries, and coastal waters.
Environmental Permitting (England and Wales) Regulations 2016	The Environmental Permitting (England and Wales) Regulations 2016 consolidate and replace earlier environmental permitting regulations and provide the primary framework for controlling discharges to surface water and groundwater.
Flood and Water Management Act 2010	Flood and Water Management Act 2010 includes provisions for the management of risk in connection with flooding and sets out requirements for Lead Local Flood Authorities (LLFA) in preparing strategies for local flood risk management.
Water Resources Act (England and Wales) Regulations 2009	The Water Resources Act (England and Wales) Regulations 2009 regulates water resources, water quality and flood defence.

Source, Author and Year	Context
Land Drainage Act 1991	The Land Drainage Act 1991 sets out requirements for maintenance of watercourses by riparian owners.
Land Drainage Act 1994	The Land Drainage Act 1994 amends the Land Drainage Act 1991 in relation to the functions of internal drainage boards and local authorities.
Environment Act 1995	The Environment Act 1995 sets out roles and responsibilities for the Environment Agency.
Private Water Supplies (England) Regulations 2016 and The Private Water Supplies	The Private Water Supplies (England) Regulations 2016 as amended transpose requirements of European Law, particularly the European Council Directive 98/83/EC on the quality of water intended for human consumption from private abstractions.
Environment Act 2021	The Environment Act 2021 sets out a legal framework for environmental government in the UK and sets out measures for the improvement of the environment. In relation to the water environment, these include obligations aimed at improving water quality and water resource management.
National Policy	
Overarching National Policy Statement for Energy (EN-1) 2025	Section 5.8. of EN-1 outlines several key issues relevant to hydrology, hydrogeology, and flood risk. These include establishing the requirement for a Flood Risk Assessment (FRA) to be undertaken for all energy projects in Flood Zones 2 and 3 in England. Paragraph 5.8.14 explains that the 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. Paragraph 5.8.9 provides detail on the application of the Sequential and Exception Tests. The Sequential Test aims to steer new development to areas at lowest risk of flooding by requiring applicants to demonstrate that there are no reasonably available sites in areas of lower flood risk. Paragraph 5.8.9 explains that if, following the application of the Sequential Test development is necessary in areas of higher risk, the Exception Test may be applied, which requires the applicant to show that the development provides wider sustainability benefits that outweigh the flood risk, and that it will be safe for its lifetime without increasing flood risk elsewhere. This approach supports climate resilience and informed site selection based on risk hierarchy. Section 5.16 covers Water Quality and Resources stating in paragraph 5.16.3 that "*Where the project is likely to have effects on the water environment, 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 ES or equivalent see Section 4.3 and 4.10).*" Paragraph 5.16.4 makes it clear that the applicant should make early contact with the relevant regulators, including the local authority, the EA and Marine Management Organisation (MMO), where appropriate. This Section goes on to set out the information

Source, Author and Year	Context
	that should be provided in the ES, alongside consideration of different mitigation measures.
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) 2024	EN-4 reiterates many of the considerations from EN-1, noting in Paragraph 2.21.37 that *"Constructing pipelines creates corridors of surface clearance and excavation that can potentially affect watercourses, aquifers, water abstraction and discharge points, areas prone to flooding and ecological receptors. Pipeline impacts could include:* *• inadequate or excessive drainage;* *• interference with groundwater flow pathways;* *• mobilisation of contaminants already in the ground;* *• the introduction of new pollutants;* *• flooding;* *• disturbance to water ecology;* *• pollution due to silt from construction; and* *• disturbance to species and their habitats."* Paragraph 2.21.39 highlights that *"The abstraction and disposal of large volumes of water through hydrostatic testing of pipelines during commissioning may also impact on water quality. Abstraction and discharges are regulated by the EA, under an abstraction licence and EP respectively."*
National Planning Policy Framework (NPPF), Department for Levelling Up, Housing and Communities, December 2025	The NPPF sets out national policy for managing flood risk and protecting water resources. It requires planning decisions to ensure that development is directed away from areas at highest flood risk, incorporates sustainable drainage systems wherever feasible, manages residual risk safely, and safeguards the quality and quantity of surface and groundwater in line with sustainable water management principles. Paragraph 181 states that "*When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:* *within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;* *the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;* *it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;* *any residual risk can be safely managed; and* a. *safe access and escape routes are included where appropriate, as part of an agreed emergency plan".* Paragraph 182 goes on to say that *"Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce*

Source, Author and Year	Context
	volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should: • *take account of advice from the Lead Local Flood Authority;* • *have appropriate proposed minimum operational standards; and* • *have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development".*
Local Plan Documents and Policies	
North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018	Policy 5 Development Boundaries Policy 31 Renewable and Low Carbon Infrastructure Policy 33 Flood Risk Policy 34 Water Management
North East Lincolnshire Local Plan Review – Draft Plan with Options – December 2023	Draft Strategic Policy 5 Flood Risk
North Lincolnshire Local Plan Saved Policies (Adopted May 2003)	DS13 Groundwater Protection and Land Drainage DS14 Foul Sewage and Surface Water Drainage DS15 Water Resources DS16 Flood Risk
North Lincolnshire Local Development Framework: Core Strategy (Adopted June 2011	Policy CS19 Flood Risk
Central Lincolnshire Local Plan (Adopted April 2023)	Policy S21 Flood Risk and Water Resources Flood Risk
Bassetlaw District Local Plan May 2024	Policy ST50 Flood Risk and Drainage Policy ST51 Protecting Water Quality and Management
Newark and Sherwood Amended Core Strategy DPD adopted March 2019	Core Policy 10 Climate Change
Newark and Sherwood Allocations and Development Management DPD adopted July 2013	Policy DM5 Design
Guidance	
Control of Water Pollution from Construction Sites (C532), Construction Industry Research and Information Association, (CIRIA) 2001	Guidance on best-practice measures to prevent and mitigate water pollution during all phases of construction. It identifies typical onsite pollution sources (e.g. sediment runoff, concrete washout, fuel/ oil spills) and sets out practical, cost-effective techniques, such as silt fences, settlement ponds, and bunded

Source, Author and Year	Context
(CIRIA, 2001)	storage, to eliminate or minimise contaminant release to surface and groundwater.
Environmental Good Practice on Site (C811), CIRIA 2023 (CIRIA, 2023)	Offers comprehensive guidance for managing environmental risks during construction activities. It covers practical measures for protecting air, land, and water quality, promoting biodiversity, and ensuring legal compliance, with a strong focus on embedding sustainability and environmental responsibility into daily site operations.
Control of water pollution from linear construction projects (C648), CIRIA 2006 (CIRIA, 2006)	Provides practical guidance on mitigating water pollution risks associated with infrastructure developments. It outlines best practices for planning, site management, and implementing sustainable drainage and pollution control measures throughout the construction lifecycle.
The Environment Agency's approach to groundwater protection, version 1.2, February 2018 (Environment Agency, 2018)	This guidance is part of a wider suite of documents and guidance relating to groundwater protection which sets out principles for assessing risk, protecting groundwater, and permitting of abstractions and discharges from groundwater.
The Sustainable Drainage System Manual (C753), CIRIA 2015 (CIRIA, 2015)	This guidance incorporates the latest research, industry practice, and guidance for design, delivery, and maintenance of Sustainable Drainage Systems.
The Environment Agency's Land Contamination Risk Management 2023 (Environment Agency, 2023)	This provides the guidance on managing the risks from historic land contamination. It outlines the steps that need to be undertaken, from completing a detailed risk assessment to implementing the necessary remediation or mitigation.

7.4 Consultation

7.4.1 In respect of Hydrology, Hydrogeology and Flood Risk, initial discussions have taken place with the Environment Agency and Local Planning Authorities, with further consultation to be undertaken following the formal EIA Scoping process The aim of this further consultation will be to seek clarification on further details, to discuss findings and to reach agreement on issues prior to submission of the application. Where required, this will also include discussion on details of assessment methods, including the specification of monitoring locations within the Study Area.

7.4.2 Consultation will be undertaken and recorded throughout the pre-application stages of the Project, with the following key consultees:

- Environment Agency;
- MMO;
- Natural England;
- North Lincolnshire Council, North East Lincolnshire Council, Lincolnshire County Council and Nottinghamshire County Council inclusive of their Lead Local Flood Authorities (LLFAs);

- Bassetlaw District Council; Newark and Sherwood District Council; North East Lincolnshire Unitary Authority; North Lincolnshire Unitary Authority; West Lindsey District Council;
- North East Lindsey Internal Drainage Board (IDB), Ancholme IDB, Scunthorpe and Gainsborough Water Management Board (WMB), Upper Witham IDB and Trent Valley IDB; and
- Canal and Rivers Trust.

7.4.3 Consultation will be reviewed throughout the assessment process. Additional consultees such as local or specialist groups will be contacted should a requirement to consult with other bodies arise. Engagement with the key consultees will continue post submission.

7.5 Baseline Review

Study Area

7.5.1 The Hydrology, Hydrogeology and Flood Risk scoping assessment presented in this Chapter has been undertaken within the Study Area as defined within this Section

7.5.2 The Study Area for Hydrology, Hydrogeology and Flood Risk is shown in **Figure 7.1**.

Spatial Scope

7.5.3 The Study Area for Hydrology, Hydrogeology and Flood Risk (hereafter the 'Study Area') is defined as a 500 m buffer around the Scoping Boundary that will reduce to 500 m around the draft Order Limits as the design of the Project progresses, up to submission of an application for Development Consent. This buffer reflects professional judgement and industry best-practice based on the likely Zone of Influence (ZoI) on the water environment for linear infrastructure projects.

7.5.4 The 500 m buffer accounts for:

- Indirect pathways such as surface water runoff and sediment transport beyond the immediate construction footprint;
- Potential changes to subsurface flow and groundwater connectivity; and
- Allowance for construction works, access tracks, and drainage diversions that may extend beyond the pipeline and all above ground infrastructure working areas.

7.5.5 This precautionary approach ensures that all receptors with a realistic potential for interaction are captured at the Scoping stage, while remaining proportionate to the likely ZoI.

Temporal Scope

7.5.6 The assessment will consider the construction, operation and maintenance and decommissioning phases of the Project. The assessment of the operation and maintenance phase effects will be limited to the above ground aspects of the Project (as set out in **Section 7.6**). As noted in **Chapter 2: The Project**,

the design life of the pipeline, HAGIs and BVIs is 40 years, but it is anticipated that the actual life of the Project could extend over 40 years depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. Although the final lifetime of the Project is not yet determined the assessment of operational flood risk will consider a worst-case scenario where the pipeline, associated HAGIs and BVIs are operational for a period of over 40 years. This will consider the implications of additional climate change allowances and UK Climate Projections extending beyond 40 years and the parameters used will be reported in the ES.

