NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Chapter 20 Onshore Air Quality

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Glossary of Acronyms

AADT	Annual Average Daily Traffic
ADMS-Roads	Atmospheric Dispersion Modelling System for Roads
APIS	Air Pollution Information System
ARN	Affected Road Network
ASR	Annual Status Report
AQMA	Air Quality Management Areas
CAS	Clean Air Strategy
CBS	Cement-Bound Sand
CEH	Centre for Ecology and Hydrology
CEA	Cumulative Effects Assessment
CoCP	Code of Construction Practice
DCO	Development Consent Order
DPF	Diesel Particulate Filters
DECC	Department for Energy and Climate Change (replaced by DESNZ)
Defra	Department for the Environment Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DETR	Department of the Environment, Transport and the Regions
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DMT	Decision-Making Threshold
EC	European Commission
EFT	Emission Factor Toolkit
EPO	Environmental Protection Officer
EIA	Environmental Impact Assessment
EN-1	National Policy Statement for Energy
EN-3	National Policy Statement for Renewable Energy Infrastructure
EN-5	National Policy Statement for Electricity Networks Infrastructure
EPP	Evidence Plan Process
EPUK	Environmental Protection United Kingdom
ES	Environmental Statement
EU	European Union
HDD	Horizontal Directional Drilling
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicles
HMSO	His Majesty's Stationery Office
HVAC	High-Voltage Alternating Current
IAQM	Institute of Air Quality Management
IPC	Infrastructure Planning Commission (now Planning Inspectorate)
IRZ	Impact Risk Zone

JNCC	Joint Nature Conservation Committee
km	Kilometre
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles
LNR	Local Nature Reserve
LPA	Local Planning Authority
MCerts	Monitoring Certification Scheme
MW	Megawatts
N-dep	Nitrogen deposition
NOx	Nitrogen Oxide
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
OCoCP	Outline Code of Construction Practice
PEIR	Preliminary Environmental Information Report
PM	Particulate Matter
SAC	Special Area of Conservation
SI	Statutory Instrument
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom

Glossary of Terminology

The Applicant	North Falls Offshore Wind Farm Limited (NFOW)
The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Cable circuit (onshore)	The onshore export cables are comprised of cable 'circuits'. Each cable circuit is typically comprised of three power cables, as well as fibre cables and earth cables. It is expected that each circuit would compromise up to seven cables in total.
Landfall	The location where the offshore cables come ashore at Kirby Brook.
Landfall compound	Compound at landfall within which horizontal directional drill (HDD) or other trenchless technique would take place.
Transition joint bay	Underground structures that house the joints between the offshore export cables and the onshore export cables.
Horizontal directional drill (HDD)	Trenchless technique to bring the offshore cables ashore at the landfall. The technique will also be the primary trenchless technique used for installation of the onshore export cables at sensitive areas of the onshore cable route.
Onshore project area	The boundary in which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and cables to the National Grid substation).
Onshore export cables	The cables which take the electricity from landfall to the onshore substation. These comprise High-Voltage Alternating Current (HVAC) cables, buried underground.
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Jointing bay	Underground structures, constructed at regular intervals along the onshore cable route to connect the sections of cable together so that each cable is a continuous length, as well as facilitating the installation of the cables into the buried cable ducts.
Link boxes	Underground chambers or above ground cabinets next to the onshore export cables housing low voltage electrical earthing links.
Temporary construction compound	Area set aside to facilitate construction of the onshore cable route. Will be located adjacent to the onshore cable route, with access to the highway where required.
Haul road	The track along the onshore cable route used by construction traffic to access different sections of the onshore cable route.
Trenchless crossing compound	Areas within the onshore cable route which will house trenchless crossing (e.g. HDD) entry or exit points.
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the National Grid.
Onshore substation works area	Area within which all temporary and permanent works associated within the onshore substation are located, including onshore substation, construction compound, access, landscaping, drainage and earthworks.
Onshore substation construction compound	Area set aside to facilitate construction of the onshore substation. Will be located adjacent to the onshore substation.
National Grid connection point	The grid connection location for the Project. National Grid are proposing to construct new electrical infrastructure (a new substation) to allow the Project to connect to the grid, and this new infrastructure will be located at the National Grid connection point.

National grid substation connection works	Infrastructure required to connect the Project to National Grid's connection point.

20 Onshore Air Quality

20.1 Introduction

1. This chapter of the Environmental Statement (ES) considers the likely significant effects of the North Falls offshore wind farm (hereafter 'North Falls' or 'the Project') on air quality. The chapter provides characterisation of the existing environment for the proposed onshore project area, followed by an assessment of likely significant effects for the construction, and decommissioning phases of the Project.

2. This chapter has been written by Royal HaskoningDHV, with the assessment undertaken with specific reference to the relevant legislation and guidance, of which the principal policy documents with respect to Nationally Significant Infrastructure Projects are the National Policy Statements (NPS). The terminology and impact assessment methodologies used in this chapter differ from the generic impact assessment terminology presented within ES Chapter 6 EIA Methodology (Document Reference: 3.1.8), as air quality guidance documents include specific assessment criteria. Details of these and the methodology used for the Environmental Impact Assessment (EIA) and Cumulative Effects Assessment (CEA) are presented in Section 20.4.

3. The Planning Inspectorate has agreed, as stated in the Scoping Opinion (the Planning Inspectorate, 2021), to scope out both 'Offshore Air Quality' impacts and 'Operational Impacts' on air quality as the effects of these impacts are unlikely to be significant. Therefore, these elements do not form part of this assessment.

4. The assessment should be read in conjunction with the following linked chapters:

   - ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25);
   - ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29);
   - ES Chapter 28 Human Health (Document Reference: 3.1.30); and
   - ES Chapter 33 Climate Change (Document Reference: 3.1.35).

5. Additional information to support the onshore air quality assessment includes the following appendices:

   - ES Appendix 20.1 Construction Dust and Particulate Matter Assessment Methodology (Document Reference: 3.3.23);
   - ES Appendix 20.2 Air Quality Assessment Traffic Data (Document Reference: 3.3.24);
   - ES Appendix 20.3 Ecological Receptor Assessment Tables (Document Reference: 3.3.25);
   - ES Appendix 20.4 Detailed Modelling Assessment Methodology – Human Receptors (Document Reference: 3.3.26).

20.2 Consultation

6. Consultation on air quality matters has been undertaken in line with the general process described in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8). The key elements to date have included scoping and ongoing technical engagement with Tendring District Council via the Evidence Plan Process (EPP). The feedback received has been considered in preparing the ES. Table 20.1 provides a summary of how the consultation and engagement responses received to date have influenced the approach that has been taken.

7. This chapter has been updated following the consultation on the Preliminary Environmental Information Report (PEIR) in order to produce the final assessment. Full details of the consultation process will also be presented in the Consultation Report produced as part of the Development Consent Order (DCO) application.

