Outer Dowsing Offshore Wind

Preliminary Environmental Information Report

Volume 1, Chapter 19: Onshore Air Quality

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Abbreviations

Acronym	Expanded name
AADT	Annual Average Daily Traffic
AoS	Area of Search
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
CEA	Cumulative Effects Assessment
CERC	Cambridge Environmental Research Consultants
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
DPF	Diesel Particulate Filters
ECA	Emission Control Area
ECC	Export Cable Corridor
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
EPUK	Environmental Protection UK
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group Portfolio company), Gulf Energy Development and TotalEnergies
HDV	Heavy-Duty Vehicle
HGV	Heavy Goods Vehicles
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LCC	Lincolnshire County Council
LDV	Light-Duty Vehicle
LGV	Light Goods Vehicle
LNR	Local Nature Reserve
LPA	Local Planning Authority
LSE	Likely Significant Effect
LWS	Local Wildlife Site
LWT	Lincolnshire Wildlife Trust
MDS	Maximum Design Scenario
N/A	Not Applicable

Acronym	Expanded name
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRMM	non-road mobile machinery
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
OnSS	Onshore Substation
PEIR	Preliminary Environmental Information Report
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
The Inspectorate	The Planning Inspectorate
TJB	Transition Joint Bay
UK	United Kingdom
WTG	Wind Turbine Generator
ZoI	Zone of Influence

Terminology

Term	Definition
Array area	The area offshore within the PEIR Boundary within which the generating stations (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling are positioned.
Baseline	The status of the environment at the time of assessment without the development in place.
Cumulative effects	The combined effect of the Project acting cumulatively with the effects of a number of different projects, on the same single receptor/resource.
Cumulative impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from the Secretary of State (SoS) for Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Environmental Impact Assessment (EIA) Regulations, including the publication of an Environmental Statement (ES).

Term	Definition
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Statement (ES)	The suite of documents that detail the processes and results of the Environmental Impact Assessment (EIA).
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups (ETGs) that discusses and where possible agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment (HRA) for those relevant topics included in the process, undertaken during the pre-application period.
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Indicative Working Width	The indicative working width within the Export Cable Corridor (ECC), required for the construction of the onshore cable route.
Joint bays	A joint bay provides a secure environment for the assembly of cable joints as well as bonding and earthing leads. A joint bay is installed between each length of cable.
Landfall	The location at the land-sea interface where the offshore export cable will come ashore.
Maximum Design Scenario	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures, or commitments, are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects (NSIPs) will be assessed and decided upon.
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Preliminary Environmental Information report (PEIR) Boundary within which the export cable running from the array to landfall will be situated.
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which the export cable running from the landfall to the onshore substation will be situated.
Onshore substation (OnSS)	The Project's onshore substation, containing electrical equipment to enable connection to the National Grid.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.

Term	Definition
Preliminary Environmental Information Report (PEIR)	The PEIR is written in the style of a draft Environmental Statement (ES) and provides information to support and inform the statutory consultation process in the pre-application phase. Following that consultation, the PEIR documentation will be updated to produce the Project's ES that will accompany the application for the Development Consent Order (DCO).
Project Design Envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
PEIR Boundary	The PEIR Boundary is outlined in Figure 3.1 of Volume 1, Chapter 3: Project Description and comprises the extent of the land and/or seabed for which the PEIR assessments are based upon.
study area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind (ODOW). The project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
The Project	Outer Dowsing Offshore Wind including proposed onshore and offshore infrastructure.
Transboundary impacts	Transboundary effects arise when impacts from the development within one European Economic Area (EEA) state affects the environment of another EEA state(s).
Transition Joint Bay (TJBs)	The offshore and onshore cable circuits are jointed on the landward side of the sea defences/beach in a Transition Joint Bay (TJB). The TJB is an underground chamber constructed of reinforced concrete which provides a secure and stable environment for the cable joint.

19 Onshore Air Quality

19.1 Introduction

19.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the results to date of the Environmental Impact Assessment (EIA) for the potential impacts of Outer Dowsing Offshore Wind (the Project) on Onshore Air Quality. Specifically, this chapter considers the potential impact of the Project from the Landfall, along the Onshore Export Cable Corridor (ECC), and incorporating the Onshore substation (OnSS) during the construction, operation and maintenance, and decommissioning phases.

19.1.2 GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop the Project. The Project will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, onshore cables, connection to the electricity transmission network, and ancillary and associated development (see Volume 1, Chapter 3: Project Description for full details).

19.1.3 This chapter summarises the information contained within the following technical annexes:

- Volume 2, Appendix 19.1: Construction Dust Assessment Methodology;
- Volume 2, Appendix 19.2: Non-Road Mobile Machinery (NRMM) Emissions Assessment;
- Volume 2, Appendix 19.3: Offshore Activities Assessment; and
- Document 8.1.2: Outline Air Quality Management Plan.

19.1.4 This chapter should be read alongside the following chapters:

- Volume 1, Chapter 3: Project Description; and
- Volume 1, Chapter 27: Traffic and Transport.

19.2 Statutory and Policy Context

Legislation

Air Quality Standards Regulations

19.2.1 The Air Quality Standards Regulations (AQSR) 2010 (His Majesty's Stationery Office (HMSO), 2010) transpose both the European Union (EU) Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within United Kingdom (UK) legislation.

19.2.2 The AQSR includes limit values, target values, and objectives for the protection of human health and the environment. Limit values are legally binding and are considered to apply everywhere with the exception of the carriageway and central reservation of roads and any location where the public do not have access (e.g., industrial sites). Compliance is regulated at a national level.

19.2.3 The AQSR were subsequently amended in 2019 to make them operable from 1 January 2021 despite the UK's withdrawal from the EU (HMSO, 2019a).

Air Quality Strategy

19.2.4 The UK Government and the Devolved Administrations are required under the Environment Act 1995 (HMSO, 1995) to produce a national air quality strategy to improve air quality. The latest Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland was published in 2007 (Department for Environment, Food and Rural Affairs (Defra), 2007).

19.2.5 The AQS provides the over-arching strategic framework for air quality management in the UK and contains non-statutory national air quality objectives for the protection of public health and the environment.

19.2.6 The ambient air quality objectives of relevance to human receptors in this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this chapter) are provided in Table 19.1.

Table 19.1: Relevant ambient AQALs

Pollutant	Objective (µg/m^3)	Measured as
Nitrogen Dioxide (NO_2)	200	1-hour mean not to be exceeded more than 18 times a year
	40	Annual mean
Particulate Matter (PM_{10})	50	24-hour mean not to be exceeded more than 35 times a year
	40	Annual mean
Particulate Matter ($PM_{2.5}$)	25	Annual mean

19.2.7 It is acknowledged that following the introduction of the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (HMSO, 2020), the $PM_{2.5}$ AQAL is now 20µg/m^3. The revised $PM_{2.5}$ AQAL will be considered within the ES.

19.2.8 The above AQALs apply at locations outside buildings or other natural or man-made structures above or below ground, where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period – herein referred to as relevant exposure. Table 19.2 provides an indication of those locations.

Table 19.2: Human health relevant exposure

Averaging Period	AQALs should apply at	AQALs should not apply at
Annual mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term

Averaging Period	AQALs should apply at	AQALs should not apply at
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

Local Air Quality Management

19.2.9 As reinforced within the AQS, Part IV of the Environment Act 1995 (HMSO, 1995) includes a statutory duty for local authorities to undergo a process of Local Air Quality Management (LAQM). This requires local authorities to review and assess air quality within their boundaries to determine the likeliness of compliance, regularly and systematically.

19.2.10 Where any of the prescribed AQALs are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the objective.

General Nuisance Legislation

19.2.11 Part III of the Environmental Protection Act (EPA) 1990 (as amended) (HMSO, 1990) contains the main legislation on statutory nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines smoke, fumes, dust, and smells emitted from industrial, trade, or business premises, which is harmful to health or a nuisance, as a potential statutory nuisance.

19.2.12 Fractions of dust greater than 10µm (i.e., greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

Designated Ecological Sites

19.2.13 Ecological habitats vary in regard to their sensitivity, perceived ecological value, geographic importance, and level of protection. Within the UK, there are three types of nature conservation designations: international, national and local, with a greater level of protection afforded to the former, relative to the latter.

19.2.14 The EU Habitats Directive (The Council of European Communities, 1992) requires member states to introduce a range of measures for the protection of habitats and species. This requirement was transposed into UK legalisation by The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations') (HMSO, 2017). These regulations were subsequently amended in 2019 to make them operable from 1 January 2021 despite the UK's withdrawal from the EU (HMSO, 2019b).

19.2.15 The Habitats Regulations introduces the precautionary principle for protected European sites, i.e., that projects can only be permitted to proceed; having ascertained that there will be no adverse effect on the integrity of the designated site. It requires an assessment to determine if significant effects are likely, followed by an 'appropriate assessment' by the competent authority, if necessary.

19.2.16 European sites include Special Areas of Conservation (SAC) and Special Protection Areas (SPA), previously termed the Natura 2000 network, and now collectively called the national site network (HMSO, 2019b).

19.2.17 Other sites of international significance are Ramsar sites, which are wetlands protected under the Ramsar Convention. Many of these sites in the UK were initially selected due to their importance to waterbirds and are therefore also classified as SPAs.

19.2.18 The Countryside and Rights of Way Act 2000 (HMSO, 2000) also provides protection to Ramsar sites and Sites of Special Scientific Interest (SSSI) to ensure that developments are not likely to cause damage. This act also provides a degree of protection to local nature conservation sites, which can be particularly important in providing 'buffers' to SSSIs and International sites.

National Policy

National Planning Policy

19.2.19 The 2021 update to the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) sets out planning policy for England.

19.2.20 The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution.

19.2.21 The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019) which includes guiding principles on how planning can take account of the impacts of new development on air quality.

National Policy Statements

19.2.22 The National Policy Statements (NPS) are a series of principal decision-making documents to appropriately assess Nationally Significant Infrastructure Projects (NSIPs). As such, this assessment has made explicit reference to the relevant NPS requirements.

19.2.23 Those relevant to the Project are:

- NPS for Overarching Energy (EN-1);
- NPS for Renewable Energy (EN-3); and
- NPS for Electricity Networks (EN-5).

19.2.24 Revised draft NPS were published in March 2023 and are currently out for consultation. To provide greater confidence that the Project is compliant with regards to future relevant policies, due consideration has been given to these draft NPSs.

19.2.25 Details of the current and future draft policies of relevance to this assessment are provided in Table 19.3 together with an indication of where each requirement is addressed. Where any part of the NPS has not been followed, an explanation as to why the requirement is not deemed relevant, or has been met in another manner, is provided.

19.2.26 EN-3 and EN-5 do not specifically include details on the assessment of air quality.

Local Policy

East Lindsey

19.2.27 The East Lindsey Local Plan was adopted by East Lindsey District Council (ELDC) on 18 July 2018. The Core Strategy (ELDC, 2018) is a key Local Plan document; however, it does not contain any policies relating specifically to air quality.

South East Lincolnshire

19.2.28 The South East Lincolnshire Joint Strategic Planning Committee is a partnership between Boston Borough Council (BBC), South Holland District Council (SHDC), and Lincolnshire County Council (LCC), who have prepared the South East Lincolnshire Local Plan 2011-2036 (BBC, SHDC and LCC, 2019). The Plan was adopted by BBC and SHDC on 8 March 2019. It contains Policy 30: Pollution which is of direct relevance to this chapter and has been considered in the assessment, as detailed in Table 19.3.

Guidance

19.2.29 The air quality assessment has been informed by the following guidance documents:

- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Institute of Air Quality Management (IAQM), 2020);
- Design Manual for Roads and Bridges (DMRB) LA 105: Air Quality (National Highways, 2019);
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2016);
- Land-Use Planning and Development Control: Planning for Air Quality (Environmental Protection UK (EPUK) & IAQM, 2017);
- LAQM Technical Guidance (TG22) (LAQM.TG22) (Defra, 2022); and
- Natural England's Approach to Advising Competent Authorities on the Assessment of Road Traffic Emissions under the Habitats Regulations (NEA001) (Natural England, 2018).

19.2.30 The legislation and planning policy of relevance to the Project, specifically in relation to Air Quality, is outlined in Table 19.3 below.

Table 19.3: Legislation and policy context

	Key provisions	Section where comment addressed
Legislation		
The Air Quality Standards Regulations 2010 (2010)	Includes statutory limit values for the protection of human health and the environment.	The numerical limit values for the protection of human health and the environment have been considered within the assessment. See Sections 19.4 to 19.8.
Environment Act 1995 (1995)	Introduced the requirement for the UK Government and the Devolved Administrations to produce a national air quality strategy to improve air quality, and the statutory duty for local authorities to undergo a process of LAQM.	Sections 19.4 to 19.8.
The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) (2007)	Includes the national air quality objectives for the protection of public health and the environment – presented in Table 19.1.	Sections 19.4 to 19.8.
Environmental Protection Act 1990 (1990)	Includes the main legislation on statutory nuisance and defines what constitutes a potential statutory nuisance, including dust.	Sections 19.5 to 19.8.
Habitats Regulations 2017 (as amended) (2017)	Sets out decision making procedures for the protection of SACs and SPAs. It requires an assessment to determine if significant effects are likely, followed by an 'appropriate assessment' by the competent authority, if necessary.	SACs and SPAs have been considered in the assessments undertaken to date, Sections 19.5 to 19.9.

	Key provisions	Section where comment addressed
Countryside and Rights of Way Act 2000 (CRoW) (2000)	Part III includes provision for the protection of SSSIs (Schedule 9) and Ramsar sites.	SSSIs and Ramsar sites have been considered in the assessments, Sections 19.5 to 19.9.
National Planning Policy		
NPS EN-1 (2011)	Paragraph 5.2.2 of EN-1 states that an Environmental Statement (ES) will include an assessment of Carbon Dioxide (CO_2) emissions, but the policies set out in Section 2 [of EN-1], including the EU ETS, apply to these emissions. The IPC (now Planning Inspectorate) does not, therefore need to assess individual applications in terms of carbon emissions against carbon budgets.	Not applicable for this assessment. No further comment needed.
NPS EN-1 (2011)	Paragraph 5.2.7 of EN-1 states that an ES should describe: ▪ any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the Project; ▪ the predicted absolute emission levels of the proposed project, after mitigation methods have been applied; ▪ existing air quality levels and the relative change in air quality from existing levels; and ▪ any potential eutrophication impacts.	Sections 19.5 to 19.9.
Draft NPS EN-1 (2023)	Paragraph 5.2.8 of the Draft EN-1 states that an ES should describe: ▪ existing air quality levels and the relative change in air quality from existing levels; ▪ any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the Project; ▪ the predicted absolute emission levels of the proposed project, after mitigation methods have been applied; and ▪ any potential eutrophication impacts.	Sections 19.5 to 19.9.

	Key provisions	Section where comment addressed
NPPF (2021)	Chapter 15 (Conserving and Enhancing the Natural Environment) states the following in specific relation to air quality: "*Planning policies and decisions should contribute to and enhance the natural and local environment by*: *[…]* *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of […] air […] pollution […]. Development should, wherever possible, help to improve local environmental conditions such as air […] quality […]*" "*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.*"	Existing environment discussed in Section 19.4. See Sections 19.7 for assessment of impacts. See Document 8.1.2: Outline Air Quality Management Plan for details regarding mitigation measures.
PPG (2019)	In regard to air quality, the PPG states: "*The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified.*" "*Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have*	Existing environment discussed in Section 19.4. See Sections 19.7 for assessment of impacts. See Document 8.1.2: Outline Air Quality Management Plan for details regarding mitigation measures.

	Key provisions	Section where comment addressed
	an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity." The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that: "*Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific. […] Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact.*"	
Local Planning Policy		
South East Lincolnshire Local Plan 2011-2036 (2019)	Policy 30: Pollution states: "*Development proposals will not be permitted where, taking account of any proposed mitigation measures, they would lead to unacceptable adverse impacts upon:* 1. *health and safety of the public;* 2. *the amenities of the area; or* 3. *the natural, historic and built environment;* *by way of:* 4. *air quality, including fumes and odour;* *[…]* *Planning applications, except for development within the curtilage of a dwelling house as specified within Schedule 2, Part 1 of The Town and Country Planning (General Permitted Development) (England) Order 2015, or successor statutory instrument, must include an assessment of:* 9. *impact on the proposed development from poor air quality from identified sources;*	Provisions of Policy 30 considered in Sections 19.5 to 19.9.

	Key provisions	Section where comment addressed
	10. impact on air quality from the proposed development; and *11. impact on amenity from existing uses.* *Suitable mitigation measures will be provided, if required. Proposals will be refused if impacts cannot be suitably mitigated or avoided.* *Development proposals on contaminated land, or where there is reason to suspect contamination, must include an assessment of the extent of contamination and any possible risks. Proposals will not be considered favourably unless the land is, or can be made, suitable for the proposed use."*	

19.3 Consultation

19.3.1 Consultation is a key part of the Development Consent Order (DCO) application process. Consultation regarding Air Quality has been conducted through the Evidence Plan Process (EPP) Expert Technical Group (ETG) meetings and the EIA scoping process (Outer Dowsing Offshore Wind, 2022). An overview of the Project consultation process is presented within Volume 1, Chapter 6: Consultation Process.

19.3.2 A summary of the key issues raised during consultation to date, specific to Air Quality, is outlined in Table 19.4 below, together with how these issues have been considered in the production of this PEIR.

Table 19.4: Summary of consultation relating to Air Quality

Consultation Phase/Type and Date	Consultation and key issues raised	Section where comment addressed
The Inspectorate, Scoping Opinion (ID 3.13.1), September 2022	**NRMM emissions during construction:** As per the Scoping Report (Outer Dowsing Offshore Wind, 2022), it was initially proposed to scope out impacts associated with emissions generated from NRMM used during the construction phase. This was based on advice provided within Defra's LAQM.TG22 (Defra, 2022) which states that providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. A series of controls were included within the Scoping Report (Outer Dowsing Offshore Wind, 2022). However, The Inspectorate recommended that an assessment of emissions generated from NRMM used during construction should be undertaken.	A qualitative assessment of construction phase NRMM emissions has been undertaken. See Section 19.7 and Volume 2, Appendix 19.2: NRMM Emissions Assessment.
The Inspectorate, Scoping Opinion (ID 3.13.2), September 2022	**Offshore vessel emissions during construction:** As per the Scoping Report (Outer Dowsing Offshore Wind, 2022), it was initially proposed to scope out impacts associated with emissions from offshore vessel movements during the construction phase. This was based on the strict emission controls which are implemented in the North Sea, which is an Emission Control Area (ECA), and the low proportion of overall shipping traffic which movements associated with the Project would represent. However, The Inspectorate recommended that an assessment of emission generated from offshore vessels	An assessment of offshore activities has been undertaken. This includes consideration of offshore vessel movements generated by the construction phase. See Section 19.7 and Volume 2, Appendix 19.3: Offshore Activities Assessment.

Consultation Phase/Type and Date	Consultation and key issues raised	Section where comment addressed
	used during construction should be undertaken for sensitive human and/or ecological receptors.	
The Inspectorate, Scoping Opinion (ID 3.13.3), September 2022	**Operational phase traffic movements:** The Inspectorate agreed that road traffic movements generated by operational activities are unlikely to cause significant effects on air quality. However, to validate this, the Inspectorate requested comparison of operation and maintenance (O&M) flows to screening criteria set out in the EPUK & IAQM guidance.	Road traffic movements generated by operational activities have been presented and compared against EPUK & IAQM screening criteria. See Section 19.7.
The Inspectorate, Scoping Opinion (ID 3.13.4), September 2022	**Offshore vessel emissions during operation:** The Inspectorate agreed that this matter can be scoped out of further assessment.	No action needed.
The Inspectorate, Scoping Opinion (ID 3.13.5), September 2022	**Decommissioning phase traffic movements and other works:** The Inspectorate requested for further information about the nature and scale of possible decommissioning activities. Specifically, an assessment of decommissioning phase traffic movements and other works, where likely significant effects could occur.	As per the Inspectorate's request, further information of potential decommissioning impacts is provided in Section 19.5. For the reasons provided, it is not considered appropriate to assess, in detail, decommissioning activities at this stage. A decommissioning methodology would be finalised nearer to the end of the lifetime of the Project, to be in line with current guidance, policy and legislation. Furthermore, decommissioning activities are not anticipated to exceed the construction phase worst-case criteria assessed for each impact. However, qualitative consideration has been given to the extent of potential decommissioning impacts through consideration of the construction phase

Consultation Phase/Type and Date	Consultation and key issues raised	Section where comment addressed
		assessment outcomes – to determine whether further assessment is required, Section 19.7.
The Inspectorate, Scoping Opinion (ID 3.13.6), September 2022	**Cumulative dust and PM_{10} during construction:** The Inspectorate noted that at present, there is a lack of detail regarding the extent of committed developments and projects/plans that will be considered within the Cumulative Effects Assessment (CEA). As such, they could not agree for this matter to be scoped out.	A CEA has been undertaken and is presented in Section 19.8. This has included consideration of cumulative dust and PM_{10} during construction.
The Inspectorate, Scoping Opinion (ID 3.13.7), September 2022	**Transboundary effects**: The Inspectorate agreed that this matter can be scoped out of further assessment.	No action needed.
The Inspectorate, Scoping Opinion (ID 3.13.8), September 2022	**Study area:** The Inspectorate requested for the ES to include appropriate figures to identify key elements of the study area and assessments.	Figures are provided for each element of the air quality assessment. Figures 19.1 to 19.5.
The Inspectorate, Scoping Opinion (ID 3.13.9), September 2022	**Project-specific air quality surveys:** As per the Scoping Report (Outer Dowsing Offshore Wind, 2022), it was initially proposed to establish the air quality baseline using publicly available sources, such as Defra background mapping and local monitoring data. This approach was noted by The Inspectorate within the Scoping Opinion. The Inspectorate recommended that the suitability of these publicly available datasets be reviewed throughout the EIA lifecycle upon refinement of the onshore ECC, and the suitability/use of the datasets, or the requirement for a project-specific survey, be confirmed with the relevant consultation bodies.	Following finalisation of the onshore PEIR boundary and assessment inputs (e.g., traffic data), the suitability of the publicly available data has been reviewed. Consistent with the approach outlined within the Scoping Report (Outer Dowsing Offshore Wind, 2022), publicly available datasets have been used to characterise the baseline environment and have been reviewed with respect to the study area. In relation to the road traffic emissions assessment, suitable roadside baseline monitoring locations (Section 19.4) are found adjacent to the affected road network and have therefore been utilised in the

Consultation Phase/Type and Date	Consultation and key issues raised	Section where comment addressed
		assessment, specifically in the dispersion model verification exercise. Use of publicly available datasets has been discussed with statutory consultees during the Air Quality ETG process – whereby no comments/responses have been raised. Additional consultation will be undertaken with relevant consultation bodies for the ES (and following receipt of Section 42 responses). The use of publicly available datasets will continue to be reviewed throughout the EIA lifecycle and evolvement of the design.
The Inspectorate, Scoping Opinion (ID 3.13.10), September 2022	**Assessment of in-combination effects on national and local designated ecological sites:** The Inspectorate noted that at present, there is insufficient detail on the extent of onshore elements of the Project to scope out significant air quality effects on nationally or locally designated sites cumulatively with other projects or plans. It was recommended that this should be included in the assessment where likely significant effects could occur.	Screening of road traffic movements generated by the Project has been undertaken in-combination with relevant committed developments and live projects / plans, in recognition of the scoping comments received from The Inspectorate. This screening process is documented in Section 19.7. This approach ensures an understanding of potential in-combination effects across all designated ecological sites. However, in accordance with the Habitats Regulations, screening of in-combination effects is required for internationally designated sites only. Furthermore, following a review of consultation comments provided by Natural England on other projects, screening of in-combination effects is requested for national (SSSI) designations, in additional to international sites. The in-

Consultation Phase/Type and Date	Consultation and key issues raised	Section where comment addressed
		combination assessment therefore typically includes international sites and SSSIs only. Assessment of in-combination effects for locally designated sites is not standard assessment procedure.
ETG Presentation, July 2022.	No consultation feedback received.	-
ETG Presentation, October 2022.	No consultation feedback received.	-

19.3.3 As identified in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives and Volume 1, Chapter 3: Project Description, the project design envelope has been refined and will be refined further prior to DCO submission. This process is reliant on stakeholder consultation feedback.

19.3.4 Design amendments to the cable routing and OnSS location are of relevance to this chapter. Variation in either of these design parameters, specifically in terms of their relative locations, influences in the study area in terms of the sensitive receptor locations likely to be impacted by associated activities e.g., construction and routing of construction phase road vehicles associated with the Project.

19.4 Baseline Environment

Study Area

19.4.1 The study area has been defined with the application of relevant screening distances to the onshore PEIR boundary and locations of associated activities; classified as the Zone of Influence (ZoI).

19.4.2 The PEIR includes optionality in relation to the Project design, which can impact assessment outcomes. To allow for greater flexibility and confidence in the assessment outcomes, a Maximum Design Scenario (MDS) has been defined and assessed (detailed in Table 19.8).

19.4.3 Following this approach, the study area defined for each assessment is described in the following sections.

Construction Dust Assessment

19.4.4 The study area for the construction dust assessment has been defined on the following, which is set out in the IAQM guidance (IAQM, 2016):

- Human receptors within 350m of the onshore PEIR boundary, and/or within 50m of routes used by construction vehicles, up to 500m from the onshore construction access points; and
- Ecological receptors within 50m of the onshore PEIR boundary and within 50m of routes used by construction vehicles, up to 500m from the onshore construction access points.

19.4.5 The full assessment methodology is detailed in Volume 2, Appendix 19.1: Construction Dust Assessment Methodology.

Road Traffic Emissions Assessment

19.4.6 The spatial extent of the study area for the road traffic assessment is initially defined using a series of established screening criteria to determine the extent of the affected road network.

19.4.7 The screening criteria utilised is dependent on the application (there are different criteria for human and ecological receptors). These are discussed further in Section 19.5.

19.4.8 Human and ecological receptors within 200m of roads expected to experience increases in traffic flows as a result of the proposed onshore construction activities have been assessed, where necessary. If an ecological and/or human receptor is located >200m from an affected road link, further consideration is not required. The 200m distance screening threshold is supported in various guidance documents (IAQM, 2020 and Highways England et al., 2019) and is therefore considered appropriate.

NRMM Emissions Assessment

19.4.9 Human and ecological receptors within 50m of potential NRMM activity have been assessed. The maximum design parameters and extent of any proposed construction area have been used for the purposes of defining the locations of potential NRMM. This is considered precautionary, as it assumes that the onshore PEIR boundary represents the location of all NRMM activity and therefore increases the opportunity for interactions with sensitive receptors. In reality, NRMM is likely to be operated within an area much smaller than this; contained within the onshore PEIR boundary.

19.4.10 If an ecological and/or human receptor is located >50m from the onshore PEIR boundary, further consideration for NRMM is not required.

19.4.11 The use of a 50m distance screening threshold in relation to NRMM emissions, where extensive onshore construction activities are proposed, has been considered appropriate and accepted by statutory consultees and the Inspectorate for other NSIPs.

19.4.12 The full assessment methodology is detailed in Volume 2, Appendix 19.2: NRMM Emissions Assessment, and the study area displayed in Figure 19.4.

Vessel Emissions Assessment

19.4.13 Onshore human and ecological receptors within 1km of vessel movements generated by the Project have been assessed, consistent with the distance screening thresholds prescribed within Defra's LAQM.TG22.

19.4.14 The offshore array area is located 54km off the coast of Lincolnshire. Given the separation distance, vessel movements associated with the Project are therefore only likely to interact with onshore sensitive receptors where they are:

- Used to facilitate the construction and decommissioning of onshore infrastructure associated with cable laying and landfall infrastructure. This interaction with onshore sensitive receptors is likely to occur at the location of the onshore and offshore interface (i.e., where the PEIR boundary interacts with the coast e.g. landfall); and/or
- Exiting/entering a port.

19.4.15 The specific port location(s) to be utilised by vessels are yet to be determined, however it is likely to be Teesside during the construction phase, and Grimsby for the O&M phase. Regardless of the port location, all vessel movements will be compliant with the relevant port's operational constraints and management plans. Therefore, further consideration of vessels exiting and entering a port has not been given.

19.4.16 The study area therefore relates to onshore human and ecological receptors located within 1km of vessels used to facilitate onshore works (i.e., at the location of the onshore and offshore interface).

19.4.17 The full assessment methodology is detailed in Volume 2, Appendix 19.3: Offshore Activities Assessment, and the study area displayed in Figure 19.5.

Data Sources

19.4.18 The onshore PEIR boundary traverses through three Local Planning Authorities (LPA); BBC, ELDC, and SHDC. Specific data for each LPA has been reviewed, where available.

19.4.19 In respect of local monitoring data, the characterisation of the baseline environment has been undertaken using the latest publicly available data sources collected prior to the COVID-19 pandemic (i.e., pre-2020), as pollutant concentrations monitored during 2020 and 2021 are expected to be atypical and have therefore not been considered. Sources utilised include the following:

- BBC, 2020 Air Quality Annual Status Report (ASR) (BBC, 2020);
- ELDC, 2021 Combined Air Quality ASR (ELDC, 2022);
- SHDC, 2020 Air Quality ASR (SHDC, 2020);
- Defra, AQMA Dataset (November 2022 update); and
- Defra, Mapped Background Concentration Estimates (2018 reference year).

19.4.20 The use of publicly available datasets to characterise the baseline environment has been discussed with statutory consultees during the Air Quality ETG process during which no concerns have been raised. This approach will continue to be reviewed throughout the EIA lifecycle following refinement of the onshore infrastructure.

Existing Environment

19.4.21 The onshore ECC is split into segments from the landfall to the OnSS search areas for means of assessment. Where possible and appropriate, these route segments have been referenced within the air quality PEIR chapter and associated assessments.

19.4.22 However, the distribution and granularity of air quality baseline data means it does not easily categorise into the segments. This is for a few reasons:

- In relation to local air quality monitoring locations, these are not necessarily located within the envelope of one segment and may be located at a distance from the onshore ECC. Assignment to one segment may therefore not be appropriate. Furthermore, the monitored concentrations at each location may be applicable to the baseline environment of more than one segment;
- In relation to AQMAs, these may be positioned away from the onshore ECC, and this separation distance causes complications when aligning them to one segment. Furthermore, in relation to Project generated road traffic flows, an AQMA may be impacted by flows generated from more than one segment; and

- In relation to the Defra mapped background concentrations, these are provided on a 1km grid square resolution. Where located on the segment borders, the 1km grid squares are likely to be intersected and would therefore apply to more than one segment.

LAQM Review and Assessment

19.4.23 ELDC, BBC, and SHDC, in fulfilment of statutory requirements, have conducted on-going exercises to review and assess air quality within their administrative areas, termed 'Review and Assessment'.

19.4.24 In ELDC and SHDC, this process has not identified any exceedances of the AQALs at locations of relevant exposure and as such, neither have declared any AQMAs.

19.4.25 Comparatively, BBC presently has one declared AQMA within their administrative area. The AQMA, known as Haven Bridge AQMA', was declared in 2001 for exceedances of the annual mean NO_2 AQAL at locations of relevant exposure. In February 2023, BBC revoked the AQMA known as Bargate Bridge AQMA; as monitored annual mean NO_2 concentrations were consistently below the AQAL.

19.4.26 Due consideration will be given to potential interactions between Project impacts and AQMAs, where relevant.

Review of Air Quality Monitoring

Automatic Air Quality Monitoring

19.4.27 From review of national and local automatic monitoring networks, the closest automatic monitor to the onshore PEIR boundary is approximately 7.5km away in Spalding. Due to the separation distance, monitored concentrations are unlikely to be fully representative of conditions at the boundary and have therefore not been considered further.

Non-Automatic Air Quality Monitoring

19.4.28 ELDC, BBC and SHDC all undertake non-automatic (passive) NO_2 diffusion tube monitoring within their administrative areas.

19.4.29 The details and results of the monitoring locations in proximity to the onshore PEIR boundary are presented in Table 19.5 and Table 19.6, respectively, whilst their locations are displayed in Figure 19.1.