7.5.7 The Study Area should be regarded as preliminary at this stage and will be reviewed and amended in response to the refinement of the Project design, the identification of additional impact pathways and, where appropriate, in response to feedback from consultation. These refinements are expected to reduce the extent of the Study Area as the Project progresses, whilst still reflecting recognised good practice. If the Study Area is required to be extended, a full assessment of any additional areas will be undertaken.

Data Sources

7.5.8 The data sources that have been used to inform this Chapter of the Scoping Report are presented within **Table 7.2** and were accessed in December 2025. These data sources will be taken forward and used to inform the EIA, alongside any additional data sources or site-specific data that will be collected for the Project.

Table 7.2: Sources of Hydrology, Hydrogeology and Flood Risk Data

Source, Author and Year	Summary	Coverage of the Study Area
Google Earth aerial imagery (Google Earth, 2025)	Used to identify existing land uses and sensitive receptors within the Study Area.	Full coverage of the Study Area.
Ordnance Survey (Ordnance Survey, 2025)	Ordnance Survey mapping for identification of topography, watercourses, springs, lakes and other water features.	Full coverage of the Study Area.
Environment Agency and data.gov.uk website (Environment Agency, 2025)	Flood zone mapping; spatial flood defence data and mapping; flood warning and flood alert areas; main rivers; ordinary watercourses; groundwater Source Protection Zones (SPZ); WFD surface water and groundwater classification data.	Full coverage of the Study Area.
British Geological Survey (BGS) Mapping (British Geology Survey, 2025)	Geology (artificial ground, superficial deposits, bedrock); borehole/ well data; aquifer designation and groundwater vulnerability.	These are national datasets providing full coverage of the Study Area.
Cranfield Soil and Agrifood Institute Soilscapes map viewer (LandIS, 2024)	Soil type and character.	This is a national dataset providing full coverage of the Area.

Source, Author and Year	Summary	Coverage of the Study Area
Department for Environment Food and Rural Affair's (Defra) magic website/ Natural England (DEFRA, 2025)	Statutory and non-statutory environmental designations.	These are national datasets providing full coverage of the Study Area.

Current Baseline

7.5.9 The following Section provides a summary of the current baseline for the Study Area.

7.5.10 The preferred route corridor has been sub-divided into the following Sections shown in **Figure 7.1** for the purpose of reporting in this Scoping Report:

- Section A: Immingham and North Killingholme;
- Section B: Immingham to Scunthorpe;
- Section C: Scunthorpe to High Marnham; and
- Section D: High Marnham to Kirton and Newark.

Section A: Immingham and North Killingholme

River Catchments

7.5.11 The area of Immingham and North Killingholme encompasses several WFD assessed water bodies. Appearing spatially from northwest to southeast, these water bodies are:

- Skitter Beck/East Halton Beck;
- North Beck Drain; and
- Mawnbridge Drain.

7.5.12 These watercourses fall under the broader Becks Northern Operational Catchment, which is part of the Louth Grimsby and Ancholme Management Catchment area.

7.5.13 The Environment Agency's Main Rivers located within Section A are:

- Skitter Beck;
- New Beck Drain;
- North Beck Drain; and
- Oldfield Drain.

7.5.14 Numerous other ordinary watercourses drain Section A. These include any watercourses not designated as Main Rivers, for example streams, drains and ditches.

7.5.15 The water bodies in Section A all drain into the Humber Estuary and are subject to its tidal influence.

Geology

7.5.16 The geology of the Study Area has been presented below in order to provide context with regard to hydrogeology. The geology is also described in detail in **Chapter 12: Ground Conditions**. The bedrock geology and superficial deposits present beneath Section A are also presented in **Figure 12.2** and **Figure 12.3** respectively, within **Chapter 12: Ground Conditions**.

7.5.17 The bedrock geology is predominantly the Burnham Chalk Formation, with a small area of Welton Chalk Formation within the western area of Section A, located to the south of Brocklesby Interchange on the A180. The Flamborough Chalk Formation is present within the Study Area to the north-east of Section A, extending into the Humber Estuary.

7.5.18 *Made Ground* is present in the eastern part of Section A along the Humber Estuary coastline, associated with Immingham Docks and surrounding industrial areas extending southeast of the docks. Beyond these areas, the superficial deposits vary spatially with their proximity to the Humber Estuary and inland features. Along the estuary margins, deposits are dominated by tidal flat sediments (clays and silts), reflecting the estuarine environment. Moving inland, these transition to Devensian diamicton (glacial till), which forms the predominant superficial cover. This transition occurs approximately 0.7 km inland from the estuary. Localised glacio/ fluvial sands and silts occur in association with former meltwater channels, extending northwards from Keelby towards Ulceby Skitter, within the western area of Section A. Where tidal flat sediments are not present, alluvial deposits of clay, silt, sand and gravel are present along various river corridors and drainage channels. A small area of peat is also mapped as being present to the east of Ulceby Skitter, within the western area of Section A.

Hydrogeology

7.5.19 The underlying chalk formations are designated as Principal Aquifer. Principal Aquifers are designated by the EA as strategically important rock units that have high permeability and water storage capacity, and designations are based on geological mapping provided by the British Geological Survey (BGS). The BGS 1:625,000 scale hydrogeological map identifies these formations as the White Chalk Subgroup, yielding 50 l/s to 100 l/s from large diameter boreholes and up to 300 l/s from adited systems.

7.5.20 The superficial deposits of till are designated as Secondary (undifferentiated) Aquifer. Secondary Aquifers generally comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers, although yield amounts may be limited.

7.5.21 A SPZ is a designated area around a drinking water supply, for example a well or borehole, that outlines the risk of contamination from nearby activities There are stricter controls in closer, higher-risk inner SPZs to prevent pollution of vital groundwater resources. Activities such as storing fuel, installing septic tanks, or building infrastructure in SPZs are controlled to safeguard water quality for human consumption. The SPZs beneath Section A are presented in **Figure 7.2.** This shows groundwater SPZs are present within

Section A, associated with public water supply abstractions. The most sensitive areas, SPZ1 (inner zone), are located around abstraction points within Section A to the northeast and south of Immingham, and to the south-west of Habrough. These zones represent the highest level of protection for groundwater quality. Surrounding SPZ1, are SPZ2 (outer zone) and SPZ3 (total catchment), which provide progressively wider protection for groundwater quality. The majority of this Section falls within SPZ3, reflecting the broader catchment area contributing to these abstractions.

7.5.22 The presence of Groundwater Dependent Terrestrial Ecosystems (GWDTE) will be confirmed through review of the results of ecological surveys conducted post-scoping and will be assessed as part of the ES.

Flood Risk

7.5.23 Flood zone mapping and flood defence infrastructure for Section A is shown in **Figure 7.1**.

7.5.24 Fluvial and tidal flood risk mapping for the Immingham area indicates that the main areas of Flood Zones 2 and 3 are located within the eastern and northern areas of the Section A Study Area, primarily associated with potential tidal flooding from the Humber Estuary. Additional areas of Flood Zones 2 and 3 occur along smaller drainage channels within the Study Area, including the North Beck Drain, which flows from Keelby to the Estuary, and the New Beck, which runs from Keelby to Ulceby Skitter.

7.5.25 Surface water flood mapping for Section A is shown in **Figure 7.2**.

7.5.26 Surface water flood mapping generally indicates risk concentrated on agricultural fields and along their boundaries, primarily associated with field drainage ditches and along the corridor of existing watercourse tributaries including Skitter Beck and East Halton Beck. Additional surface water flood risk is present where *Made Ground* occurs at a number of isolated topographical low points.

7.5.27 The flood defences present within Section A are:

- Tidal defences along the full extent of the Humber Estuary; and
- Fluvial defences along the full extent of all Main Rivers present within this Section.

Water Quality

7.5.28 The current (2022) status of the WFD surface water bodies within Section A: are presented in **Table 7.3**.

Table 7.3: WFD Cycle 3 (2022) Water Bodies within Section A

Water Body Name	Ecological Status	Chemical Status
Skitter Beck/East Halton Beck	Bad	Does not require assessment
North Beck Drain	Moderate	Does not require assessment

Water Body Name	Ecological Status	Chemical Status
Mawnbridge Drain	Moderate	Does not require assessment

Designated Sites

7.5.29 The statutory designated sites present within Section A are presented in **Figure 5.1** within **Chapter 5: Biodiversity**.

7.5.30 Several environmentally designated sites are located within the Study Area for this Section. These sites are listed in **Table 7.4**. A value of 0 km shows that the site is adjoining or within the Scoping Boundary.

Table 7.4: Designated Sites within Section A: Immingham and North Killingholme

Site	Closest Distance to Scoping Boundary	Location
International		
Humber Estuary SPA, Ramsar, SAC	0 km	Along the northeastern edges of the Scoping Boundary.
National		
Humber Estuary SSSI	0 km	Along the northeastern edges of the Scoping Boundary.
North Killingholme Haven Pits SSSI	0.29 km North North-East (NNE)	NNE of the Scoping Boundary, 1.8 km northeast from Easton Halton.

Section B: Immingham to Scunthorpe

River Catchments

7.5.31 The Immingham to Scunthorpe area includes several WFD assessed water bodies. Appearing spatially from east to west, these water bodies are:

- Skitter Beck/ East Halton Beck;
- Kettleby Beck;
- Ancholme from Bishopbridge to the Humber;
- Hibaldstow area Catchment (tributary of Ancholme);
- Manton Sewer;
- Bottesford Beck Catchment (tributary of Trent);
- Manton Sewer Catchment (tributary of Eau); and
- Eau from Manton Sewer to Trent.

7.5.32 These water bodies fall within the broader Operational Catchments of Becks Northern, Ancholme, and Trent and tributaries. These Operational Catchments are managed under the Louth Grimsby and Ancholme Management Catchment and the Lower Trent and Erewash Management Catchment areas.

7.5.33 The Environment Agency's designated Main Rivers located within this Section are:

- Bottesford Beck;
- Brocklesby Beck;
- Froghall Drain;
- Highland Drain;
- Kettleby Beck;
- Kettleby Catchwater;
- Little Carr Drain;
- New Beck Drain;
- New River Ancholme;
- Old River Ancholme;
- Scawby Old Ancholme and Soak Drain;
- Skegger Beck;
- Skitter Beck; and
- Wrawby Catchment Drain.

7.5.34 Numerous other ordinary watercourses drain this Section. These include any watercourses not designated as Main Rivers, for example streams, drains and ditches.

Geology

7.5.35 The geology of the Study Area has been presented below in order to provide context with regard to hydrogeology. The geology underlying Section B is also described in detail in **Chapter 12: Ground Conditions**. The bedrock geology and superficial deposits present beneath Section B are also presented in **Figure 12.2** and **Figure 12.3** respectively, within **Chapter 12: Ground Conditions.**

7.5.36 The eastern extent of this Section of the Study Area is predominantly dominated by bedrock chalk formations, while further west, the bedrock geology transitions, west of Melton Ross, into clay formations, including Kimmeridge Clay, Ampthill Clay and Oxford Clay, with intervening mudstones and siltstones such as the West Walton Formation. Further west, the bedrock geology includes sandstone and limestone formations before reaching mudstones of the Whitby, Charmouth, and Scunthorpe formations towards the western extent of Section B, and Frodingham Ironstone towards the northwestern extent of Section B.