Table 20.1 Consultation responses

Consultee	Date / Document	Comment	Response / where addressed in the ES
Planning Inspectorate	26/08/2021 Scoping Opinion: Proposed North Falls Offshore Wind Farm	Offshore Air Quality: The Scoping Report states that the main source of emissions is likely to be from vessels used during construction, operation and decommissioning emitting nitrogen oxides (NOx), particular matter (PM) and sulphur dioxide (SO_2). It is stated that vessels operating in this area are required to comply with Emission Control Area restrictions in respect of NOx and SO_2 limits. It is stated that in the context of existing vessel traffic in the North Sea, the contribution would be small, although no data is presented in terms of the baseline position or likely number of vessel movements as a result of the Proposed Development. It is also stated that vessel movements would be carried out at some distance from the shore and therefore unlikely to impact on land based human and ecological receptors, although no information is presented as to the likely routes of vessel movements. The Inspectorate agrees that this matter may be scoped out of the ES on the basis that the main source of emissions would be exhaust emissions from vessels, and due to the nature and location of the offshore components of the Proposed Development associated vessel movements would only generate a small increase in emissions in all phases, which is unlikely to result in significant effects to land based human and ecological receptors.	Offshore air quality impacts have been scoped out of the assessment.
		Dust and particulate matter during operation: The Inspectorate notes that the onshore components of the Proposed Development are underground cables and a substation; it is not considered that the operation and maintenance of these components would generate levels of dust and particulate matter sufficient to result in significant effects and this matter can be scoped out of out the ES.	Operational dust and particulate matter (PM) impacts have been scoped out of the assessment.
		Plant and machinery emissions during operation: The Inspectorate agrees that impacts associated with plant and machinery emissions during operation of the Proposed Development can be scoped out of the ES on the basis that the	Operational plant and machinery emission impacts have been scoped out of the assessment.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		substation will not generate any emissions, and that emissions associated with other plant and machinery will be small scale and for limited duration.	
		Road traffic emissions during operation: Given the nature of the onshore components of the Proposed Development, e.g. underground cables and a substation, and that maintenance activities are not expected to generate a significant increase in road vehicles compared to the baseline conditions as described in section 3.9.1.1 of the Scoping Report, the Inspectorate agrees that it is unlikely that there would be a significant change in vehicle flows and therefore it is also unlikely that significant effects would occur in respect of air quality. However, the ES should explain how the anticipated road vehicle movements, associated with the operational phase including those relating to offshore operational maintenance (see ID 5.9.2 of this Scoping Opinion), these relate to the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) screening values set out in paragraph 458 [of the Scoping Report].	With reference to ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), the preferred base port (or ports) for the offshore construction, operation and decommissioning of the Project is not known and is not expected to be confirmed until post-consent. Such facilities would be existing or would be provided or brought into operation by means of one or more planning applications or as port operations with permitted development rights. It has therefore been agreed with National Highways (at a meeting on the 7 June 2022) and Essex County Council (at a meeting on the 9 July 2021) to scope out of the assessment the onshore impacts of traffic and transport associated with offshore construction, operation and decommissioning activities. As such, the number of vehicle movements generated during operation has not been considered, and comparison to IAQM and EPUK criteria is therefore not possible. This approach has been accepted by the Planning Inspectorate for other recently consented offshore wind farm projects, e.g. Norfolk Vanguard and Boreas, East Anglia Two, East Anglia One North and Hornsea Three.
		Ecological receptors: The Inspectorate notes that no reference is made to Riddles Wood SSSI and Stour and Copperas Wood, Ramsey SSSI, which are located to 0.5 kilometres (km) south and 3km north-west of the scoping boundary respectively, and whether these designated sites would be potentially sensitive to air quality changes including from construction traffic movements once the16 onshore components of the Proposed Development are refined. This should be confirmed in the ES and where there is potential for likely significant effects, these receptors should be scoped into the assessment.	Riddles Wood Site of Special Scientific Interest (SSSI) and Stour and Copperas Wood and Ramsey SSSI are both located over 200 m from construction traffic routes. As such, these sites are beyond the 200m Study Area considered within this chapter as the potential extent within which there is the potential for significant impacts on environmental features (see Section 20.3.1). On this basis it is considered there would be no significant impacts on these designated sites and they were not considered in the assessment. The impact of construction traffic movements on other ecological receptors within 200m of construction traffic routes is considered in Section 20.6.1.3.2.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		Approach to data collection: The Scoping Report states that it is not anticipated that primary air quality data will be collected and that it is proposed to use data collected by Tendring District Council as part of its air quality monitoring, although the locations of monitoring sites are not currently known and it is not stated which pollutants are monitored. Effort should be made to agree the requirement for any additional baseline survey data with the relevant consultation bodies. The assessment in the ES should be carried out with reference to a robust baseline position reflecting the relevant study area, including an understanding of relevant pollutant concentrations. Where required further monitoring should be conducted to supplement available data taken from the Council's monitoring.	The existing air quality monitoring data coverage is considered to be appropriate, and Tendring District Council did not identify a requirement for additional monitoring during initial technical engagement. Existing air quality monitoring data are presented in Section 20.5.2.
		Baseline conditions: The Scoping Report does not describe whether there are any air quality management areas (AQMAs) within the scoping boundary or potential affected road network (ARN), which has not yet been defined, that may be affected by the Proposed Development. The ES should confirm whether there are any relevant AQMAs likely to experience impacts from the Proposed Development and, if so, identify their location on a figure.	There are no AQMAs within the air quality study area, as discussed in Section 20.5.1.
		Emissions from non-road mobile machinery (NRMM) and plant during construction and decommissioning: The Inspectorate considers that the Applicant should seek to agree the approach to assessment of NRMM with relevant consultation bodies. The ES should explain how emissions from NRMM will be managed.	The approach to the assessment of NRMM has been agreed with Tendring District Council as part of the technical engagement (as set out below). The assessment of NRMM emissions is set out in Section 20.6.1.2. Mitigation and management measures are also set out within Section 20.6.1.2.
		Figures: The ES should include a figure / figures to identify the final study area for air quality and the human and ecological receptors that have been considered in the assessment.	This chapter is supported by figures which illustrate the study area for air quality and the receptors which have been considered in the assessment.
		Relationship between air quality assessment and transport assessment:	The transport assessment has informed the air quality assessment, as discussed in Section 20.4.3.3.1.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		The air quality assessment should be informed by data from a transport assessment in respect of road vehicle movements on the ARN with regard to defining the study area and the potential impact from vehicle movements during construction and decommissioning.	
		Odour: Section 3.1 of the Scoping Report, relating to ground conditions and contamination, identifies potential impact arising from the Proposed Development in terms of release of vapours / ground gases associated with former landfill sites within the scoping boundary during construction. This matter should be kept under review as the onshore components of the Proposed Development, including location and parameters are refined; where there is potential for likely significant effects to occur in respect of odour, this matter should be scoped into the ES.	With reference to ES Chapter 19 Ground Conditions and Contamination (Document Reference: 3.1.21), as a result of project refinements since the scoping report was submitted, there are no longer any historic landfill sites located within the onshore project area. Therefore, there are not anticipated to be any impacts in relation to odour. Impacts from odour have been scoped out of the assessment.
Tendring District Council	11/2022 Detailed Proposed Methodology Sent via Email	Agreement with proposed methodology.	The methodology agreed with the Environmental Protection Officer (EPO) at Tendring District Council has been used within this air quality assessment.
Woodland Trust	14/07/2023 Consultation response to PEIR	We hold concerns with regards to potential nitrogen deposition to several ancient woodlands within the surrounding area. The Trust is of the opinion that all developments should ensure that the process contribution of ammonia/nitrogen does not exceed 1% of the critical level and load. We would therefore recommend that the cable's location should be designed using detailed ammonia modelling to achieve insignificant process contributions on the surrounding ancient woodlands.	The impact of construction traffic movements on other ecological receptors within 200m of construction traffic routes is considered in Section 20.6.1.3.2. Where the in-combination values are above 1% of the Critical Load or Level, an ecologist determined whether any significant effects may be experienced at the affected habitats. The determination of the significance of effects associated with nutrient nitrogen/acid deposition and airborne NOx concentrations is detailed in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26).
United Kingdom (UK) Health Security Agency –	14/07/2023 Consultation response to PEIR	We have considered the submitted documentation and can confirm that we are satisfied with the overall approach taken in preparing the EIA and the conclusions drawn. We wish to make the following comments:	The monitoring data carried out by Tendring District Council has been updated since the PEIR, including description of the monitoring results including in Section 20.5.