Table 19.5: Details of local non-automatic monitoring locations

Site ID	LPA	Site Type	NGR-X	NGR-Y	In AQMA?	Distance to PEIR Boundary (km)
1	BBC	Roadside	532575	343696	Haven Bridge	4.6
2	BBC	Roadside	532656	343716	Haven Bridge	4.5
3	BBC	Roadside	532470	343736	Haven Bridge	4.7
4	BBC	Roadside	532331	343848	Haven Bridge	4.9
5	BBC	Roadside	532859	343760	Haven Bridge	4.4

Site ID	LPA	Site Type	NGR-X	NGR-Y	In AQMA?	Distance to PEIR Boundary (km)
8	BBC	Roadside	533112	344476	No (former Bargate Bridge)	4.0
9	BBC	Roadside	533251	344642	No (former Bargate Bridge)	3.8
12	BBC	Roadside	532168	343987	No	5.1
14	BBC	Roadside	533226	344624	No (former Bargate Bridge)	3.9
16	BBC	Roadside	532855	343719	No	4.4
17	BBC	Roadside	532877	343690	No	4.3
18	BBC	Roadside	532600	342737	No	3.9
19	BBC	Roadside	532630	342760	No	3.9
20	BBC	Roadside	532744	343719	Haven Bridge	4.5
21	BBC	Roadside	532024	344060	No	5.2
22	BBC	Roadside	532544	343702	Haven Bridge	4.6
SK1/2/3	ELDC	Roadside	556355	363295	No	3.8
SK4	ELDC	Roadside	556380	363363	No	3.8
SH3	SHDC	Urban Background	525694	321999	No	6.3
SH5	SHDC	Roadside	526585	328726	No	2.2
SH6	SHDC	Roadside	535525	325589	No	6.2
SH13	SHDC	Kerbside	524595	323793	No	5.6
SH15	SHDC	Roadside	524182	325804	No	4.8
SH16	SHDC	Roadside	524203	331510	No	3.5
SH17	SHDC	Roadside	524892	322571	No	6.3
SH19(14)	SHDC	Roadside	532684	324311	No	4.5

Table 19.6: Results from local non-automatic monitoring locations

Site ID	LPA	2019 Data Capture (%)	Annual Mean NO_2 Concentration ($\mu g/m^3$)				
			2015	2016	2017	2018	2019
1	BBC	91.7	49.7	45.8	49.4	42.4	49.2
2	BBC	8.3	50.1	37.5	44.5	44.5	-
3	BBC	100.0	46.0	46.2	53.2	48.3	46.5
4	BBC	100.0	36.4	38.6	38.0	39.4	39.8
5	BBC	91.7	34.9	34.6	36.8	34.7	34.8
8	BBC	100.0	31.1	31.1	31.3	32.5	31.3
9	BBC	100.0	44.2	41.5	43.6	39.4	37.0
12	BBC	100.0	28.6	26.8	27.6	31.8	28.9
14	BBC	100.0	36.6	36.7	37.1	37.8	35.8

Site ID	LPA	2019 Data Capture (%)	Annual Mean NO_2 Concentration ($\mu g/m^3$)				
			2015	2016	2017	2018	2019
16	BBC	100.0	-	-	-	-	30.1
17	BBC	83.3	-	-	-	-	30.5
18	BBC	100.0	-	-	-	-	33.8
19	BBC	100.0	-	-	-	-	27.5
20	BBC	100.0	-	-	-	46.3	41.6
21	BBC	100.0	-	-	-	30.0	29.0
22	BBC	66.7	-	-	-	-	35.9
SK1/2/3	ELDC	100.0	-	29.7	28.2	29.4	28.7
SK4	ELDC	58.3	-	25.5	26.4	24.2	22.7
SH3	SHDC	100.0	-	-	-	-	11.0
SH5	SHDC	100.0	14.6	16.2	16.2	13.4	12.8
SH6	SHDC	91.7	19.7	25.9	19.9	19.2	27.9
SH13	SHDC	100.0	29.8	34.8	34.9	27.1	25.7
SH15	SHDC	100.0	-	-	-	-	22.3
SH16	SHDC	100.0	12.5	13.9	14.1	16.1	17.0
SH17	SHDC	100.0	24.3	27.5	24.2	22.8	20.3
SH19(14)	SHDC	100.0	-	-	-	-	16.3

19.4.30 As displayed in Table 19.6, annual mean NO_2 concentrations above the AQAL ($40\mu g/m^3$) have been recorded at some of the monitors for the period 2015-2019. These monitors are all located within BBC, either in the current Haven Bridge AQMA or the revoked Bargate Bridge AQMA. Monitored annual mean NO_2 concentrations within the Bargate Bridge AQMA have been below the AQAL since 2018 (i.e., monitor ID 8, 9 and 14).

19.4.31 Monitored annual mean NO_2 concentrations at the monitors within ELDC and SHDC have remained below the AQAL throughout the period 2015-2019.

19.4.32 The closest monitor to the onshore PEIR boundary is SHDC monitor SH5, located approximately 2.2km away. Monitor SH5 is situated near the village of Surfleet, in proximity to the roadside of A16 – which may experience construction generated road traffic flows. Monitored annual mean NO_2 concentrations at monitor were well below the AQAL (i.e., <75%) across the period 2015-2019.

19.4.33 In accordance with the empirical relationship presented in LAQM.TG22, exceedances of the 1-hour mean AQAL are considered unlikely where annual mean concentrations are $<60\mu g/m^3$. On this basis, exceedances of the 1-hour mean AQAL are considered unlikely across the period (2015-2019) at monitors presented.

520000 540000 560000 580000

380000 360000 340000 320000

N

Lincolnshire Node OnSS Search Area Substation

LN1 LN2 WM1 WM2 WM3 WM4 WM5 WM6 WM7 WM8 WM9 WM10 WM11 WM12 WM13 WM14 A1 A2 A3 A4 A5

Page 2 Page 3 Page 4 Page 5

West Lindsey District
East Lindsey District
North Kesteven District
Boston District
South Kesteven District
South Holland District
Fenland District
King's Lynn and West Norfolk District
Breckland District

Haven Bridge AQMA

Weston Marsh North OnSS Search Area Substation

Weston Marsh South OnSS Search Area Substation

THE WASH

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Lincolnshire Node OnSS Search Area
- Weston Marsh North OnSS Search Area
- Weston Marsh South OnSS Search Area
- Boston Borough Council Monitor
- East Lindsey District Council Monitor
- South Holland District Council Monitor
- Air Quality Management Area (AQMA)
- Local Authority Boundary

Coordinate System: British National Grid

0 5 10 km

Scale: 1:250,000

Preliminary Environmental Information Report

Air Quality Monitoring Locations Overview

Figure 19.1.1

OUTER DOWSING OFFSHORE WIND

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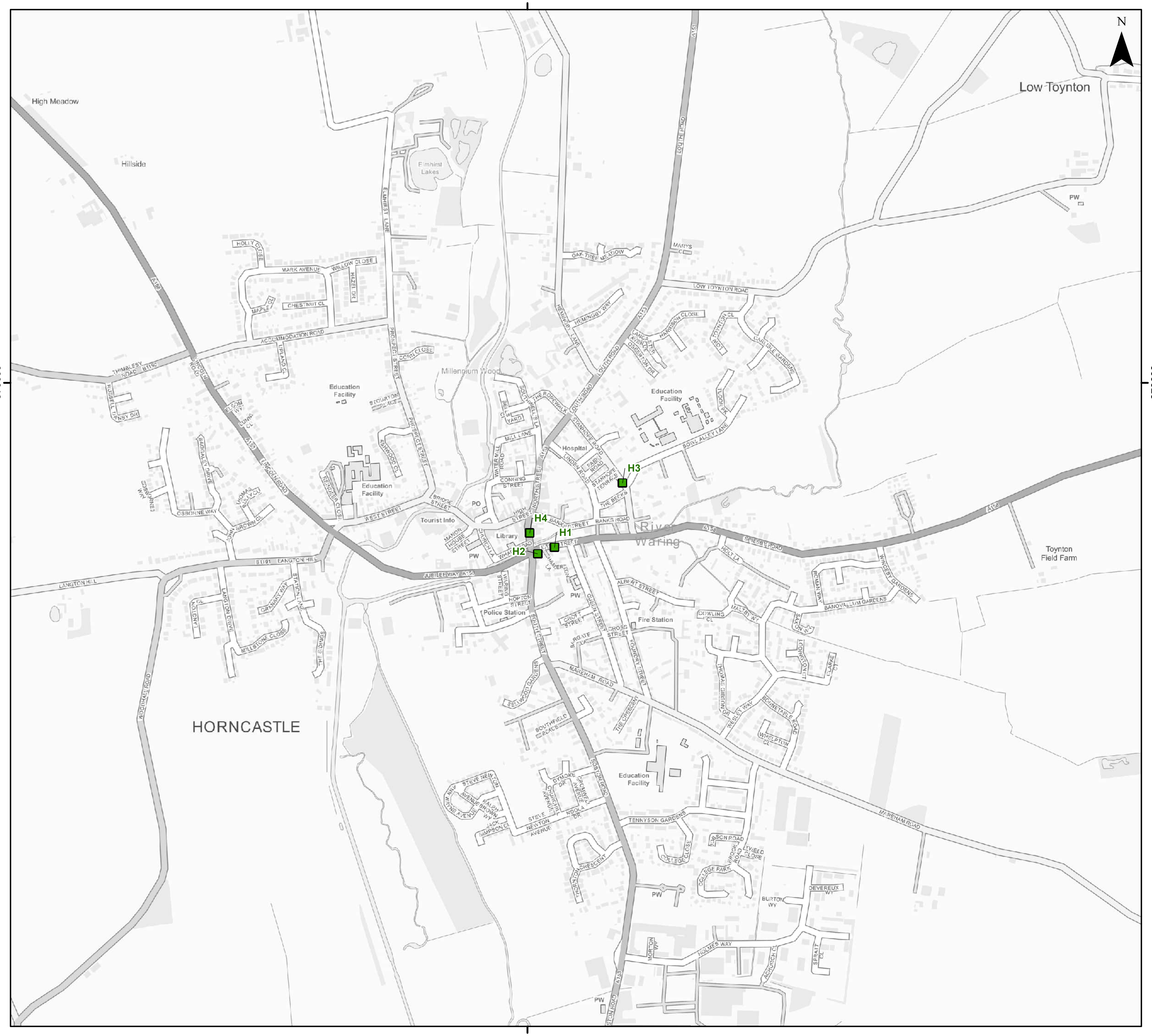

526000
370000
N
High Meadow
Hillside
Low Toynton
Elmhirst Lakes
Millennium Wood
Education Facility
Hospital
H1
H2
H3
H4
Library
Tourist Info
PO
PW
Police Station
Fire Station
River Waring
Toynton Field Farm
HORNCASTLE
LOW TOYNTON ROAD
ACCOMMODATION ROAD
WEST STREET
BANKS ROAD
JUBILEE WAY
LANGTON HILL
MAREHAM ROAD
BOSTON ROAD
SOUTH STREET
PROSPECT STREET
ELMHIRST LANE
LOUTH ROAD
SPILSBY ROAD
LINCOLN ROAD

Legend

East Lindsey District Council Monitor

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Coordinate System: British National Grid

0 0.25 0.5 km

Scale: 1:10,000

Preliminary Environmental Information Report

Air Quality Monitoring Locations
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Figure 19.1.2

OUTER DOWSING OFFSHORE WIND

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- East Lindsey District Council Monitor

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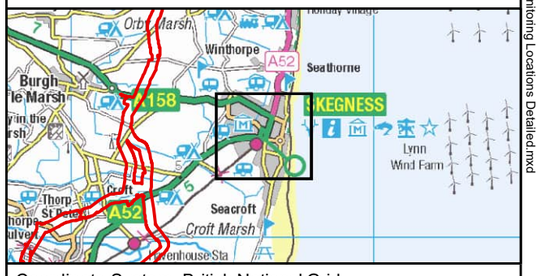

Coordinate System: British National Grid

0 0.25 0.5 km

Scale: 1:10,000

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Air Quality Monitoring Locations
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Figure 19.1.3

OUTER DOWSING OFFSHORE WIND

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- Boston Borough Council Monitor
- Air Quality Management Area (AQMA)

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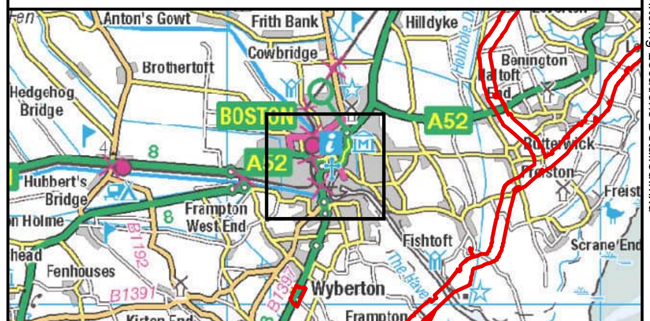

Coordinate System: British National Grid

0 0.25 0.5 km

Scale: 1:10,000

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Air Quality Monitoring Locations
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Figure 19.1.4

OUTER DOWSING OFFSHORE WIND

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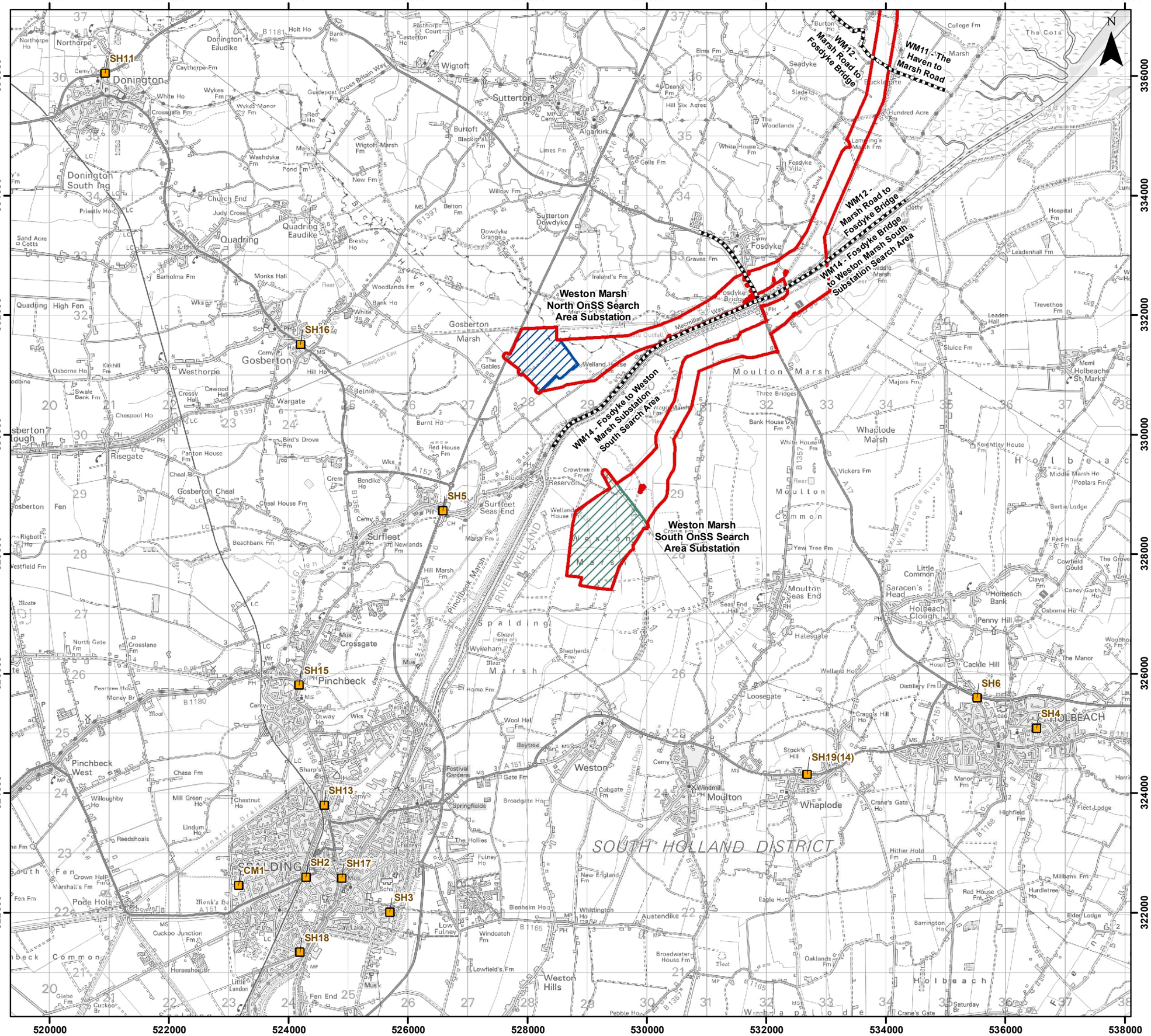

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Weston Marsh North OnSS Search Area
- Weston Marsh South OnSS Search Area
- South Holland District Council Monitor

Coordinate System: British National Grid

0 1.5 3 km

Scale: 1:60,000

Preliminary Environmental Information Report

Air Quality Monitoring Locations
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Figure 19.1.5

OUTER DOWSING OFFSHORE WIND

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Defra Mapped Background Concentrations

19.4.34 Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution.

19.4.35 Annual mean background concentrations of NO_x, NO_2, PM_{10} and $PM_{2.5}$ have been obtained from the Defra published background maps (2018 reference year), based on the 1km grid squares which cover the onshore PEIR boundary (Defra, 2020). The minimum and maximum Defra mapped background concentrations for the base year (2019), anticipated commencement of the construction phase (2027), and anticipated operational year (2030) are presented in Table 19.7.

Table 19.7: Defra mapped background concentrations

Year	Annual Mean Background Concentration (µg/m^3)			
	NO_x	NO_2	PM_{10}	$PM_{2.5}$
2019	9.3 – 12.1	7.3 – 9.2	11.7 – 16.8	7.6 – 9.4
2027	7.3 – 9.6	5.8 – 7.4	10.6 – 15.8	6.7 – 8.5
2030	7.0 – 9.3	5.6 – 7.2	10.6 – 15.8	6.7 – 8.5
AQAL	-	***40***	***40***	***25***

19.4.36 All of the mapped background concentrations across the grid squares covered by the onshore PEIR boundary are well below the respective annual mean AQALs.

Sensitive Receptors

19.4.37 The study area has been defined in line with the criteria for each assessment, described at the beginning of this section. Where sensitive human and ecological receptors are located within the ZoI and are relevant to the assessment, these have been specifically discussed for each of the impact assessments (Section 19.7).

Future Baseline

19.4.38 Baseline air quality conditions are expected to evolve in the future, including in the interim prior to the commencement of construction works associated with the Project.

19.4.39 As discussed in paragraphs 19.4.30 to 19.4.32, monitored NO_2 concentrations in proximity to the onshore ZoI have remained relatively stable across the period 2015-2019. Except for within BBC's Bargate Bridge AQMA where concentrations have decreased and remained below the AQAL.

19.4.40 Air quality is expected to improve in future years, with the introduction of cleaner technologies and more stringent emission standards, as well as the recent enforcement of local and national policies and initiatives. With the introduction of these initiatives and cleaner technologies, pollutant concentrations reported locally are expected to reduce further, or at least remain comparable to those presented. This is reflected in annual mean background concentration projections provided by Defra (based upon semi-empirical evidence), as presented in Table 19.7.

19.4.41 This data demonstrates the anticipated improvement in background pollutant concentrations for the local area, particularly for NO_2; which reflects the current policy emphasis via the Air Quality Plan for NO_2 in UK (Defra and Department for Transport (DfT), 2017) for example.

19.5 Basis of Assessment

Scope of the Assessment

19.5.1 The scope of the assessment has been informed by both national and local planning policy and guidance, established best practice and experience, as well as via the consultation process with relevant consultees.

19.5.2 As detailed in Table 19.4, following receipt of the Scoping Opinion from The Inspectorate (The Inspectorate, 2022), there were impacts agreed to be scoped out of the assessment, however others which required further consideration. The impacts scoped in and out of the assessment are detailed below, with further information or justification, where required.

Impacts Scoped in for Assessment

19.5.3 The following impacts have been scoped into this assessment:

- Construction:
  - Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works;
  - Impact 2: Road traffic emissions generated from temporary construction vehicle movements;
  - Impact 3: Emissions generated from temporary construction NRMM – this impact was scoped into the assessment following comments from The Inspectorate within the Scoping Opinion (The Inspectorate, 2022); and
  - Impact 4: Emissions generated from temporary offshore vessel movements – this impact was scoped into the assessment following comments from The Inspectorate within the Scoping Opinion (The Inspectorate, 2022). Consideration of Impact 4 has been undertaken as part of a wider Offshore Activities Assessment.
- Operation and maintenance:
  - Impact 1: Operational phase traffic movements – comments from The Inspectorate within the Scoping Opinion (The Inspectorate, 2022) agreed that significant effects were unlikely to occur from O&M phase vehicle movements. However, The Inspectorate requested comparison of the O&M phase road traffic flows against the EPUK & IAQM screening criteria. This has therefore been scoped into the assessment, and the likely flows presented.
- Decommissioning:

- Impact 1: Decommissioning phase traffic movements and other works – following receipt of comments from The Inspectorate contained within the Scoping Opinion (The Inspectorate, 2022), it was stated that impacts associated with road traffic flows and other works during the decommissioning phase were not fully described or understood, and therefore the potential for a significant effect could not be scoped out. Further details are provided below.

19.5.4 Details surrounding the decommissioning phase are yet to be fully clarified. In addition, it is also recognised that policy, legislation and local sensitivities evolve, which will limit the relevance of undertaking an assessment at this stage.

19.5.5 Furthermore, decommissioning activities are expected to occur for up to three-years – however this will be driven primarily by offshore works. Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given the following:

- Landfall and cable infrastructure is expected to be left in situ where appropriate, to abate potential future impacts and minimise the extent of decommissioning activities;
- Emission restrictions are expected to tighten in future years and in the interim before decommissioning activities occur (i.e., >25 years from installation). This forecast is based on the introduction and availability of cleaner technologies and fuels, alongside legislation. Therefore, emission contributions from potential future sources (e.g., vehicles, vessels and NRMM) generated during the decommissioning phase are expected to be lower in comparison; and
- Air quality is expected to improve in future years, and in the interim before decommissioning activities occur; based on the introduction of policy and legislation, and availability of cleaner technologies.

19.5.6 These elements (alone and/or in combination) would result in a reduction in the level of significance in comparison to the assessment of construction effects.

19.5.7 Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of the Project, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees. Furthermore, the DCO will include requirements for the submission of decommissioning programmes.

19.5.8 To satisfy The Inspectorates comments, qualitative consideration has been given to the extent of potential decommissioning impacts through consideration of the construction phase worst case assessment outcomes – to determine whether further assessment is required.

Impacts Scoped out of Assessment

19.5.9 In line with the Scoping Opinion (The Inspectorate, 2022), and based on the receiving environment, expected parameters of the Project (Volume 1, Chapter 3: Project Description), and expected scale of impact/potential for a pathway for effect on the environment, the following described impacts have been scoped out of the assessment.

- Operation and maintenance:
  - Impacts associated with emissions generated from offshore vessel movements during the O&M phase have been scoped out of the assessment. This was agreed following the receipt of comments from The Inspectorate within the Scoping Opinion (The Inspectorate, 2022).
- Transboundary effects: based on the Scoping Opinion (The Inspectorate, 2022), it was agreed with The Inspectorate that transboundary effects can be scoped out of the assessment.

Realistic Worst Case Scenario

19.5.10 The onshore elements of the Project include some optionality in terms of the grid connection point (Lincolnshire Node or Weston Marsh) and subsequently the onshore ECC and OnSS. The onshore ECC is 300m in width, however the indicative working width for construction of the onshore ECC is 80m. These design elements will be finalised prior to submission of the ES.

19.5.11 Furthermore, as described in Volume 1, Chapter 3: Project Description, the Applicant requires flexibility in the wind turbine generator (WTG) choice to allow for changes in available technology and economics to be accommodated within the Project design.

19.5.12 These potential design scenarios/parameters can individually impact the outcomes of the air quality assessment. As such, to allow for greater flexibility and undertake precautionary assessment, a MDS has been defined and considered for each assessment individually.

19.5.13 The MDS has been selected as that which has the potential to result in the greatest effect on air quality. The scenario has been selected from the project design envelope detailed in Volume 1, Chapter 3: Project Description.

19.5.14 Table 19.8 identifies the MDS in environmental terms.

Table 19.8: Maximum design scenario for Air Quality for the Project alone

Potential effect	Maximum adverse scenario assessed	Justification
Construction		
Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works	Maximum design parameters/extents of any proposed construction area have been used for the purposes of defining potential dust sources, where not finalised. This has included the use of the onshore PEIR boundary to determine the extent of all potential dust sources. For the purposes of trackout[1], all draft potential construction access points and subsequent access routes have been used. Onshore construction areas have been assessed for each of three onshore ECC options, rather than in the discrete segments. This aggregated approach will increase the opportunity for greater derived sensitivities and dust emission magnitudes, and therefore impacts.	This captures all potential scenarios and associated impacts in the assessment.
Impact 2: Road traffic emissions generated from temporary construction vehicle movements	Traffic data used for the purposes of the modelling exercise has been informed by analysis undertaken and presented as part of Volume 1, Chapter 27: Traffic and Transport. Road traffic volumes for the three onshore ECC options have been considered. To ensure potential air quality impacts that may arise throughout the construction phase are understood, 2027 has been adopted for the purposes of dispersion modelling (i.e., earliest date of potential construction). Use of 2027 is conservative in recognition of the forecast reductions in vehicle emission factors and background pollutant concentrations following the introduction of legislative and policy initiatives, alongside low emission technologies/fuels. As an input to the dispersion modelling exercise, annual average daily traffic (AADT) flows are required. To provide greater confidence in the road traffic emissions assessment outcomes, construction road traffic	This captures all potential scenarios and associated impacts in the assessment.

[1] The IAQM guidance (IAQM, 2016) defines trackout as "The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when HDVs leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site."

Potential effect	Maximum adverse scenario assessed	Justification
	flows have been calculated with use of the maximum consecutive 12-month (representing annual) flows (heavy-duty vehicles (HDVs) and employees (light-duty vehicles (LDVs)) separately) across the construction programme. This ensures the highest average period of construction is captured for each section of the network. This approach is considered appropriate in comparison to averaging out road traffic values across the full onshore construction period to derive AADT flows (i.e., annualised average daily traffic flows), which would dilute the predicted datasets. Based upon information currently available, the dispersion modelling assessment has incorporated the potential maximum traffic flows that are likely to occur in the future assessment year (i.e., 2027) to facilitate a robust cumulative assessment. The traffic flows used include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area. The dispersion modelling exercise is therefore inherently cumulative in nature. For further information regarding the road traffic flows generated by the Project see Volume 1, Chapter 27: Traffic and Transport.	
Impact 3: Emissions generated from temporary construction NRMM	The maximum design parameters/extents of any proposed construction area (onshore PEIR boundary) have been used for the purposes of defining the locations of potential NRMM. This is considered conservative, as assumes that all NRMM will be operating at the PEIR boundary and therefore increases the opportunity for potential interactions with sensitive receptors. This is unlikely to be the case as NRMM locations will vary across the active construction area and the spatial extent of NRMM activities is to be refined at the ES stage (onshore ECC width reduced, and one grid connection point pursued). Furthermore, as per Document 8.1.2: Outline Air Quality Management Plan, site machinery will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible.	This captures all potential scenarios and associated impacts in the assessment.

Potential effect	Maximum adverse scenario assessed	Justification
Impact 4: Emissions generated from temporary offshore vessel movements	Vessel movements used within this assessment derive from values provided within Volume 1, Chapter 3: Project Description. To increase the confidence in the screening exercise and minimise the use of assumptions, the total number of construction vessel movements estimated to occur throughout the whole construction phase has been used. This is considered to be conservative, as the screening thresholds relate to the number of vessel movements permitted to occur in an annual period. Actual annual movements are anticipated to be lower than those values used for screening. The LAQM.TG22 screening thresholds applied within the assessment relate explicitly to large ship movements which comprise cross-channel ferries, roll-on/roll-off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by the Project are unlikely to represent large ships, given the nature and location works (within 1 km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships.	This approach provides a precautionary assessment.
Operation and Maintenance		
Impact 1: Operational phase traffic movements	For the purposes of facilitating a conservative screening exercise, peak vehicle movements generated during the O&M phase have been assessed.	This approach provides a precautionary assessment.
Decommissioning		
Impact 1: Decommissioning phase traffic movements and other works	Details surrounding the decommissioning phase are not fully known, however, decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given forecast improvements to air quality and the potential for the cables to remain *in situ*. It is therefore considered that impacts associated with decommissioning activities will be similar or lesser in comparison to those established for the construction phase.	

Embedded Mitigation

19.5.15 Mitigation measures that have been identified and adopted as part of the evolution of the project design that are relevant to Air Quality are listed in Table 19.9. The mitigation includes embedded measures such as design changes, and applied mitigation, which is subject to further study or approval of details; these include avoidance measures that will be informed by pre-construction surveys, and necessary additional consents where relevant. The composite of embedded and applied mitigation measures apply to all parts of the Project development works, including pre-construction, construction, operation and maintenance and decommissioning.

19.5.16 General mitigation measures, which would apply to all parts of the project, are set out first (if relevant). Thereafter mitigation measures that would apply specifically to Air Quality issues associated with the landfall, onshore cable corridor and OnSS, are described separately where applicable.

Table 19.9: Embedded mitigation relating to Air Quality

Project phase	Mitigation measures embedded into the project design
Construction	
Code of Construction Practice (CoCP)	Development of, and adherence to, a CoCP. The construction dust mitigation measures recommended as part of the construction dust assessment will form inclusion within the CoCP, in agreement with the relevant Authority. This will be undertaken in accordance with best practice measures that are proportional to the likely impacts, including those relating to dust and Non-Road Mobile Machinery (NRMM). Dust mitigation measures are identified by the applied IAQM methodology. This would apply to all onshore construction activities.
Decommissioning	
Decommissioning Programme	Development of, and adherence to, a Decommissioning Programme.

19.6 Assessment Methodology

19.6.1 Whilst Volume 1, Chapter 5: EIA Methodology provides an indicative EIA assessment matrix, it also identifies that assessment methodologies will reflect the prevailing technical area guidance and specific requirements of receptor groups. As such the following sections provide a description of the assessment criteria and assessment methodologies used to assess air quality, which are derived from best practice guidance.

Construction Phase

Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works

19.6.2 The assessment of dust generated by construction activities on nearby sensitive human and ecological receptors has been undertaken in accordance with the IAQM construction guidance (IAQM, 2016).

19.6.3 The likely impact magnitude of unmitigated dust emissions associated with demolition, earthworks, construction, and trackout is used in conjunction with the receptor sensitivity to determine the risk of impact for each activity. These sensitivities are:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}, and
- Harm to ecological receptors.

19.6.4 The risk of impact is then used to determine proportionate mitigation requirements in line with the IAQM guidance (IAQM, 2016), which form embedded mitigation for the Project. The likelihood for a significant effect to arise is considered with this embedded mitigation in place.

19.6.5 Full details of the assessment methodology are provided in Volume 2, Appendix 19.1: Construction Dust Assessment Methodology.

Impact 2: Road traffic emissions generated from temporary construction vehicle movements

19.6.6 For the assessment of construction phase road traffic emissions on ecological and human receptors, an initial screening exercise has been conducted to determine whether detailed modelling is required through definition of the affected road network. The screening criteria utilised is dependent on the application for human and ecological receptors. This is discussed further in the following sections.

19.6.7 Where road traffic movements cannot be screened out in accordance with the applied screening criteria, further detailed assessment has been undertaken.

19.6.8 Where required, road traffic impacts generated by the Project on human and ecological receptors have been assessed with use of the Cambridge Environmental Research Consultants (CERC) ADMS-Roads v5 dispersion model.

19.6.9 The dispersion modelling assessment has considered the following scenarios:

- 2019 Base Case (2019 BC) – Base flows for the year (2019);
- 2027 Do Minimum (2027 DM) – Without construction phase road traffic flows for the planned construction start year (2027), inclusive of any other relevant development flows; and
- 2027 Do Something (2027 DS) – 'Do Minimum' flows, plus road traffic flows associated with construction activities for the planned construction start year (2027).

19.6.10 For the above future year scenarios (2027 – representing the earliest date of potential construction), concurrent emission factors and background (projected) pollutant concentrations have been used.

19.6.11 To ensure potential air quality impacts that may arise throughout the construction phase are understood, 2027 has been adopted for the purposes of dispersion modelling (i.e., earliest date of potential construction). Use of 2027 is conservative, in recognition of the forecast reductions in vehicle emission factors and background pollutant concentrations following the introduction of legislative and policy initiatives, alongside low emission technologies/fuels.

19.6.12 Traffic data used for the purposes of the road traffic emissions assessment has been informed by analysis undertaken and presented as part of Volume 1, Chapter 27: Traffic and Transport. This included consideration of scenarios associated with the three onshore ECC options:

- Lincolnshire Node onshore ECC;
- Weston Marsh south of the A52 onshore ECC; and
- Weston Marsh north of the A52 onshore ECC.

19.6.13 To provide greater confidence in the road traffic emissions assessment outcomes, the maximum consecutive 12-month (representing annual) traffic flows have been used. Within the context of dispersion modelling, this approach assumes that the maximum consecutive 12-month vehicle flows generated throughout the whole construction phase occur under worst case air quality conditions (vehicle emission factors and background pollutant concentrations) projected for the full construction period. This is considered conservative.

19.6.14 Based upon information currently available, the dispersion modelling assessment has incorporated the potential maximum traffic flows that are likely to occur in the future assessment year (i.e., 2027) to facilitate a robust cumulative assessment. The traffic flows used include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area. The dispersion modelling exercise is therefore inherently cumulative in nature.

19.6.15 The dispersion modelling exercise has been undertaken in accordance with Defra's LAQM.TG22.

19.6.16 With respect to human receptors, consideration has been given to the relevant AQALs. Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted at locations of relevant exposure at existing sensitive receptors – adjacent to the affected road network.

19.6.17 With respect to ecological receptors, consideration has been given to the relevant Critical Levels and Critical Loads. Concentrations of NO_x have been predicted at ecological designations within 200m of the affected road network, with use of gridded and boundary receptors (to ensure maximum impacts are understood). Empirical methods recommended by the Environment Agency's (EA) Air Quality Technical Advisory Group (AQTAG) (AQTAG, 2014) have been used to facilitate the assessment of Critical Loads.