7.5.37 Areas of *Made Ground* deposits are present within the eastern area of Section B at Singleton Birch and at various locations around Brigg towards the centre of the Section and at Messingham Sand Quarries within the western area of the Section. Superficial deposits, where present, predominantly include diamicton till and glaciofluvial deposits towards the eastern extent of Section B, with some smaller more isolated areas to the

east and north-east of Brigg in the centre of the Section. Alluvial clay, silt, sand and gravels are also present in the centre around Brigg, along with Glaciolacustrine sands and gravels. Where present in the western extent of Section B, superficial deposits comprise sand.

7.5.38 The geology underlying Section B is also described in detail in **Chapter 12: Ground Conditions**. The bedrock geology and superficial deposits present beneath Section B are also presented in **Figure 12.2** and **Figure 12.3** respectively, within **Chapter 12: Ground Conditions**.

Hydrogeology

7.5.39 The chalk bedrock deposits within the eastern extent of this this Section are designated as Principal Aquifer, as are the limestone deposits to the west of Brigg. The BGS 1:625,000 scale hydrogeological map identifies the chalk formations as the White Chalk Subgroup, yielding 50 l/s to 100 l/s from large diameter boreholes and up to 300 l/s from adited systems. The limestone deposits are identified as the Inferior Oolite Group, yielding up to 40 l/s.

7.5.40 The mudstone and siltstone to the east of Brigg is classified as unproductive strata. The mudstone bedrock at the western extent of Section B is generally classified as Secondary Aquifers. The BGS hydrogeological mapping identifies both sets of mudstone as comprising rocks with essentially no groundwater.

7.5.41 Where present, the superficial deposits within Section B are primarily designated as Secondary A Aquifers, with small areas of Secondary (undifferentiated) Aquifers.

7.5.42 The SPZs beneath Section B are presented in **Figure 7.2.** This shows the majority of the western area of this Section does not coincide with any SPZ areas. The eastern extent includes two areas of SPZ1, to the south of Ulceby and to the south-west of Habrough respectively. Wider areas of SPZ2 and SPZ3 are associated with these SPZ1 points.

7.5.43 The presence of GWDTE will be confirmed through results of ecological surveys conducted post-scoping and will be assessed as part of the ES.

Flood Risk

7.5.44 Flood zone mapping and flood defence infrastructure for Section B is shown on **Figure 7.1**.

7.5.45 Fluvial and tidal flood risk mapping indicates extensive areas of Flood Zones 2 and 3 within this Section, primarily associated with the River Ancholme and associated tributaries as it flows from south to north through Brigg within the centre-west area of Section B. Little Carr Drain and Wrawby Catchment Drain also drain land to the north-east of Brigg and are at the eastern extent of the River Ancholme floodplain. Smaller areas of Flood Zones 2 and 3 are also present in the western area of Section B, including within the south-east area of Scunthorpe, associated with the corridor of Bottesford Beck and the area to the south of Ulceby, associated with the corridor of New Beck Drain and tributaries.

7.5.46 Surface water flood mapping for Section B is shown on **Figure 7.2**.

7.5.47 Surface water flood mapping generally indicates the risk concentrated on agricultural fields and along their boundaries, associated with field drainage ditches and along the corridor of existing watercourses. Additional surface water flood risk is present where *Made Ground* occurs at a number of isolated topographical low points. Surface water flood risk mapping identifies two notable overland flowpaths within Section B:

- A west to east flowpath towards the centre of Section B follows the northern edge of the M180 motorway, extending from Junction 4 to the western outskirts of Brigg; and
- A flowpath within the eastern part of Section B, originating near the quarry north of Melton Ross, crossing agricultural land before looping south to meet the main rail line, then continuing east along the rail corridor to New Beck Drain.

7.5.48 Fluvial defences are present along the full extent of all Main Rivers present within this Section.

Water Quality

7.5.49 The current (2022) status of the WFD surface water bodies within Section B are presented in **Table 7.5**.

Table 7.5: WFD Cycle 3 (2022) water bodies within Section B

Water Body Name	Ecological Status	Chemical Status
Skitter Beck/East Halton Beck	Bad	Does not require assessment
Kettleby Beck	Moderate	Does not require assessment
Ancholme from Bishopbridge to the Humber	Moderate	Does not require assessment
Hibaldstow area Catchment (tributary to Ancholme)	Moderate	Does not require assessment
Manton Sewer	Moderate	Does not require assessment
Bottesford Beck Catchment (tributary of Trent)	Moderate	Does not require assessment
Manton Sewer Catchment (tributary of Eau)	Moderate	Does not require assessment
Eau from Manton Sewer to Trent	Moderate	Does not require assessment

Designated Sites

7.5.50 The statutory designated sites present within Section B are presented in **Figure 5.1** within **Chapter 5: Biodiversity**.

7.5.51 Several environmentally designated sites are located within the Study Area for this Section. These sites are listed in **Table 7.6**. A value of 0 km shows the site is adjoining or within the Scoping Boundary.

Table 7.6: Designated Sites Within Section B: Immingham to Scunthorpe

Site	Closest Distance to Scoping Boundary	Location
National		
Ashbyville LNR	0 km	On the northwestern boundary of Section B, south of Scunthorpe Steelworks.
Castlethorpe Tufas SSSI	0 km	On the northern boundary of the central-west area of Section B, west of Brigg.
Cleatham Quarry SSSI	0 km	On the southwestern boundary of Section B, north of Kirton in Lindsey.
Cliff Farm Pit SSSI	0.40 km S	On the southwestern boundary of Section B, north of Kirton in Lindsey.
Kirmington Pits SSSI	56 m E	On the southern boundary of the eastern area of Section B, north of Kirmington.
Manton and Twigmoor SSSI	0 km	In the southwestern area of Section B, west of Scawby.
Manton Stone Quarry SSSI	0 km	On the southwestern boundary of Section B, north of Kirton in Lindsey.
Messingham Sand Quarry SSSI	0 km	On the southwestern boundary of Section B, east of Messingham.
Wrawby Moor SSSI	0 km	On the northern boundary of the central area of Section B, northeast of Wrawby.

Section C: Scunthorpe to High Marnham

River Catchments

7.5.52 The Scunthorpe to High Marnham area encompasses several WFD water bodies. Appearing spatially from north to south these water bodies are:

- Manton Sewer Catchment (tributary of Eau);
- Eau from Manton Sewer to Trent;
- Eau from Source to Northorpe Beck;
- Northorpe Beck from Source to River Eau;
- Laughton Drain Catchment (tributary of Trent);
- River Till;
- Tributary of Till;
- Fillingham Beck;
- Skellingthorpe Main Drain;

- Sewer Drain Catchment (tributary of the River Trent); and
- River Trent from Carlton-on-Trent to Laughton Drain.

7.5.53 These water bodies fall within the broader Operational Catchments of the River Trent and tributaries, and Upper Witham. These Operational Catchments are managed under the Lower Trent and Erewash Management Catchment and Witham Management Catchment areas.

7.5.54 The Environment Agency's Main Rivers located within this section are:

- River Eau;
- River Till;
- Foss Dyke; and
- River Trent.

7.5.55 Numerous other ordinary watercourses drain this Section. These include any watercourses not designated as Main Rivers, for example streams, drains and ditches.

Geology

7.5.56 The geology of the Study Area has been presented below in order to provide context with regard to hydrogeology. The geology underlying Section C is also described in detail in **Chapter 12: Ground Conditions**. The bedrock geology and superficial deposits present beneath Section C are also presented in **Figure 12.2** and **Figure 12.3** respectively, within **Chapter 12: Ground Conditions**.

7.5.57 Within the northern extent of Section C there are some interbedded layers of Frodingham Ironstone Member, Charmouth Mudstone Formation, and Pecton Ironstone Member, as well as some isolated areas Scunthorpe Mudstone Formation (Limestone). The majority of Section C is then underlain by interbedded mudstone and limestone of the Scunthorpe Mudstone Formation until it reaches the southern extent of Section C which overlies a small area of mudstone of the Mercia Mudstone Group and the Penarth Group.

7.5.58 No significant areas of *Made Ground* deposits are present within Section C. Superficial deposits, where present, include sand within the northern extent of the Section that transition into diamicton till, and glaciofluvial deposits towards the central part of the Section, in the reach to the east of Gainsborough. At the southern extent of the Section, the superficial deposits, where present, are predominantly sand and gravel.

Hydrogeology

7.5.59 The bedrock deposits underlying Section C are designated as Secondary B or Secondary (undifferentiated) Aquifer. BGS 1:625,000 scale hydrogeological mapping identifies the bedrock underlaying Section C as predominantly comprising rocks with essentially no groundwater. The small area of mudstone of the Mercia Mudstone Group and the Penarth Group to the south are identified as a low productivity Aquifer, yielding less than 0.5 l/s of water.

7.5.60 Where present, the superficial deposits within Section C are primarily designated as Secondary A Aquifers, with the area of diamicton till and glaciofluvial deposits in the reach to the east of Gainsborough defined as Secondary (undifferentiated) Aquifer.

7.5.61 The SPZs beneath Section C are presented in **Figure 7.2.** This shows the majority of Section C does not coincide with any SPZ areas. In the northernmost area of this Section, north of Kirton in Lindsey, a small area intersects with SPZ3.

7.5.62 The presence of GWDTE will be confirmed through results of ecological surveys conducted post-scoping and will be assessed as part of the ES.

Flood Risk

7.5.63 Flood zone mapping and flood defence infrastructure for Section C is shown on **Figure 7.1**.

7.5.64 Fluvial and tidal flood risk mapping shows extensive areas of Flood Zones 2 and 3 within this Section. These are predominantly associated with three catchment areas:

- Areas of Flood Zone 2 and 3 associated with the River Eau within the northern area of Section C, which includes potential flooding from a significant confluence of tributaries of the River Eau, approximately 2 km west of Kirton in Lindsey.
- Fluvial flood risk associated with the River Till and tributaries within the centre of Section C, along reaches of the river north of Upton and Willingham by Stow, flowing south to the confluence with Foss Dyke navigation to the east of Saxby.
- Extensive areas of fluvial flood risk within the southern part of Section C, associated with Foss Dyke navigation, the River Trent and numerous associated tributaries.

7.5.65 Surface water flood mapping for Section C is shown on **Figure 7.2**.

7.5.66 Surface water flood mapping generally indicates risk across all of Section C, particularly within areas of agricultural fields and along field boundaries, primarily associated with field drainage ditches and tributaries of the River Eau, River Till, Foss Dyke, and the River Trent.