Consultee	Date / Document	Comment	Response / where addressed in the ES
Environmental Public Health		We would note that although it does not affect the results of the assessment, the developer has stated that the annual mean NO_2 Objective of 40µg m^{-3} has been not exceeded at any diffusion tube location across the five-year period, whereas the data presented indicate that the annual monitored concentrations at three of the diffusion tube monitoring locations from 2017 exceed the annual mean NO_2 objective; in our view this statement should be corrected both within the Air Quality chapter and throughout the submission."	
Little Bromley Parish Council (LBPC)	07/2023 Consultation response to PEIR	Construction Dust and Mud – North Falls are planning a 5-year construction project which will create significant dust, dirt and mud on roads. Residents properties and gardens will be affected, and our roads will be affected. LBPC would like to understand how North Falls plan to mitigate this.	Construction dust and PM impacts have been assessed in Section 20.6.1.1 with site specific mitigation included in Section 20.6.1.1.5.

20.3 Scope

20.3.1 Study area

8. The study area for air quality has been defined on the basis of the Planning Inspectorate's Scoping Opinion (the Planning Inspectorate, 2021), and through consultation with Tendring District Council.

9. The Planning Inspectorate agreed that offshore and operational air quality impacts could be scoped out of the assessment, as they were unlikely to be significant (see Table 20.1).

10. During construction, the onshore elements of North Falls may give rise to construction phase dust and fine PM, NRMM emissions and road traffic emissions. These aspects have been assessed in this chapter.

11. The onshore project area is defined as the landfall area between Clacton-on-Sea and Frinton-On-Sea, Bentley Road improvement works, the onshore cable route, and the onshore substation works area, including access requirements.

12. The study area for the air quality assessment is defined as follows:

- Construction phase dust and fine PM emissions:
  - Human receptors within 250 m of the onshore project area and within 50m of routes used by construction vehicles (for track out up to 500m from the onshore project area). These distances were obtained from IAQM guidance (IAQM, 2024); and
  - Ecological receptors within 200m of the onshore project area for construction related dust (from Natural England internal guidance) and within 50m of routes used by construction vehicles (for trackout up to 500m from the onshore project area) (from IAQM guidance (IAQM, 2024)).
- Construction phase NRMM emissions:
  - Human and ecological receptors within 200m of the onshore project area boundary.
- Construction phase road traffic emissions:
  - Human and ecological receptors within 200m of routes which will experience traffic flows in exceedance of the relevant air quality screening criteria. Further information on construction traffic routes is provided in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29). This screening distance was based on criteria specified within Highways England (Highways England, 2019) and Joint Nature Conservation Committee (JNCC) (Chapman and Kite, 2021a) guidance beyond which the impact of emissions from road traffic would be negligible.

13. The air quality study area is shown in ES Figure 20.1 (Document Reference: 3.2.16).

20.3.2 Realistic worst case scenario

14. The final design of North Falls will be confirmed through detailed engineering design studies that will be undertaken post-consent. In order to provide a precautionary but robust impact assessment at this stage of the development process, realistic worst case scenarios have been defined in terms of the likely significant effects that may arise. This approach to EIA, referred to as the Rochdale Envelope, is common practice for developments of this nature, as set out in Planning Inspectorate Advice Note Nine (2018). The Rochdale Envelope for a project outlines the realistic worst case scenario for each individual impact, so that it can be safely assumed that all other scenarios within the design envelope will have less impact. Further details are provided in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

15. The realistic worst case scenarios for the likely significant effects scoped into the EIA for the air quality assessment are summarised in Table 20.2. These are based on North Falls parameters described in ES Chapter 5 Project Description (Document Reference: 3.1.7), which provides further details regarding specific activities and their durations.

16. The main grid connection options considered in the ES are outlined below:

- Option 1: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, with a project alone onshore cable route and onshore substation infrastructure;
- Option 2: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, sharing an onshore cable route and onshore cable duct installation (but with separate onshore export cables) and co-locating separate project onshore substation infrastructure with Five Estuaries Offshore Wind Farm; or
- Option 3: Offshore electrical connection, supplied by a third party.

17. Grid connection Option 2 is considered the realistic worst case scenario for the air quality assessment because the build out requires four sets of cable ducts and associated joint bays to be installed, impacting upon the largest footprint of the three grid connection options.

18. Under Option 2, the Project's onshore infrastructure comprises the following elements:

- Landfall, where the offshore export cables are brought ashore;
- Onshore cable route, which includes space for temporary works for the installation of cable ducts and buried onshore export cables, including areas for temporary construction compounds (TCCs), construction and operation and maintenance accesses (including Bentley Road improvement works);
- Onshore substation, proposed to be located west of Little Bromley;

- Onshore substation works area, which includes land required for temporary construction, export cables, means of access, drainage, landscaping and environmental mitigation for the onshore substation;
- The search area for the East Anglia Connection Node (EACN) (the Project's national grid connection point), within which will be located the Project's national grid substation connection works.

19. Collectively, the footprint of the Project's onshore infrastructure is referred to herein as the 'onshore project area' and is shown on ES Figure 5.2 (Document Reference: 3.2.3). The Project's onshore infrastructure outlined above is proposed to be located entirely within the Tendring peninsula of Essex.