19.6.18 The assessment criteria outlined within the following sections has been used to determine the overall significance of the Project, with respect to construction road traffic modelled impacts on human and ecological receptors.

19.6.19 Full details of the assessment methodology are provided within Volume 2, Appendix 19.4: Road Traffic Dispersion Modelling.

Human Receptors

19.6.20 The assessment procedure outlined within the EPUK & IAQM guidance document (EPUK & IAQM, 2017) has been used in relation to the assessment of road traffic emissions generated by the Project on human receptors.

19.6.21 This initially comprises a screening exercise to determine whether detailed modelling is required.

Step 1: Numerical Screening of Road Traffic Flows

19.6.22 The screening criteria provided in the EPUK & IAQM guidance document has been used to determine whether further assessment of traffic generated by the construction or O&M phases of the Project is required on sensitive human receptor locations.

19.6.23 Specific to locations outside of an AQMA:

- A change of Light-Duty Vehicle (LDV) flows of more than 500 AADT; and/or
- A change of Heavy-Duty Vehicle (HDV) flows of more than 100 AADT.

19.6.24 Specific to locations near to or within an AQMA:

- A change of LDV flows of more than 100 AADT; and/or
- A change of HDV flows of more than 25 AADT.

19.6.25 If road traffic flows are found not to exceed any of the screening criteria presented, then effects are considered insignificant and can be screened out of further consideration.

19.6.26 Where the screening criteria are exceeded (and relevant human receptors are located within 200m of the affected road network), detailed dispersion modelling is required (Step 2).

Step 2: Dispersion Modelling

19.6.27 Significance criteria as provided within EPUK & IAQM guidance has been used for the purposes of informing effects arising from road traffic emissions on human receptors where dispersion modelling has been undertaken.

19.6.28 Whilst describing the impact at an existing human receptor, the resultant total concentration as well as the magnitude of change in relation to respective AQALs are both considered, using the approach detailed in Table 19.10.

Table 19.10: EPUK & IAQM Impact descriptors

Concentration with development	Percentage change in air quality relative to AQAL (%)			
	1% *	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Note:
* = changes less than 0.5% are considered to be 'Negligible'.

19.6.29 Following derivation of impacts at all existing receptor locations assessed, the overall significance of the developmental 'effect' is determined based upon consideration, as necessary, of the following factors:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts;
- The worst-case assumptions adopted when undertaking the prediction of impacts; and
- The extent to which the proposed development has adopted best practice to eliminate and minimise emissions.

Ecological Receptors

19.6.30 The assessment procedure outlined within the IAQM ecological guidance document (IAQM, 2020) has been used in relation to the assessment of sensitive ecological receptors and road traffic.

19.6.31 This comprises a staged screening procedure to determine the potential for a likely significant effect to occur.

Step 1: Screening

19.6.32 The first stage is to consider whether any ecological designations with sensitive qualifying features are located within 200m of a road link that is projected to experience vehicle movements >1,000 AADT and/or >200 HDVs resulting from the Project.

19.6.33 For the purposes of assessing impacts, screening of Project trips will be undertaken in-combination with trips associated with other projects and plans following legislation and recent case law outcomes (e.g. the Wealden Judgement).

19.6.34 If the above screening criteria are not exceeded, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects are considered to be not significant.

19.6.35 If the screening criteria are exceeded, then detailed assessment through dispersion modelling is required to quantify the impact on Critical Levels and/or Critical Loads (Step 2).

Step 2: Dispersion Modelling

19.6.36 Where impacts can otherwise not be screened out, dispersion modelling has been used to quantify the impact of road traffic emissions on Critical Levels and/or Critical Loads.

19.6.37 Effects associated with changes can be classed as insignificant where they are:

- International and national sites: <1% of the Critical Levels and/or Critical Loads; and
- Local sites: <100% of the Critical Levels and/or Critical Loads.

19.6.38 Use of the 1% threshold for the assessment of road traffic impacts on international sites is supported by Natural England (Natural England, 2018). This guidance does not specifically cover other ecological designations. However, the 1% threshold has been applied to national sites (SSSIs) following a review of consultation comments provided by Natural England on similar projects recently.

19.6.39 This risk-based approach to the assessment of road traffic impacts on different ecological designations reflects the level of protection afforded to these sites. It is also consistent with the Environment Agency approach for the assessment of ecological designations (Environment Agency, 2022).

19.6.40 If modelled changes are below these thresholds, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects are considered to be not significant in terms of the EIA regulations.

Impact 3: Emissions generated from temporary construction NRMM

19.6.41 The IAQM construction guidance (IAQM, 2016) states that experience of assessing exhaust emissions from NRMM suggests that they are unlikely to result in a significant effect in terms of the EIA regulations.

19.6.42 Furthermore, Defra's LAQM.TG22, states that experience of assessing exhaust emissions from NRMM suggests that, with suitable controls and site management, they are unlikely to make a significant impact on local air quality. In recognition of this, a series of construction phase control measures are included within the CoCP (outlined within Document 8.1.2: Outline Air Quality Management Plan) to minimise NRMM emissions and potential impacts. Implementation of the CoCP will be secured as a requirement of the DCO.

19.6.43 Further to the above, a qualitative assessment of NRMM emissions on sensitive human and ecological receptors has been undertaken in accordance with guidance prescribed within Defra's LAQM.TG22. As per LAQM.TG22, qualitative consideration of NRMM emissions is likely to provide sufficient screening of impacts.

19.6.44 The qualitative assessment has considered the likelihood for a significant effect to arise on sensitive human and ecological receptors, based on the following items:

- Duration of construction works and associated locations of activities;
- The number and type of plant to be used, and the embedded mitigation to be applied (including the emissions standards of NRMM);
- Operating hours of NRMM;
- Proximity of receptors to NRMM working areas, and spatial extent of affected areas; and
- Existing air quality conditions in the area (e.g., background pollutant concentrations).

19.6.45 Full details of the assessment methodology are provided in Volume 2, Appendix 19.2: NRMM Emissions Assessment.

Impact 4: Emissions generated from temporary offshore vessel movements

19.6.46 Consideration of Impact 4 has been undertaken as part of a wider Offshore Activities Assessment.

19.6.47 The assessment of construction phase offshore vessel emissions has been informed by Defra's LAQM.TG22 (Defra, 2022).

19.6.48 Vessel movements generated during the construction phase have been compared against the following screening thresholds to determine whether further assessment is required:

- More than 5,000 large ship movements per year, with relevant exposure within 250m of berths and main areas of manoeuvring; and/or
- More than 15,000 large ship movements per year, with relevant exposure within 1km of these areas.

19.6.49 It should be acknowledged that the LAQM.TG22 screening thresholds relate explicitly to large ship movements which comprise cross-channel ferries, roll-on/roll-off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by the Project are unlikely to represent large ships, given the nature and location works (within 1km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships. Use of this assumption provides a precautionary assessment.

19.6.50 If annual vessel movements generated by the construction phase of the Project are below the LAQM.TG22 prescribed screening thresholds, then impacts are considered to be negligible, with the resultant effect not significant in terms of the EIA regulations and can be screened out of further consideration.

19.6.51 Consideration has also been given to the extent of helicopter movements generated by the Project, during all stages of development, and the likelihood for a significant effect to arise.

19.6.52 Full details of the assessment methodology are provided in Volume 2, Appendix 19.3: Offshore Activities Assessment.

Operational Phase

Impact 1: Operational phase traffic movements

19.6.53 In response to The Inspectorate's specific request within the Scoping Opinion (The Inspectorate, 2022), road traffic flows generated by operational phase activities have been compared against EPUK & IAQM screening thresholds to determine whether further assessment is required.

19.6.54 These screening thresholds are outlined within Paragraph 19.1.1

Decommissioning Phase

Impact 1: Decommissioning phase traffic movements and other works

19.6.55 To satisfy The Inspectorates comments, qualitative consideration has been given to the extent of potential decommissioning impacts through consideration of the construction phase worst-case assessment outcomes to determine whether further assessment is required.

Assumptions and Limitations

General

19.6.56 Data used to compile this report consists of secondary information derived from a variety of sources. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

19.6.57 Unless otherwise specified, all distances within this report relate to the shortest distance between two described points i.e., linear – 'as the crow flies'.

19.6.58 It is recognised that the baseline may not list all receptors within the study area, however it includes identified sensitive receptors from the reviews undertaken and is considered representative of the baseline at the time of the desk-based assessment. Furthermore, where summarised or grouped, receptors have been selected to represent worst-case exposure locations (in accordance with Table 19.2).

Construction Dust Assessment

19.6.59 The construction dust assessment is primarily a tool to identify the proportionate level of mitigation required for the various construction activities.

19.6.60 Resultant effects ultimately depend on the effective application of this mitigation. Therefore, there can be uncertainty on how representative the assessment procedure and associated post-mitigated outcomes would be if appropriate mitigation is not secured.

19.6.61 To secure the necessary mitigation an Outline Air Quality Management Plan (AQMP) (Document 8.1.2: Outline Air Quality Management Plan), included as part of the overall CoCP, has been developed for the proposed onshore construction activities which adheres to construction industry good practice guidance for control measures and dust management. The CoCP will be secured as a requirement of the DCO.

19.6.62 The AQMP provides details of control measures to manage dust during construction works. At this stage the outline AQMP provided with the outline CoCP provides principals for agreement, which will subsequently be developed to ensure that all required mitigation measures are appropriately secured via a requirement in the DCO that will be approved by Lincolnshire County Council (as host Authority) prior to works commencing.

Road Traffic Emissions Assessment

Construction Phase

19.6.63 Dispersion modelling is inherently uncertain and is principally reliant on the accuracy and representativity of its inputs. In acknowledgement of this, the ADMS-Roads dispersion model has been verified with the latest representative publicly available local monitoring data – as collected by BBC and ELDC.

19.6.64 Following verification, all model output statistical parameters (used to evaluate model performance and uncertainty) are within LAQM.TG22 prescribed tolerances.

19.6.65 In addition, there is a widely acknowledged disparity between emission factors and ambient monitoring data. To help minimise any associated uncertainty when forming conclusions from the results, this assessment has utilised the latest Emissions Factors Toolkit (EFT) version 11.0 utilising COPERT 5.3 emission factors, and associated tools/datasets published by Defra.

19.6.66 Further detail on how uncertainty has been addressed is provided in Volume 2, Appendix 19.4: Road Traffic Dispersion Modelling.

19.6.67 Traffic data for the purposes of the modelling assessment is consistent with the analysis undertaken, and presented as part of Volume 1, Chapter 27: Traffic and Transport. Road traffic volumes for all potential onshore ECC options (consistent with the Traffic and Transport analysis) have been assessed.

19.6.68 Furthermore, a series of conservative assumptions relating to the assessment of a MDS have been adopted to facilitate a precautionary assessment and provide greater confidence in the road traffic emissions assessment outcomes. See Section 19.5 for further information.

O&M Phase

19.6.69 For the purposes of facilitating a conservative screening exercise, peak vehicle movements generated during the operational phase have been assessed.

19.6.70 Use of peak vehicle movements within this context presents a precautionary assessment. See Section 19.5 for further information.

NRMM Emissions Assessment

19.6.71 Where there is uncertainty and/or optionality regarding the extent of specific construction activities within 50m of a receptor, all possible construction activities have been considered for completeness. This is considered worst-case, as it is possible that the full extent of construction activities and NRMM identified may not occur within 50m of the receptor. However, this approach provides confidence that all potential scenarios and associated impacts have been assessed.

19.6.72 In addition to the above, the assessment has utilised the maximum potential number of NRMM potentially active for each of the grouped activities (i.e., activity lifecycles). This is likely to be conservative as the actual number of NRMM utilised for each activity at any point could be less than the value assessed.

19.6.73 Furthermore, the maximum estimated percentage use of each item of NRMM across each of the activity lifecycles has also been utilised. Again, this is likely to be conservative as the percentage use for certain activities within the lifecycle could be less than the value assessed.

Vessel Emissions Assessment

19.6.74 The LAQM.TG22 screening criteria relates to the number of large ships movements per year; however, the extent of predicted construction vessels numbers for the Project provided in Volume 1, Chapter 3: Project Description relates to the total number of round trips for the entire construction phase. In order to derive the number of vessel movements per year, the total number of vessels movements (round trips) has been multiplied by two.

19.6.75 This is conservative, as the screening thresholds relate to the number of vessel movements in an annual period, whereas the duration of the construction phase is greater than 1 year. However, to increase the confidence in the screening exercise and minimise the use of assumptions, the total number of construction vessel movements estimated to occur throughout the whole construction phase has been used. Actual annual movements associated with the Project are therefore expected to be lower than those values used for screening.

19.6.76 Construction vessel movements have been categorised based upon their likelihood to occur within 250m or 1km of an onshore sensitive receptor located in proximity of construction works to be consistent with the LAQM.TG22 screening thresholds.

19.6.77 Furthermore, the LAQM.TG22 screening thresholds relate explicitly to large ship movements. For the purposes of facilitating an assessment, it has been assumed that all vessels associated with the Project will comprise large ships. However, vessels used to facilitate the construction of onshore infrastructure (within 250m and/or 1km of the offshore vs. onshore interface) are unlikely to represent large ships, given the nature and location of works.

19.6.78 Vessel movements used for the purposes of this screening assessment is consistent with the analysis undertaken, and presented within Volume 1, Chapter 3: Project Description.

19.7 Impact Assessment

Construction

19.7.1 This section presents the assessment of impacts arising from the construction phase of the Project.

Impact 1: Dust/PM_{10} emissions generated from temporary onshore construction works

19.7.2 The assessment of construction dust has utilised the methodology prescribed in Volume 2, Appendix 19.1: Construction Dust Assessment Methodology.

19.7.3 Where figures relating to area or volume of the onshore PEIR boundary, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance (IAQM, 2016) to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

19.7.4 The assessment has considered the three onshore ECC options, to highlight any differences in assessment outcomes where these exist.

19.7.5 It is acknowledged that the onshore ECC is also split into segments. However, given the present uncertainties around the locations and timing of construction activities, the onshore construction areas have been assessed collectively for each onshore ECC option, rather than in discrete segments. This aggregated approach accounts for simultaneous construction activities across the onshore ECC. It also increases the opportunity for greater derived sensitivities and dust emission magnitudes, and therefore impacts.

Assessment Screening

19.7.6 There are both human and ecological receptors within the relevant screening distances. Therefore, an assessment of construction dust on both human and ecological receptors has been undertaken.

Potential Dust Emission Magnitude

19.7.7 No demolition activities are proposed as part of the onshore construction phase. As such, impacts associated with demolition activities have therefore not been considered further and are screened out.

19.7.8 Earthworks are required across the onshore ECC and at the landfall over a total area >10,000m^2. The onshore ECC extends approximately 11km in length to the Lincolnshire Node grid connection point, or approximately 80km in length to the Weston Marsh grid connection points. Construction activities will be carried out in a sequence, with different areas of the onshore ECC being worked at different times according to the phase.

19.7.9 The total amount of material moved (excavated/infilled) is estimated to be >100,000 tonnes over the construction phase of the Project. In addition, it is anticipated that >10 heavy earth moving vehicles may be active at any given time. Therefore, the dust emission magnitude for earthworks is considered to be large.

19.7.10 Onshore construction activities will be limited to the erection of the OnSS substation and associated buildings, with further activities for the joint bays and the Transition Joint Bays (TJBs) at the landfall. Indicative building dimensions have been provided to inform the total building volume, which is >100,000m^3. Further to this, the use of piling and potential dust materials (e.g., concrete) will be required. Therefore, the dust emission magnitude for construction is considered to be large.

19.7.11 Given the scale of onshore construction works, the number of outward HDV movements in any worst-case day will be greater than 50. In addition, unpaved road lengths are likely to exceed 100m. Therefore, the dust emission magnitude for trackout is considered to be large.

19.7.12 The determined dust emission magnitude for each activity is summarised in Table 19.11. These magnitudes are considered to apply for all three onshore ECC options.

Table 19.11: Potential dust emission magnitude

Activity	Dust Emission Magnitude
Demolition	N/A
Earthworks	Large
Construction	Large
Trackout	Large

Sensitivity of the Area

Dust Soiling Impacts

19.7.13 For the Lincolnshire Node onshore ECC option, it is estimated there are 10-100 existing residential properties (high sensitivity receptors) within 20m of any worst-case construction working area (PEIR boundary). Furthermore, there are 1-10 high sensitivity receptors located within 20m, and 1-10 within 50m of road links up to 500m from the proposed construction access points (commensurate with a large site). The sensitivity of the area with respect to dust soiling impacts on people and property is considered to be high in relation to earthworks and construction, and medium in relation to trackout.

19.7.14 For the Weston Marsh onshore ECC south of the A52, it is estimated there are >100 existing residential properties (high sensitivity receptors) within 20m of any worst-case construction working area (PEIR boundary). Further to this, there are predicted to be 10-100 high sensitivity receptors located within 20m of road links up to 500m of the proposed construction access points (commensurate of a large site). The sensitivity of the area with respect to dust soiling impacts on people and property is considered to be high in relation to earthworks, construction, and trackout.

19.7.15 For the Weston Marsh onshore ECC north of the A52, it is estimated there are >100 existing residential properties (high sensitivity receptors) within 20m of any worst-case construction working area (PEIR boundary). Further to this, there are predicted to be 10-100 high sensitivity receptors located within 20m of road links up to 500m of the proposed construction access points (commensurate of a large site). The sensitivity of the area with respect to dust soiling impacts on people and property is considered to be high in relation to earthworks, construction, and trackout.

Human Health Impacts

19.7.16 As discussed in Section 19.4, no local background PM_{10} monitoring exists in proximity to the onshore elements of the Project. The Defra supplied background maps (2018 reference year) have therefore been utilised to characterise the PM_{10} background concentrations (presented in Table 19.7).

19.7.17 The maximum 2019 mapped background PM_{10} concentration for the $1km^2$ grid squares covering any potential onshore construction works is estimated to be $16.8\mu g/m^3$ and therefore falls into the $<24\mu g/m^3$ class regardless of the onshore ECC option.

19.7.18 The number of high sensitivity receptors within 20m of potential construction works, and within 20m/50m of potential trackout routes has been utilised to determine the sensitivity of the area with respect to human health impacts for each of the onshore ECC options.

19.7.19 For the Lincolnshire Node onshore ECC option, this is determined as low in relation to earthworks, construction and trackout.

19.7.20 For the Weston Marsh south of the A52 and Weston Marsh north of the A52 onshore ECC, this is determined as medium in relation to earthworks and construction, and low in relation to trackout.

Ecological Impacts

19.7.21 There are several designated ecological sites within 20m of potential worst-case construction working areas.

19.7.22 This includes the Greater Wash SPA, Sea Bank Clay Pits SSSI, and several Local Wildlife Sites (LWS) / Lincolnshire Wildlife Trust reserves (LWT) near the landfall (i.e., segments WM1 Landfall to A52 – Hogsthorpe, and LN1 Landfall to A52 – Mumby), and is therefore applicable to all three onshore ECC options.

19.7.23 Of these sites, the SPA (if containing dust sensitive features) is potentially of greatest sensitivity. For the purposes of defining the sensitivity of the area, it has conservatively been assumed that the SPA contains dust sensitive features/habitats, as this has not yet been confirmed with habitats surveys (to be undertaken prior to ES). In line with IAQM guidance (IAQM, 2016), the SPA would therefore be classified as a high sensitivity receptor.

19.7.24 In terms of the identified trackout routes, there are only LWS/LWT present within 20m or 50m. This is the case for all three onshore ECC options. Such designations are classified as low sensitivity in accordance with the IAQM guidance.

19.7.25 Given the above and for all three onshore ECC options, the sensitivity of the study area with respect to ecological impacts in relation to earthworks and construction is therefore considered to be high, and low in relation to trackout activities.

19.7.26 A summary of the sensitivity of the surrounding area is detailed in Table 19.12.

Table 19.12: Sensitivity of the area

Onshore ECC Option	Potential Impact	Sensitivity of the Surrounding Area		
		Earthworks	Construction	Trackout
Lincolnshire Node	Dust Soiling	High	High	Medium
	Human Health	Low	Low	Low
	Ecological	High	High	Low
Weston Marsh south of the A52	Dust Soiling	High	High	High
	Human Health	Medium	Medium	Low
	Ecological	High	High	Low
Weston Marsh north of the A52	Dust Soiling	High	High	High
	Human Health	Medium	Medium	Low
	Ecological	High	High	Low

Risk of Impacts

19.7.27 The outcome of the assessment of the potential magnitude of dust emissions, and the sensitivity of the area are combined in Table 19.13 below to determine the risk of impact. The defined level of risk has been used to inform the selection of appropriate mitigation, which constitutes embedded mitigation for the Project.

19.7.28 The IAQM construction dust assessment methodology does not include the consideration of embedded mitigation measures when determining the potential risk of dust impacts, rather is used to define this mitigation.

Table 19.13: Risk of dust impacts (without mitigation)

Onshore ECC Option	Potential Impact	Activity		
		Earthworks	Construction	Trackout
Lincolnshire Node	Dust Soiling	High Risk	High Risk	Medium Risk
	Human Health	Low Risk	Low Risk	Low Risk
	Ecological	High Risk	High Risk	Low Risk
Weston Marsh south of the A52	Dust Soiling	High Risk	High Risk	High Risk
	Human Health	Medium Risk	Medium Risk	Low Risk
	Ecological	High Risk	High Risk	Low Risk
Weston Marsh north of the A52	Dust Soiling	High Risk	High Risk	High Risk
	Human Health	Medium Risk	Medium Risk	Low Risk
	Ecological	High Risk	High Risk	Low Risk

19.7.29 Following the construction dust assessment, the risk of impacts from potential worst-case onshore construction works (in the absence of mitigation) are summarised as follows:

- Lincolnshire Node onshore ECC:
  - High risk in relation to dust soiling impacts on people and property;
  - Low risk in relation to human health impacts; and
  - High risk in relation to ecological impacts.
- Weston Marsh onshore ECC south of the A52:

- High risk in relation to dust soiling impacts on people and property;
- Medium risk in relation to human health impacts; and
- High risk in relation to ecological impacts.

- Weston Marsh onshore ECC north of the A52:
  - High risk in relation to dust soiling impacts on people and property;
  - Medium risk in relation to human health impacts; and
  - High risk in relation to ecological impacts.

19.7.30 Potential dust effects during the construction phase are considered to be temporary and short-term (up to 36-months) and may only arise at particular times (i.e., certain activities and/or meteorological conditions).

19.7.31 Nonetheless, commensurate with the above designation of dust risk and maximum high risk determined for all three onshore ECC options, mitigation measures are identified by IAQM guidance (IAQM, 2016) to ensure that any potential impacts arising from any onshore construction works are minimised and, where possible, completely removed.

19.7.32 These measures represent embedded mitigation for the Project and are included within the Outline AQMP, detailed in Document 8.1.2: Outline Air Quality Management Plan and provided as part of the CoCP. The CoCP will be a requirement of the DCO and be submitted to Lincolnshire County Council for approval post-consent, in advance of works to secure implementation.

19.7.33 As such, in accordance with the IAQM construction guidance and with reference to the methodology described in Volume 2, Appendix 19.1: Construction Dust Assessment Methodology, residual effects are concluded to be negligible to minor adverse and **not significant** in terms of the EIA Regulations.

Impact 2: Road traffic emissions generated from temporary construction vehicle movements

Human Receptors

19.7.34 Consistent with the assessment criteria outlined in Section 19.6, road traffic flows generated by the Project on the local road network have been compared against the EPUK & IAQM prescribed screening thresholds.

19.7.35 This process was undertaken for each of the scenarios associated with the three onshore ECC options.

19.7.36 For the onshore ECC – Lincolnshire Node option, the associated road traffic flows generated by the Project are all below the EPUK & IAQM screening thresholds. Therefore, no further assessment of this scenario is required in relation to human receptors. Effects associated with road traffic emissions generated by this scenario can be considered not significant.

19.7.37 Table 19.14 outlines the extent of road links where road traffic movements cannot be screened out, i.e., the affected road network, for the Weston Marsh south of the A52 onshore ECC, and the Weston Marsh north of the A52 onshore ECC.

Table 19.14: Construction phase road traffic flows above screening criteria (human receptors)

Road Link	Onshore ECC			
	Weston Marsh south of the A52		Weston Marsh north of the A52	
	AADT		AADT	
	HDV	LDV	HDV	LDV
Outside an AQMA				
Sea Lane (Staples Farm)	117	172	-	-
A158 Skegness Road (east of ECC)	199	210	125	137
A158 Skegness Road (west of ECC)	290	342	261	319
A52 (east of Croft)	199	268	125	201
A52 (Wainfleet)	199	307	122	249
A52 (Holland Lane)	158	270	-	-
A52 (Wrangle)	158	289	-	-
A52 Wainfleet Road (east of Haltoft End)	139	288	189	354
A52 Wainfleet Road (west of Haltoft End)	215	365	297	483
Ings Road	-	-	101	149
West End Road	-	-	101	149
A16 (south of Boston, south of Kirton)	161	300	109	255
A17 (north of River Welland)	174	258	161	246
A17 (north of A16)	170	179	144	153
A17 (west of A1221)	260	300	203	249
A16 (south of the A155)	-	-	238	304
A16 (north of the A155)	-	-	238	304
A16 (between A158 and A1028)	237	294	308	366
A16 (north of A1028)	237	270	308	343
A1028	159	177	147	166
A158 (between A1028 and A16)	188	219	147	180
A158 (west of A16)	266	297	308	340
Lincoln Road, Skegness	199	210	125	137
Within or Adjacent to an AQMA				
A16 (south of Boston, north of Kirton)	88	235	36	190
A1121	90	119	59	94
A16 (Boston)	90	206	59	204

19.7.38 Dispersion modelling has therefore been undertaken for these links. The spatial extent of the modelled domain (modelled road links and human receptors considered) is illustrated in Figure 19.2.

19.7.39 A summary of modelled results is provided below and represents the maximum from the onshore ECC options at each modelled receptor location. Exhaustive results are presented in Volume 2, Appendix 19.4: Road Traffic Dispersion Modelling.

NO_2 Modelling Results

19.7.40 The maximum predicted annual mean NO_2 concentration at all existing receptors during the 2019 BC scenario is at R109 with a predicted concentration of 61.1µg/m^3; this represents 152.8% of the AQAL. Receptor R109 is located on the façade of a residential property, adjacent to the A52/A16 roundabout in Boston and within the AQMA.

19.7.41 Receptor R109 is located at a closer proximity (~15m closer) to the roundabout than BBC diffusion tube 1; where a 2019 annual mean NO_2 concentration of 49.2µg/m^3 was recorded. A modelled concentration higher than this would therefore be anticipated at Receptor R109.

19.7.42 The maximum predicted annual mean NO_2 concentration at existing receptors (inclusive of committed developments) during the planned construction phase (2027 DS) is at Receptor R109 with a predicted concentration of 33.9µg/m^3; this represents 84.8% of the AQAL. The change in the annual mean NO_2 concentrations at this location, during the construction of the onshore elements of the Project (2027 DS vs. 2027 DM) relative to the AQAL was 0.7%.

19.7.43 The maximum observed increase in annual mean NO_2 concentrations at all existing receptors as a result of the construction of the onshore elements of the Project was 1.2% at Receptor R167 – which is located on the façade of a residential property, near the A16/A158 roundabout, southwest of Partney.

19.7.44 In accordance with EPUK & IAQM guidance, the impact of the construction phase of the Project on annual mean NO_2 concentrations at all relevant existing receptors is considered to be 'negligible'. Given the marginal increase in annual mean NO_2 concentrations associated with the construction phase of the onshore elements of the Project, and that there are no predicted exceedances of the annual mean NO_2 AQAL in the 2027 DS scenario, unmitigated effects associated with annual mean NO_2 concentrations at all assessed receptor locations are therefore considered to be not significant in terms of the EIA regulations.

19.7.45 The empirical relationship given in LAQM.TG22 states that exceedances of the 1-hour mean NO_2 AQAL are unlikely to occur where annual mean concentrations are <60µg/m^3. Annual mean NO_2 concentrations predicted at all receptor locations are well below this limit in the 2027 DS scenario. Therefore, it is unlikely that an exceedance of the 1-hour mean AQAL will occur. Effects associated with likely 1-hour mean NO_2 concentrations at all assessed receptor locations are therefore considered to be **not significant** in terms of the EIA regulations.

PM_{10} Modelling Results

19.7.46 The maximum predicted annual mean PM_{10} concentration at all existing receptors during the 2019 BC is at receptor R109 with a predicted concentration of 25.7µg/m^3, this represents 64.3% of the AQAL.

19.7.47 The maximum predicted annual mean PM_{10} concentration at existing receptors (inclusive of committed developments) during the planned construction phase (2027 DS) is at Receptor R109 with a predicted concentration of 24.6µg/m^3; this represents 61.5% of the AQAL (i.e., 'well-below'). The change in the annual mean PM_{10} concentrations at this location, during the construction of the onshore elements of the Project (2027 DS vs. 2027 DM) relative to the AQAL is 0.4%.

19.7.48 The maximum observed increase in annual mean PM_{10} concentrations at all existing receptors as a result of the construction of the onshore elements of the Project was 0.6% at Receptors R22, R167 and R183. Receptor R22 is located on the façade of a residential property adjacent to the A158 Partney Road, R167 is located near the A16/A158 roundabout (as described above), and R183 is located on the façade of a residential property adjacent to the A52 Wainfleet Road.

19.7.49 In accordance with EPUK & IAQM guidance, the impact of the Project on annual mean PM_{10} concentrations at all relevant existing receptors is considered to be 'negligible'. Given the marginal increase in annual mean PM_{10} concentrations associated with the construction phase of the onshore elements of the Project, and that there are no predicted exceedances of the annual mean PM_{10} AQAL, unmitigated effects associated with annual mean PM_{10} concentrations at all assessed receptor locations are therefore considered to be not significant in terms of the EIA regulations.

19.7.50 Based upon the maximum predicted annual mean PM_{10} concentration of 24.6µg/m^3 (predicted at R109 in 2027 DS), this equates to 12-days where 24-hour mean PM_{10} concentrations are predicted to be greater than 50µg/m^3. This is well below the 35 permitted exceedances, and therefore the number of maximum exceedances is in compliance with the 24-hour mean AQAL. Effects associated with likely 24-hour mean PM_{10} concentrations at all assessed receptor locations are therefore considered to be **not significant** in terms of the EIA regulations.

$PM_{2.5}$ Modelling Results

19.7.51 The maximum predicted annual mean $PM_{2.5}$ concentration at all existing receptors during the 2019 BC is at Receptor R109 with a predicted concentration of 15.8µg/m^3, this represents 63.2% of the AQAL.

19.7.52 The maximum predicted annual mean $PM_{2.5}$ concentration at existing receptors (inclusive of committed developments) during the planned construction phase (2027 DS) is at Receptor R109 with a predicted concentration of 14.6µg/m^3; this represents 58.4% of the AQAL (i.e., 'well-below'). The change in the annual mean $PM_{2.5}$ concentrations at this location, during the construction of the onshore elements of the Project (2027 DS vs. 2027 DM) relative to the AQAL is 0.3%.

19.7.53 The maximum observed increase in annual mean $PM_{2.5}$ concentrations at all existing receptors as a result of the construction of the onshore elements of the Project is 0.5% at Receptors R13, R14, R16, R22, R44, R47, R167 and R183.

19.7.54 In accordance with EPUK & IAQM guidance, the impact of the Project on annual mean $PM_{2.5}$ concentrations at all relevant existing receptors is considered to be 'negligible'. Given the marginal increase in annual mean $PM_{2.5}$ concentrations associated with the construction phase of the onshore elements of the Project, and that there are no predicted exceedances of the annual mean $PM_{2.5}$ AQAL, unmitigated effects associated with annual mean $PM_{2.5}$ concentrations at all assessed receptor locations are therefore considered to be **not significant** in terms of the EIA regulations.

Summary

19.7.55 Road traffic effects associated with the construction phase on concentrations of NO_2, PM_{10} and $PM_{2.5}$ at human receptor locations are found to be **not significant** in terms of the EIA regulations.

19.7.56 Furthermore, onshore construction works are expected to last up to 36-months and as such, any consequential impacts onto local road traffic flows are believed to be temporary, with no long-term deterioration of conditions. Implementation of road traffic air quality mitigation measures is therefore not required.