- Potential out of bank overland flowpaths within the northern area of Section C correspond with mapped areas of surface water flood risk along watercourses draining land south and west of Kirton-in-Lindsey, land around Northorpe and land north of Corringham. These form part of the River Eau catchment;
- Potential out of bank overland flowpaths within the centre of Section C correspond with mapped areas of surface water flood risk along watercourses and across some open areas of agricultural land draining areas north and west of Springthorpe and land to the east and to the west of Kexby and Willingham by Stow. These form part of the River Till catchment; and

- A significant potential overland flowpath within the southern area of Section C is associated with an unnamed watercourse that rises on land to the west of Stow and flows south to the Foss Dyke navigation to the west of Saxilby.

7.5.67 The flood defences present within Section C are:

- Fluvial defences along the full extent of all Main Rivers present within Section C; and
- Localised flood defences within the southern area of Section C, including embankments within South Clifton and along the A1133 west of Spalford.

Water Quality

7.5.68 The current (2022) status of the WFD surface water bodies within Section C: Scunthorpe to High Marnham are presented in **Table 7.7**.

Table 7.7: WFD Cycle 3 (2022) water bodies within Section C

Water Body Name	Ecological Status	Chemical Status
Manton Sewer Catchment (tributary of Eau)	Moderate	Does not require assessment
Eau from Manton Sewer to Trent	Moderate	Does not require assessment
Eau from Source to Northorpe Beck	Moderate	Does not require assessment
Northorpe Beck from Source to River Eau	Moderate	Does not require assessment
Laughton Drain Catchment (tributary of Trent)	Moderate	Does not require assessment
River Till	Moderate	Does not require assessment
Tributary of Till	Poor	Does not require assessment
Fillingham Beck	Moderate	Does not require assessment
Skellingthorpe Main Drain	Moderate	Does not require assessment
Sewer Drain Catchment (tributary of the River Trent)	Moderate	Does not require assessment
River Trent from Carlton-on-Trent to Laughton Drain	Moderate	Does not require assessment

Designated Sites

7.5.69 There are no designated sites within the Study Area for Section C.

Section D: High Marnham to Kirton and Newark

River Catchments

7.5.70 The area from High Marnham to Kirton and Newark encompasses several WFD assessed water bodies. Appearing spatially from north to south, these water bodies are:

- Fledborough Beck Catchment (tributary of Trent);
- River Trent from Carlton-on-Trent to Laughton Drain;
- Tuxford Beck Catchment (tributary of Trent);
- Goosemoor Dyke from Source to Moorhouse Beck;
- Bevercotes Beck Catchment (tributary of Maun);
- Gallow Hole Dyke Catchment (tributary of Rainworth Water);
- Moorhouse Beck (tributary of Goosemoor Dyke);
- The Beck Catchment (tributary of Trent);
- Pingley/Rundell Dyke Catch Upper (tributary of Trent);
- River Trent from Soar to The Beck; and
- Trent Bifurcation Pingley Dyke to Winthorpe.

7.5.71 These water bodies fall within the broader Operational Catchments of Trent and tributaries, Idle River, Nottingham Urban and Nottinghamshire South A. These Operational Catchments are managed under the Lower Trent and Erewash Management Catchment, and the Idle and Torre Management Catchment areas.

7.5.72 The only Environment Agency Main River located within Section D is the River Trent.

7.5.73 Numerous other ordinary watercourses drain this Section. These include any watercourses not designated as Main Rivers, for example streams, drains and ditches.

Geology

7.5.74 The geology of the Study Area has been presented below to provide context with regard to hydrogeology. The geology underlying Section D is also described in detail in **Chapter 12: Ground Conditions**. The bedrock geology and superficial deposits present beneath Section D are also presented in **Figure 12.2** and **Figure 12.3** respectively.

7.5.75 The bedrock geology of Section D is dominated by mudstone of the Mercia Mudstone Group. Small areas of siltstone, mudstone, and sandstone of the Tarporley Siltstone Formation are present at and around the Industrial User at Kirton, within the north-west area of Section D.

7.5.76 No significant areas of *Made Ground* deposits are present within Section D. Superficial deposits, where present, include alluvial deposits of clay, silt, sand, and gravel along tributaries of the River Trent, with larger deposits of sand and gravel present to the south of the Study Area.

Hydrogeology

7.5.77 The mudstone bedrock within this Section is designated as Secondary B Aquifer. The BGS 1:625,000 scale hydrogeological map identifies the mudstone formations as Triassic Rocks (undifferentiated), yielding less than 0.5 l/s of water.

7.5.78 Where present, the superficial deposits within Section D are primarily designated as Secondary A Aquifers.

7.5.79 The SPZs beneath Section D are presented in **Figure 7.2.** This shows the majority of Section D does not lie within a SPZ. A small area of SPZ3 is present within the northwest area of Section D, north-east of Ollerton, forming part of the wider catchment for groundwater abstractions located to the west of the Study Area.

7.5.80 The presence of GWDTE will be confirmed through review of results of ecological surveys conducted post-scoping and will be assessed as part of the ES.

Flood Risk

7.5.81 Flood zone mapping and flood defence infrastructure for Section D is shown on **Figure 7.1**.

7.5.82 Fluvial and tidal flood risk mapping identifies one main area of flood risk associated with the River Trent catchment. This includes several smaller areas associated with tributaries of the River Trent. The main area shown to be at risk follows the corridor of the River Trent from Newark on Trent in the south of Section D, to High Marnham in the north. This flood risk corridor is predominantly outside of the Study Area. However, two smaller areas of the flood risk corridor at the northern end (near High Marnham) and southern end (near Newark-on-Trent) intersect the Study Area. Additional smaller areas of fluvial flood risk are associated with tributaries of the River Trent, including:

- Goosemoor Dyke and Moorhouse Beck within the northern area of Section D which drain land to the north and south of Laxton, respectively and drain into Grassthorpe Beck. Grassthorpe Beck drains into the River Trent to the south of High Marnham;
- The Beck and tributaries within the south-central area of Section D which passes through Caunton and drains land to the west of Norwell. The Beck drains into the River Trent to the east of Carlton on Trent; and
- Unnamed tributaries of the River Trent within the southern area of Section D. One which drains through Kelham, draining land to the west of the village, and one which drains land to the southwest of South Muskham.

7.5.83 Surface water flood mapping for Section D is shown on **Figure 7.2**.

7.5.84 Surface water flood mapping generally indicates risk across areas of agricultural fields and along field boundaries, primarily associated with field drainage ditches and small tributaries draining to the River Trent.

- Potential out of bank overland flowpaths within the northern area of Section D are mapped as areas of surface water flood risk along existing watercourses draining land west of High Marnham;

- Potential out of bank overland flowpaths within the northern area of Section D are mapped as areas of surface water flood risk along watercourses and across some open areas of agricultural land draining areas served by Grassthorpe Beck;
- Potential out of bank overland flowpaths within the south-central area of Section D are mapped as areas of surface water flood risk along watercourses and across some open areas of agricultural land draining areas served by The Beck; and
- Areas of open agricultural land within the southern area of Section D, west of Kelham, is noted to be at risk of surface water flooding. It is assumed that this is associated with localised topographical low points.

7.5.85 The flood defences present within Section D are:

- Fluvial defences along the full extent of all Main Rivers present within this Section; and
- Localised flood defences, including embankments, are present within Low and High Marnham within the northern area of Section D, and within Little Carlton South Muskham, and the area west of Newark Castle within the southern area of Section D.

Water Quality

7.5.86 The current (2022) status of the WFD surface water bodies within Section D: High Marnham to Kirton and Newark are presented in **Table 7.8**.

Table 7.8: WFD Cycle 3 (2022) Water Bodies within Section D

Water Body Name	Ecological Status	Chemical Status
Fledborough Beck Catchment (tributary of Trent)	Moderate	Does not require assessment
River Trent from Carlton-on-Trent to Laughton Drain	Moderate	Does not require assessment
Tuxford Beck Catchment (tributary of Trent)	Moderate	Does not require assessment
Goosemoor Dyke from Source to Moorhouse Beck	Moderate	Does not require assessment
Bevercotes Beck Catchment (tributary of Maun)	Moderate	Does not require assessment
Gallow Hole Dyke Catchment (tributary of Rainworth Water)	Poor	Does not require assessment
Moorhouse Beck (tributary of Goosemoor Dyke)	Moderate	Does not require assessment
The Beck Catchment (tributary of Trent)	Moderate	Does not require assessment
Pingley/Rundell Dyke Catch Upper (tributary of Trent)	Good	Does not require assessment
River Trent from Soar to The Beck	Moderate	Does not require assessment

Trent Bifurcation Pingley Dyke to Winthorpe	Moderate	Does not require assessment

Designated Sites

7.5.87 The statutory designated sites present within Section D are presented in **Figure 5.1** within **Chapter 5: Biodiversity**.

7.5.88 Several environmentally designated sites are located within this Section. These sites are listed in **Table 7.9**. A value of 0 km shows that the site is adjoining or within the Scoping Boundary.

Table 7.9: Designated Sites Within Section D: South of High Marnham

Site	Closest Distance to Scoping Boundary	Location
National		
Kirton Wood, Notts. SSSI	0 km	In the northwestern area of Section D, east of Boughton.
Laxton Sykes SSSI	0 km	On the northern boundary of the north-central area of Section D, west of Ossington.
Wellow Park SSSI	0 km	On the northwestern boundary of Section D, southeast of Boughton.

Future Baseline

7.5.89 The future baseline will consider anticipated changes over the Project's design life, drawing on Environment Agency climate change allowances and UK Climate Projections. The baseline environment is not static and will exhibit some degree of change over time, with or without the Project in place. Therefore, when undertaking impact assessments, it is necessary to place any potential impacts in the context of the envelope of change that might occur naturally (i.e., in the absence of the Project) over the lifetime of the Project.

7.5.90 The design life of the pipeline and HAGIs (including BVIs) is 40 years but it is anticipated that the actual life of the Project could extend well over 40 years depending on ongoing monitoring of pipeline integrity and routine maintenance and upgrading where required. The future baseline will consider a worst-case scenario in terms of the Project design life.

7.5.91 With regard to Hydrology, Hydrogeology and Flood Risk, future baseline conditions will be forecast drawing on the latest data and best practice guidelines at the time of reporting within the ES, as set out by the EA, taking into account the likely impacts of climate change on rainfall intensities and, where applicable, peak river flows and sea level rise. These conditions will inform resilience measures for any infrastructure located in flood risk areas. Changes to regional groundwater levels as a consequence of either climate change, sea level rise or anthropogenic influences in the future will be assessed, however these changes are considered unlikely to be significant to this assessment.

7.5.92 Future baseline conditions will be updated iteratively during the EIA process, and the implications of any updates will be considered on a case-by-case basis within the EIA. A description of the potential future baseline will be provided in any future environmental reporting.