Table 20.2 Realistic worst case scenarios of effects arising from development of NFOW alone – Option 2 (installation of ducts for a second project)

Element of the project infrastructure	Parameter	Notes
Construction		
Impact 1: Construction Dust and Fine PM	Standard working hours are 07:00 to 19:00 hours, Monday to Saturday, with no activities on Sundays or bank holidays.[1]	Overall duration of onshore cable route works includes establishing / reinstating temporary construction

[1] The Outline CoCP submitted with the DCO application commits that on Saturdays between 13:00 and 19:00 no high impact works (e.g. piling/breaking out) shall take place (e.g. piling/breaking out), and that no activity where noise is audible beyond the onshore project area will take place outside the stated working hours unless required by the following circumstances:

- Continuous periods of operation that are required as assessed in the environmental statement, such as concrete pouring, drilling, dewatering, cable jointing and pulling cables (including fibre optic cables) through ducts;
- Delivery to the onshore works of abnormal loads that may otherwise cause congestion on the local road network, where the relevant highway authority has been notified prior to such works 72 hours in advance;
- Works required that may necessitate the temporary closure of roads;
- Onshore works requiring trenchless installation techniques;
- Onshore works at the landfall, including where works are being carried out in the marine environment and maybe tidally restricted;
- Commissioning or outage works associated with the national grid substation connection works;
- Electrical installation, testing and commissioning;
- Activity necessary in the instance of an emergency where there is a risk to persons, the environment, delivery of electricity or property, as otherwise agreed in writing with the local planning authority (lpa);
- Security monitoring;
- Fitting out works associated with the onshore substation; and
- Daily start up or shut down.

Element of the project infrastructure	Parameter	Notes
	Trenchless crossing works e.g., Horizontal Directional Drill (HDD) to include 24 hour / 7 days working where required Landfall HDD (temporary works) physical parameters: Landfall construction compound dimensions (2 circuits) = 75 x 150m Individual Transition Joint Bay (TJB) dimensions = 4 x 15m No. of TJBs = 2 Maximum HDD depth = 20m Maximum number of HDD = 3, of which a maximum of two could work simultaneously Construction duration 13 months (of which HDD = 6 months) Maximum indicative length of HDD = 1.1 km Drill exit location = subtidal exit below MHWS (up to 8m depth) Onshore cable route construction physical parameters: Working width = 72m (open cut trenching), 90m (trenchless crossings), 130m (complex trenchless crossings) Corridor length = Up to 24km Cable trench dimensions = 3.5 – 1.2 x 2m (tapered top to bottom) No. of trenches = 4 Maximum cable trench depth = 2m Minimum cable burial depth = 0.9m Haul road width = 6m wide road, 10m wide total including verges, drainage and passing places. Jointing bays = Up to 192 (approximately every 500m) buried below ground Jointing bay construction footprint (per bay) = 15 x 4m Temporary construction compound footprint = 150 x 150m (main) to 100 x 100m (satellite). No. of compounds (est.) = 11 Trenchless crossing compound dimensions = 75 x 150m	compounds (TCC) and haul roads, cable installation (trench excavation, duct installation, cable jointing and pulling), trenchless crossing works (e.g. HDD) (includes compound establishment, HDD (which is a worst-case of potential crossing methods), and reinstatement).

Element of the project infrastructure	Parameter	Notes
	Bentley Road improvement works = 6 – 9 months Onshore cable route works = 18 – 27 months, of which cable pull = 12 months Major trenchless crossings (assumed to be HDD (each location)) = 8 months (of which HDD = 4 months)) Minor trenchless crossings (assumed to be HDD) = 2 months Onshore substation (temporary works) physical parameters: Onshore substation platform maximum footprint = 280 x 210m Construction compound indicative dimensions = 150 x 250m Construction duration = 21 – 27 months	
Impact 2: NRMM Emissions	Landfall HDD (temporary works) physical parameters: Landfall construction compound dimensions (2 circuits) = 75 x 150m Maximum HDD depth = 20m Maximum number of HDD = 3, of which a maximum of two could work simultaneously Construction duration 13 months (of which HDD = 6 months) Maximum indicative length of HDD = 1.1 km Drill exit location = subtidal exit below MHWS (up to 8m depth) Onshore cable route construction physical parameters: Working width = 72m (open cut trenching), 90m (trenchless crossings), 130m (complex trenchless crossings) Corridor length = Up to 24km Cable trench dimensions = 3.5 – 1.2 x 2m (tapered top to bottom) No. of trenches = 4 Maximum cable trench depth = 2m Minimum cable burial depth = 0.9m Haul road width = 6m wide road, 10m wide total including verges, drainage and passing places.	

Element of the project infrastructure	Parameter	Notes
	Jointing bays = Up to 192 (approximately every 500m) buried below ground Jointing bay construction footprint (per bay) = 15 x 4m Temporary construction compound footprint = 150 x 150m (main) to 100 x 100m (satellite). No. of compounds (est.) = 11 Trenchless crossing compound dimensions = 75 x 150m Bentley Road improvement works = 6 – 9 months Onshore cable route works = 18 – 27 months, of which cable pull = 12 months Major trenchless crossings (assumed to be HDD (each location)) = 8 months (of which HDD = 4 months)) Minor trenchless crossings (assumed to be HDD) = 2 months Onshore substation (temporary works) physical parameters: Onshore substation platform maximum footprint = 280 x 210m Construction compound indicative dimensions = 150 x 250m Construction duration = 21 – 27 months	
Impact 3: Road Vehicle Exhaust Emissions	Associated average movements and routeing (for landfall, onshore cable route and onshore substation): Average Heavy Goods Vehicle (HGV) movements = 381 HGV trips per day (inclusive of contingencies for incidental deliveries) Average Light Duty Vehicle (LDV) movements = 728 employee trips, 485 LDV trips per day (applying an employee to vehicle ratio of 1.5 employees per vehicle) Construction routing = All HGV traffic is assumed to have an origin on either the A120, either east towards the port of Harwich or west towards Colchester and the A12 Rail or water transport = HGV numbers are based on all materials are delivered direct to the work area by road, i.e. no use of rail or water transport Backhauling = HGV numbers are based on no back-hauling, i.e. no reduction has been applied to take account of the potential that vehicles making deliveries could be used to export materials	

Element of the project infrastructure	Parameter	Notes
	Contingencies = A contingency (reflecting the uncertainties in the design) has been applied to all material quantities and associated HGV movements Travel planning = LV movements have been based upon an average of 1.5 employees per vehicle Traffic reassignment = No reduction in traffic movements has been applied to account for the reassignment of traffic. For example, many HGVs would already be on the local network serving existing supply chains and would potentially reassign to serve North Falls without creating additional demand within the TTSA. However, within the assessment all HGV movements are assessed as 'new' trips.	
Operation		
Operational phase air quality impacts have been scoped out of the assessment as detailed in the Scoping Report (North Falls, 2021) and Scoping Opinion (the Planning Inspectorate, 2021).		
Decommissioning		
No final decision has yet been made regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable route, 400kV cable route and onshore substation. It is also recognised that legislation and industry good practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled where practicable, with the transition joint bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that, for the purposes of a worst-case scenario, the impacts will be no greater than those identified for the construction phase.		