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380000 360000 340000

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Page 2 Page 3 Page 4 Page 5 Page 6 Page 7 Page 8 Page 9 Page 10 Page 11 Page 12

LN1 LN2 WM1 WM2 WM3 WM4 WM5 WM6 WM7 WM8 WM9 WM10 WM11 WM12 WM13 WM14 A1 A2 A3 A4 A5

Lincolnshire Node OnSS Search Area Substation

Weston Marsh North OnSS Search Area Substation

Weston Marsh South OnSS Search Area Substation

LINCOLN HORNCASTLE SPILSBY SKEGNESS BOSTON SLEAFORD LOUTH MABLETHORPE ALFORD SPALDING HOLBEACH KING'S LYNN HUNSTANTON

THE WASH

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Lincolnshire Node OnSS Search Area
- Weston Marsh North OnSS Search Area
- Weston Marsh South OnSS Search Area
- Modelled Road Network
- Modelled Human Receptor
- Verification Monitoring Location
- Air Quality Management Area (AQMA)

Coordinate System: British National Grid

0 5 10 km

Scale: 1:250,000

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Modelled Road Network and Human Receptors Overview

Figure 19.2.1

OUTER DOWSING OFFSHORE WIND

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Legend

- Modelled Road Network
- Modelled Human Receptor

R1 Kenwick Bar
R2
R3
R4 Haugham Pasture
R5
R6
R7 Burwell
R8 Walmsgate
R9
R10
R11 White Pit
R12
R13
R14
R15 Top
R16

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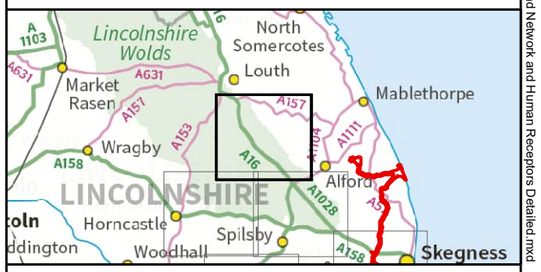

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Preliminary Environmental Information Report

Modelled Road Network & Human Receptors
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Figure 19.2.2

OUTER DOWSING OFFSHORE WIND

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374000 372000 370000 368000 366000

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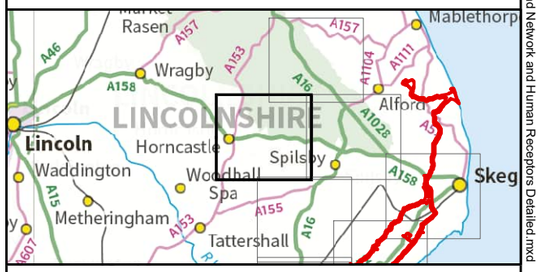
- Modelled Road Network
- Modelled Human Receptor
- Verification Monitoring Location

N

Sources:



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Modelled Road Network & Human Receptors
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Figure 19.2.3

OUTER DOWSING OFFSHORE WIND

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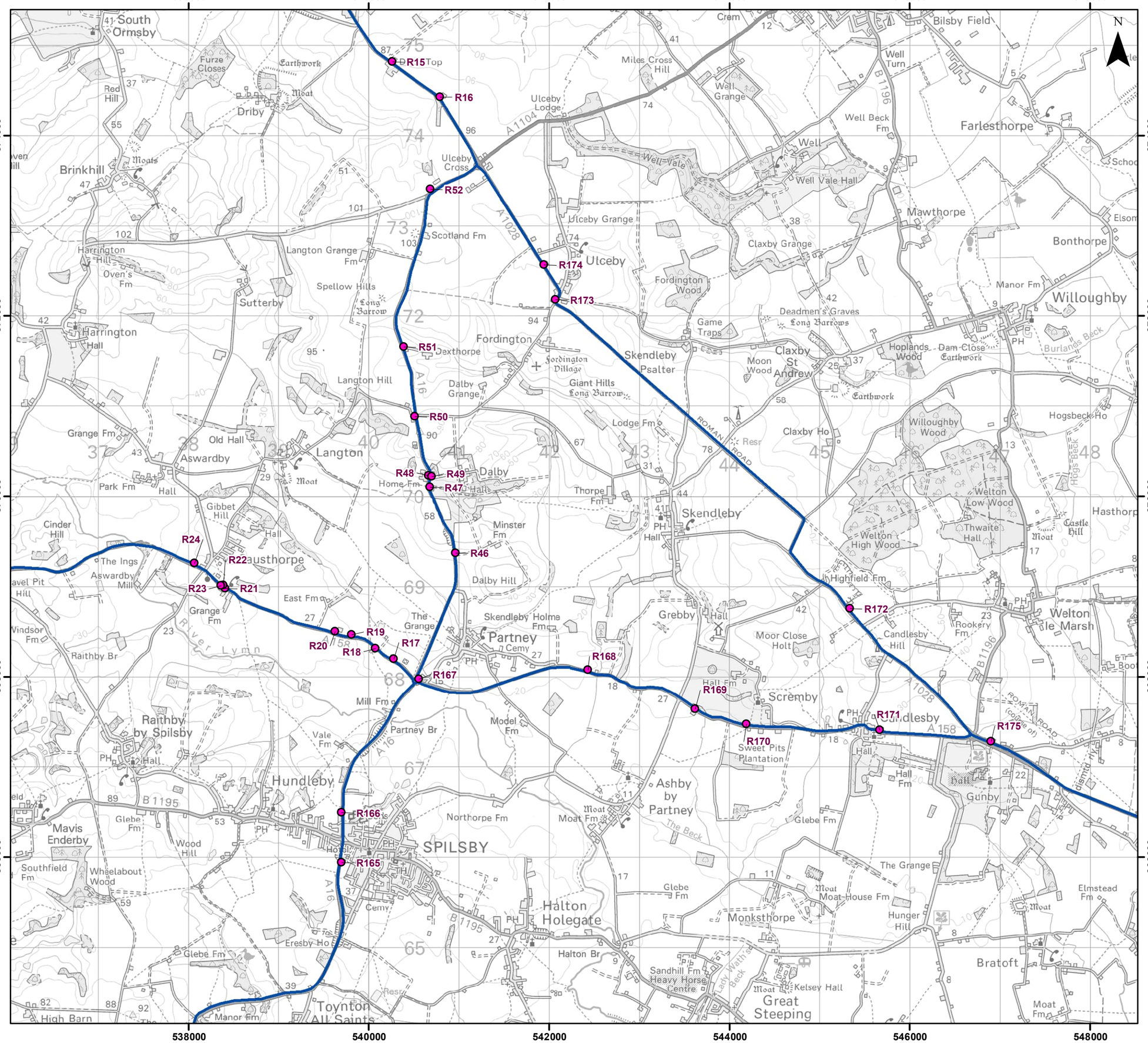

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Figure 19.2.4

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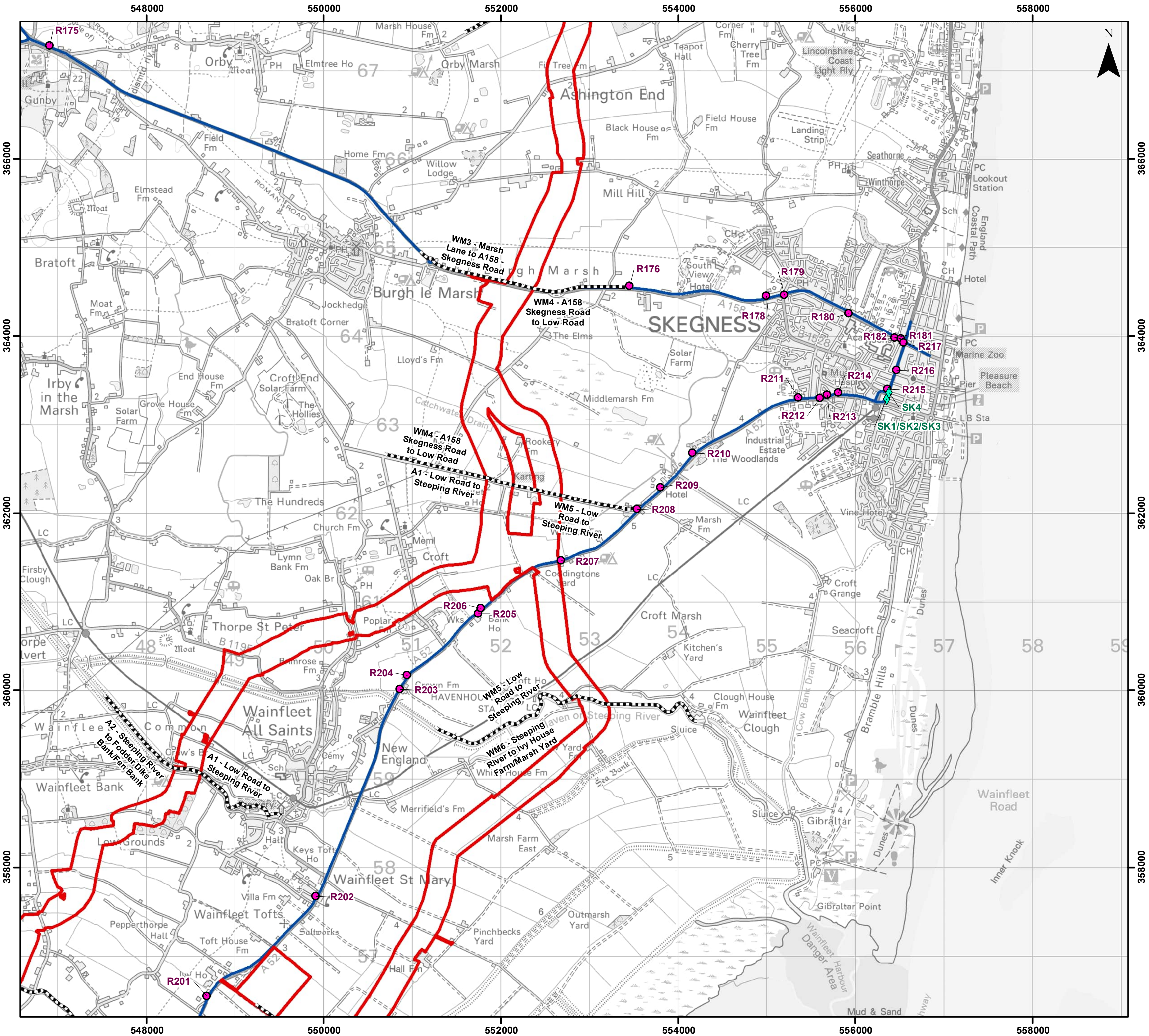

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Modelled Human Receptor
- Verification Monitoring Location

Sources:

Coordinate System: British National Grid

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Scale: 1:40,000

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Modelled Road Network & Human Receptors
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Figure 19.2.5

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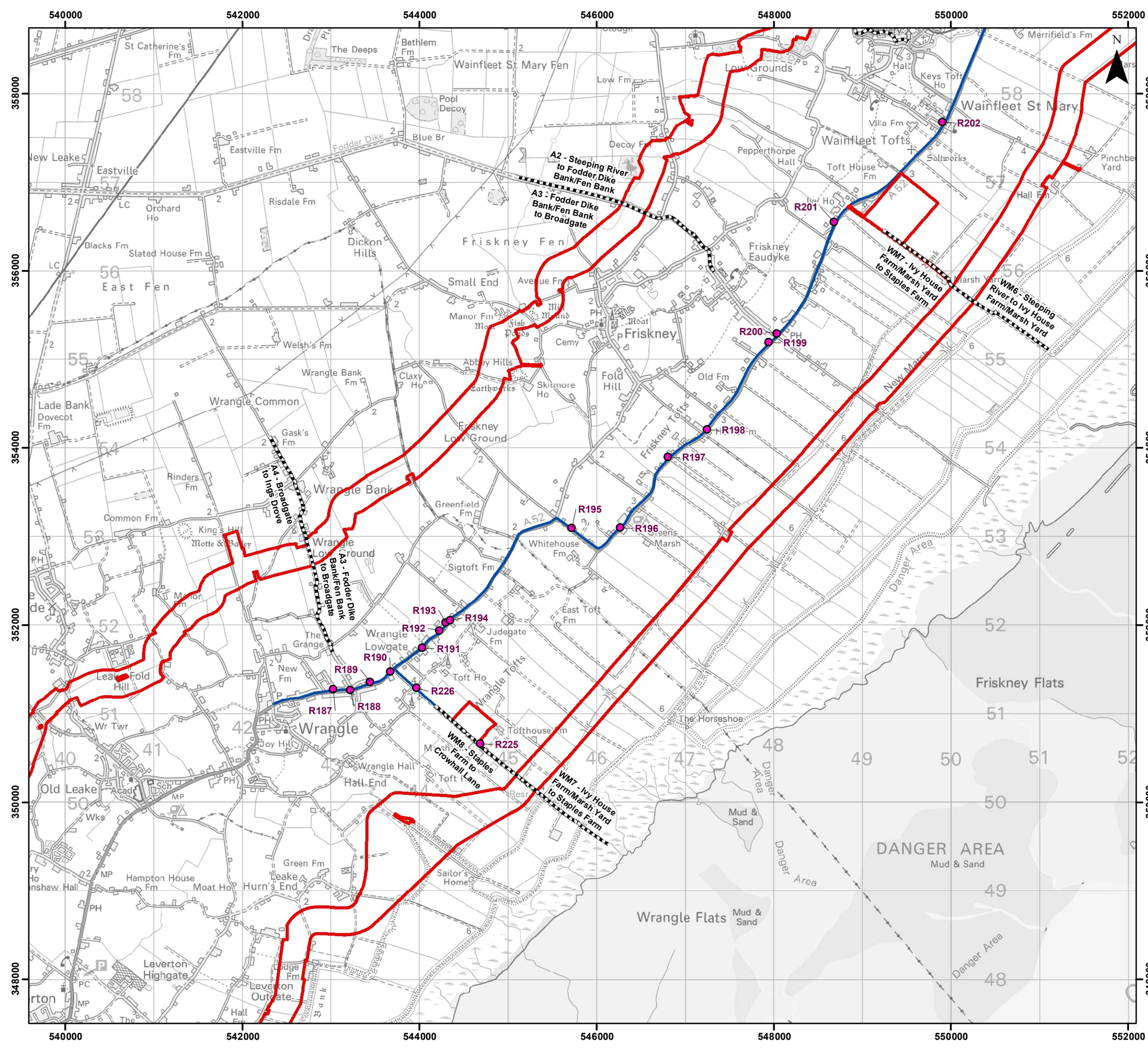

Legend

- 🟥 Onshore PEIR Boundary
- ▪▪▪ Onshore Segment Break
- ― Modelled Road Network
- ● Modelled Human Receptor

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Figure 19.2.6

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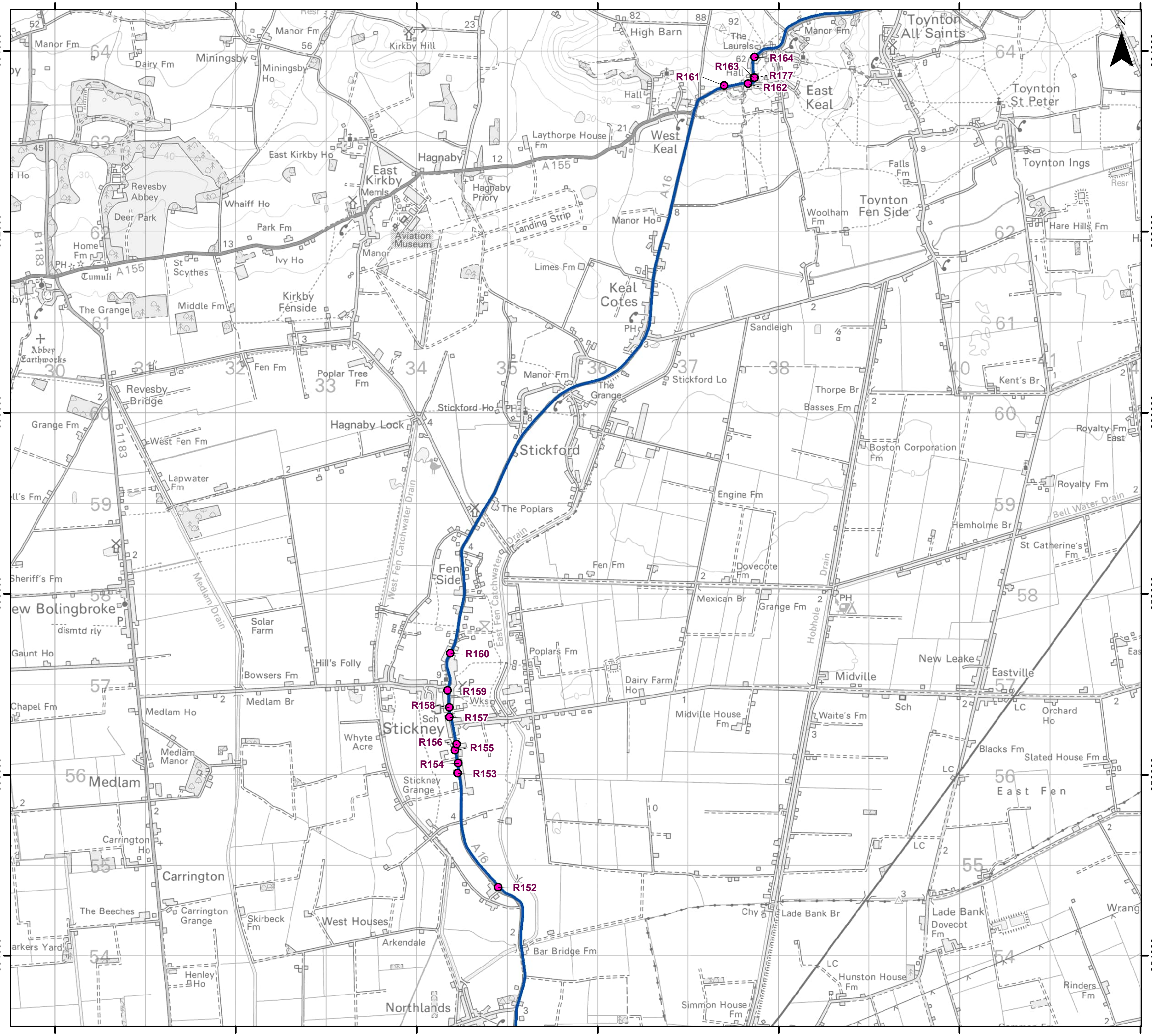

Legend

- Modelled Road Network
- Modelled Human Receptor

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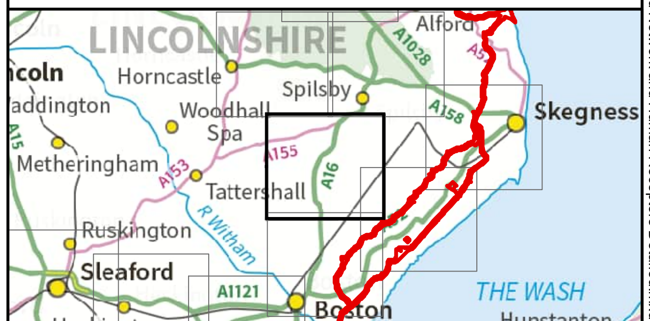

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Modelled Road Network & Human Receptors
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Figure 19.2.7

OUTER DOWSING OFFSHORE WIND

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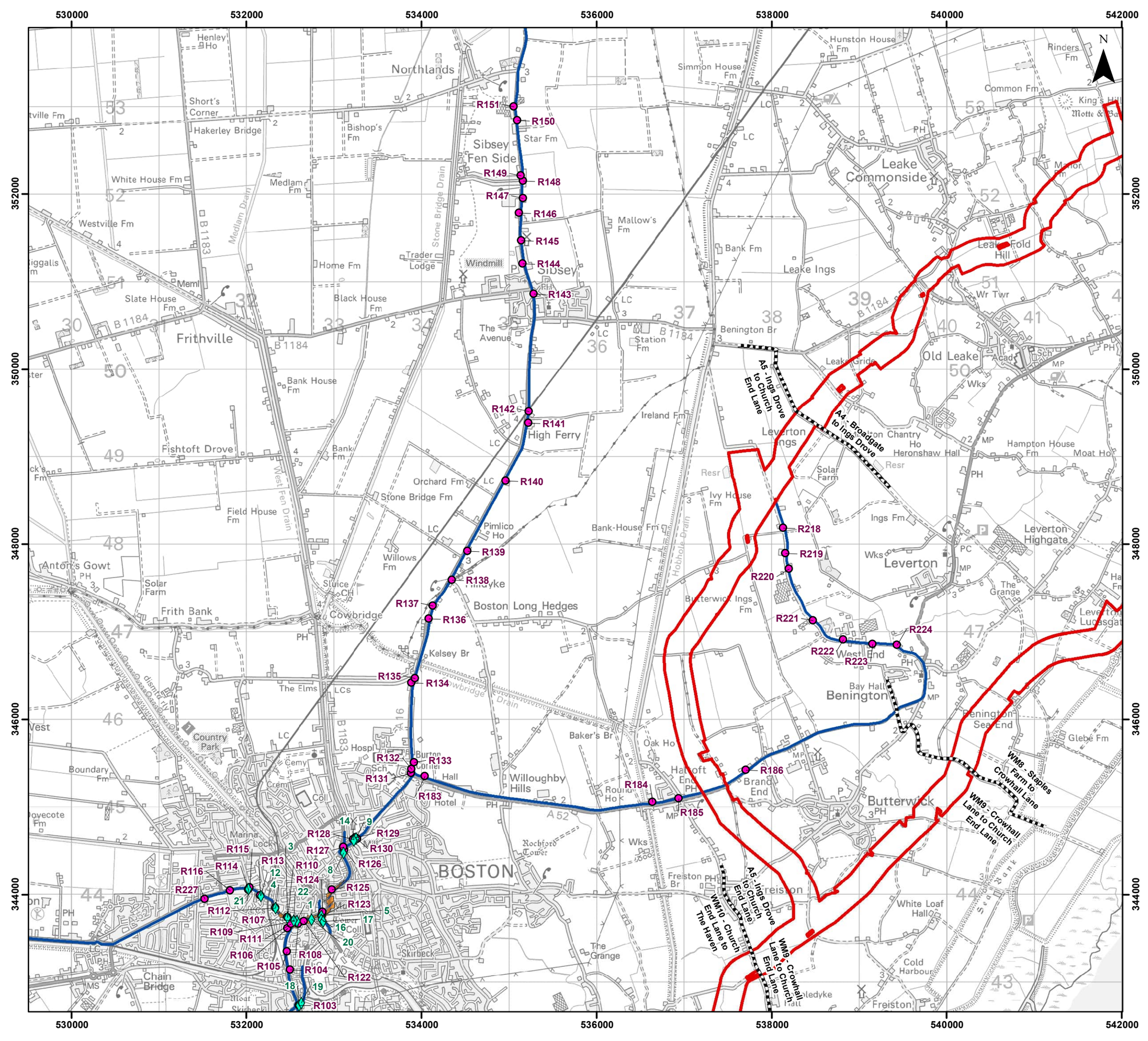

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Modelled Human Receptor
- Verification Monitoring Location
- Air Quality Management Area (AQMA)

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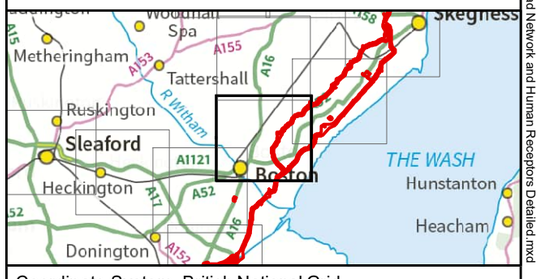

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

Preliminary Environmental Information Report

Modelled Road Network & Human Receptors
Page 8

Figure 19.2.8

OUTER DOWSING OFFSHORE WIND

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522000 524000 526000 528000 530000 532000

346000 344000 342000 340000 338000 336000

N

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Modelled Human Receptor
- Verification Monitoring Location
- Air Quality Management Area (AQMA)

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

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Modelled Road Network & Human Receptors
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Figure 19.2.9

OUTER DOWSING OFFSHORE WIND

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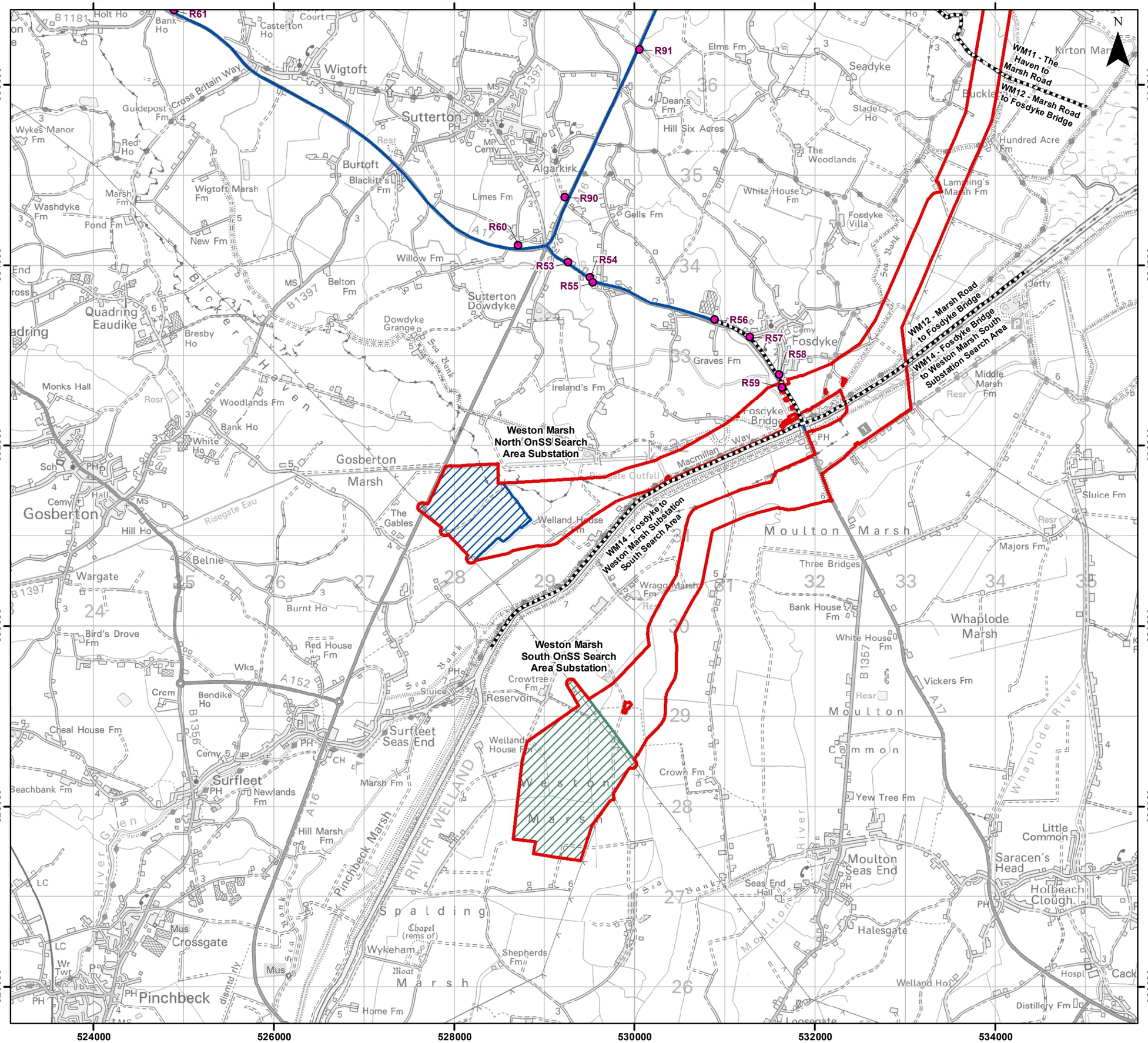

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Weston Marsh North OnSS Search Area
- Weston Marsh South OnSS Search Area
- Modelled Road Network
- Modelled Human Receptor

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

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Modelled Road Network & Human Receptors
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Figure 19.2.10

OUTER DOWSING OFFSHORE WIND

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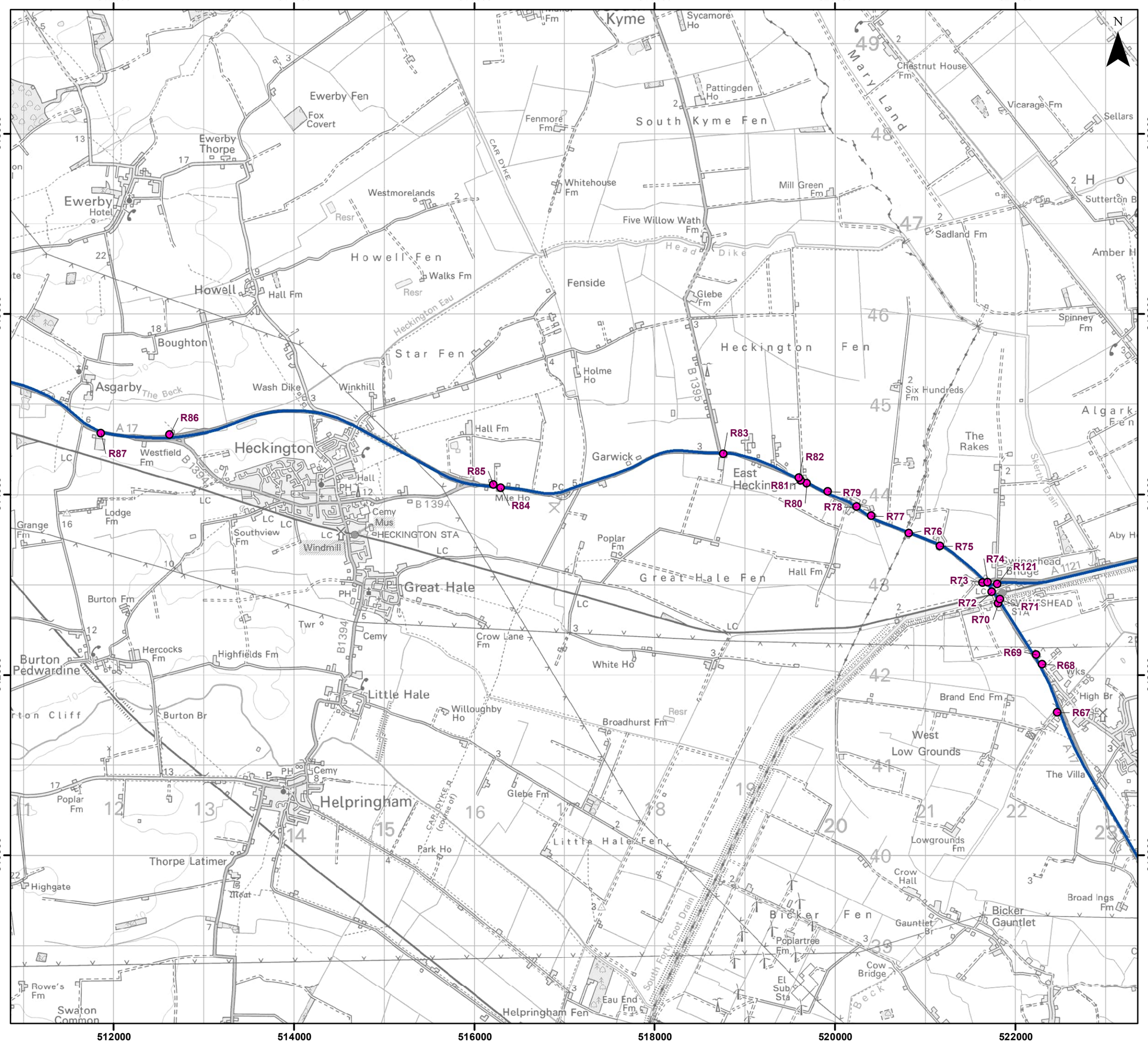
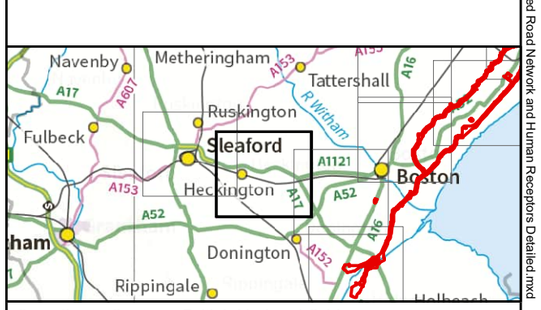


Legend

- Modelled Road Network
- Modelled Human Receptor



Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

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Modelled Road Network & Human Receptors
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Figure 19.2.11

OUTER DOWSING OFFSHORE WIND

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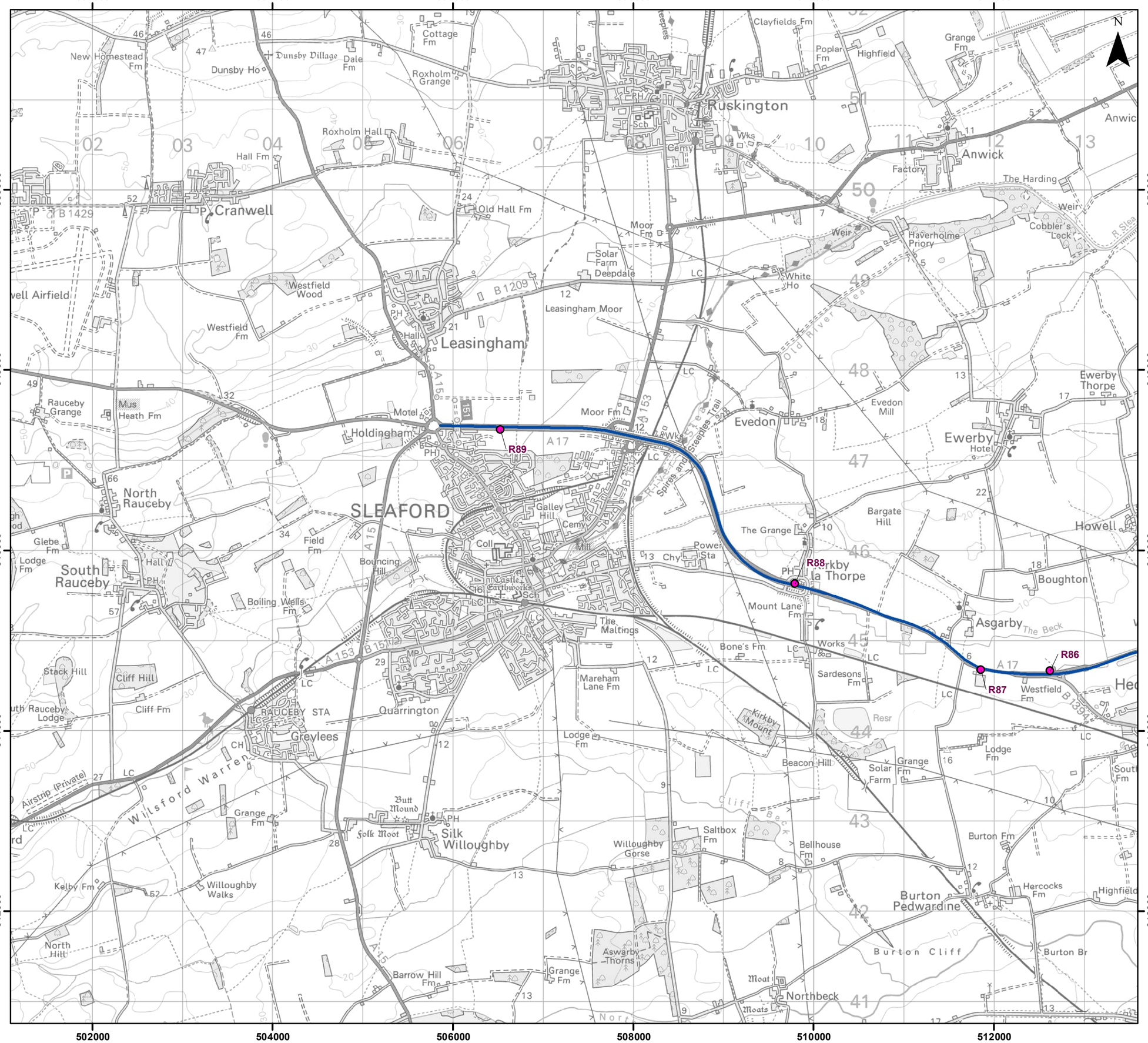

Legend

- Modelled Road Network
- Modelled Human Receptor

Sources:

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

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Modelled Road Network & Human Receptors
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Figure 19.2.12

OUTER DOWSING OFFSHORE WIND

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Ecological Receptors

19.7.57 Figure 19.3 provides an illustration of the proposed main public road network routing arrangements (referred to as Ecological Road Traffic Screening Routes), along with 200m buffers from these roads for initial screening, and the designated ecological sites which then progressed to detailed assessment.