Further Data Collection to be Undertaken

7.5.93 A site walkover will be undertaken to inform the EIA. This will enable a visual survey of areas along the route corridor and above ground infrastructure locations to identify any outstanding Hydrological, Hydrogeological or Flood Risk-related issues or features which, particularly those which are not readily apparent from desk-based assessments or existing mapping.

7.5.94 In addition to the walkover survey, further data collection will be necessary to fully assess the potential impacts of the Project on the water environment within the Hydrology, Hydrogeology and Flood Risk Study Area. This will include targeted data requests to the Environment Agency, local planning authorities, and IDBs to gather essential information, such as flood risk, maps, asset data, data relating to water users (licenced abstractions or registered private water supplies), groundwater data and hydrological studies.

7.6 Assessment Methodology

Introduction

7.6.1 The EIA will follow the overarching methodology outlined in **Chapter 4: The EIA Process**. While those principles provide the foundation for this assessment, this Chapter explains how they will be applied and, where necessary, adapted to address the specific requirements of the Hydrology, Hydrogeology and Flood Risk assessment in the ES.

7.6.2 An FRA and WFD Assessment will be prepared as technical appendices to the ES and will inform the assessment of impacts in the Hydrology, Hydrogeology and Flood Risk Chapter.

Proposed Supporting Studies

7.6.3 The assessment will be supported by the following technical studies:

- An FRA will be prepared in accordance with the NPPF, as well as with reference to CIRIA guidance and local flood risk management guidelines published by the LLFAs and IDBs. The FRA will:
  - Consider flood risk from fluvial, coastal, surface water and groundwater sources during construction, operation and maintenance and decommissioning;
  - Incorporate climate change scenarios for peak flows, rainfall and sea level rise;
  - Include details of the measures proposed to adhere to local drainage and flood risk planning policies;
  - Consider flood risk over the lifetime of all above ground infrastructure, incorporating allowance for climate change in accordance with current published guidance;

- Consider surface water runoff from areas of construction and areas of above ground infrastructure throughout the operational phase; and
- Reporting will reflect the natural drainage catchments intersected by the Project. This approach ensures that potential effects on watercourses, flood risk, and groundwater are considered within their functional catchment context, in line with FRA requirements.

7.6.4 The WFD Assessment will be prepared in line with the Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive guidance (Planning Inspectorate, 2024) and EA WFD compliance requirements for estuarine and coastal waters. The WFD Assessment will:

- Assess potential effects on the Humber River Basin Management Plan water bodies and Operational Catchments;
- Demonstrate how the Project design avoids deterioration in water body status and supports WFD objectives; and
- Include qualitative assessment illustrating how the Project design will avoid water body deterioration, as well as provide any other mitigation necessary.

7.6.5 The assessment will be reported reflecting the WFD Operational Catchments intersected by the Project. This approach ensures that potential effects on watercourses and groundwater are considered within their functional catchment context, in line with WFD requirements.

Significance Evaluation Methodology

7.6.6 The significance level attributed to each effect will be assessed based on the 'sensitivity' of the affected receptor and the magnitude of change resulting from the development. The level of significance is then determined by the combination of receptor sensitivity and magnitude of change.

7.6.7 Receptor sensitivity is assessed on a scale of High, Medium, Low and Very Low, whilst magnitude of change is assessed on a scale of High, Medium, Low and Negligible. The criteria for defining sensitivity and magnitude can be found in **Table 7.10** and **Table 7.11**. These criteria are defined and applied based on professional judgement, using recognised approaches to classification relevant to the receptor types, including WFD, the NPPF and Design Manual for Roads and Bridges (DMRB), all of which represent good practice for water environment assessments within EIAs.

Sensitivity of Receptor

7.6.8 The criteria for receptor sensitivity used in this Chapter are outlined in **Table 7.10.**

Table 7.10: Definitions of Receptor Sensitivity

Sensitivity	Criteria	Description
High	Aquatic environment feature with a high quality and rarity at an international scale, with	Watercourses, waterbodies and tributaries of national importance.

Sensitivity	Criteria	Description
	little potential for substitution. Water resources supporting human health and economic activity at a regional scale. Property and infrastructure with a very high vulnerability to flooding.	Watercourses or waterbodies supporting highly sensitive large abstractions. Watercourses or waterbodies of good chemical status/ high ecological status and/ or high-quality targets under the WFD. Watercourses or waterbodies protected under international legislation, with an environmental designation for ecological/ conservation value, for example SAC, SPA, Ramsar. Aspects of the Project are classified as highly vulnerable to flood risk. Flood Zone 3 floodplains within the Flood Map for Planning, which are narrow and floodplains where a small increase in volume results in a relatively large increase in flood levels. Public potable water supply from either surface or groundwater source. Aquifer is a Principal Aquifer providing regionally important potable water supply and classified as a groundwater SPZ.
Medium	Aquatic environment features with a high yield and/ or quality and rarity at a national scale, with a limited potential for substitution. Water resources supporting human health and economic activity at a local scale. Property and infrastructure with a high vulnerability to flooding.	Watercourses, waterbodies and tributaries of district or regional importance. Watercourses or waterbodies supporting moderately sensitive abstractions. Watercourses or waterbodies of good chemical status/ moderate to good ecological status and/ or moderate to high quality targets under the WFD. Watercourses or waterbodies protected under national conservation designations, for example SSSI, National Nature Reserve (NNR), where the designation is based specifically on aquatic features. Flood Zone 2 floodplains within the Flood Map for Planning with limited constraints to the watercourse. Private Water Supply (PWS) from a watercourse or waterbody for potable use or non-drinking water abstraction for agricultural use from either surface or groundwater source. Aquifer is a Principal Aquifer not designated as SPZ.
Low	Aquatic environment features with a medium yield and/ or quality at a regional scale, or good quality at a local scale, with some potential for substitution. Water resources supporting human health and economic activity at household or individual business scale. Property and infrastructures with a	Watercourses, waterbodies and tributaries of local importance. Watercourses or waterbodies supporting abstractions of limited sensitivity. Watercourses or waterbodies with a chemical water quality status classed as ‘fail’ or an ecological water quality status classed as ‘poor’ and/ or moderate quality targets under the WFD. Watercourses or waterbodies protected under local conservation designations, for example LNR, County Wildlife site, where the designation is based specifically on aquatic features. Receptors classified as ‘less vulnerable’ to flood risk. Flood Zone 1 or 2 floodplains within the Flood Map for Planning, where any floodplain is wide and a large

Sensitivity	Criteria	Description
	moderate to low vulnerability to flooding.	increase in volume results in a small increase in flood levels. Aquifer is a Secondary A or Secondary B Aquifer.
Very Low	Aquatic environment features with a low yield and/or quality at a local scale, with good potential for substitution. Water resources that do not support human health, and of only limited economic benefit. Property and infrastructure that are resilient to flooding.	Small artificial, or heavily modified watercourses or waterbodies of limited local importance, with low habitat potential. Watercourses or waterbodies supporting no recorded abstractions. Watercourses or waterbodies with a chemical water quality status classed as 'fail' and an ecological water quality status classed as 'poor', and/ or low quality targets under the WFD. Unlicensed non-potable surface water abstractions.

Magnitude of Change

7.6.9 The magnitude of impact upon Hydrology, Hydrogeology and Flood Risk receptors is determined by defining the duration and reversibility of the change, and relevant legislation, policy standards and guidance as set out in **Table 7.1**. Magnitude of change may be either beneficial or adverse.

Table 7.11: Definitions of Magnitude of Change

Magnitude	Description
High	Long term or permanent loss of resource and/or quality and integrity of resource/ attribute; likely to cause exceedance of statutory objectives and/or breaches of legislation; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major long-term improvement of attribute quality (Beneficial).
	Changes to land resulting in an increase in runoff with flood potential and significant changes to erosion and sedimentation patterns.
	Major changes to groundwater levels, flow regime and risk of groundwater flooding.
Medium	Loss of resource/ attribute but not adversely affecting the overall integrity; partial loss of/ damage to key characteristics, features or elements with/ without exceedance of statutory objectives or with/ without breaches of legislation (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
	Moderate changes to erosion and sedimentation patterns.
	Moderate changes to groundwater levels, flow regime and risk of groundwater flooding.
Low	Some measurable change in attributes, quality or vulnerability; reversible or minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).

Magnitude	Description
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
	Minor changes to erosion and sedimentation patterns.
	Minor changes to groundwater levels, flow regime and risk of groundwater flooding.
Negligible	Very minor or no loss or detrimental alteration to one or more characteristics, features or elements; impact of insufficient magnitude to affect the use/ integrity of attribute (Adverse).
	Very minor or no benefit to or positive addition of one or more characteristics, features or elements; impact of insufficient magnitude to affect the use/ integrity (Beneficial).
	No alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion and sedimentation patterns.

Significance of Effect

7.6.10 The likelihood of an effect occurring also needs to be considered in any assessment and is evaluated on professional judgement and past experience of similar developments.

7.6.11 The effect's significance is determined by correlating the potential magnitude of the impact and sensitivity of the receptor, as defined in the matrix presented at **Table 7.12**. The final assessment for each effect is based upon professional judgement, after taking likelihood into consideration. Effects assessed as Major will be considered significant and reported as such in the ES. Effects assessed as Moderate will be considered potentially significant at this stage of the EIA process and will be subject to further investigation during the assessment process, following refinement of design information. Effects assessed as minor or negligible are deemed to be not significant in EIA terms.

Table 7.12: Definitions of Significance of Effect

Sensitivity/ Magnitude	High	Medium	Low	Negligible
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Very Low	Negligible	Negligible	Negligible	Negligible

7.7 Scope of the Assessment

7.7.1 The approach to EIA follows the principles set out in **Chapter 4: The EIA Process**. This Chapter outlines how those principles will be applied and, where necessary, adapted to address the specific requirements of the Hydrology, Hydrogeology and Flood Risk aspects of the EIA.

Key Receptors

7.7.2 As part of the desk study, the key receptors within the Hydrology, Hydrogeology and Flood Risk Study Area have been identified as follows:

Hydrology

7.7.3 The key water environment receptors are the Main Rivers and ordinary watercourses, which include WFD water bodies within the Study Area, illustrated in **Figure 7.1** and **Figure 7.2**.

7.7.4 These features have several attributes that could be affected, including water quality, flow conveyance and hydromorphology. Watercourses are monitored by the EA under the WFD as surface waterbodies (river and transactional). Watercourses may also support existing water interests such as abstractions providing water supplies, receiving discharges and transporting/ diluting waste waters. This will be confirmed through further assessment work post-scoping.

Flood Risk

7.7.5 Flood risk is mapped throughout the Study Area, generally associated with the Main River features detailed above for fluvial and tidal floodplains. EA flood zone areas associated with fluvial and tidal floodplains are illustrated in **Figure 7.1**. Some areas of floodplain benefit from flood defence assets which are also considered to be a key receptor within the Study Area due to the protection they afford to the local area. The Study Area crosses large extents of fluvial and coastal floodplain, where potential changes to flood risk as a result of Project activities will need to be controlled.