20.3.3 Summary of mitigation embedded in the design

20. This section outlines the embedded mitigation relevant to the air quality assessment, which has been incorporated into the design of North Falls (Table 20.3). Where other mitigation measures are proposed, these are detailed in the impact assessment (Section 20.6), where applicable.

Table 20.3 Embedded mitigation measures

Parameter	Mitigation measures embedded into North Falls design
Site Selection	North Falls has undergone an extensive site selection process which has involved incorporating environmental considerations in collaboration with the engineering design requirements. Considerations include (but are not limited to) adhering to the Horlock Rules (for explanation see ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference: 3.1.6)) for the onshore substation and associated infrastructure, a preference for the shortest route length (where practical) and developing construction methodologies to minimise potential impacts. Key principles that have informed the location of the onshore cable route include: • Preference for the shortest onshore cable route to minimise the overall footprint and the number of receptors that will be affected; • Avoid key constraints, where practicable; and • Avoid populated areas, where practicable. Consideration has been taken into account for the following constraints: • Sites designated for nature conservation; • Residential properties; and • Other infrastructure (e.g., buried cables, railways, roads).
Industry good practice dust management mitigation measures	The Project is committing to the implementation of industry good practice dust mitigation measures. As detailed in Section 20.4.3.1, a project-specific dust assessment has been undertaken in accordance with the IAQM Guidance (IAQM, 2024), taking into consideration the specific activities which will be carried out and the sensitivity of nearby receptors. This has resulted in the identification of site specific embedded mitigation measures, as set out in Section 20.6.1.2.
NRMM	The following mitigation measures specific to NRMM are outlined within the Project's Outline Code of Construction Practice (OCoCP) submitted as part of the Project's DCO application and will be secured within the final CoCP submitted post-consent. NRMM and plant should be well maintained. If any emissions of dark smoke occur, then the relevant machinery should stop immediately, and any problem rectified. In addition, the following controls should apply to NRMM: • All NRMM should use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004) where practicable; • All NRMM should comply with the appropriate NRMM regulations; • All NRMM would be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting); • The ongoing conformity of plant retrofitted with DPF, to a defined performance standard, should be ensured through a programme of onsite checks; and • Fuel conservation measures should be implemented, including instructions to (i) throttle down or switch off idle construction equipment; (ii) switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded and (iii) ensure equipment is properly maintained to ensure efficient fuel consumption. Consideration will also be given to the siting of NRMM within the working area. Where practicable, locating generators and plant at the greatest distance from receptors will reduce the potential for air quality effects.

20.4 Assessment methodology

20.4.1 Legislation, guidance and policy

20.4.1.1 National Policy Statements

21. The assessment of potential impacts upon air quality has been made with specific reference to the relevant legislation and guidance, of which the principal policy documents with respect to the Nationally Significant Infrastructure Projects are the NPSs. Those relevant to the Project are:

    - Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ, 2023a);
    - NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b);
    - NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023c);

22. The specific assessment requirements for air quality, as detailed in the NPS, are summarised in Table 20.4 together with an indication of the section of the ES chapter where each is addressed.

Table 20.4 NPS assessment requirements

NPS Requirement	NPS Reference	ES Reference
Overarching NPS for Energy (EN-1)		
The 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. In addition, applicants should consider the Environment Targets (Fine Particulate Matter) (England) Regulations 2022 and associated Defra [Department for the Environment Food and Rural Affairs] guidance.	Paragraph 5.2.9 and 5.2.10	The existing air quality levels are detailed in Section 20.5. The predicted absolute emission levels have been assessed and are presented in Section 20.6.
Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling and evaluation to demonstrate local and national impacts. If an applicant believes they have robust additional supporting evidence, to the extent they could affect the conclusions of the assessment, they should include this in their representations to the Examining Authority along with the source.	Paragraph 5.2.11	The assessment uses Defra's published air quality data, as presented in Section 20.5.

NPS Requirement	NPS Reference	ES Reference
Where a proposed development is likely to lead to a breach of any relevant statutory air quality limits, objectives or targets, or affect the ability of a noncompliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan/strategy at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those statutory limits, objectives or targets are not breached.	Paragraph 5.2.12	Assessments of the compliance of the Project against relevant statutory air quality limits, objectives or targets are presented in Section 20.6.
The Secretary of State should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage. In doing so the Secretary of State should have regard to the Air Quality Strategy in England, or the Clean Air Plan for Wales in Wales, or any successors to these and should consider relevant advice within Local Air Quality Management guidance and $PM_{2.5}$ targets guidance. The mitigations identified in Section 5.14 [of EN-1] on traffic and transport impacts will help mitigate the effects of air emissions from transport.	Paragraph 5.2.13 and 5.2.14	A summary of embedded mitigation measures relevant to air quality is described in Section 20.3.3. The assessments determined there is no requirement for additional mitigation measures, as described in Section 20.6.
NPS for Renewable Energy Infrastructure (EN-3)		
A review of NPS EN-3 (2023) did not identify requirements relating to air quality and is therefore not considered relevant to this chapter.		
NPS for Electricity Networks Infrastructure (EN-5)		
A review of NPS EN-5 (2023) did not identify requirements relating to air quality and is therefore not considered relevant to this chapter.		

20.4.1.2 Other legislation, policy and guidance

23. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of air quality.

20.4.1.2.1 UK Legislation

24. Air pollution can have adverse effects on the health of humans and ecosystems. There are two type of air quality regulations that apply in England:

- Regulations implementing mandatory European Union (EU) Directive limit values originally set by the EU:
  - The EU Air Quality Framework Directive 96/62/European Commission (EC) on Ambient Air Quality Assessment and Management entered into force in 1996 (European Parliament, 1996). This was a framework for tackling air quality through setting European wide air quality limit values in a series of Daughter Directives, prescribing how air quality should be assessed and managed by the Member States. Directive 96/62/EC and the first three Daughter Directives were combined to form the new EU Directive 2008/50/EC (European Parliament, 2008) on Ambient Air Quality and Cleaner Air for Europe, which came into force in June 2008.
  - The Air Quality Standards Regulations 2010 (Statutory Instrument (SI) 2010 No. 1001) (His Majesty's Stationery Office (HMSO), 2010) and

The Air Quality Standards (Amendment) Regulations 2016 (SI 2016 No. 1184) (HMSO, 2016).

- Regulations implementing national air quality Objectives:
  - Air Quality (England) Regulations 2000 (SI 2000 No. 928) (HMSO, 2000) and Air Quality (England) (Amendment) Regulations 2002 (SI 2002 No. 3043) (HMSO, 2002)

20.4.1.2.2 Air Quality Limit Values or Objectives

25. The EU (Withdrawal Agreement) Act 2020 sets out arrangements for implementing the air quality limit values that are included in the EU Directive on Ambient Air Quality and Cleaner Air for Europe (2008/50/EC), included in air quality regulations (SI 2010 No. 1001) and as amended (SI 2016 No. 1184). The current and relevant air quality standards and Objectives for pollutants of relevance to this assessment for the protection of human health are detailed further in the following sections and outlined in Table 20.5.