19.7.58 It should be noted that the Ecological Road Traffic Screening Routes are based on the Core and Local Access Routes established as part of Volume 1, Chapter 27: Traffic and Transport. The spatial extent of these links has been extended to ensure all possible interactions with nearby sensitive ecological designations are captured. This is likely to represent a conservative assessment, as it assumes there is no reduction in vehicle movements generated by onshore activities with distance from the Core and Local Access Routes.

19.7.59 All road links associated with the three onshore ECC options have been considered collectively. This presents a conservative outlook as the road links associated with each of the onshore ECC options individually are smaller, representing a lesser footprint.

19.7.60 The traffic flows utilised in the screening assessment include vehicle movements associated with relevant committed developments and live projects/plans in the assessment area.

19.7.61 Table 19.15 details the extent of ecological designations located within 200m of a road link expected to witness a change in vehicular flow as a result of the Project. For each designation, the maximum traffic flow on the affected link from the three onshore ECC options have been presented. Where the traffic flow is above the IAQM screening thresholds, this is marked in bold. In all instances, the maximum traffic flow is associated with the Weston Marsh south of the A52 or the Weston Marsh north of the A52 onshore ECC options, and therefore (as per the assessment of human receptors), the Lincolnshire Node onshore ECC option screened out of consideration.

Table 19.15: Ecological designations within 200m of an affected link

ID	Site	Designation	Project Alone		In-Combination	
			Total AADT	HDV	Total AADT	HDV
ER1	Greater Wash	SPA	24	0	269	0
ER2	Candlesby Hill	SSSI	177	159	177	159
ER3	Dalby Hill	SSSI	Geological Interest – not sensitive			
ER4	Jenkins Carr	SSSI	304	**238**	304	**238**
ER5	Keal Carr	SSSI	304	**238**	304	**238**
ER6	South Thoresby Warren	LNR	304	**238**	304	**238**
ER7	A16 Road Verge, Burwell North	LWS	304	**238**	304	**238**
ER8	A16 Road Verge, Dalby Bar	LWS	366	**308**	366	**308**
ER9	A16 Road Verge, White Pit	LWS	304	**238**	304	**238**
ER10	A16 Road Verges, Green Man Plantation	LWS	304	**238**	304	**238**

ID	Site	Designation	Project Alone		In-Combination	
			Total AADT	HDV	Total AADT	HDV
ER11	A16 Verges North of the River Glen	LWS	138	85	138	85
ER12	Banovallum House	LWT	340	**308**	340	**308**
ER13	Bluestone Heath Road Verges, East	LWS	304	**238**	304	**238**
ER14	Calceby Beck, Furze Closes to A16	LWS	304	**238**	304	**238**
ER15	Callow Carr	LWS	366	**308**	366	**308**
ER16	Candlesby Hill Quarry	LWT	177	159	177	159
ER17	Chalk Pit Lane Verges, Candlesby	LWS	177	159	177	159
ER18	Cowdyke Plantation	LWS	304	**238**	304	**238**
ER19	Dawber Lane Road Verges	LWS	177	159	177	159
ER20	Frampton Hall	LWS	106	88	106	88
ER21	Gunby Meadow	LWS	342	**290**	342	**290**
ER22	Gunby Park	LWS	342	**290**	342	**290**
ER23	Hagworthingham Meadow	LWS	340	**308**	340	**308**
ER24	Hall Weir	LWS	343	161	732	**231**
ER25	Hobhole Bank	LWS	76	52	76	52
ER26	Hobhole Drain, Baker's Bridge South	LWS	483	**297**	787	**297**
ER27	Horncastle Canal Grassland	LWS	340	**308**	340	**308**
ER28	Hunger Hill Pasture	LWS	9	5	9	5
ER29 (A)	Keal Carr	LWT	304	**238**	304	**238**
	Keal Carr East	LWS				
	Keal Carr South	LWS				
ER30	Ketsby Beck, Ketsby to Calc'by	LWS	304	**238**	304	**238**
ER31	Mackay's Pit	LWS	179	170	179	170
ER32	Mill Lane Road Verges	LWS	177	159	177	159
ER33	Moulton River	LWS	161	85	161	85
ER34	Pinfold Lane, White Pit	LWS	304	**238**	304	**238**
ER35	Risegate Eau	LWS	138	85	138	85
ER36	River Lymn (Partney Bridge to Mill Bridge)	LWS	304	**238**	304	**238**
ER37	Riverdale Meadow, Hagworthingham	LWS	340	**308**	340	**308**
ER38	South Bank Fosdyke	LWS	258	174	258	174
ER39	South Forty Foot Drain	LWS	300	**260**	624	**260**

ID	Site	Designation	Project Alone		In-Combination	
			Total AADT	HDV	Total AADT	HDV
ER40	Spendluffe Meadow	LWS / LWT	148	84	393	84
ER41	The Lymn	LWS	21	5	21	5
ER42	Thunker Hollow Road Verge	LWS	340	**308**	340	**308**
ER43	Vale Farm Meadow	LWS	304	**238**	304	**238**
ER44	Well Vale Estate, Alford Road Plantation	LWS	123	84	3'8	84
ER45	Well Vale Estate, Dadley's Stone Wood	LWS	123	84	368	84
ER46	Welton le Marsh Quarry Verges	LWS	177	159	177	159
	IAQM Screening Thresholds		***1,000***	***200***	***1,000***	***200***

Table note:

(A) Assessed collectively as the LWT mostly incorporates the two LWS.

19.7.62 One international ecological designation, the Greater Wash SPA, is found within 200m of the road links expected to witness a change in vehicular flows as a result of Project construction activities. However, the road traffic flows generated by the Project are below the IAQM prescribed screening thresholds (IAQM, 2020) both alone and in-combination with other relevant plans/projects. Effects on international ecological designation can be considered insignificant for all three onshore ECC options.

19.7.63 Four SSSIs are found within 200m of the road links expected to witness a change in vehicular flows as a result of Project construction activities. One is designated for geological interest (Dalby Hill SSSI) and is therefore not considered sensitive or assessed further. Construction road traffic flows (alone and in-combination with other relevant plans/projects) are above the IAQM prescribed screening criteria on road links within 200m of ER4 (Jenkins Carr SSSI) and ER5 (Keal Carr SSSI).

19.7.64 In terms of local designations, the South Thoresby Warren LNR, and several LWS/LWT are found within 200m of the road links expected to witness a change in vehicular flows as a result of Project construction activities. Construction road traffic flows (alone and in-combination with other relevant plans/projects) are above the IAQM prescribed screening criteria on road links within 200m of all local designations assessed. Project alone flows within 200m of ER24 Hall Weir are below the IAQM prescribed screening thresholds (IAQM, 2020). Despite this, further assessment has been undertaken for ER24 to consider in-combination effects.

19.7.65 Consistent with the staged screening procedure outlined within Section 19.6, further assessment with the use of dispersion modelling to quantify the effect on Critical Loads/Levels has therefore been undertaken for these ecological sites. This includes two SSSIs and 24 local designations. The spatial extent of the modelled domain is illustrated in Figure 19.3.

19.7.66 Effects on all other ecological designations can be considered insignificant.

19.7.67 Results presented herein relate to the maximum modelled impact of each individual ecological designation requiring detailed assessment (i.e., where impacts cannot be screened out), and as such, represents a conservative outlook. The maximum from the onshore ECC options has also been considered. Exhaustive results are presented in Volume 2, Appendix 19.4: Road Traffic Dispersion Modelling.

19.7.68 As discussed in Section 19.6, effects associated with modelled changes can be classed as insignificant where they are:

- International and national sites: <1% of the Critical Levels and/or Critical Loads; and
- Local sites: <100% of the Critical Levels and/or Critical Loads.

19.7.69 The maximum modelled 2027 impacts on Critical Levels/Loads as a result of the Project alone and in-combination with other projects/plans was considered for initial screening.

19.7.70 In relation to national sites (ER4 and ER5), maximum modelled impacts (alone and in-combination) were below 1% of all Critical Levels/Loads.

19.7.71 In relation to local sites, maximum modelled impacts (alone and in-combination) were below 100% of all Critical Levels/Loads.

19.7.72 In consideration of the above outcomes, road traffic impacts on all ecological designations can be considered negligible. Resultant effects are concluded to be **not significant** in terms of the EIA Regulations. No further assessment is therefore required.

500000 520000 540000 560000

380000 360000 340000 320000

Page 2 Page 3 Page 4 Page 5 Page 6 Page 7 Page 8 Page 9 Page 10 Page 11 Page 12 Page 13 Page 14 Page 15 Page 16

LN1 LN2 WM1 WM2 WM3 WM4 WM5 WM6 WM7 WM8 WM9 WM10 WM11 WM12 WM13 WM14 A1 A2 A3 A4 A5

Lincolnshire Node OnSS Search Area Substation

Weston Marsh North OnSS Search Area Substation

Weston Marsh South OnSS Search Area Substation

LINCOLN HORNCASTLE SLEAFORD BOSTON SPALDING SPILSBY SKEGNESS HUNSTANTON KING'S LYNN

THE WASH

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Lincolnshire Node OnSS Search Area
- Weston Marsh North OnSS Search Area
- Weston Marsh South OnSS Search Area
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)
- Local Wildlife Site (LWS)
- Local Wildlife Trust (LWT)

Sources:

Locally Designated Sites provided by Lincolnshire Environmental Records Centre (October 2022)

Coordinate System: British National Grid

0 5 10 km

Scale: 1:250,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Overview
Figure 19.3.1

OUTER DOWSING OFFSHORE WIND

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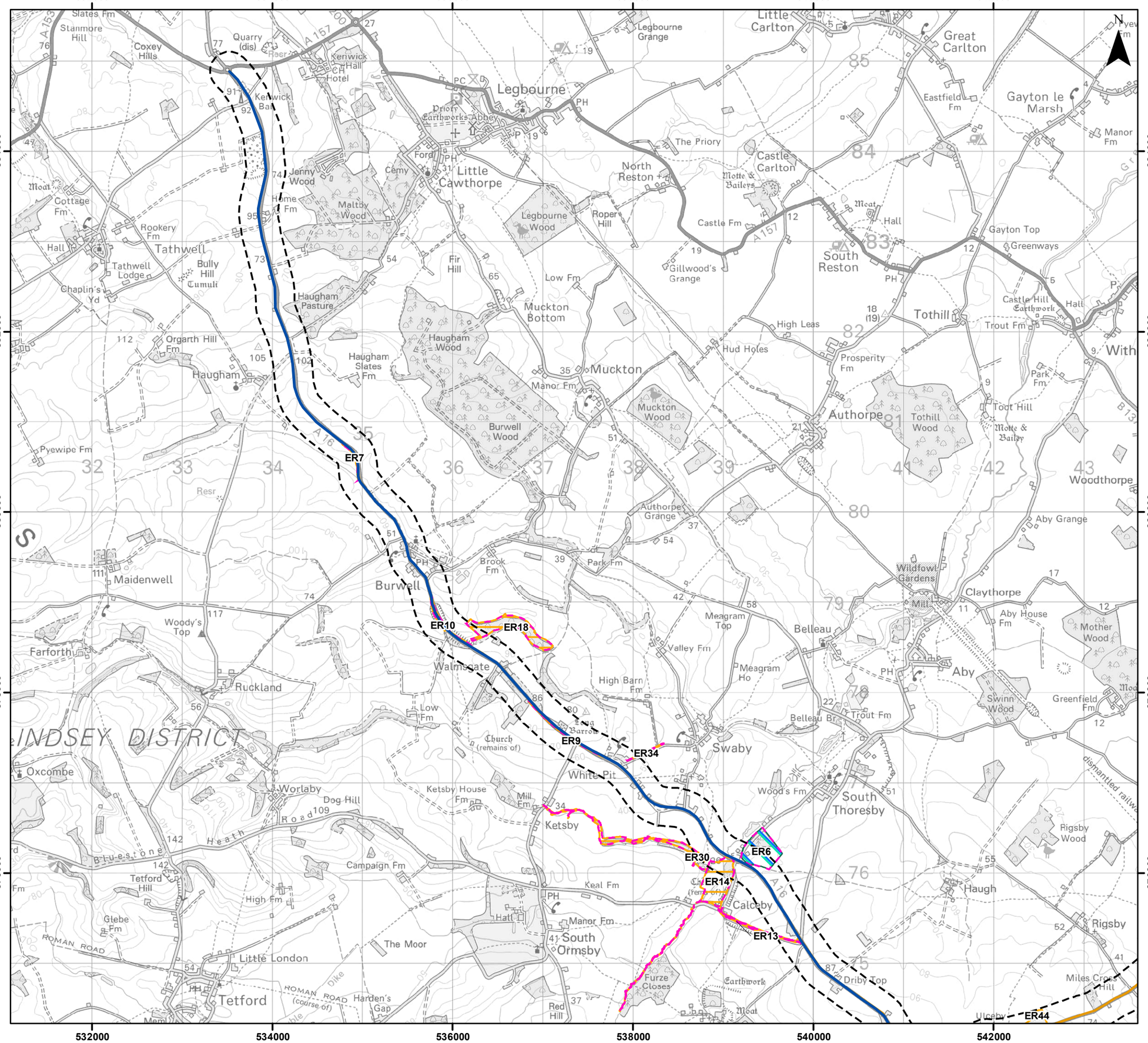
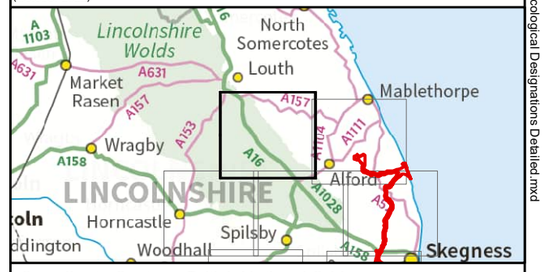


Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Local Nature Reserve (LNR)
- Local Wildlife Site (LWS)

Sources:

Locally Designated Sites provided by Lincolnshire Environmental Records Centre (October 2022)



Coordinate System: British National Grid

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Scale: 1:40,000

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Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Page 2
Figure 19.3.2

OUTER DOWSING OFFSHORE WIND

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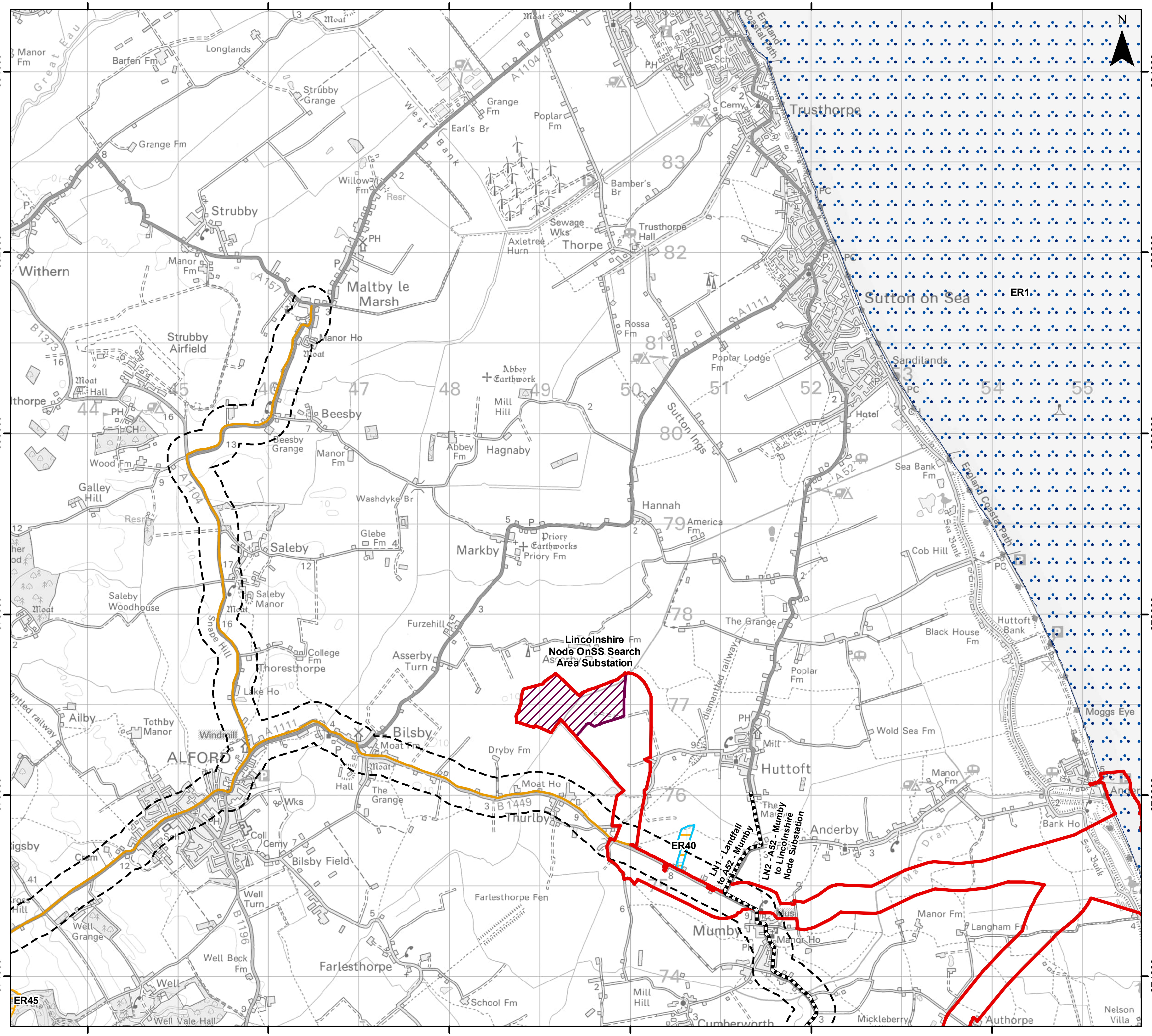

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Lincolnshire Node OnSS Search Area
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Special Protection Area (SPA)
- Local Wildlife Site (LWS)
- Local Wildlife Trust (LWT)

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Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network

Page 3

Figure 19.3.3

OUTER DOWSING OFFSHORE WIND

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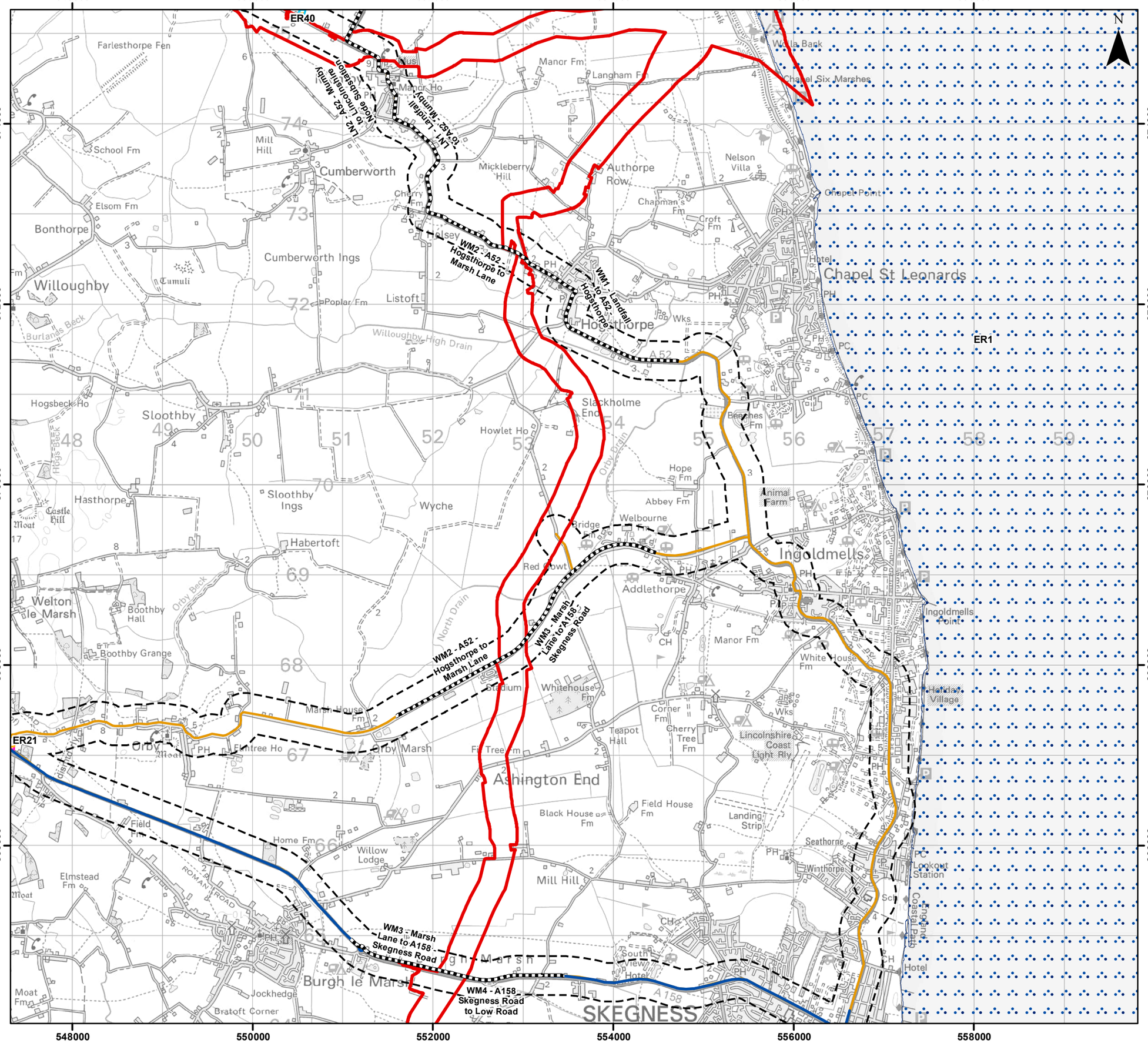

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Special Protection Area (SPA)
- Local Wildlife Site (LWS)
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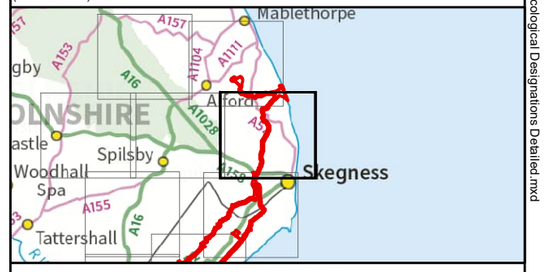

Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Page 4
Figure 19.3.4

OUTER DOWSING OFFSHORE WIND

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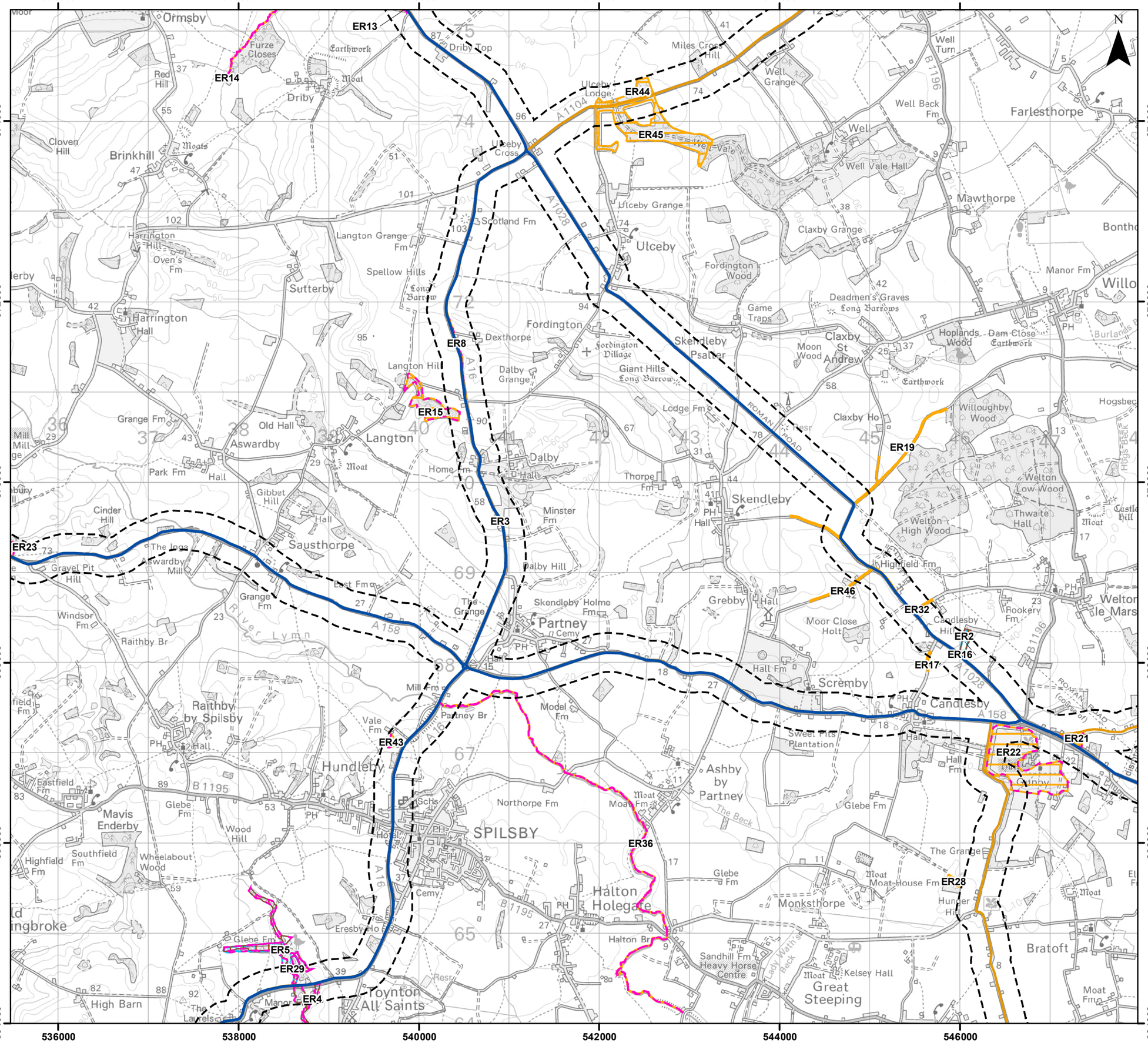

Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)
- Local Wildlife Trust (LWT)

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network

Figure 19.3.5

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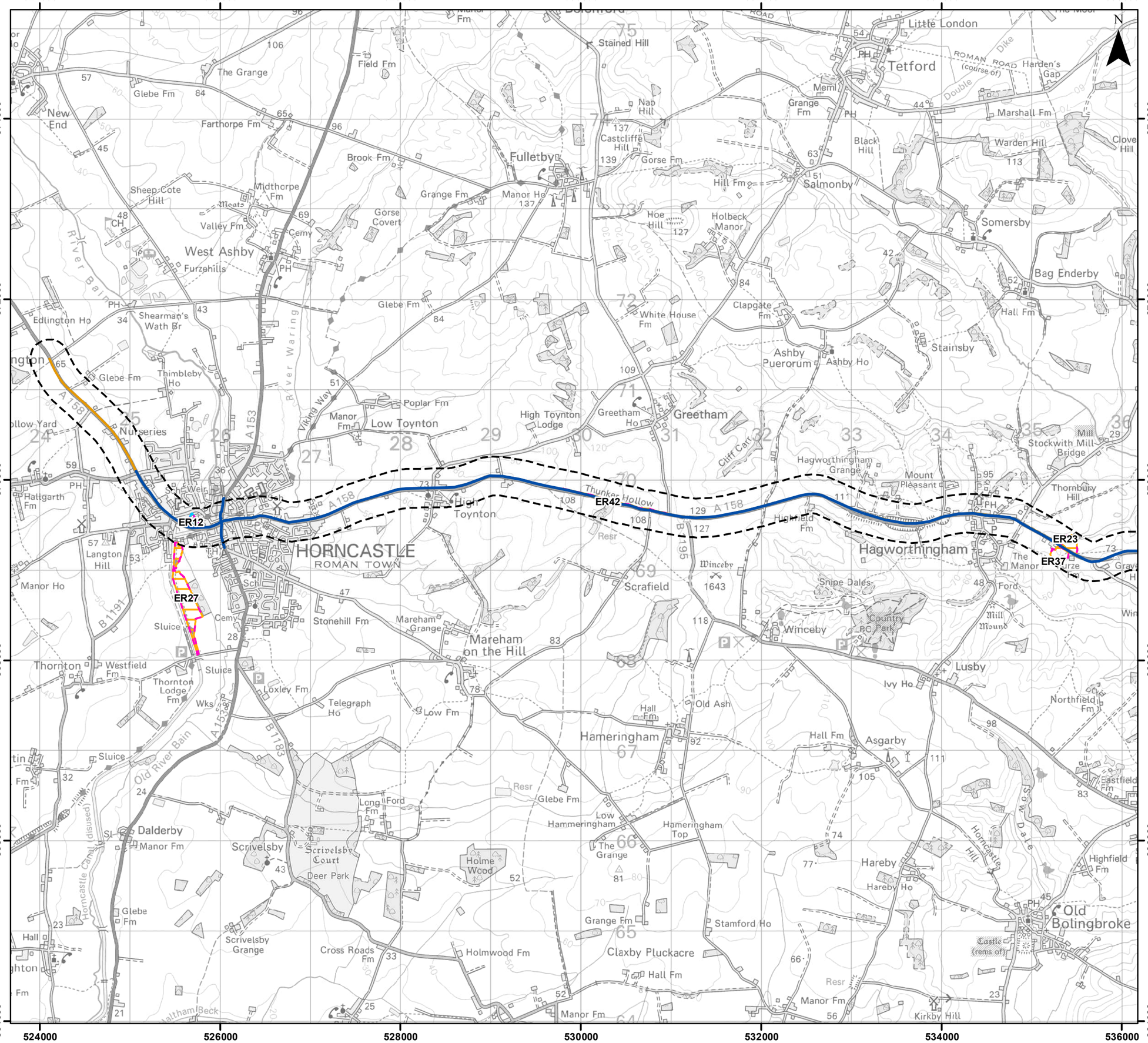
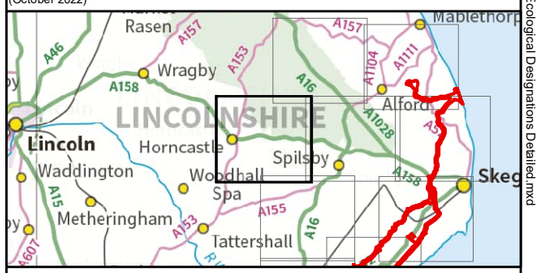


Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Local Wildlife Site (LWS)
- Local Wildlife Trust (LWT)

Sources:

Locally Designated Sites provided by Lincolnshire Environmental Records Centre (October 2022)



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Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.6