Hydrogeology

7.7.6 Groundwater within Principal and Secondary Aquifers have been identified within the Study Area. Groundwater can form a key linkage into baseflow for rivers, provide a water supply resource and support ecological habitat. Groundwater is monitored by the EA under the WFD as groundwater bodies.

7.7.7 Groundwater SPZ are mapped below significant areas of Section A and the north of Section B. These areas are associated with drinking water abstraction points, such as wells, boreholes, or springs. Groundwater SPZ any other registered or licenced groundwater abstractions are key groundwater receptors.

7.7.8 GWDTE will be identified through review of results of ecological surveys conducted post-scoping and will be assessed as part of the ES.

7.7.9 Environmentally designated sites, where interaction with the water environment plays a key role in sustaining the designated interest features, are also important key receptors. Identification of such sites will be confirmed through review of ecology data reported in **Chapter 5: Biodiversity**.

Mitigation Commitments

7.7.10 As part of the early Project design process, several primary commitments are proposed to avoid and reduce the potential for effects through the Project

design evolution. These commitments are considered to be embedded mitigation, inherent to the Project design.

7.7.11 In addition, a range of tertiary commitments would be implemented through legislative requirements or standard industry practice. These commitments are proposed to eliminate or reduce (where avoidance is not possible) the potential for effects on the environment.

7.7.12 Further detail on the role of commitments, as part of a proportionate EIA approach, is provided within **Chapter 4: The EIA Process**. A full description of the Mitigation Commitments identified to date is provided in **Appendix 4A: Draft Register of Environmental Actions and Commitments (REAC)**. Mitigation Commitments will be secured by requirements in the Development Consent Order (DCO) or in relevant management plans which would also be secured by requirements within the DCO. Those of relevance to Hydrology, Hydrogeology and Flood Risk which have been identified at this stage in the process are described in **Table 7.13**.

7.7.13 Additional Mitigation Commitments will be identified through the EIA process as required and will be taken into account when looking at residual effects.

Table 7.13: Relevant Commitments to Hydrology, Hydrogeology and Flood Risk

ID	Commitment Proposed	Description
Comm G-01	Construction Environmental Management Plan (CEMP) will be prepared by the Applicant and/ or its appointed Contractors	The DCO application will include an outline CEMP, that will outline the construction related environmental measures to be applied during construction of the Project, including details of any mitigation and how it will be managed through the construction phase. Approval of a final version of the CEMP prior to the commencement of construction will be controlled via a Requirement in the draft DCO. The purpose of the outline CEMP will be to set out the measures which will be taken to manage the potential adverse environmental impacts of the construction of The Project and limit the disturbance from construction activities such as site preparation, material delivery and removal, works activities and site reinstatement as far as is reasonably practicable. The CEMP will support the protection identified sensitive receptors from all stages of construction of the Project, setting out principles for storage and handling of oils, fuel, or any other potentially polluting substance, management of surface water, and soil management.
Comm Wt-13	Underground pipeline	The pipeline will, where practicable, be completely buried underground (with the exception of above ground infrastructure) and the ground will be suitably reinstated.
Comm Wt-14	Temporary access track design	Temporary access tracks will be optimised to minimise impacts on drainage/soil conditions and will be specified based on ground conditions and planned works along the route.

ID	Commitment Proposed	Description
Comm Wt-15	Management of subsurface flow pathways	All subsurface infrastructure will be designed to minimise disruption to existing subsurface flow pathways so as to avoid any localised increases in groundwater flooding risk and changes to the availability of water resources.
Comm Wt-16	Timing of works	Pipeline construction is generally focused on the spring and summer months (March to September). The works for trenchless crossings, pipelines in roads and construction of HAGIs or BVIs may occur outside the typical pipelaying season and throughout the year.
Comm Wt-17	Diversion and reinstatement of existing drainage networks	To minimise impacts on surrounding agricultural land, particular care will be taken to ensure that the existing land drainage regime is not compromised as a result of construction. If required, any damage will be repaired and existing drainage reinstated such that existing drainage regimes will not be compromised. Existing land drainage systems will be maintained and diverted as necessary during Construction and reinstated on completion.
Comm Wt-18	Refuelling, inspection and maintenance	Plant and machinery used during the construction and operation phases will be maintained to minimise the risks of oils leaks or similar. Drip trays will be available when re-fuelling plant and machinery and the availability of spill kits will contain small spillages in line current legislation
Comm Gr-27	Unexpected contamination protocol	Prior to construction, an unexpected contamination protocol will be developed in line with Environment Agency (2023) guidance (Land Contamination Risk Management (LCRM)) to minimise the potential risks to human health, ecological receptors and controlled waters from any unexpected ground contamination. The protocol will take into account the requirements for risk assessment, the use of Personal Protective Equipment (PPE) and adoption of best practice methods during construction.
Comm Gr-28	Hydrocarbon contamination	In areas where there is a potential for hydrocarbon residues from run-off/isolated leakages, surface water drainage measures included in the CEMP will be provided to capture hydrocarbons prior to discharge, for example use of hydrocarbon interceptors.
Comm Gr-29	Drilling Fluids	Environmentally hazardous drilling fluids, or those containing groundwater hazardous substances, will not be used during trenchless crossings
Comm Sa-31	Trenchless Crossings	Where appropriate major crossings of rivers/ canals, large IDB drains, major roads (primarily A Road and Motorways),rail crossings, buried high voltage cables, gas pipelines and other sensitive environmental constraints will typically

ID	Commitment Proposed	Description
		be constructed using trenchless techniques, in agreement with third party asset owners whereas for more minor crossings (such as minor roads or smaller watercourses) open cut crossings would typically be employed. The crossing methodology will be assessed on a case by case basis.
Comm Sa-35	Phased construction	The pipeline will generally be constructed using a staged approach for excavation, pipeline laying and reinstatement, to allow reinstatement to take place in as short a timeframe as possible from the point of excavation. This may differ around trenchless crossing locations where there is a need to tie in open cut and trenchless crossing pipeline works.
Comm Sa-36	Stockpile duration	Stockpiles will be present for the shortest practicable timeframe, with stockpiles being reinstated as the construction work progresses. Stockpiles of topsoil which remain present for six months or longer will be managed (e.g. through seeding) to encourage stabilisation, minimise soil erosion and prevent nuisance weeds, which will be secured within the SMP. Land within the working corridor or other areas of development will be kept vegetated for as long as is practicable before topsoil stripping to reduce the risk of soil erosion, which will be secured within the SMP.
Comm G-51	Decommissioning Plan	A Decommissioning Plan will be developed prior to decommissioning in accordance with the latest available guidance and legislation. The Plan will consider the potential for below ground infrastructure to remain in-situ where appropriate. Decommissioning activities will include measures to mitigate flood risk, prevent pollution, and minimise ground disturbance. The decommissioning plan will set out management measures to ensure activities that are undertaken are ALARP and remaining decommissioned assets are left in a safe condition.
Comm Ec-50	Avoidance of ponds	During construction, ponds will be avoided through route amendments, trenchless crossings or micro-siting of the pipeline working area, access and Temporary Construction Compounds (TCCs) where practical.
Comm Wa-54	Surface Water Management Plan	All construction work will be undertaken in accordance with a Surface Water Management Plan (SWMP) secured as part of the CEMP. This will include measures to manage the supply and drainage of water used for hydrostatic testing. An outline SWMP will be provided with the application for development consent, either within the outline CEMP or as a management plan supporting the outline CEMP, that sets out

ID	Commitment Proposed	Description
		the principles to be followed when the final SWMP is finalised. A separate drainage strategy may also be provided.
Comm Gc-57	Pollution Prevention and Emergency Incident Response Plan	All construction work will be undertaken in accordance with Pollution Prevention and Emergency Incident Response measures that will be included within the CEMP.

Likely Significant Effects

7.7.14 A range of potential impacts on Hydrology, Hydrogeology and Flood Risk receptors have been identified from the desk-based review undertaken for Scoping which may occur during the construction, operation and maintenance and decommissioning phases of the Project.

7.7.15 The potential impacts that have been identified as having the potential for LSEs at this time, and which are scoped into the assessment, are outlined in **Table 7.14**. The potential for LSEs has been identified on the basis that primary and tertiary Mitigation Commitments have been applied.

Table 7.14: Impacts Proposed to be Scoped In to the Project Assessment for Hydrology, Hydrogeology and Flood Risk (Project Phase Refers to Construction (C), Operation and Maintenance (O&M) and Decommissioning (D)).

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
WE-01	Temporary generation of turbid runoff during construction which could directly enter the water environment.	C; D	Comm G-01 Comm Wt-14 Comm Wt-17	TCCs, Pipeline, all above ground infrastructure	Pollution from construction and decommissioning activities, including the generation of turbid runoff, may directly impact the water environment.
WE-03	Temporary changes to surface water runoff patterns during construction which could directly or indirectly affect surface hydrology and flood risk.	C; D	Comm G-01 Comm Wt-14 Comm Wt-15 Comm Wt-17	TCCs, Pipeline, all above ground infrastructure	Construction and decommissioning activities such as vegetation removal, soil compaction, establishment of TCC, pipework trenching, and dewatering of excavations may affect surface water flows and flood risk around all infrastructure.
WE-04	Permanent changes to surface water runoff patterns which could directly or indirectly affect surface hydrology and flood risk.	O&M	Comm Wt-15	HAGI and BVI	Changes to fluvial or tidal flood risk at HAGI and BVI locations, associated with loss of floodplain storage and/ or change in floodplain flow conveyance.
WE-05	Damage to flood defence or surface water drainage infrastructure during construction.	C	Comm G-01 Comm Wt-13 Comm Wt-15	TCCs, Pipeline, all above ground infrastructure	Construction of the pipeline and above ground infrastructure may intersect existing flood defence or land drainage systems, potentially affecting their operational effectiveness or structural integrity.
WE-07	Pollution directly to groundwater resources or disruption of groundwater flow through ground excavations or piling during construction.	C	Comm G-01 Comm Wt-15 Comm Gr-27	TCCs, Pipeline, HAGI, BVI	Construction activities involving piling, trenchless drilling, or deep excavations for HAGI or BVI may impact groundwater resources and create pathways for pollution to groundwater. Earthworks or deep excavation activities for the hydrogen pipeline may impact groundwater resources and create pathways for pollution to groundwater.

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Description of Impact
WE-08	Potential leakage and breakout of bentonite during HDD works resulting in risk to controlled waters during construction.	C	Comm G-01 Comm Gr-27 Comm Gr-29	Pipeline	Potential breakouts of bentonite and drilling fluids during trenchless/ HDD works could result in physical and chemical contamination of controlled waters directly into ground and surface water run-off and sediment loading in nearby surface water receptors.
WE-11	Accidental spillages and leakages of oils, fuel and other polluting substances which could potentially enter the surface water or groundwater environment.	C	Comm G-01 Comm Wt-14 Comm Wt-18 Comm Gr-27 Comm Gr-29	TCCs, Pipeline, all above ground infrastructure	The use of chemicals or potential pollutants could result in physical and chemical contamination of controlled waters directly into ground and surface water run-off and sediment loading in nearby surface water receptors.
WE-12	Hydrostatic pressure testing	C	Comm Wa-54	Pipeline	Hydrostatic pressure testing has the potential to require the abstraction and disposal of large volumes of water during commissioning may also impact on water quality.