20.4.1.2.3 UK Air Quality Strategy

26. The 1995 Environment Act required the preparation of a national Air Quality Strategy which sets air quality standards for specified pollutants. The Act also outlined measures to be taken by local planning authorities in relation to meeting these standards and Objectives, which became the Local Air Quality Management (LAQM) system.

27. The UK Air Quality Strategy was originally adopted in 1997 (Department of Environment, 1997) and has been reviewed and updated to take account of the evolving EU legislation, technical and policy developments and the latest information on health effects of air pollution. The strategy was revised and reissued in 2000 as the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Department of the Environment, Transport and the Regions (DETR), 2000). This was subsequently amended in 2003 (DETR, 2003) and was last updated in July 2007 (Defra, 2007).

28. The Government published its Clean Air Strategy (CAS) in January 2019 (Defra, 2019), which reset the focus for the first time since the 2007 Air Quality Strategy revision (Defra, 2007). The CAS identifies a series of 'new' air quality issues, including biomass combustion, shipping emissions and releases from agricultural activities. There was a recognition that the effects of pollutant deposition on sensitive ecosystems and habitats needs greater focus. The concept of an overall exposure reduction approach is raised, in recognition that numerical standards are not safe dividing lines between a risk and a safe exposure, within a population with a varying age and health profile. Within the CAS, the government proposes an ambitious target to reduce the population exposed to concentrations of $PM_{2.5}$.

29. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (HMSO, 2023a) set two $PM_{2.5}$ targets into law and contain provisions on how they will be monitored and assessed. The targets are as follows:

- An annual mean concentrations target for $PM_{2.5}$ levels in England to be 10 µg m^{-3} or less by 2040, and
- A population exposure reduction target for a reduction in $PM_{2.5}$ population exposure of 35% compared to 2018 to be achieved by 2040.

30. The Environmental Improvement Plan (HMSO, 2023b) was published in January 2023 and includes non-statutory interim $PM_{2.5}$ targets as milestones to meeting the full long-term targets.

20.4.1.2.4 Local Air Quality Management (LAQM):

31. The standards and Objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) (HMSO, 2000), and the Air Quality (England) (Amendment) Regulations (2002) (HMSO, 2002). The EU Limit Values have been implemented via the Air Quality Standards (England) Regulations (2010) set out the combined Daughter Directive Limit Values and Interim Targets for Member State compliance (HMSO, 2010). The Air Quality Standards (Amendment) Regulations 2016 (HMSO, 2016) were published on 6 December 2016.

32. The current air quality standards and Objectives of relevance to this assessment are presented in Table 20.5. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health. Pollutant Objectives, however, incorporate target dates and averaging periods which take into account economic considerations, practicability and technical feasibility.

33. Under Part IV of the Environment Act 1995, as amended by Part 4 of the Environment Act 2021, all local authorities are responsible for LAQM, the mechanism by which the government's air quality Objectives are to be achieved. It is the responsibility of local authorities to periodically review and assess present and likely future local pollution levels against these Objectives. Where an air quality Objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as AQMAs and take action to work towards meeting the Objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan to work towards meeting the Objectives and to improve air quality locally. Under the current LAQM regime, local authorities are to publish reports (following consultation and review by Defra) on the regular review and assessment of local air quality.

34. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health. Pollutant Objectives, however, incorporate target dates and averaging periods which take into account economic considerations, practicability and technical feasibility.

Table 20.5 Air quality strategy objectives (England) for the purposes of LAQM

Pollutant	Air Quality Objective Concentration (µg m^{-3})	Measured as*	To be achieved by
Nitrogen dioxide (NO_2)	200	1-hour mean not to be exceeded more than 18 times per year	31/12/2005
	40	Annual mean	31/12/2005
Particles (PM_{10})	50	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	20	Annual mean	2020
	10	Annual mean	2040**

Pollutant	Air Quality Objective Concentration (µg m^{-3})	Measured as*	To be achieved by
	Target of 20% reduction in concentrations at urban background in annual mean (urban background exposure)		2010 and 2020
	Target of 35% reduction compared to 2018 concentrations		2040
*The way the Objectives are to be measured is set out in the UK Air Quality (England) Regulations 2000 (as amended) ** Environmental targets required by section 1 of the Environment Act were adopted in January 2023 (HMSO, 2023b).			

35. It should be noted that the air quality Objectives only apply in locations likely to have 'relevant exposure', i.e., where members of the public are exposed for periods equal to or exceeding the averaging periods set for the standards. For this assessment, locations of relevant exposure include building facades of residential properties, and where relevant schools and medical facilities. Places of work are not included.

36. National air quality Objectives also apply for the protection of vegetation and ecosystems, which are termed Critical Levels. Critical Levels apply irrespective of habitat type and are based on the concentration of the relevant pollutants in air. IAQM guidance (IAQM, 2020) recommends that only the annual mean Critical Level is used in assessments due to the comparative importance of annual effects to impacts upon vegetation, except where specifically required by the regulator where high short-term emissions may occur, such as from an industrial stack emission source. As such, given the consistent traffic exhaust emission source along road links, only annual mean Critical Levels were considered.

37. The Critical Levels of relevance to this assessment are detailed in Table 20.6.

Table 20.6 Critical levels

Pollutant	Critical Level Concentration (µg m^{-3})	Measured as
NOx	30	Annual mean
Ammonia (NH_3)	3*	Annual mean
*Critical Level is 1 µg.m^{-3} if certain lichen/bryophyte species are present		

38. Critical Loads for habitat sites in the UK are published on the Air Pollution Information System (APIS) website (Centre for Ecology and Hydrology (CEH), 2022). These are the maximum levels of nutrient nitrogen and acid deposition that can be tolerated without increasing the risk of harm to the most sensitive features of these habitat sites. An increase in Critical Load of less than 1% is typically considered to be insignificant, as a change in this level is within the magnitude of natural fluctuation and is unlikely to be measurable. The 1% threshold of insignificance is referenced in guidance provided by Natural England (2018), IAQM (2020) and Chapman & Kite (2021a, 2021b).