OUTER DOWSING OFFSHORE WIND

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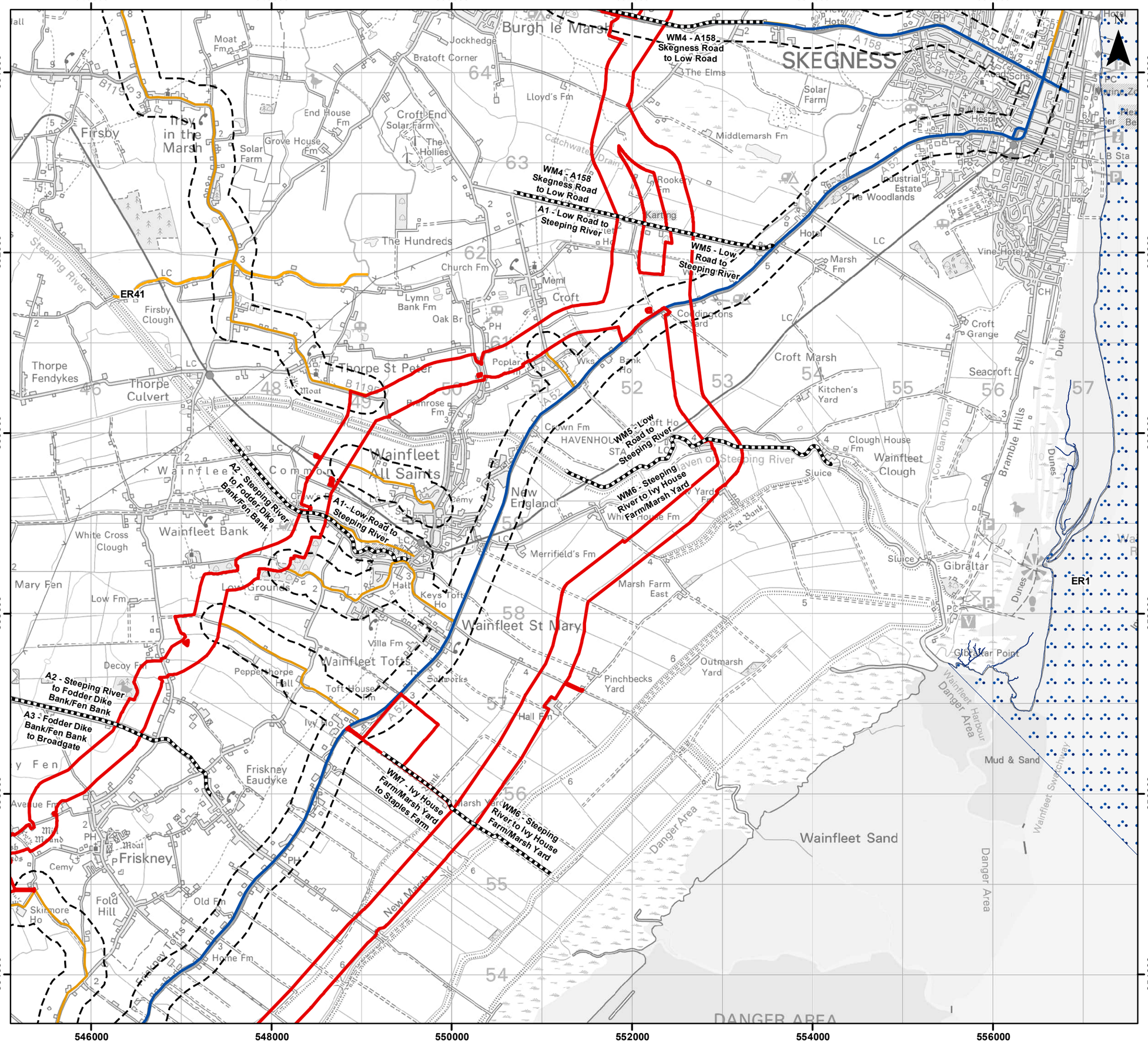

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Special Protection Area (SPA)
- Local Wildlife Site (LWS)

Coordinate System: British National Grid

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Scale: 1:40,000

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Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.7

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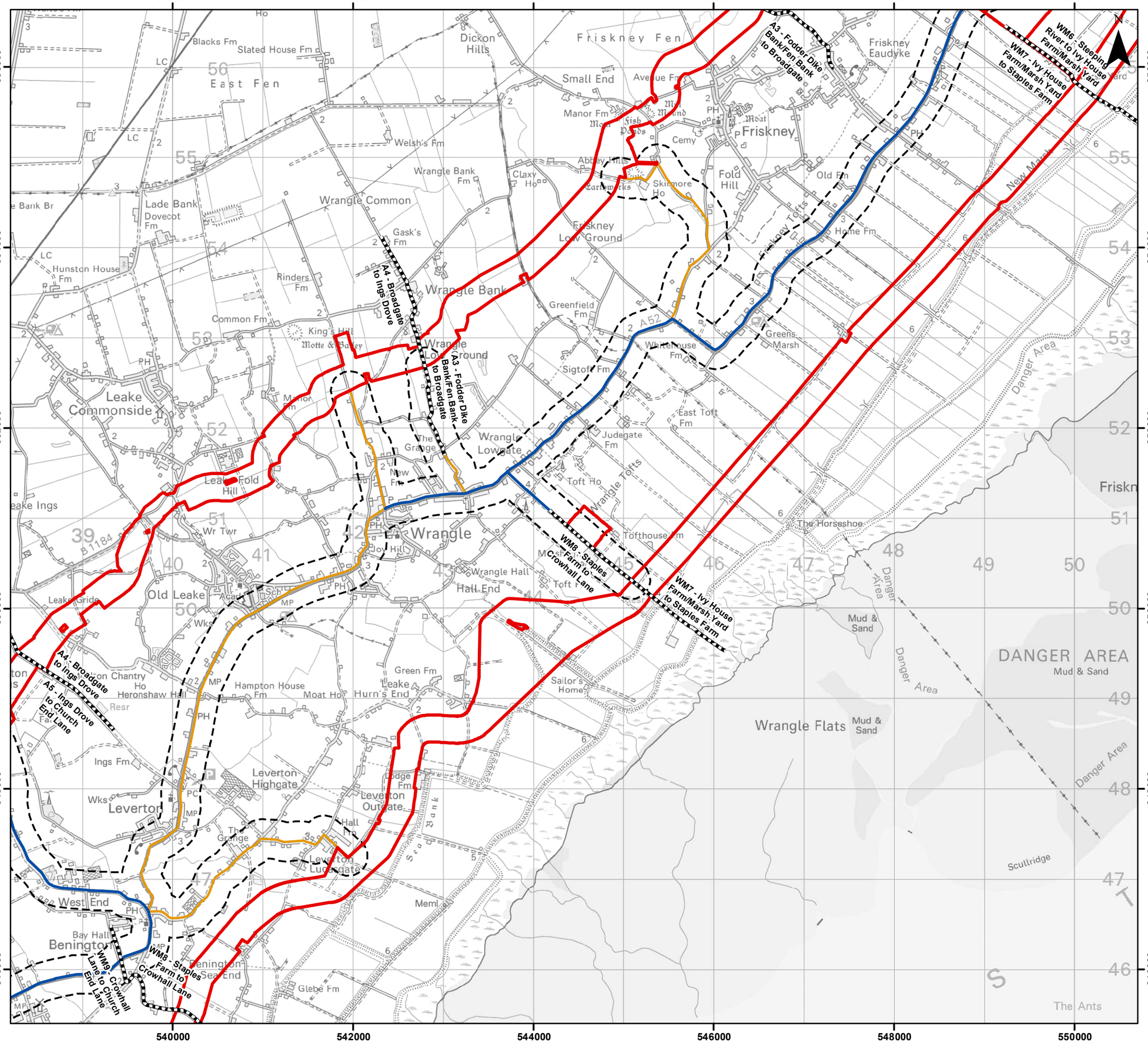

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- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer

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Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.8

OUTER DOWSING OFFSHORE WIND

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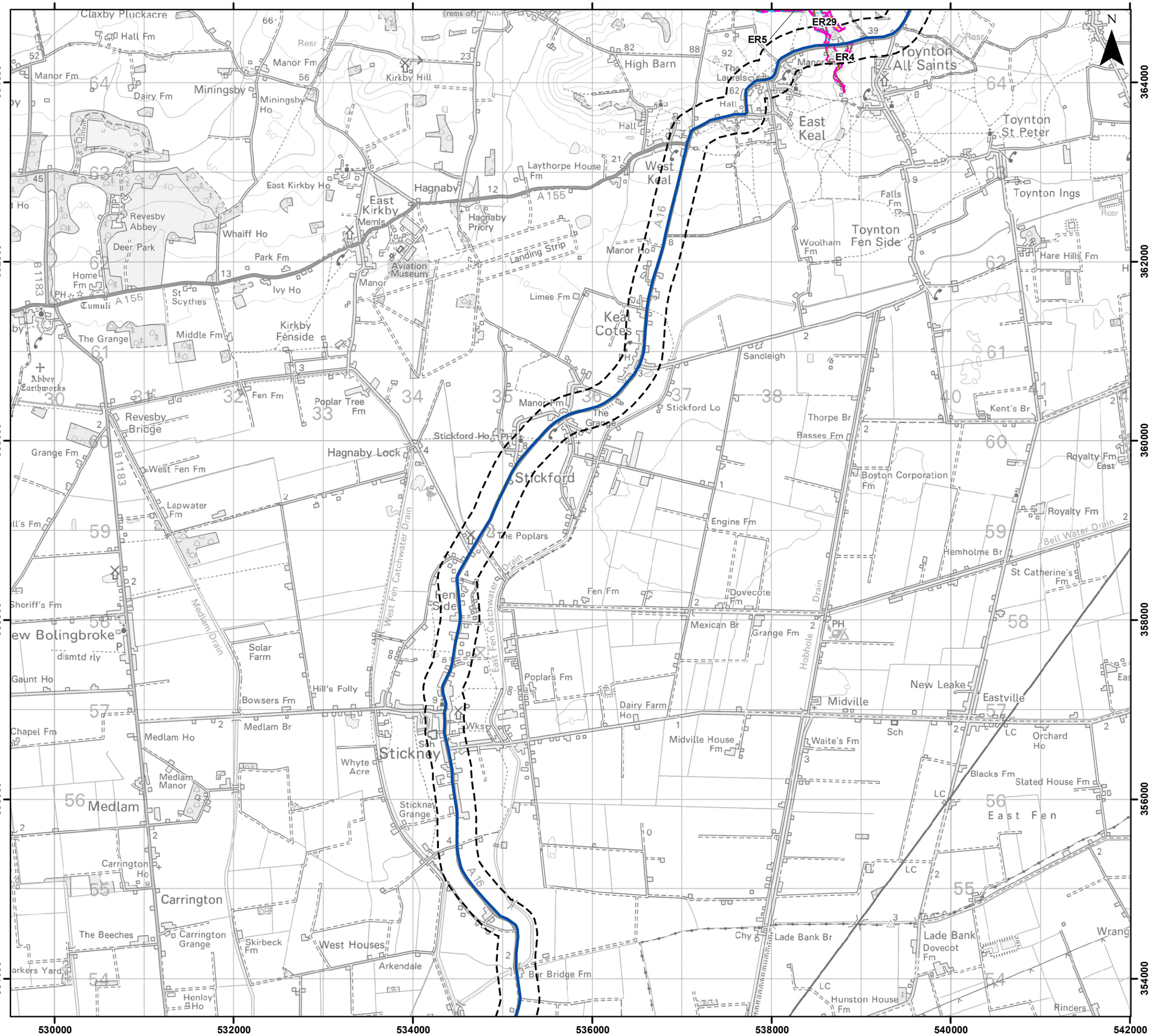

Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)
- Local Wildlife Trust (LWT)

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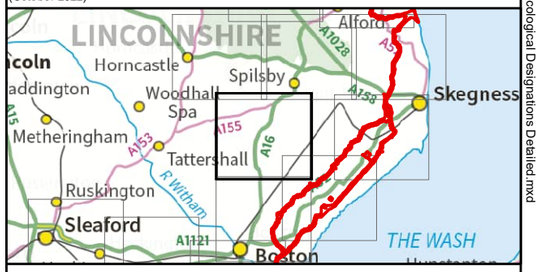

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Page 9
Figure 19.3.9

OUTER DOWSING OFFSHORE WIND

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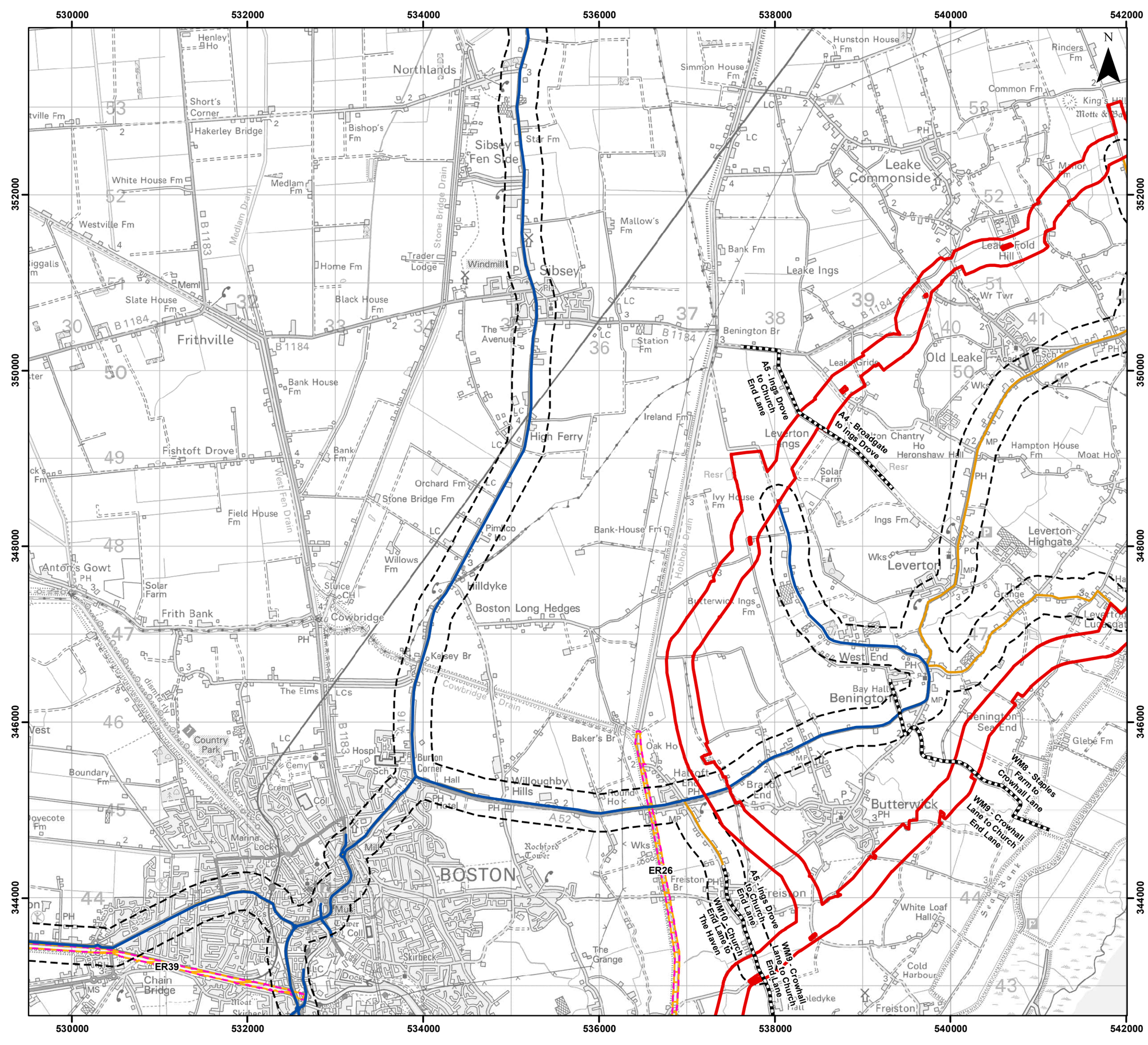

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Local Wildlife Site (LWS)

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

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Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.10

OUTER DOWSING OFFSHORE WIND

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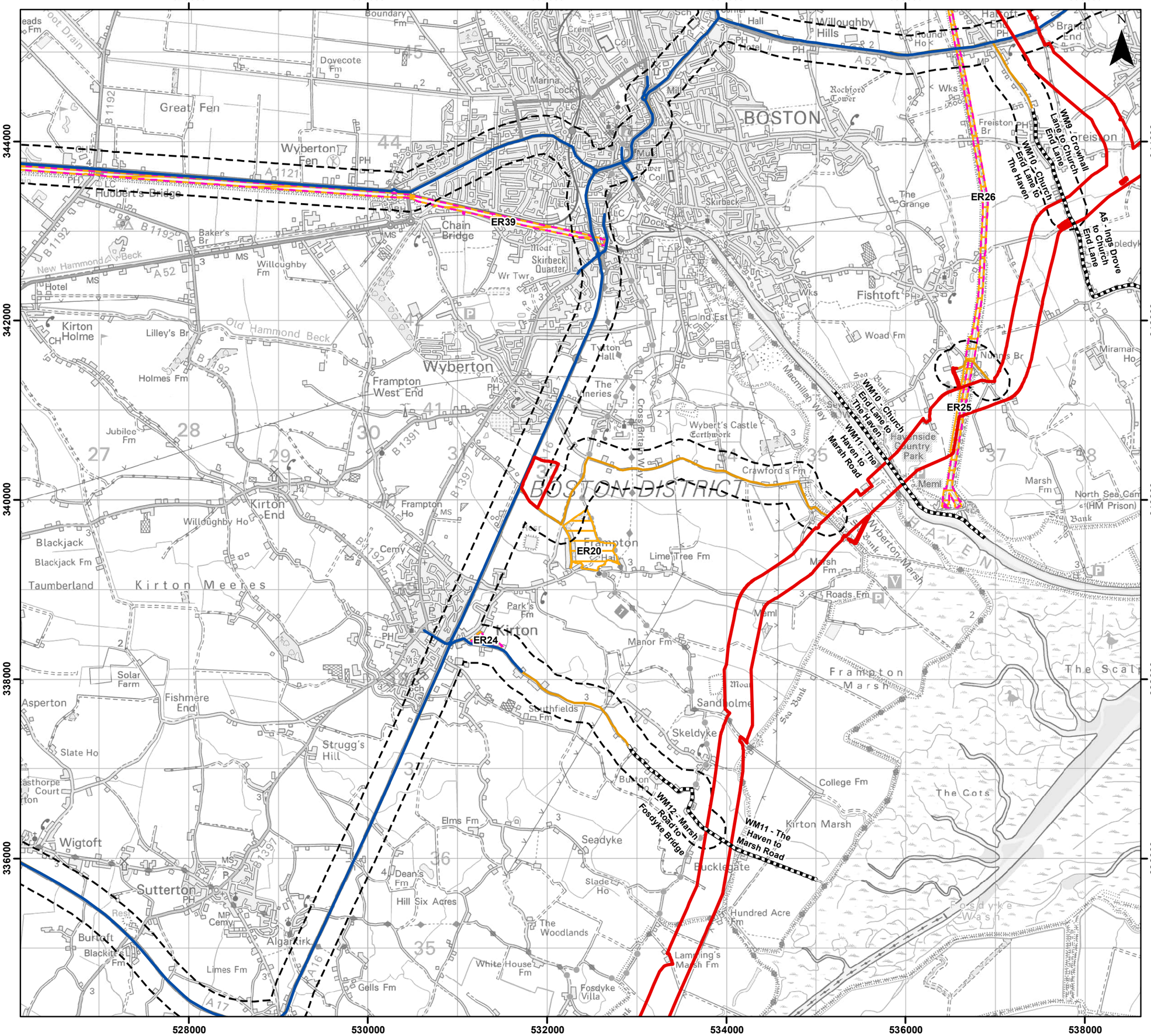
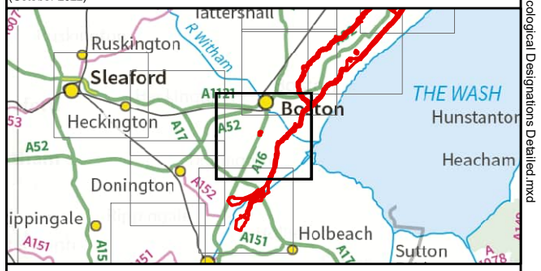


Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Local Wildlife Site (LWS)



Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Page 11
Figure 19.3.11

OUTER DOWSING OFFSHORE WIND

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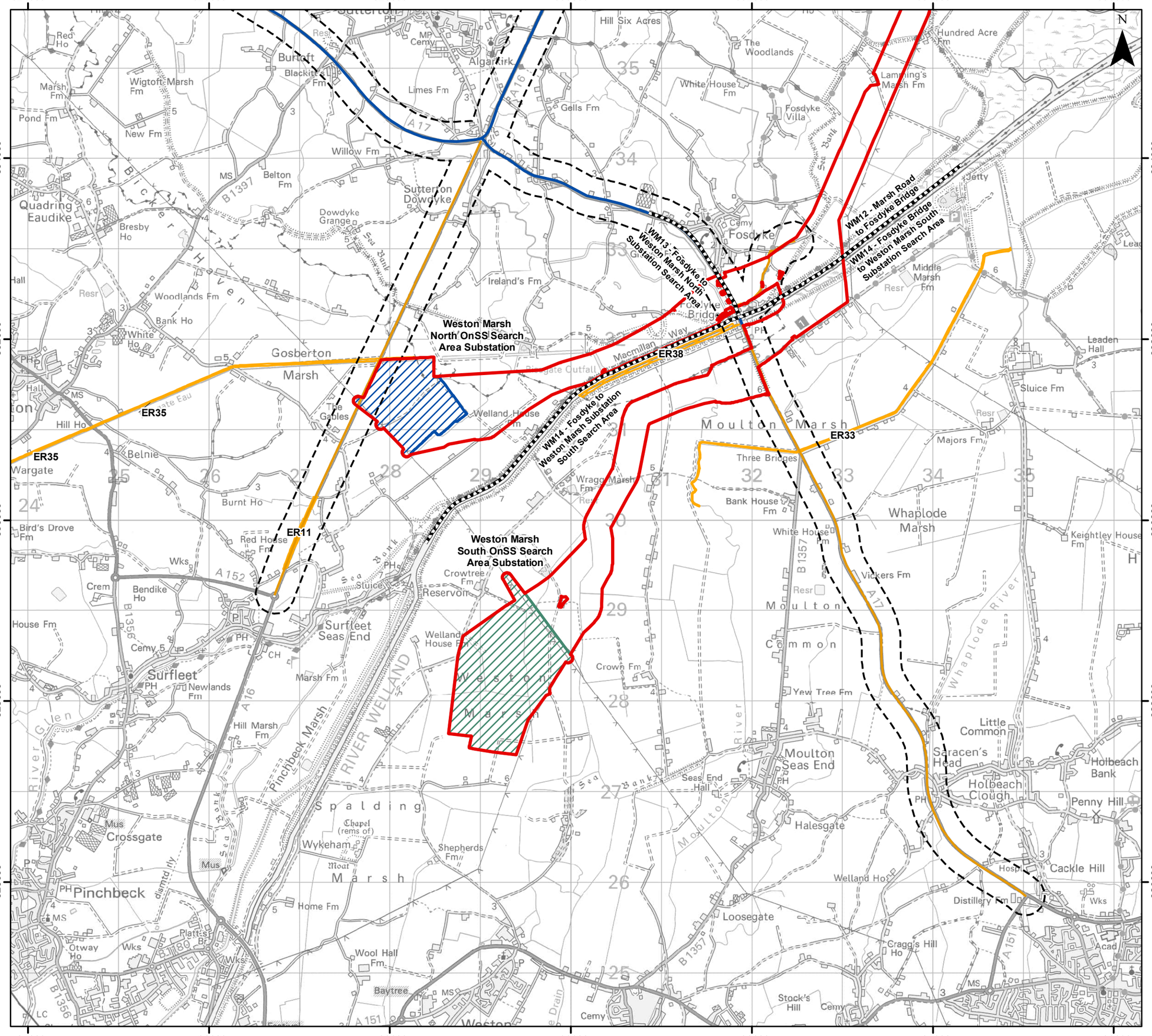
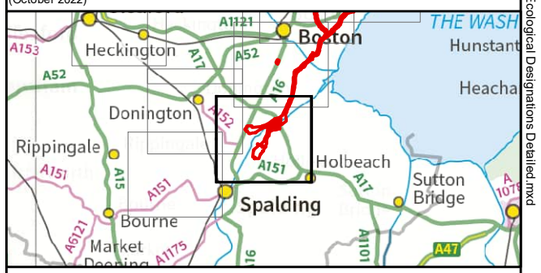


Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Weston Marsh North OnSS Search
- Weston Marsh South OnSS Search
- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Local Wildlife Site (LWS)



Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Page 12
Figure 19.3.12

OUTER DOWSING OFFSHORE WIND

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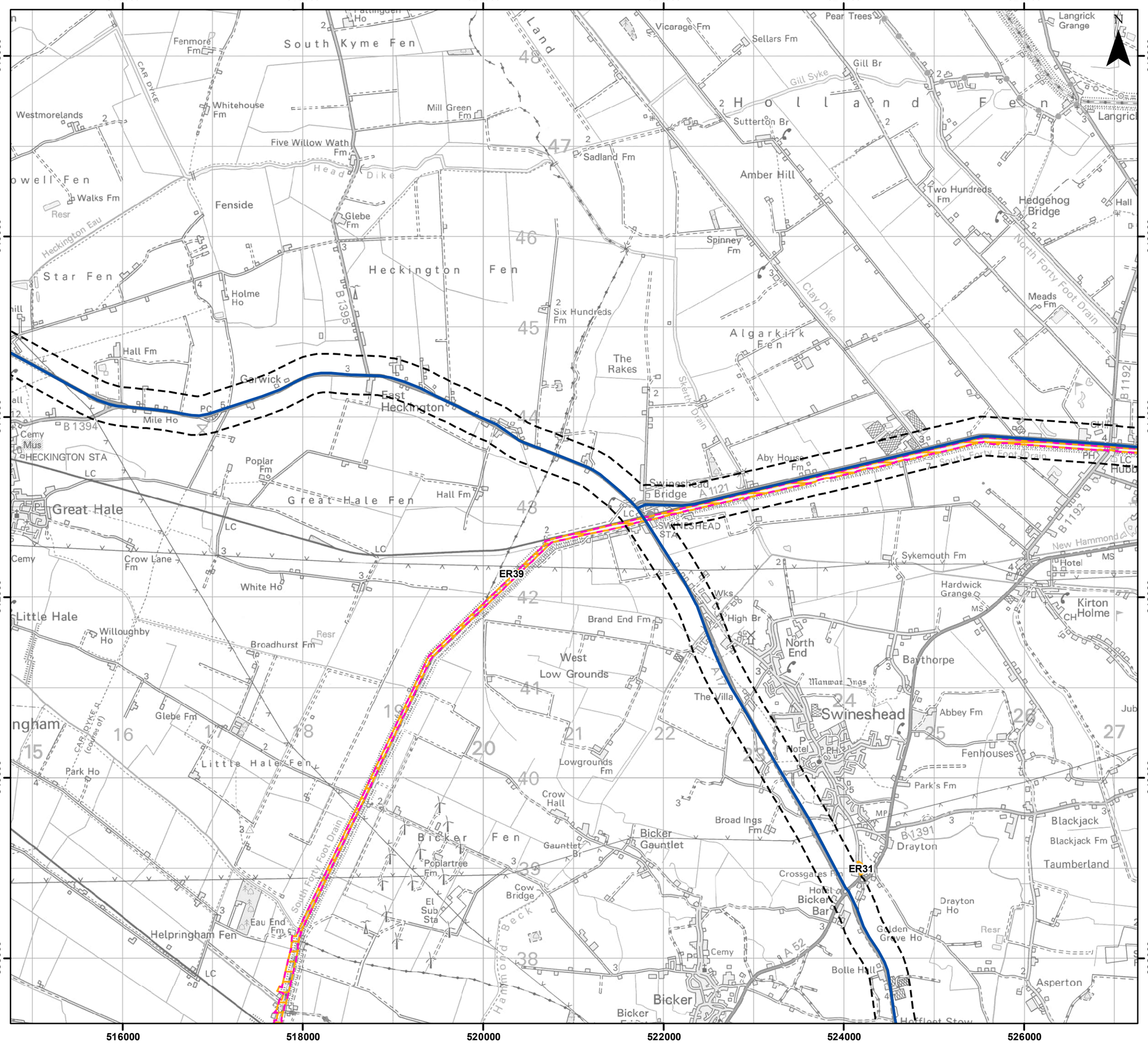

Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Local Wildlife Site (LWS)

Sources:

Locally Designated Sites provided by Lincolnshire Environmental Records Centre (October 2022)

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.13

OUTER DOWSING OFFSHORE WIND

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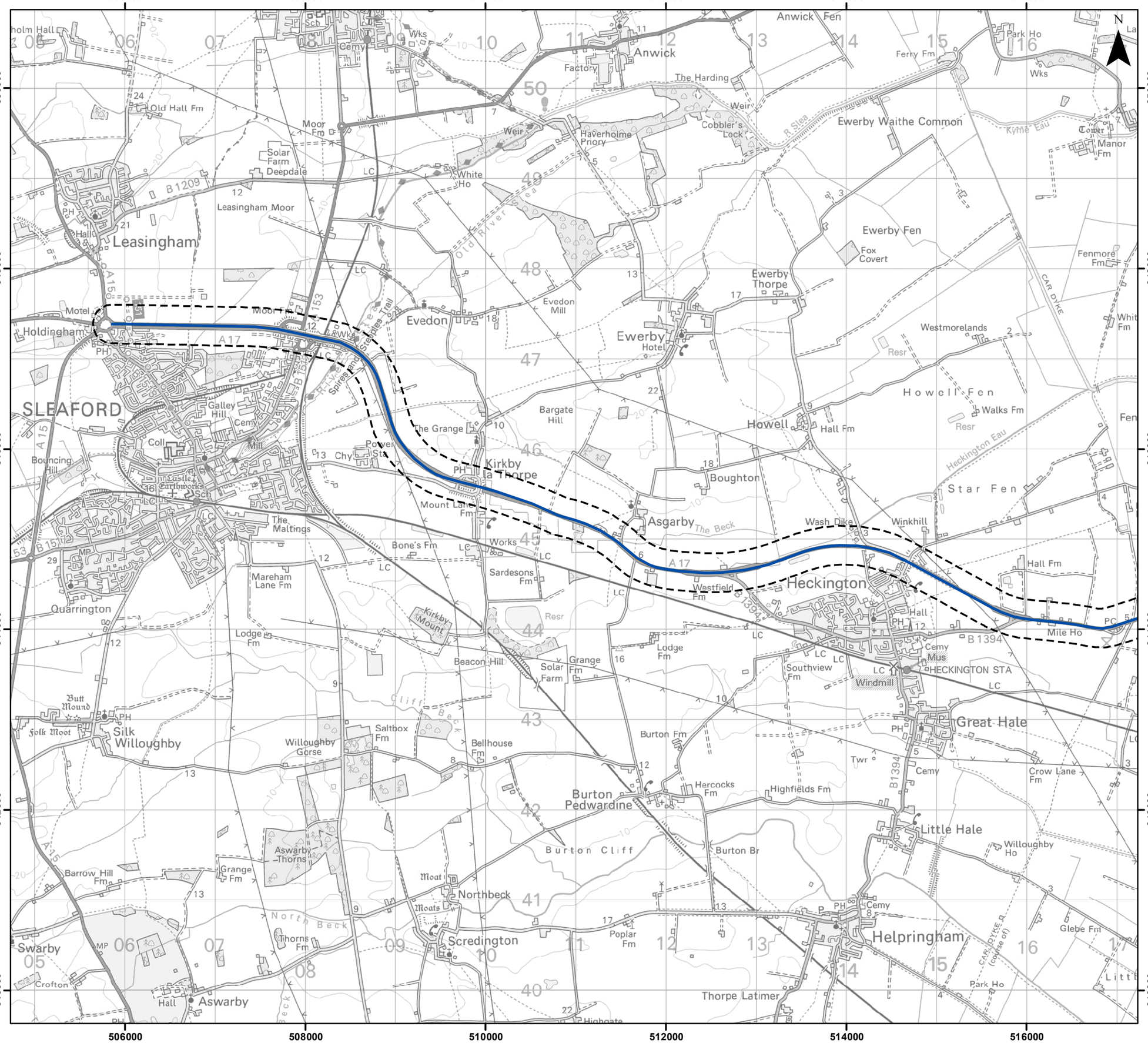

Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer

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Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.14