Impacts Proposed to be Scoped Out

7.7.16 On the basis of the baseline information currently available, the Project Description outlined in **Chapter 2: The Project**, and the good practice Mitigation Commitments outlined in **Section 7.7.10**, potential impacts which are unlikely to result in LSE are proposed to be scoped out of the assessment. These effects are presented **Table 7.15** with justification for why they should be scoped out, plus where relevant reference to the Mitigation Commitments which will be applied. This approach aligns with NSIP - Advice Note Seven: Environmental Impact Assessment (PINS, 2020) as described in **Chapter 4: The EIA Process**.

Table 7.15: Impacts Proposed to be Scoped Out of the Project Assessment for Hydrology, Hydrogeology and Flood Risk

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Justification
WE-02	Temporary generation of turbid runoff during O&M which could directly enter the water environment.	O&M	None applied	All above ground infrastructure	Operation and maintenance activities will not involve significant earthworks, vegetation clearance or excavation. Any potential for impact from surface water runoff will be managed through formalised surface water drainage for all above ground infrastructure.
WE-06	Damage to flood defence or surface water drainage infrastructure after construction.	O&M; D	Comm G-51	All above ground infrastructure	Once constructed, there would be no potential for change to existing flood defence infrastructure or surface water drainage infrastructure during operation and maintenance. Hydrogen pipelines and any piling or deep excavation works are expected be left in situ and therefore no effects would result from decommissioning.
WE-09	Pollution directly to groundwater resources or disruption of groundwater flow after construction.	O&M; D	Comm G-51	HAGI, BVI	No excavations or piling will occur during operation and maintenance activities and therefore no effects would result during operation and maintenance. Any piling or buried infrastructure are expected to be left in situ and therefore no effects would result from decommissioning.
WE-10	Accidental spillages and leakages of	O&M; D	Comm G-51	TCCs, Pipeline, all	O&M activities will be limited to occasional inspections and maintenance at HAGI and

Impact ID	Potential Impact	Project Phase (C, O&M, D)	Mitigation Commitments (if applied)	Project Aspect	Justification
	oils, fuel and other polluting substances which could potentially enter the surface water or groundwater environment.			above ground infrastructure	BVI locations. Appropriate environmental management measures will be implemented in line with the principles set out for Construction. Any buried infrastructure is expected to be left in situ at decommissioning, therefore the risk of accidental spillages and leakages is considered lower and will be managed by a Decommissioning Plan that will be developed prior to decommissioning in accordance with the latest available guidance and legislation.

Cumulative Effects

7.7.17 **Chapter 4: The EIA Process**, details how potential cumulative effects will be assessed through a Cumulative Effects Assessment (CEA) and gives examples of the projects which are likely to be included in that assessment.

7.7.18 The CEA for Hydrology, Hydrogeology and Flood Risk will consider whether the Project, in combination with other proposed developments, could result in significant cumulative effects on Hydrology, Hydrogeology and Flood Risk receptors. The assessment will include a desk-top exercise and consultation with stakeholders to identify relevant potential projects with which there could be interactions within the water environment.

7.7.19 The Hydrology, Hydrogeology and Flood Risk impacts proposed to be scoped into the CEA are construction and decommissioning based impacts. Operational cumulative effects are not considered to be significant as any new development is legally required to control effects to the water environment, such that there are no potential detrimental effects on the water environment. At decommissioning, the pipeline and below-ground infrastructure will be left in situ, which subsequently reduces the potential for effects on Hydrology, Hydrogeology and Flood Risk. Any residual risk will be effectively managed through the Decommissioning Plan. Any potential for cumulative impact would be dependent on phasing of the other major developments considered. Plans and programmes for other developments are unlikely to generate additional significant adverse cumulative effects, unless they:

- Impact Main Rivers or ordinary watercourses;
- Alter flood risk;
- Significantly impact groundwaters in the vicinity of the pipeline or HAGI; or

- Adversely impact waterbody catchments within the Study Area.

7.7.20 Where there is sufficient, suitable, publicly available information to undertake a meaningful assessment, cumulative assessment will be quantitative, however the level of data available and the ease with which impacts can be combined across different developments is variable. Where the availability of public information is not sufficient for a quantitative assessment, a qualitative assessment will be undertaken.

Intra-Project Effects

7.7.21 The assessment of intra-related effects from multiple impacts from the construction, operation and maintenance and decommissioning of the Project will be considered for Hydrology, Hydrogeology and Flood Risk. It will include consideration of the Project lifetime effects and receptor led effects in line with the approach outlined in **Chapter 4: The EIA Process**.

Secondary Effects

7.7.22 Secondary effects are effects on one receptor group that may influence another receptor group. Potential secondary effects between Hydrology, Hydrogeology and Flood Risk and the following Chapters will be reviewed, and a qualitative assessment (drawing on expert judgement) will be undertaken if there is potential for LSE to occur and presented in the ES:

- **Chapter 5: Biodiversity**: assessment of the LSEs of the Project on water dependent, ecologically sensitive receptors;
- **Chapter 12: Ground Conditions**: assessment of the LSEs of the Project on groundwater from the potential mobilisation of contaminants present on site; and
- **Chapter 13: Agriculture and Soil Resources**: assessment of the LSEs of the Project on agricultural land in terms of land lost from agricultural production and on soil resource in terms of damage, degradation, and loss of soil resources, including from entrainment of soils in surface water runoff.

Transboundary Effects

7.7.23 At this stage, it is not anticipated that transboundary effects relating to Hydrology, Hydrogeology and Flood Risk would arise. This is due to the localised nature of any Hydrology, Hydrogeology and Flood Risk impacts relating to the Project. It is, therefore, proposed that transboundary effects are scoped out of the Hydrology, Hydrogeology and Flood Risk assessment, however, this will be kept under review.

7.8 Conclusion

7.8.1 The Hydrology, Hydrogeology and Flood Risk Scoping Chapter has provided an overview of the legislative and policy background for the Project as well as setting out the principal guidance that will be referenced, and the methodologies which will be adopted to inform the Hydrology, Hydrogeology and Flood Risk ES Chapter.

7.8.2 The Study Area has been defined based on the geographical extent over which the Project is likely to result in significant Hydrology, Hydrogeology and Flood Risk effects. The Study Area is defined by a 500 m buffer from the Scoping Boundary, which will be reduced to a 500 m buffer from the draft Order Limits as the Project design is refined. This buffer reflects professional judgement and industry best practice based on the likely ZoI on the water environment for linear infrastructure projects.

7.8.3 Hydrology, Hydrogeology and Flood Risk receptors within the Study Area have been identified using desktop analysis and review of the relevant national and local government data sets including ordnance survey mapping and aerial photography. Receptors scoped into the assessment include Main Rivers and ordinary watercourses within the Study Area, areas at risk of flooding, groundwater resources, GWDTE, water users and water dependent environmentally designated areas.

7.8.4 The identification of Hydrology, Hydrogeology and Flood Risk receptors will be further refined through consultation and data analysis. This will be undertaken following completion of the preliminary Project design and confirmation of routing and above ground installation locations.

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510000 515000 520000 525000

420000

415000

East Halton Beck

Skitter Beck

Section A

Section B

New Beck Drain

New Beck

North Beck Drain

Oldfleet Drain

Foulholme Sands

Mud & Sand

Jetties

Ore Terminal

Immingham Dock

Humberside International Airport

Goxhill

Thornton Curtis

Wootton

Ulceby

Habrough

Immingham

Killingholme

South Killingholme

East Halton

Stallingborough

Healing

Keelby

Great Limber

Aylesby

Riby

Croxton

Barnetby Wold

Hendale Wood

Searby Top

Cherry Cobb Sands

Saltfleetby Sands

Sunk Island

West Marsh

Bradley

Lacey Acres

Little Coates

Grimsby

Cleethorpes

Scunthorpe

Doncaster

Barnsley

Lincoln

LINCOLNSHIRE

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Flood Defence
- Tidal Water
- Environment Agency Flood Zone 2
- Environment Agency Flood Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

0 2.5 5

Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

MAIN RIVERS AND FLOOD ZONES SECTION A

FIGURE 7.1a

Scale: 1:60,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0009.0 Main Rivers and Flood Zones

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490000 495000 500000 505000 510000

415000 410000 405000

East Halton Beck
Skitter Beck
Section A
Section B
New Beck Drain
Little Carr Drain
Wrawby Catchment Drain
River Ancholme
Old River Ancholme
Kettleby Beck
Scawby Old Ancholme and Soak Drain
Highland Drain
Bottesford Beck
Section B
Section C
River Eau

Winterton
Burton upon Stather
Roxby Carrs
Saxby All Saints Carrs
Bonby Carrs
Appleby Carrs
Risby Warren
Crosby Warren
Worlaby
Elsham
Wootton
Thornton Curtis
Barnetby le Wold
Wrawby
Brigg
Broughton
Scawby
Hibaldstow
North Kelsey
South Kelsey
Messingham
Kirton in Lindsey
Redbourne
Great Limber
CUNTHORPE

N

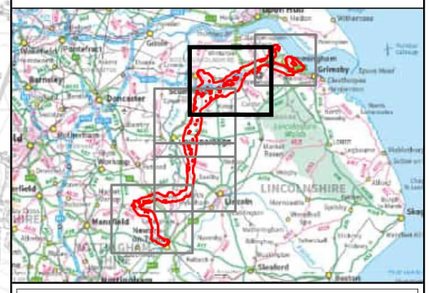
0 2.5 5
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Flood Defence
- Environment Agency Flood Zone 2
- Environment Agency Flood Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.



H2East Pipeline
Humber to Nottinghamshire

Cadent

SCOPING REPORT

MAIN RIVERS AND FLOOD ZONES SECTION B

FIGURE 7.1b

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0009.0 Main Rivers and Flood Zones

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480000 485000 490000 495000 500000

405000 400000 395000 390000

Scawby Old Ancholme and Soak Drain

Highland Drain

River Ancholme

Section B

Section C

River Eau

River Till

Messingham

Scotter

Kirton in Lindsey

GAINSBOROUGH

N

0 2.5 5

Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Flood Defence
- Environment Agency Flood Zone 2
- Environment Agency Flood Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent
Your Gas Network

SCOPING REPORT

MAIN RIVERS AND FLOOD ZONES SECTION C

FIGURE 7.1c

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00009.0 Main Rivers and Flood Zones

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480000 485000 490000 495000 500000

385000

380000

375000

River Till

Foss Dyke

River Trent

Section C

Section D

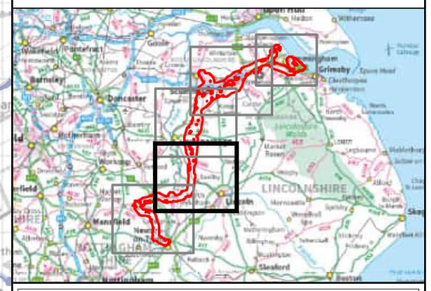
N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Flood Defence
- Environment Agency Flood Zone 2
- Environment Agency Flood Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.