20.4.1.3 Local policy

39. The onshore project area falls within Tendring District Council's area of jurisdiction, located within Essex County Council's administrative area. The responsibility for LAQM lies with Tendring District Council rather than Essex County Council. Local planning policy documents and policies of relevance to the air quality assessment include:

20.4.1.3.1 Tendring District Council's Local Plan 2013-2033 and Beyond Section 1 (Tendring District Council, 2021a)

40. 'Policy SP1 Presumption in Favour of Sustainable Development' states that *"When considering development proposals the Local Planning Authorities will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. They will always work pro-actively with applicants to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area."*

20.4.1.3.2 Tendring District Council Local Plan 2013-2033 and Beyond Section 2 (Tendring District Council, 2021b)

41. 'Policy SPL 3 Sustainable Design Part C: Impacts and Compatibility' states that *"New development (including changes of use) should be compatible with surrounding uses and minimise any adverse environmental impacts. The following criteria must be met:[…] the development, including any additional road traffic arising, will not have unacceptable levels of pollution on: air."*

20.4.1.4 Guidance

42. The following guidance documents have been used within the assessment:

- Guidance on Decision-making Thresholds for Air Pollution: Main Report and Technical Report (Chapman & Kite, 2021a and 2021b).
- Guidance on the assessment of air quality impacts on designated nature conservation areas (IAQM, 2020).
- Guidance on the assessment of impacts from construction dust and fine particulate matter (IAQM, 2024).
- Design Manual for Roads and Bridges (DMRB) assessment methodology (Highways England, 2019).
- Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (Natural England, 2018).
- Land-Use Planning & Development Control: Planning For Air Quality (IAQM & EPUK, 2017).

20.4.2 Data sources

43. No primary air quality data was collected, as it has been agreed with Tendring District Council that model verification would be undertaken using their own diffusion tube data, as part of technical engagement (Tendring District Council,

pers. comm., 9 November 2022). Data sources that have been used to inform the assessment are listed in Table 20.7.

Table 20.7 Other available data and information sources

Data Set	Spatial Coverage	Year	Notes
Tendring District Council Air Quality Annual Status Report (ASR)	Tendring District Council boundary	2021 to 2023	Local monitoring locations and baseline information
Defra LAQM Technical Guidance (TG22) (Defra, 2022)	UK	2022	Assessment methodology
Defra's LAQM support portal Mapped background pollutant concentrations	Study area	Assessment years (2022 to 2027)	2018-based 1km x 1km grid pollutant background maps
JNCC (Chapman & Kite, 2021a and 2021b)	UK	2021	Guidance on Decision-making Thresholds (DMT) for Air Pollution: Main Report and Technical Report
CEH, APIS	UK	2024	Details of Critical Loads and Levels for ecological habitats

20.4.3 Impact assessment methodology

44. ES Chapter 6 EIA Methodology (Document Reference: 3.1.8) explains the general impact assessment methodology applied to North Falls. The following sections describe the methods used to assess the likely significant effects on air quality.

20.4.3.1 Construction phase dust and fine particulate matter

45. Assessment of potential impacts associated with construction phase dust and fine PM emissions has been undertaken in accordance with the latest IAQM guidance (IAQM, 2024). The terminology and method differs from the generic impact assessment terminology presented within ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

46. A summary of the assessment process is provided below.

20.4.3.1.1 Assessment steps

47. The assessment steps are as follows:

1. Screen the need for a more detailed assessment;
2. Separately for demolition, earthworks, construction and trackout:
    a. Determine potential dust emission magnitude;
    b. Determine sensitivity of the area; and
    c. Establish the risk of dust impacts.
3. Determine site specific mitigation; and
4. Examine the residual effects to determine if additional mitigation is required.

48. It is anticipated that there will be no dust-generating demolition required as part of the construction phase of North Falls; therefore, this has been not considered as part of the assessment.

49. In addition, it should be noted that trackout is defined as the transport of dust and dirt from the construction site onto the public road network. Full details of the assessment methodology are provided in ES Appendix 20.1 (Document Reference: 3.3.23).

20.4.3.1.2 Sensitivity

50. Definitions of the different sensitivity levels for human and ecological receptors to dust (IAQM, 2024) are given in Table 20.8.

Table 20.8 Definitions of the different sensitivity levels for receptors to construction dust

Sensitivity	Sensitivity of people and property to dust soiling	Sensitivity of people to the health effects of PM_{10}	Sensitivity of ecological receptors
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Residential properties, hospitals, schools and residential care homes.	Internationally or nationally designated sites and features affected by dust soiling or locations with dust-sensitive species.
Medium	Parks, places of work.	Office and shop workers not occupationally exposed to PM_{10}.	Locations with important plant species or nationally designated sites with features affected by dust soiling.
Low	Playing fields, farmland, footpaths, short-term car parks and roads.	Public footpaths, playing fields, parks and shopping streets.	Locally designated sites where features may be affected by dust deposition.

20.4.3.1.3 Magnitude

51. The magnitude of construction phase dust emissions should be defined for each type of activity. These are broken down into four categories: demolition, earthworks, construction and trackout. The dust emission magnitudes can either be small, medium or large and are dependent on the methods of work undertaken and the scale of the activity.

52. The IAQM guidance provides broad ranges of the area of a site, the total building volume and the number of outward vehicle trips which are used to determine the dust emission magnitude.

53. The dust emission magnitudes for each activity are detailed in Table 20.9.

Table 20.9 Definitions of the different magnitudes of construction phase dust emissions

Activity	Criteria used to determine dust emission magnitude		
	Small	Medium	Large
Earthworks	Total site area <18,000m^2. Potentially dusty soil type (e.g. clay).	Total site area 18,000-110,000m^2. Moderately dusty soil type (e.g. silt).	Total site area >110,000m^2. Soil type with large grain size (e.g. sand)
Construction	Total building volume <12,000m^3.	Total building volume 12,000-75,000m^3.	Total building volume >75,000m^3.

Activity	Criteria used to determine dust emission magnitude		
	Small	Medium	Large
Trackout	<20 outward Heavy Duty Vehicle (HDV) trips in any one day. Unpaved road length <50m.	20-50 outward HDV trips in any one day. Unpaved road length 50-100m.	>50 outward HDV trips in any one day. Unpaved road length >100m.

20.4.3.1.4 Significance of effect

54. In assessing the significance of construction dust effects using the IAQM guidance, the dust emission magnitude is combined with the sensitivity of the area to determine the risk of effects prior to mitigation. This is shown in more detail in ES Appendix 20.1 (Document Reference: 3.3.23). This assessment deviates slightly from the methodology set out in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8), as the IAQM guidance does not assign a significance before applying embedded mitigation measures. Once appropriate mitigation measures have been identified as required, the significance of construction phase effects can be determined. The IAQM considers it to be most appropriate to only assign significance post mitigation as it assumes mitigation is inherent in the design/construction approach. A matrix is therefore not provided in the guidance to determine significance. The guidance notes that, with the implementation of effective mitigation measures, the effects of dust generated during construction would be not significant.

20.4.3.2 Construction Phase NRMM Emissions

55. Defra technical guidance (Defra, 2022) states that emissions from NRMM used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed. However, intensive construction activities, for example HDD works, may temporarily increase pollutant concentrations in the vicinity of receptors.

56. In addition, the Scoping Opinion requested that *"the Applicant should seek to agree the approach to assessment of NRMM with relevant consultation bodies. The ES should explain how emissions from NRMM will be managed".* Therefore, a qualitative assessment of project-generated NRMM used during construction of the onshore cable corridor and/or onshore substation has been undertaken, where impacts on receptors may occur. This approach has been agreed with Tendring District Council (pers. comm., 9 November 2022).