OUTER DOWSING OFFSHORE WIND

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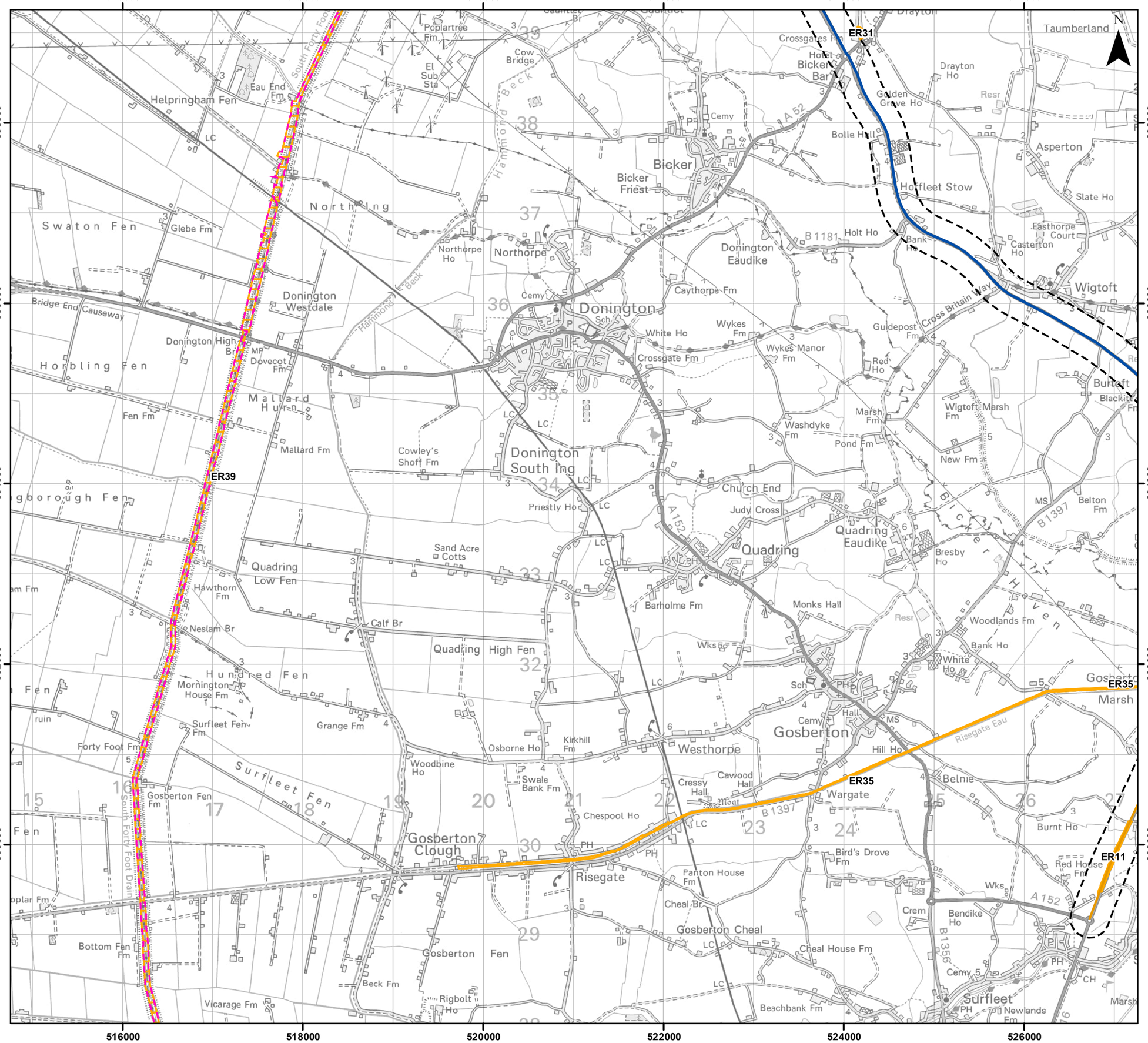

Legend

- Modelled Road Network
- Ecological Road Traffic Screening Routes
- Ecological Road Traffic Screening Routes 200 m Buffer
- Modelled Ecological Site
- Local Wildlife Site (LWS)

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Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
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Figure 19.3.15

OUTER DOWSING OFFSHORE WIND

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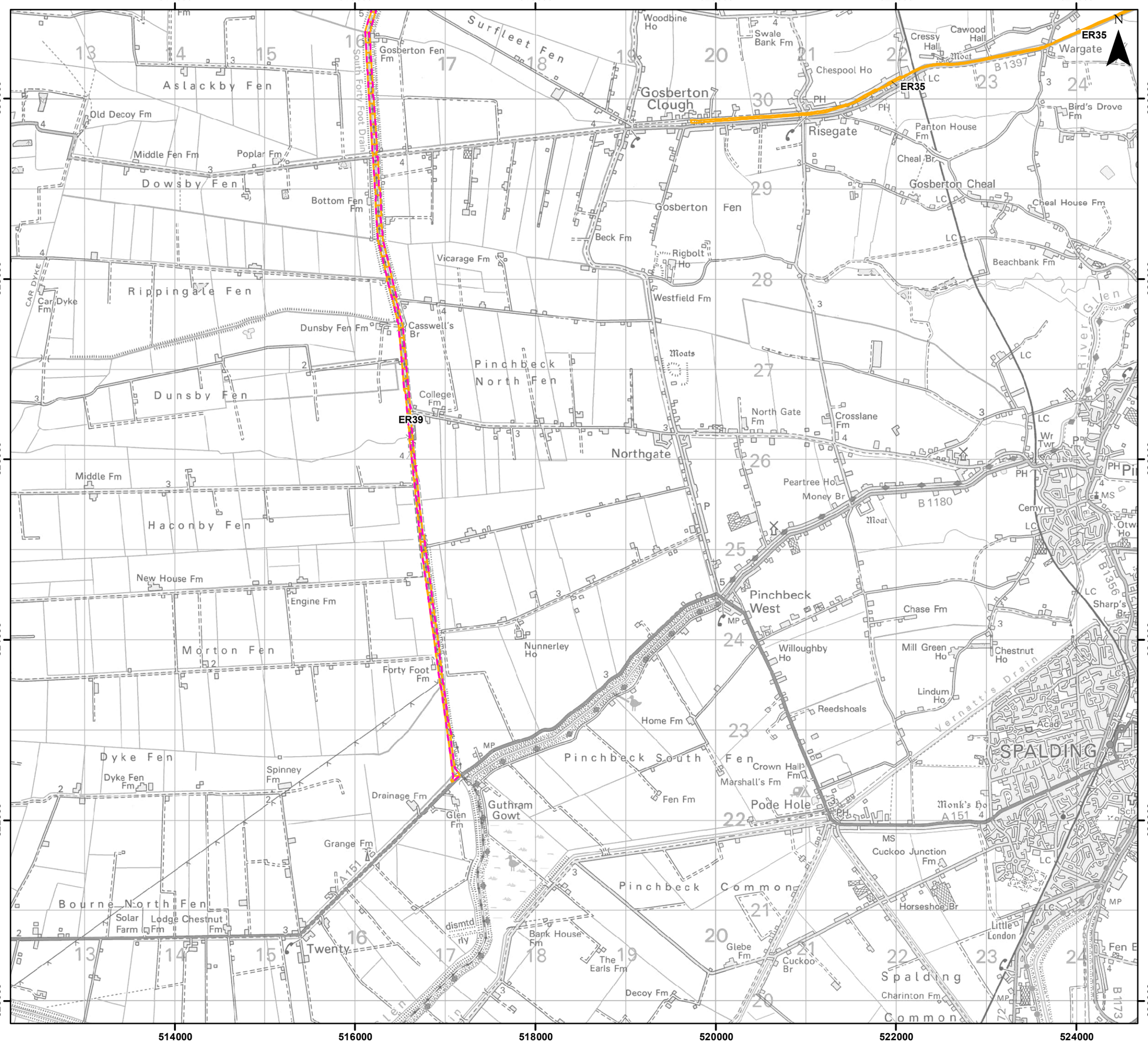

Legend

- Modelled Ecological Site
- Local Wildlife Site (LWS)

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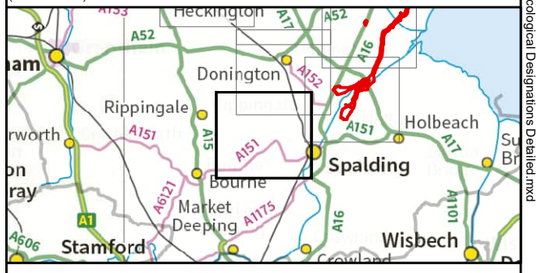

Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Assessment of Ecological Designations in Relation to Proposed Construction Haul Routes on the Public Road Network
Page 16
Figure 19.3.16

OUTER DOWSING OFFSHORE WIND

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Impact 3: Emissions generated from temporary construction NRMM

19.7.73 The full assessment of Impact 3 is presented in Volume 2, Appendix 19.2: NRMM Emissions Assessment, whilst the study area is presented in Figure 19.4.

19.7.74 It is acknowledged that the onshore ECC is split into segments. However, given the present uncertainties around the locations and timing of construction activities and use of NRMM, the onshore construction areas have been assessed collectively, rather than in discrete segments. This aggregated approach accounts for simultaneous construction activities across the onshore ECC.

19.7.75 The assessment has considered embedded mitigation in relation to NRMM, which includes controls relating to NRMM operation and emissions standards that have been included in the Outline AQMP, which forms part of the CoCP.

Human Receptors

19.7.76 Human receptors are present within 50m of potential NRMM activity associated with the landfall connection and onshore ECC elements of the Project. There are no human receptors near the OnSS search areas (which would have represented worst-case exposure in terms of construction and NRMM activity). Discrete construction activities are unlikely to occur concurrently in the same location, as activities are carried out in a sequence. Furthermore, given the phased nature and movement of works, exposure at any given location will be temporary. The locations of Temporary Construction Compounds (TCCs) and associated NRMM activity is more fixed, however the overall construction period and exposure is still considered short-term (i.e., up to 36-months).

19.7.77 The maximum annual mean background concentrations across the study area are well below the respective AQALs. Concentrations across the full extent of the onshore PEIR boundary are expected to vary and be lower relative to the maximum reported.

19.7.78 Whilst taking into account the embedded mitigation as well as the short-term, transient, phased nature of the construction works, and the background pollutant concentrations, the likelihood of NRMM causing an exceedance is therefore low. Potential impacts from NRMM emissions on human receptors are therefore considered negligible, with the resultant effect short-term, temporary and **not significant** in terms of the EIA Regulations.

Ecological Receptors

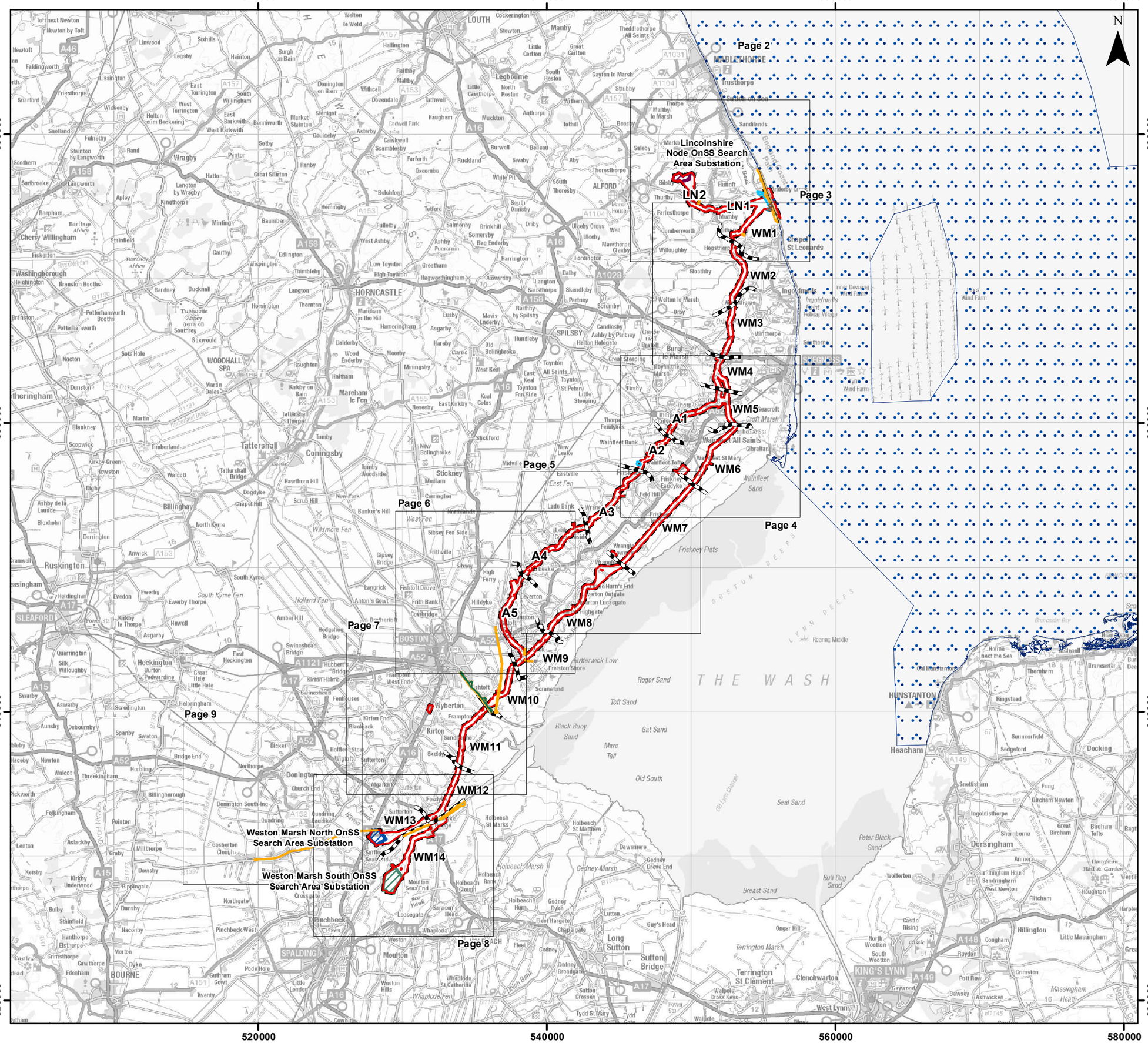
19.7.79 Designated ecological sites are present within 50m of potential NRMM activity associated with the landfall connection, onshore ECC and OnSS elements of the Project. Discrete construction activities are unlikely to occur concurrently in the same location. These activities are temporary, lasting up to a maximum of 36-months but likely to be far less at any given location.

19.7.80 Several of the designated ecological sites are in proximity to potential landfall connection activities and associated NRMM activity. Only 0.02% of the overall Greater Wash SPA designation is potentially exposed to NRMM activity, and less than half (43.6%) of the Sea Bank Clay Pits SSSI, and these affected areas are likely to be further reduced once the locations of activities are finalised.

19.7.81 One designated ecological site is located near one of the OnSS search areas (Weston Marsh north substation), this is the Risegate Eau LWS, however, only 5.7% of the designation is potentially impacted by NRMM activity.

19.7.82 The maximum annual mean background concentrations across the study area are well below the respective Critical Levels. Concentrations across the full extent of the onshore PEIR boundary are expected to vary and be lower relative to the maximum reported.

19.7.83 Whilst taking into account the embedded mitigation as well as the short-term, transient, phased nature of the construction works, the background pollutant concentrations and the potential areas of the designations affected, the likelihood of NRMM causing an exceedance or significant effect is therefore low. Potential impacts from NRMM emissions on ecological receptors are therefore considered negligible, with the resultant effect short-term, temporary and **not significant** in terms of the EIA Regulations.



Legend

- ▭ Onshore PEIR Boundary
- ▬ Onshore Segment Break
- ▨ Lincolnshire Node OnSS Search Area
- ▨ Weston Marsh North OnSS Search Area
- ▨ Weston Marsh South OnSS Search Area
- ▭ Special Protection Area (SPA)
- ▭ Site of Special Scientific Interest (SSSI)
- ▨ Local Nature Reserve (LNR)
- ▬ Local Wildlife Site (LWS)
- ▦ Lincolnshire Wildlife Trust Reserve (LWT)

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0 5 10 km

Scale: 1:250,000

Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions
Affected Areas
Overview

Figure 19.4.1

OUTER DOWSING
OFFSHORE WIND

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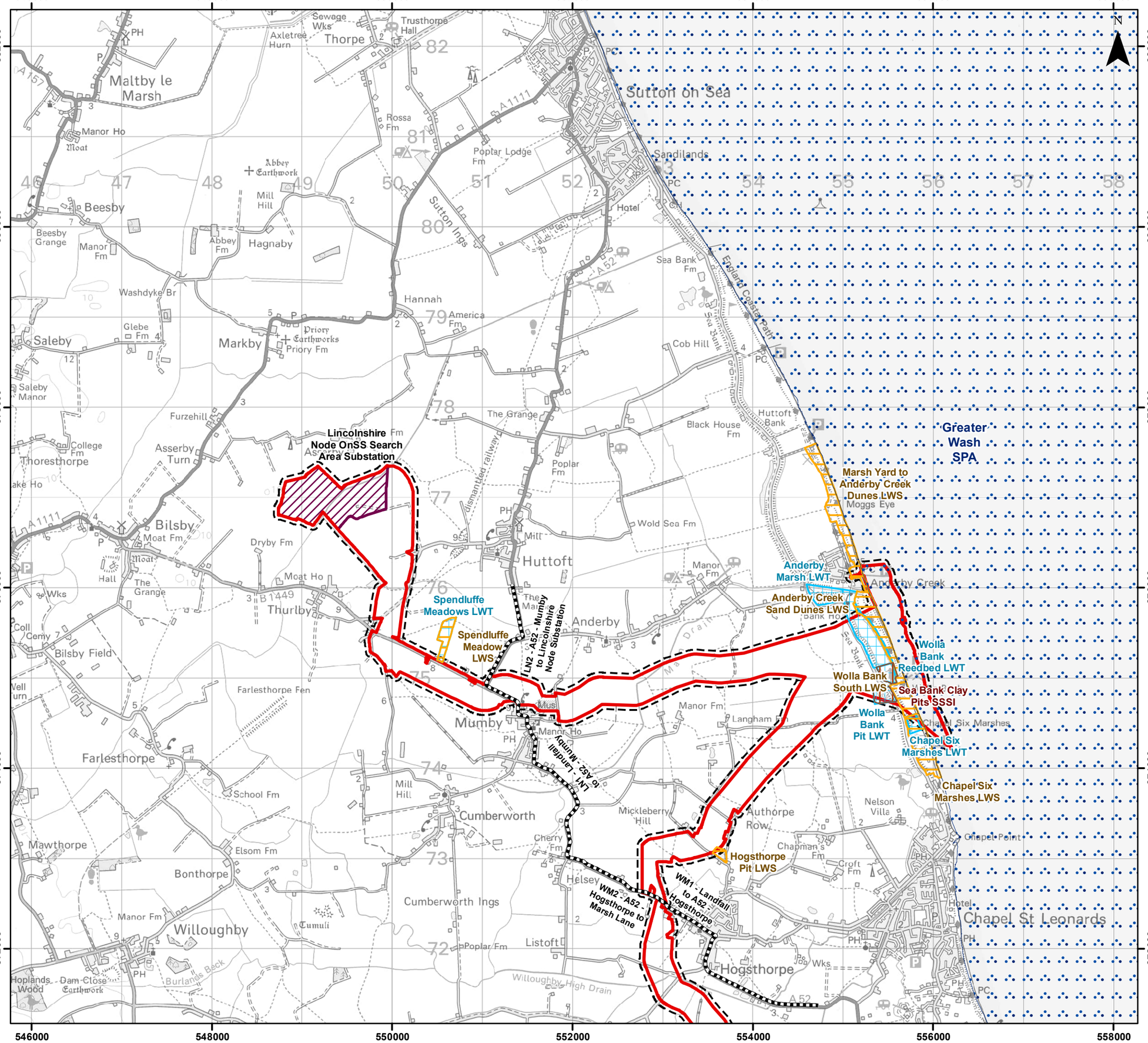

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Lincolnshire Node OnSS Search Area
- Onshore PEIR Boundary 50m Buffer
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)
- Lincolnshire Wildlife Trust Reserve (LWT)

Sources:

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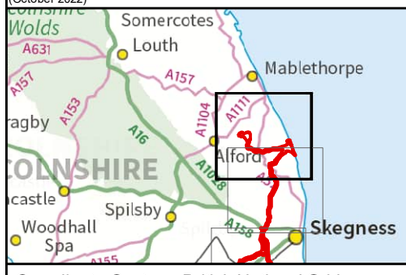

Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions Affected Areas
Page 2

Figure 19.4.2

OUTER DOWSING OFFSHORE WIND

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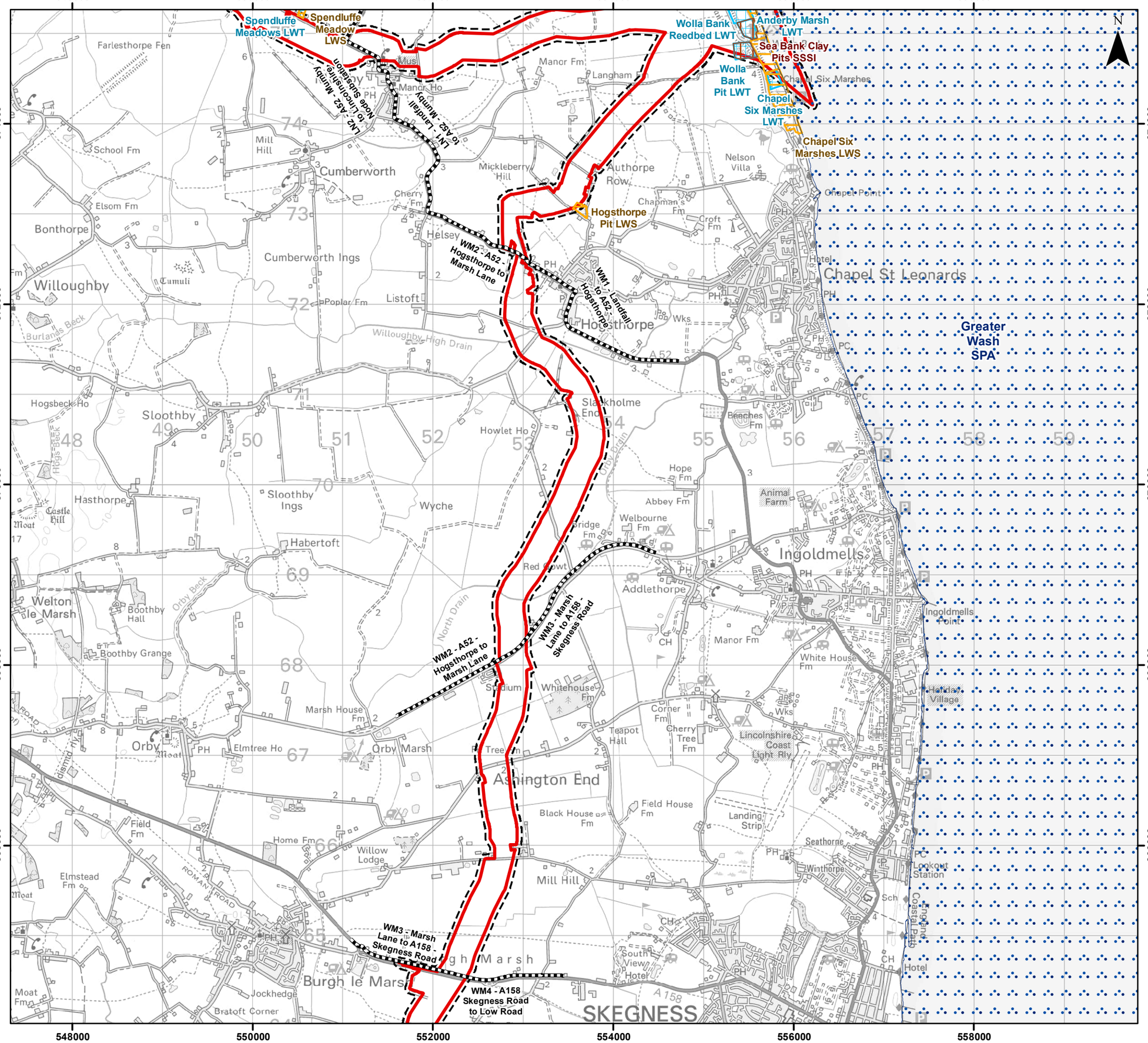

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Onshore PEIR Boundary 50m Buffer
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)
- Lincolnshire Wildlife Trust Reserve (LWT)

Sources:

Locally Designated Sites provided by Lincolnshire Environmental Records Centre (October 2022)

Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions Affected Areas
Page 3

Figure 19.4.3

OUTER DOWSING OFFSHORE WIND

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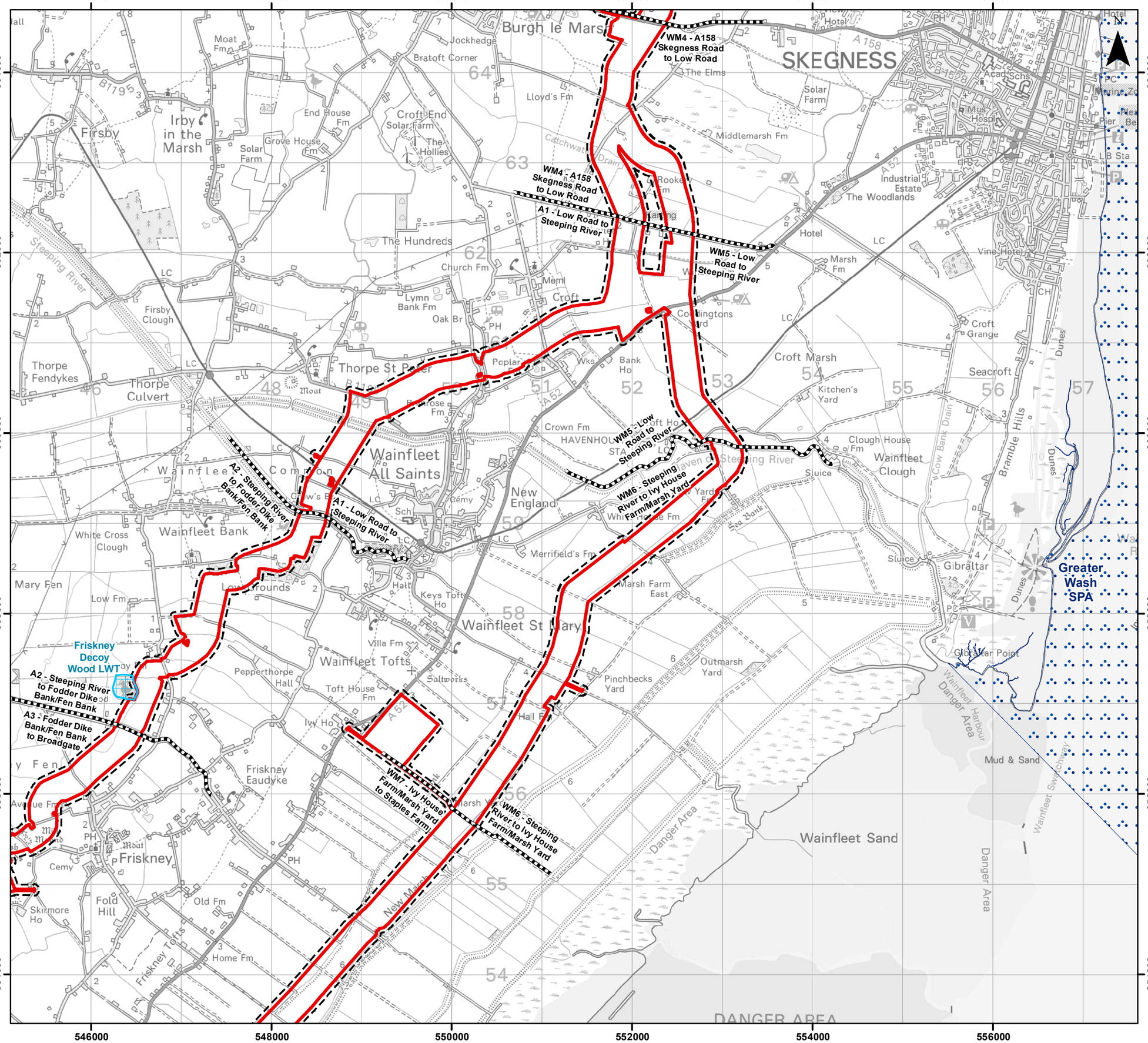

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Onshore PEIR Boundary 50m Buffer
- Special Protection Area (SPA)
- Lincolnshire Wildlife Trust Reserve (LWT)

Sources:

Locally Designated Sites provided by Lincolnshire Environmental Records Centre (October 2022)

Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions Affected Areas
Page 4

Figure 19.4.4

OUTER DOWSING OFFSHORE WIND

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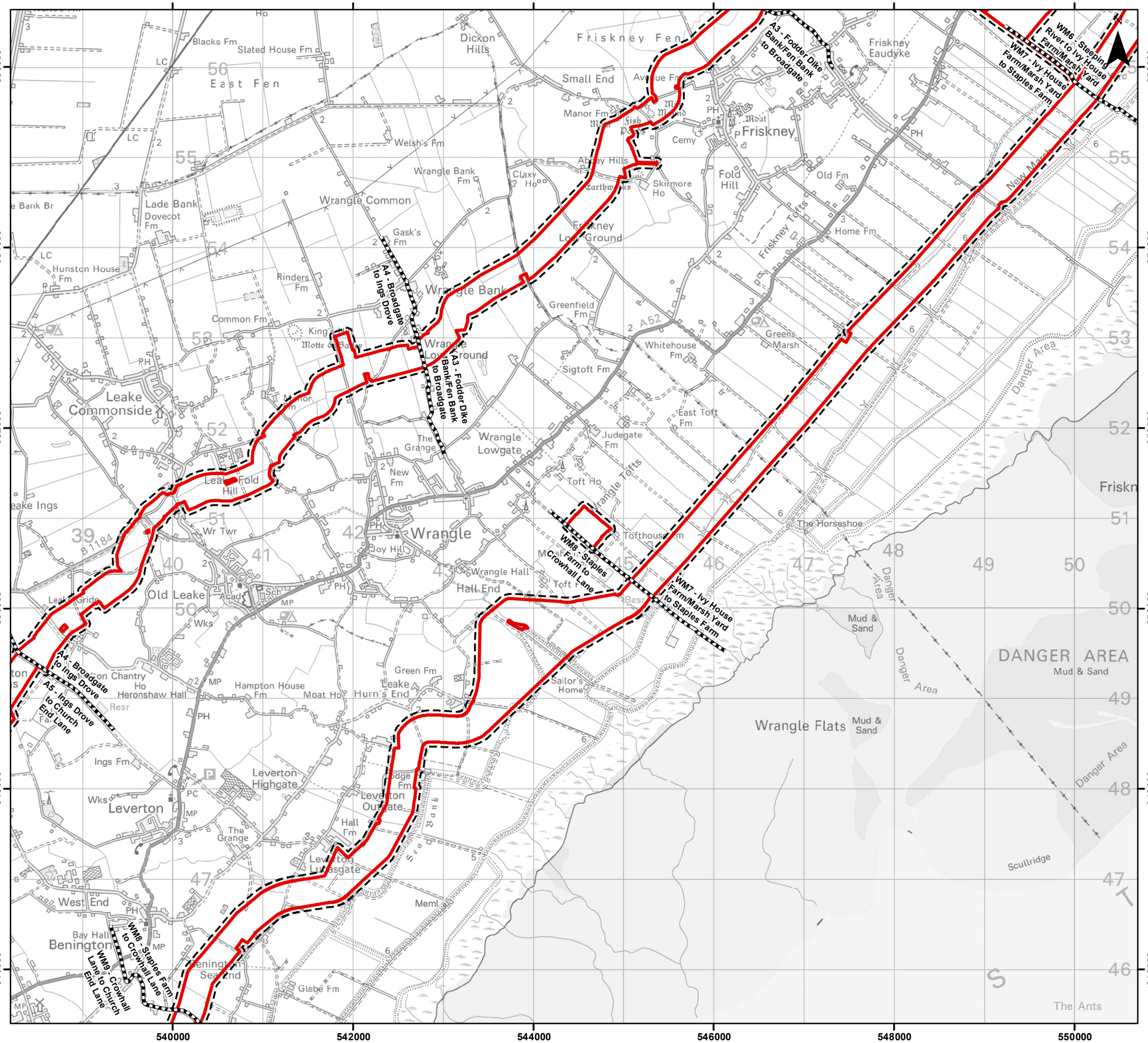
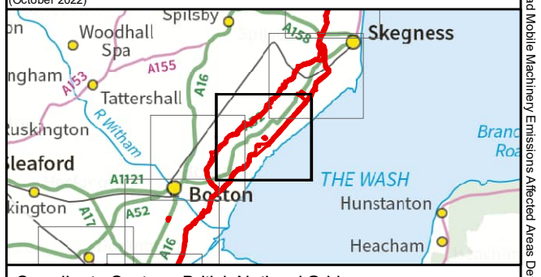


Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Onshore PEIR Boundary 50m Buffer



Coordinate System: British National Grid

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Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions Affected Areas
Page 5