0 2.5 5

Kilometres

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

MAIN RIVERS AND FLOOD ZONES SECTION C

FIGURE 7.1d

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0009.0 Main Rivers and Flood Zones

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465000 470000 475000 480000 485000

370000 365000 360000

River Trent

Section C

Section D

River Trent

NEWARK AND SHERWOOD DISTRICT

NEWARK ON TRENT

SOUTHWELL

0 2.5 5

Kilometres

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Flood Defence
- Environment Agency Flood Zone 2
- Environment Agency Flood Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent
Your Gas Network

SCOPING REPORT

MAIN RIVERS AND FLOOD ZONES SECTION D

FIGURE 7.1e

Scale: 1:80,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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402.064333.00001.0009.0 Main Rivers and Flood Zones

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516000 518000 520000 522000 524000

416000 414000 412000

N

North Beck Drain

Oldfleet Drain

New Beck

0 1 2

Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)
- Tidal Water

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline
Humber to Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION A

FIGURE 7.2a

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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510000 512000 514000 516000 518000

422000 420000 418000

N

EAST HALTON CP

GOXHILL CP

NORTH KILLINGHOLME CP

SOUTH KILLINGHOLME CP

ULCEBY CP

East Halton Beck

Skitter Beck

New Beck Drain

Section A

Section B

0 1 2

Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)
- Tidal Water

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H₂East Pipeline
Humber to
Nottinghamshire

Cadent
Your Gas Network

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION A

FIGURE 7.2b

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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508000 510000 512000 514000 516000

416000 414000 412000

East Halton Beck
Skitter Beck
Section A
Section B
New Beck Drain
New Beck
WOOTTON CP
ULCEBY CP
CROXTON CP
MELTON ROSS CP
KIRMINGTON CP
BROCKLESBY CP
SOUTH KILLINGHOLME CP
HABROUGH CP
BARNETBY LE WOLD CP

N

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

0 1 2
Kilometres

402.064333.0004 10.0 Surface Water Flood Risk and SPZs

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION A TO SECTION B

FIGURE 7.2c

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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500000 502000 504000 506000 508000

414000 412000 410000

N

Worlaby Fox Covert
Worlaby House Farm
Worlaby
Elsham Hill
Elsham Wolds
Elsham
Elsham Carrs
Worlaby Carrs
Broughton Carrs
Wrawby Moor
Wrawby
Barnetby le Wold
Little Carr Drain
Wrawby Catchwater Drain
River Ancholme
Old River Ancholme
Kettleby Beck
WORLABY CP
ELSHAM CP
WRAWBY CP
BRIGG CP
BIGBY CP
SOMERBY CP
BARNETBY LE WOLD CP
CROXTON
MELTON ROSS CP
LINCOLNSHIRE

0 1 2
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION B

FIGURE 7.2d

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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496000 498000 500000 502000 504000

410000 408000 406000

Little Carr Drain
Wrawby Catchwater Drain
River Ancholme
Old River Ancholme
Kettleby Beck
Scawby Old Ancholme and Soak Drain
Highland Drain

BROUGHTON CP
BRIGG
BRIGG CP
WRAWBY CP
SCAWBY CP
CADNEY CP

N

0 1 2
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION B

FIGURE 7.2e

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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488000 490000 492000 494000 496000

412000 410000 408000

Bottesford Beck

SCUNTHORPE

NORTH LINCOLNSHIRE

Santon

Berkeley

Bottesford CP

Holme

Holme Lane

M180

Steel Works

Kilometres 0 1 2

N

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION B

FIGURE 7.2f

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

402.064333.00001.0010.0650 Surface Water Flood Risk and SPZs

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492000 494000 496000 498000

406000 404000 402000

Section B
Section C

Scawby Old Ancholme and Soak Drain
River Ancholme
Old River Ancholme
Highland Drain
River Eau

SCAWBY CP
HIBALDSTOW CP
MANTON CP
MESSINGHAM CP
KIRTON IN LINDSEY CP
REDBOURNE CP

Kirton in Lindsey
Redbourne
Hibaldstow
Scawby
Greetwell
Manton
Messingham

0 1 2
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION B

FIGURE 7.2g

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
01	FIRST DRAFT	DB	JS	MF	25/11/25

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486000 488000 490000 492000 494000

406000 404000 402000

N

Section B
Section C

River Eau

0 1 2
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION B TO SECTION C

FIGURE 7.2h

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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484000 486000 488000 490000 492000

398000 396000 394000

N

River Eau

LAUGHTON CP NORTHORPE CP GRAYINGHAM CP PILHAM CP CORRINGHAM CP HEMSWELL CP BLYBOROUGH CP

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION C

FIGURE 7.2i

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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484000 486000 488000 490000 492000

390000

388000

386000

N

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

0 1 2 Kilometres

H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION C

FIGURE 7.2j

Scale: 1:30,000 @ A3

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402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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484000 486000 488000 490000 492000

382000 380000 378000

N

River Till

Foss Dyke

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H₂East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION C

FIGURE 7.2k

Scale: 1:30,000 @ A3

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402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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480000 482000 484000 486000 488000

374000 372000 370000

N

Foss Dyke

River Trent

Section C

Section D

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

0 1 2 Kilometres

H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION C

FIGURE 7.2I

Scale: 1:30,000 @ A3

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402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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472000 474000 476000 478000 480000

374000 372000 370000

N

0 1 2 Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary Section Division
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

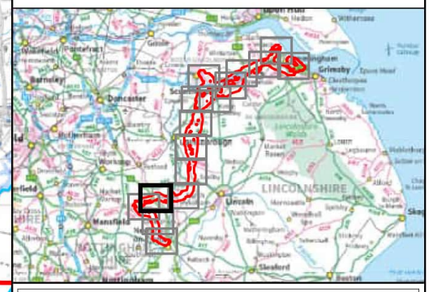
- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.



H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION D

FIGURE 7.2m

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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402_06603.00001.0010.0 Surface Water Flood Risk and Source Protection Zones Section D.mxd

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468000 470000 472000 474000 476000

370000 368000 366000

N

Tuxford
Walesby
TUXFORD CP
WALESBY CP
EGMANTON CP
Egmanton
Laxton
Moorhouse
LAXTON AND MOORHOUSE CP
WELLOW CP
OMPTON CP
KNEESALL CP
OSSINGTON CP
Boughton
Kneesall
Ompton
Wellow
Wellow Park
Ollerton Pit Woods
Golden Hill
Laxton Common
Kneesall Green
Westwood Grange
Willoughby Hill
Gooseheon Bridge
Egmanton Crossing
Egmanton Common
Moorhouse
Ossington
Rudentwood
Marnham Road
Ollerton Road
Long Lane
Hall Farm
Grange Farm
Abbey Moor Farm
Egmanton Hill Farm
Brecks Farm
Church Farm
Primrose Farm
North Wood
Knapeney Farm
Home Farm
Highland Farm
Highland Cottages
Lady Elinor's Plantation
Broadwaters Farm
Broadwaters Wood
Lower Lodge
Hartshorn Farm
Mainwood Farm
Brockilow Farm
Kneesall Wood
Laxton Wood
Laxton Middle Wood
Lady Wood
Ladywood Farm
Gypsy Lodge Farm
Scarthingwell Hall
Scarthingwell Farm
Oil Bore Holes (disused)
Oil Bore Hole (disused)
Oil Bore Hole
Bore Hole
Motts & Bailey
Memorial Earthworks
Westwood Farm
Far Leys Farm
Farleys Wood
Hanging Hill Plantation
Beverscotes Park
Nickerbush Plantation
Collinridge Wood
Priest Park Farm
Caravan Site
Solar Panels
Doncaster Farm
Munn Farm
Sewage Works
Birkhill Wood
Cocking Moor
Beth Shalom
Westwood Farm
Woodside Farm
Jordan Castle
Jordan Castle Farm
Grimston Hill
Wood Close Farm
Sportwood Farm
Besuchamp Barn
Little Leyfields
Leyfields
Red Hill
Lound Wood
Hunger Hills
Brickyard Plantation
Buckshaw Farm
Park Farm
Victoria Plantation
Mill Field
South Field
Copchorne Farm
Primrose Plantation
Knapeney Plantation
Lake Plantation
Commonside Plantation
Sewage Works (disused)
Post Office Farm
Moorhouse Farm
Lincolnshire
Nottinghamshire
Barnsley
Doncaster
Grimsby
Lincoln
Mansfield
Sleaford
Boston

0 1 2
Kilometres

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

- High – Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
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Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2
- Source Protection Zone 3

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

H₂East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION D

FIGURE 7.2n

Scale: 1:30,000 @ A3

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402.064333.00001.00101.Surface Water Flood Risk and SPZs

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472000 474000 476000 478000 480000

366000 364000 362000

N

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

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- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year

Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.

0 1 2 Kilometres

H2East Pipeline
Humber to
Nottinghamshire

Cadent

SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION D

FIGURE 7.2o

Scale: 1:30,000 @ A3

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402.064333.00001.0010.0 Surface Water Flood Risk and SPZs

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474000 476000 478000 480000 482000

360000 358000 356000

LEGEND

- Scoping Boundary
- Scoping Boundary 500 m Buffer
- Statutory Main River
- Minor Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Flood Likelihood Category for Risk of Flooding from Surface Water (RoFSW)

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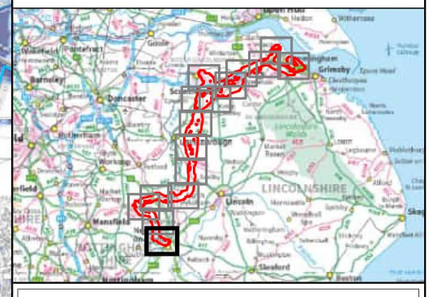
Source Protection Zones (SPZs)

- Source Protection Zone 1
- Source Protection Zone 2

NOTES

Main Rivers only labelled within 500 m Buffer of Scoping Boundary.



H2East Pipeline Humber to Nottinghamshire

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SCOPING REPORT

SURFACE WATER FLOOD RISK AND SOURCE PROTECTION ZONES SECTION D

FIGURE 7.2p

Scale: 1:30,000 @ A3

REV	COMMENT	CR	CH	AP	DATE
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0 1 2 Kilometres

402_06203_00001_0010.0 Surface Water Flood Risk and SPZs

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