Figure 19.4.5

OUTER DOWSING OFFSHORE WIND

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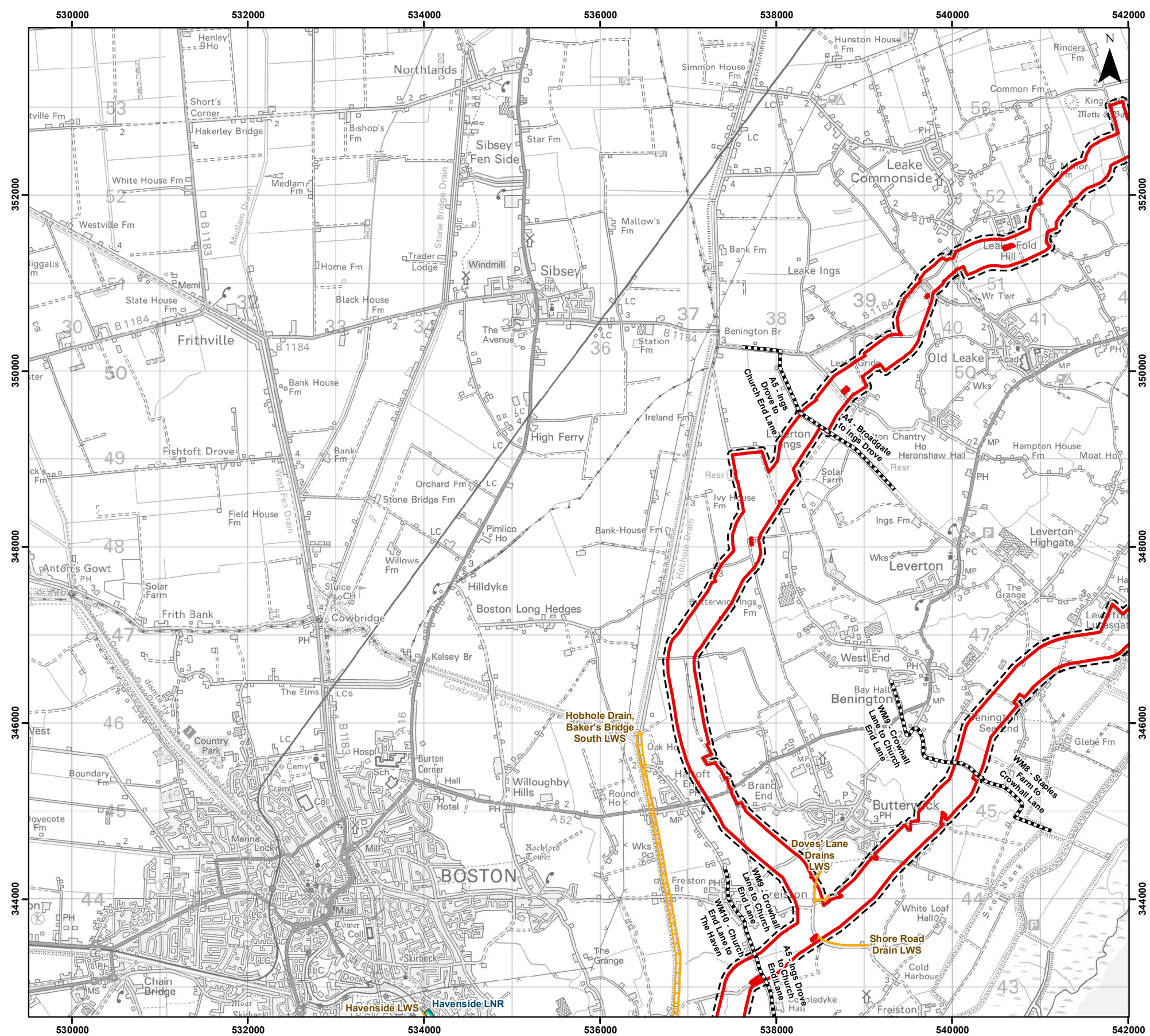
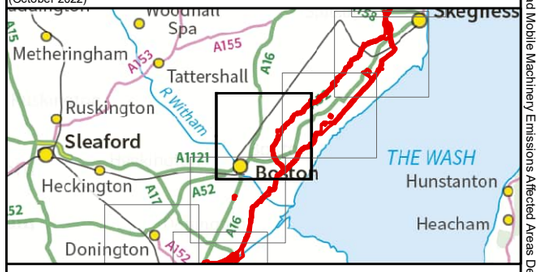


Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Onshore PEIR Boundary 50m Buffer
- Local Nature Reserve (LNR)
- Local Wildlife Site (LWS)



Coordinate System: British National Grid

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Scale: 1:40,000

Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions Affected Areas
Page 6

Figure 19.4.6

OUTER DOWSING OFFSHORE WIND

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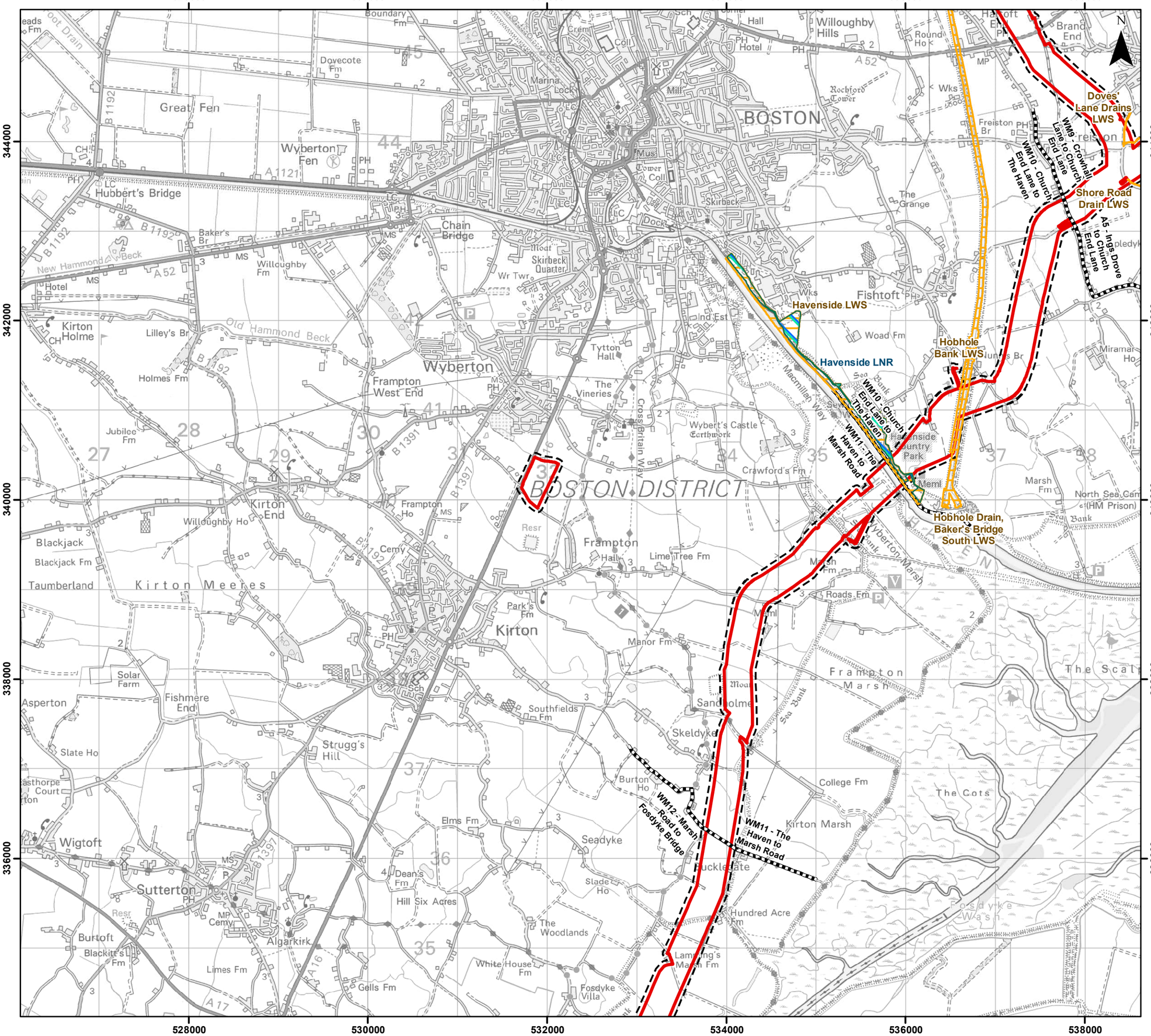

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Onshore PEIR Boundary 50m Buffer
- Local Nature Reserve (LNR)
- Local Wildlife Site (LWS)

Sources:

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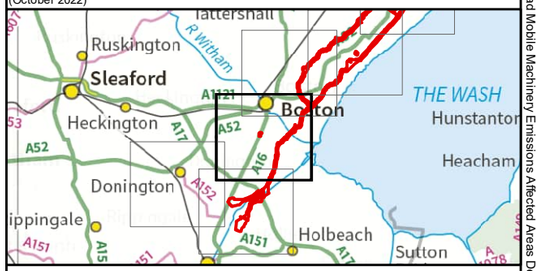

Coordinate System: British National Grid

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Scale: 1:40,000

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Non-Road Mobile Machinery Emissions Affected Areas
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Figure 19.4.7

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524000 526000 528000 530000 532000 534000 536000

334000 332000 330000 328000 326000

Weston Marsh North OnSS Search Area Substation

Weston Marsh South OnSS Search Area Substation

WM13 - Fosdyke to Weston Marsh North Substation Search Area

WM12 - Marsh Road to Fosdyke Bridge

WM14 - Fosdyke Bridge to Weston Marsh South Substation Search Area

WM14 - Fosdyke to Weston Marsh Substation South Search Area

Risegate Eau LWS

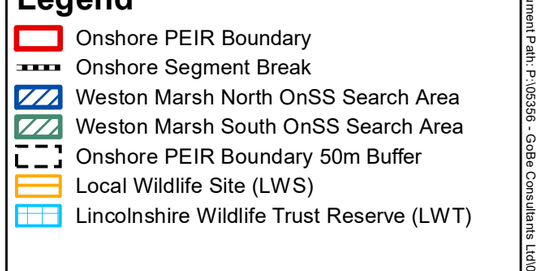
South Bank Fosdyke LWS

Moulton Marsh LWS

Moulton Marsh LWT

Legend

- Onshore PEIR Boundary
- Onshore Segment Break
- Weston Marsh North OnSS Search Area
- Weston Marsh South OnSS Search Area
- Onshore PEIR Boundary 50m Buffer
- Local Wildlife Site (LWS)
- Lincolnshire Wildlife Trust Reserve (LWT)



Coordinate System: British National Grid

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Scale: 1:40,000

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Non-Road Mobile Machinery Emissions Affected Areas
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Figure 19.4.8

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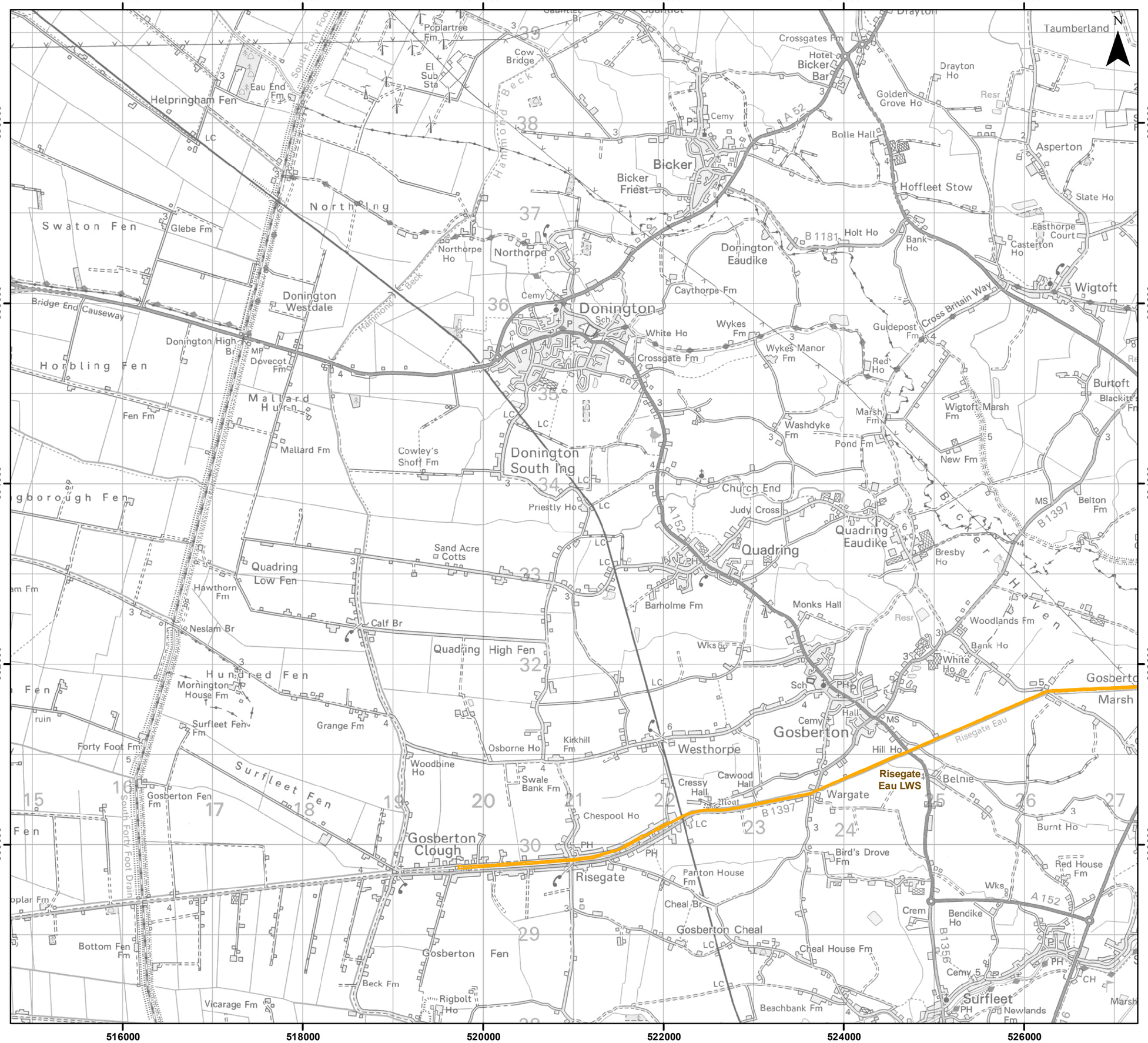

Legend

Local Wildlife Site (LWS)

Sources:

Coordinate System: British National Grid

0 1 2 km

Scale: 1:40,000

Preliminary Environmental Information Report

Non-Road Mobile Machinery Emissions Affected Areas
Page 9

Figure 19.4.9

OUTER DOWSING OFFSHORE WIND

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Impact 4: Emissions generated from temporary offshore vessel movements

19.7.84 The full assessment of Impact 4 is presented in Volume 2, Appendix 19.3: Offshore Activities Assessment, whilst the study area is presented in Figure 19.5. A summary is provided below. The assessment focuses on the offshore and onshore interface, therefore the segments WM1 Landfall to A52 – Hogsthorpe, and LN1 Landfall to A52 – Mumby.

19.7.85 Offshore vessel movements associated with the Project would represent a small number of overall vessel traffic in the North Sea, therefore accounting for a small proportion of total emissions. Further information is provided within Volume 1, Chapter 15: Shipping and Navigation.

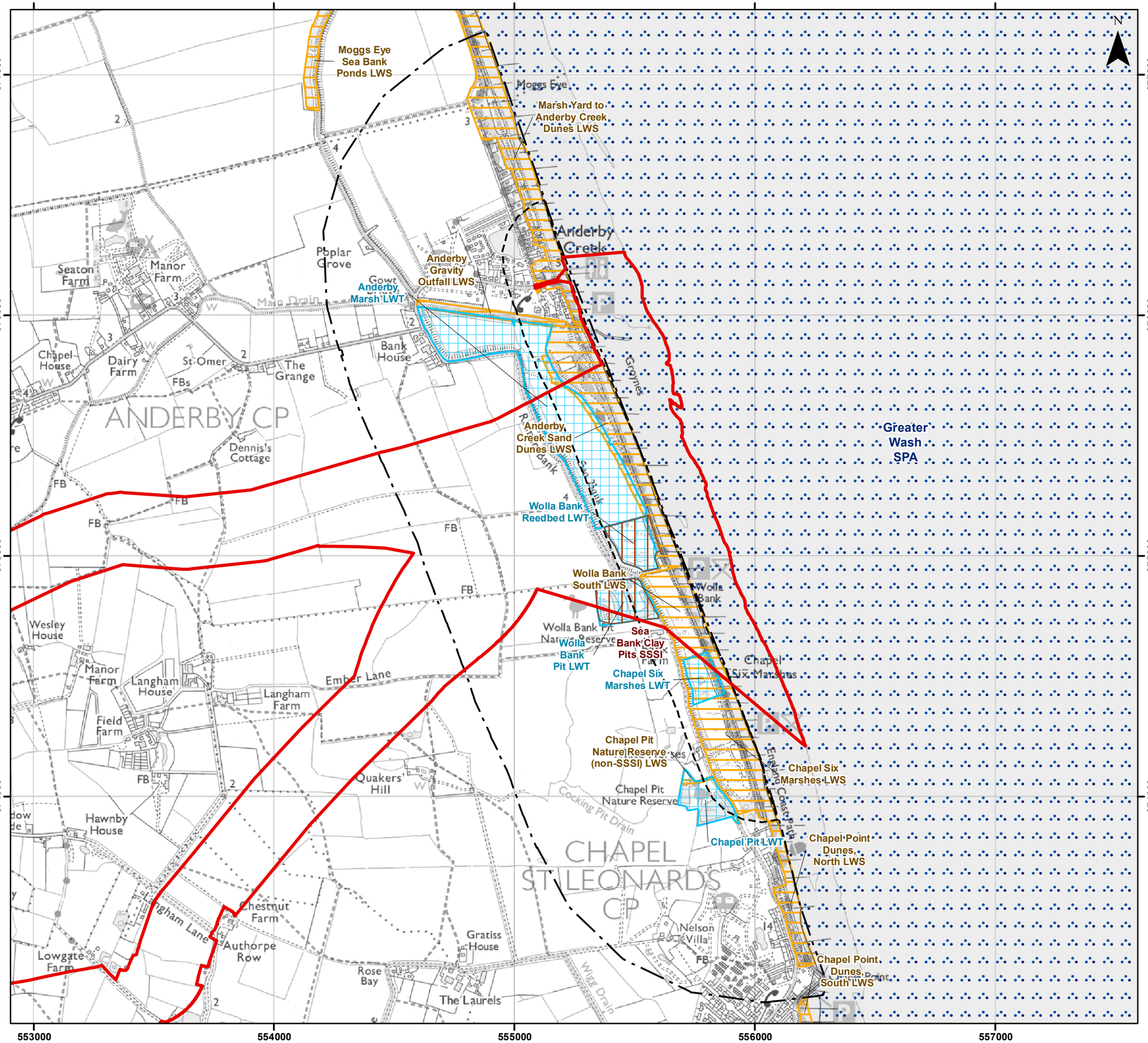
19.7.86 Furthermore, vessel emissions within the North Sea are regulated by legislation. The North Sea is a designated Emissions Control Area under MARPOL Annex VI, where strict pollutant emission limits apply. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy such as the Maritime 2050 and Clean Maritime Plan. These policies provide a strategy for the transition to zero emission shipping within the UK. Therefore, emission contributions from vessel emissions are expected to reduce further in the future.

19.7.87 The maximum projected background concentrations reported for the onshore locations likely to be affected by nearshore vessel movements are well below the corresponding AQALs and Critical Levels.

19.7.88 The assessment determined that vessel movements associated with the 'Offshore Export Cable Installation' activity, i.e., movements by main cable laying, main cable jointing, main cable burial and support vessels, are the only vessel movements likely to occur within 250m and/or 1km of sensitive onshore receptors (at the location of the offshore and onshore interface).

19.7.89 The total number of vessel movements estimated to occur throughout the construction phase within 250m and/or 1km of onshore works are below the LAQM.TG22 screening thresholds. Furthermore, actual annual movements are anticipated to be lower than those values used for screening. Onshore construction works are expected to last up to three-years, and as such impacts are considered to be negligible, with no long-term deterioration of conditions.

19.7.90 Whilst taking the above into account, in conjunction with baseline conditions, emissions from vessels associated with the construction phase are considered to be short-term, temporary and **not significant** in terms of the EIA Regulations.



Legend

- Onshore PEIR Boundary
- 250 m Study Area
- 1 km Study Area
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Wildlife Site (LWS)
- Lincolnshire Wildlife Trust Reserve (LWT)

Coordinate System: British National Grid

0 0.5 1 km

Scale: 1:15,000

Preliminary Environmental Information Report

Vessel Emissions Affected Areas

Figure 19.5

OUTER DOWSING OFFSHORE WIND

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Operations and Maintenance

19.7.91 This section presents the assessment of impacts arising from the O&M phase of the Project.

19.7.92 Once operational, activities will be limited to maintenance activities. These are expected to be intermittent and infrequent in comparison to the assessed construction activities.

19.7.93 Effects associated with all construction phase assessment are considered to be not significant. For these reasons, operational activities are not anticipated to exceed the construction phase worst-case criteria assessed and impacts are considered to be not significant.

Impact 1: Operational phase traffic movements

19.7.94 In relation to likely O&M vehicle movements, these will predominantly be LDV movements associated with visits to the unstaffed OnSS. It is anticipated that at a maximum, there would be approximately 4-8 traffic movements per day – however these will be limited to a 2-week period for annual testing. Outside of this period, there are likely to be approximately 4-8 traffic movements per week. In addition, there is expected to be 1 visit to each joint bay per year.

19.7.95 Furthermore, during the O&M phase and aside from the routine activities described above, there is a possibility of the need to replace any failed major components at the OnSS – which would require Abnormal Indivisible Load (AIL) movements. This would be a rare, occasional occurrence and therefore associated vehicle movements would not exceed the EPUK & IAQM screening thresholds for HDVs.

19.7.96 As such, based on the above information, O&M phase vehicle movements are below the EPUK & IAQM screening thresholds. Therefore, operational effects from road traffic emissions can be screened out from requiring further assessment and are considered **not significant**.

Decommissioning

19.7.97 This section presents the assessment of impacts arising from the Decommissioning phase of the Project.

Impact 1: Decommissioning phase traffic movements and other works

19.7.98 Decommissioning activities are expected to occur for up to three-years – however this will be driven primarily by offshore works. Decommissioning activities are not anticipated to exceed the construction phase worst-case criteria assessed, given the following:

- Landfall and cable infrastructure is expected to be left in situ where appropriate, to abate potential future impacts and minimise the extent of decommissioning activities;
- Emission restrictions are expected to tighten in future years and in the interim before decommissioning activities occur (i.e., >25 years from installation). This forecast is based on the introduction and availability of cleaner technologies and fuels, alongside legislation. Therefore, emission contributions from potential future sources (e.g., vehicles, vessels and NRMM) generated during the decommissioning phase are expected to be lower in comparison to at present; and

- Air quality is expected to improve in future years, and in the interim before decommissioning activities occur; based on the introduction of policy and legislation, and availability of cleaner technologies.

19.7.99 These elements (alone and/or in combination) would result in a reduction in the level of significance in comparison to the assessment of construction effects. The outcomes of the construction phase assessment indicate that all impacts assessed following applied mitigation are not significant. Further assessment in relation to the decommissioning phase is therefore not required and effects are considered to be **not significant**.

19.8 Cumulative Impact Assessment

19.8.1 As detailed in Volume 2, Appendix 5.2: Onshore Cumulative Impact Assessment, a staged process is followed to identify potential cumulative developments which may interact with the Project.

19.8.2 Of the potential cumulative developments identified, the following were screened in for potential cumulative air quality effects, and therefore considered in the CEA:

- B/20/0488 – Outline application for 46 residential dwellings and associated works with all matters reserved for later approval;
- B/20/0489 – Proposed residential development of 20 affordable dwellings and associated works;
- B/21/0196 – Approval of reserved matters (Access, appearance, landscaping, layout and scale) following outline approval B/16/0465 (Residential development of up to 42 dwellings);
- N/084/01712/22 – Detailed particulars relating to the erection of 89 no. Dwellings, erection of a pumping station, construction of a vehicular access and construction of internal roads (Outline planning permission ref no. N/084/0809/19, granted 13th September 2019); and
- Boston Alternative Energy Facility (BAEF) – 102Mwe gross (80Mwe exportable) energy from waste facility with light weight aggregates facility, wharf, waste reception and storage facility and grid connection.

19.8.3 Each assessed impact from the main assessment is discussed in turn in the following sections.

Construction Phase

Construction Dust Assessment

19.8.4 Cumulative dust effects arising from construction activities could be experienced where construction activities from more than one scheme overlap at an affected receptor, dependent on the dust impact (e.g., dust soiling, human health and ecological).

19.8.5 However, all schemes which are considered to pose a risk of cumulative effects will have had to undertake a construction dust assessment separately relating to their own site activities and associated risks, with the recommendation of best practice mitigation to remedy residual effects as not significant in terms of the EIA regulations.

19.8.6 These measures would be integrated into a Construction Environmental Management Plan or similar, to be adhered to during construction, as part of their own environmental responsibilities and commitments.

19.8.7 The IAQM construction guidance (IAQM, 2016) states that, with the implementation of the recommended mitigation, effects will be not significant. As such, it is not anticipated that there would be significant cumulative effects associated with construction phase dust emissions.

19.8.8 Given that all other assessment considerations have been screened out in isolation as per the IAQM construction guidance, no further assessment in relation to cumulative effects is therefore required.

Road Traffic Assessment

19.8.9 In consideration of the likely changes in road traffic flows that may occur on the local highway network as a result of the Project, consideration has been given to the potential maximum traffic flows that could occur in the future assessment year (i.e., 2027), (based upon information currently available). The traffic flows used include vehicle movements associated with relevant committed developments and live projects / plans in the assessment area.

19.8.10 As such, the dispersion modelling results are inherently cumulative in nature. The cumulative effect of the Project is therefore considered to be not significant in terms of the EIA regulations.

NRMM Emissions Assessment

19.8.11 According to the IAQM construction guidance (IAQM, 2016) and LAQM.TG22 (Defra, 2022), experience of assessing the exhaust emissions from NRMM and site traffic suggests that, with suitable controls and site management, they are unlikely to contribute to a significant effect on local air quality.

19.8.12 A series of construction phase control measures to minimise potential NRMM impacts are outlined within Document 8.1.2: Outline Air Quality Management Plan. These measures will be included within the CoCP, secured as a requirement of the DCO.

19.8.13 Similarly, NRMM emissions at other surrounding construction sites (where cumulative effects may pose a risk) would be controlled and minimised to remedy residual effects as not significant in terms of the EIA regulations. These controls would be integrated into a Construction Environmental Management Plan or similar, to be adhered to during construction, as part of their own environmental responsibilities and commitment.

19.8.14 As such, it is not anticipated that there would be significant cumulative effects associated with construction phase NRMM emissions.

19.8.15 With respect to the NRMM assessment outcomes for the Project, resultant effects are considered not significant – validating Defra's and the IAQM's position. This was based on the extent of NRMM proposed to be used (type, quantum and likely emission standards), associated control measures, the transient/phased nature of the construction works, proximity to receptors and pollutant concentrations across the construction study area. Cumulative effects are therefore not likely.

19.8.16 There is very low likelihood of NRMM activities from other developments to simultaneously overlap within 50m of a sensitive receptor at any one time, given the spatial extent and temporal limitations of likely activities. In addition, any potential for cumulative effects would rely on an overlap of construction phases, which may be unlikely.

19.8.17 Construction activities will be temporary/mobile, and plant will not be fixed for the full duration of works. By way of example, construction activities along the onshore ECC will be undertaken in a sequence, according to the phase, and will therefore spatially vary as construction progresses. Exposure to NRMM emissions (in the majority of cases) will be transient. Therefore, in the event that construction activities from the Project did overlap with a cumulative development, exposure would be temporary and not cause a long-term persistent deterioration of conditions.

19.8.18 Furthermore, given that the maximum pollutant background concentrations across the onshore ECC study area are well-below the AQALs/Critical Levels, localised NRMM emissions are highly unlikely to contribute to a significant effect on any identified receptor, from the Project alone or cumulatively with other schemes.

19.8.19 In consideration of the above, potential cumulative effects associated with NRMM emissions are considered to be **not significant** in terms of the EIA regulations.

Offshore Activities Assessment

19.8.20 Potential large vessel movements that are simultaneously generated by other developments within 1km of landfall (i.e., where the Project vessels will interact with onshore receptors) during the three-year construction period have the potential to cause cumulative effects.

19.8.21 From review of the committed developments which screen into the CEA (outlined above), it is concluded that no large vessel movements would be generated and therefore cumulative effects associated with offshore activities on onshore receptors during construction are not possible and would be considered **not significant** in terms of the EIA regulations.

Operational Phase

Road Traffic Assessment

19.8.22 Consistent with The Inspectorate's (The Inspectorate, 2022) recommendation, road traffic flows generated by operational activities have been compared against criteria outlined within the EPUK & IAQM guidance document. Operational road traffic flows screen below the EPUK & IAQM criteria and effects are considered to be **not significant** in terms of the EIA Regulations and no further assessment is required.

19.8.23 Consistent with applied guidance prescribed by the EPUK & IAQM, screening of projected road traffic vehicle movements has been undertaken in isolation and associated effects are considered insignificant. No further assessment in relation to cumulative effects is therefore required.

19.8.24 Notwithstanding, operational phase impacts are not likely to exceed the construction phase for which a full cumulative assessment was undertaken and concluded that there are no significant effects.

19.8.25 Cumulative effects associated with operational road traffic flows are considered **not significant** in terms of the EIA regulations.

19.9 Inter-Relationships

19.9.1 The construction phase road traffic screening assessment is based on traffic flows presented in Volume 1, Chapter 27: Traffic and Transport.

19.9.2 It is acknowledged that noise, visual, and air quality effects could overlap at a sensitive human receptor location. Furthermore, ecological designations could experience noise and air quality effects, in-combination.

19.9.3 However, given that all air quality effects established as part of this assessment are considered to be **not significant** in terms of the EIA regulations, the likelihood of a cumulative intra-project effect occurring as a result of air quality is low. No further assessment is therefore required.

19.10 Transboundary Effects

19.10.1 Air quality impacts and effects will be localised; restricted to the onshore areas where activities are occurring and not experienced across international boundaries. Further assessment of transboundary effects has therefore been scoped out of the assessment. This approach was agreed by The Inspectorate in the Scoping Opinion (The Inspectorate, 2022).

19.11 Conclusions

19.11.1 This assessment has considered the potential air quality effects on onshore receptors arising from activities associated with the Project. Consideration has been given to the MDS and worst-case parameters have been adopted to provide a robust assessment.

19.11.2 The approach undertaken was based upon the Scoping Opinion received from The Inspectorate (The Inspectorate, 2022), and the EPP. The summary of effects is summarised in Table 19.16.

Construction

19.11.3 The assessments of dust/PM_{10}, NRMM, and offshore vessel emissions generated during the construction phase of the Project concluded that effects are **not significant** at sensitive human and ecological receptors in line with EIA regulations.

19.11.4 Embedded mitigation measures for dust/PM_{10} and NRMM have been identified in Document 8.1.2: Outline Air Quality Management Plan for inclusion within the CoCP.

19.11.5 Impacts associated with temporary increases in road traffic flows on the local road network as a result of the construction phase of the Project have been assessed at sensitive human and ecological receptors. An initial screening assessment determined the extent of the affected road network and receptors for inclusion within the dispersion modelling assessment.

19.11.6 It is concluded that effects associated with road traffic emissions generated by Project construction activities on human and ecological receptors are not significant in terms of the EIA regulations. Road traffic flows associated with committed developments and live projects/plans are considered in the assessment, which is therefore cumulative in nature. Furthermore, onshore construction works are expected to last up to 36-months and as such, any consequential impacts onto local road traffic flows are believed to be temporary, with no long-term deterioration of conditions.

Operations and Maintenance

19.11.7 Operational road traffic impacts were screened out from requiring further assessment based on the anticipated road traffic flows being below the EPUK & IAQM screening criteria.

Decommissioning

19.11.8 Decommissioning activities are not anticipated to exceed the construction phase worst-case criteria assessed; whereby all effects assessed are concluded as being **not significant**. Further assessment in relation to the decommissioning phase is therefore not required as effects are believed to be **not significant**.

Cumulative Impact Assessment

19.11.9 A cumulative impact assessment has been undertaken to consider potential cumulative effects of the Project in combination with other committed developments and live projects / plans in the assessment area.

19.11.10 Potential cumulative effects associated with construction phase dust/PM_{10}, road traffic, NRMM, and offshore vessel emissions are considered to be **not significant** in terms of the EIA regulations.

19.11.11 Furthermore, during the operational phase, cumulative effects associated with road traffic flows are considered **not significant** in terms of the EIA regulations.

Table 19.16: Summary of effects for Air Quality

Description of effect	Effect	Additional mitigation measures	Residual effect
Construction			
Dust/PM_{10} emissions generated from temporary onshore construction works	Negligible to minor adverse (**not significant**)	No additional mitigation identified.	Negligible to minor adverse (**not significant**)
Road traffic emissions generated from	Negligible (**not significant**)	No additional mitigation identified.	Negligible (**not significant**)

Description of effect	Effect	Additional mitigation measures	Residual effect
temporary construction vehicle movements – human receptors			
Road traffic emissions generated from temporary construction vehicle movements – ecological receptors	Negligible (**not significant**)	No additional mitigation identified.	Negligible (**not significant**)
Emissions generated from temporary construction NRMM	Negligible (**not significant**)	No additional mitigation identified.	Negligible (**not significant**)
Emissions generated from temporary offshore vessel movements	Negligible (**not significant**)	No additional mitigation identified	Negligible (**not significant**)
Operation and Maintenance			
Operational phase traffic movements	Negligible (**not significant**)	Not required	Negligible (**not significant**)
Decommissioning			
Likely air quality impacts associated with decommissioning phase traffic movements and other works	Impacts and effects comparable to the construction phase, or likely lesser given the forecast improvements to air quality and the potential for the cables to remain in situ.		

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