57. This assessment has taken into account:

- The number and type of plant to be used;
- The working hours to be employed and the duration of works;
- Distances from NRMM to the nearest human and ecological receptors;
- Existing air quality conditions in the area (based on either local monitoring (where available) and/or Defra background pollutant concentration maps (Defra, 2020a)); and
- Prevailing meteorological conditions.

58. The significance of effects have been determined using professional judgement, taking into account the factors above.

20.4.3.3 Construction road vehicle exhaust emissions

20.4.3.3.1 Traffic data

59. Traffic data for the assessment is detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29).

60. Twenty-four-hour annual average daily traffic (AADT) flows and HGV percentages were derived for the worst-case construction year (2027). The traffic data for the assessment is detailed in ES Appendix 20.2 (Document Reference: 3.3.24).

61. Traffic data has been factored to account for traffic growth between 2022 and 2027, by applying background growth factors that account for regional traffic growth from the Trip End Model Presentation Program (TEMPro), which takes into account traffic growth from committed developments (e.g., residential developments and employment developments).

62. The traffic flows and distribution associated with the Plans and Projects screened into the CEA, as discussed in Section 20.7, have also been included in the worst-case construction year (2027) base flows to provide a conservative assessment.

20.4.3.3.2 Screening criteria and assessed road links

63. The requirement for a detailed assessment of construction vehicle exhaust emissions at human receptors has been considered using screening criteria provided by IAQM and EPUK (2017). Guidance from recently released reports by the JNCC (Chapman & Kite, 2021a and 2021b) has been used for the screening of ecological receptors, within 200m of affected road links. The assessment criteria are detailed in Table 20.10.

Table 20.10 Road traffic assessment screening criteria

Guidance Document	Receptor		Screening Criteria
IAQM and EPUK (2017)	Human receptors	LDVs	A change in AADT of more than 100 within or adjacent to an AQMA, or more than 500 elsewhere.
		HDVs	An increase in HDV movements of more than 25 per day within or adjacent to an AQMA, or more than 100 elsewhere.
JNCC (Chapman & Kite, 2021a and 2021b)	Ecological receptors	AADT	An increase 0.15% or more of existing AADT (over 5 years) (i.e., the DMT)

64. Ecological receptors are screened inclusive of (a) Project traffic, (b) in-combination traffic growth from the base year (2022) to the future base year (2027) and (c) cumulative traffic from Projects and Plans identified in Section 20.7.2. Reasoning for this is provided in further detail in Section 20.4.3.3.6

65. The increases in traffic flows on the road network associated with the construction phase of North Falls were screened using the criteria detailed in Table 20.10. All road links were anticipated to experience increases in traffic flows greater than the stringent JNCC DMT screening criteria (i.e., 0.15% of existing 2022 baseflow AADT). As such, sensitive ecological receptor locations were identified on all affected road links.

66. The road links which were predicted to experience increases in vehicle numbers and HGVs in exceedance of the human receptor screening criteria are detailed in Table 20.11.

67. More information on the derivation of the traffic flows is provided in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29) and the traffic data used in the assessment is provided in ES Appendix 20.2 (Document Reference: 3.3.24).

Table 20.11 Human receptor screening – affected road links for North Falls (figures highlighted in a darker blue indicate traffic flows (LDV and/or HGVs) that exceed the IAQM & EPUK (2017) criteria)

Link ID	Road	Number of vehicles generated by the construction phase of North Falls (2027)	
		LDVs	HGVs
1[A]	A120 from the A12 to the A133	160	327
2	A120 from the A133 to Harwich Road	204	327
3	A120 from Harwich Road to Bentley Road	204	327
4	Bentley Road from the A120 to Little Bromley	177	139
5	Bentley Road through Little Bromley	42	0
6	B1035 south of the A120 to Tendring Green	107	43
7	Bromley Road north of Little Bromley	42	0
8	Bromley Road south of the A137	42	0
9	A137 east-west through Lawford	0	0
10	A137 north-south through Lawford	3	0
11	Parsonage Lane and Wolves Hall Lane east of the B1035	0	0
12	Stones Green Road	0	0
13	B1035 south of the B1352	37	0
14	B1035 north of the A120	53	16
15	A120 from Bentley Road to the B1035	228	327
16	A120 from the B1035 to Colchester Road	25	327
17	Colchester Road south of the A120 – No Longer Used	0	0
18	A120 from Colchester Road to the B1352	25	327
19	A120 from the B1352 to Parkeston Road	16	327
20	A133 south of the A120	103	151
21a	A133 to Crown Lane	158	151
21b	A133 from Crown Lane to the B1034	168	151
22	A133 south of the B1033 to Progress Way	93	61
23	A133 south of Progress Way to the B1032	63	61
24	B1032 east of the A133 to Holland Road	76	61
25	B1032 from Holland Road to Kings Parade	76	61

Link ID	Road	Number of vehicles generated by the construction phase of North Falls (2027)	
		LDVs	HGVs
26	B1032 from Kings Parade to the south of Great Holland	76	61
27	B1032 through Great Holland	29	0
28	B1033 north of the B1032 through Kirby Cross to Pork Lane	47	0
29	B1033 from Pork Lane to the south of Thorpe-le-Soken	72	19
30	B1033 south of the B1414 through Thorpe-le-Soken	72	19
31	B1414 east of the B1033	37	0
32	B1033 north of the B1414 through Thorpe-le-Soken	76	19
33	B1033 from the B1441 to the B1035 through Weeley	97	91
34	B1033 from the A133 to the B1441	97	91
35	B1035 north of B1033 to Whitehall Lane	132	71
36	B1035 through Tendring Green from Parsonage Lane to Stones Green Road	72	0
37	B1035 north of Whitehall Lane to Swan Road	89	18
38	B1035 through Goose Green	72	0
39	B1035 north of Swan Road to the south of Tendring	62	0
40	B1035 through Tendring to Crown Lane	62	0
41	Crown Lane	10	0
42	B1035 from Crown Lane to Lodge Lane	72	0
43	A133/Colchester Road from A133/Colchester Road roundabout to end of TTSA	48	0
44	B1441 (Progress Way) from A133/St Osyth Road/Progress Way Roundabout to B1414	4	0
45	B1414 east of B1441 to B1033 in Thorpe-le-Soken	2	0
46	B1441 from B1414 to B1033 in Weeley	0	0
47	A120 from Parkeston Roundabout to St Nicholas Roundabout	3	327
48	St John's Road from St Osyth Roundabout to end of TTSA	18	0
Notes: A: Road link 1 (A120 from the A12 to the A133) has conservatively been extended along the A120 into Colchester Brough Council's area of jurisdiction to allow for the assessment of Colchester Borough Council AQMA – 4. Discussed further in Section 20.5.1.			

68. The potential impacts on human receptors as a result of LDVs and HGVs travelling along the internal haul road have also been considered. The average

daily number of vehicles travelling along the haul road is below the human receptor screening criteria detailed in Table 20.10 and links. As such, impacts on human receptors as a results of haul road traffic were not considered further in the assessment, as they are considered to be not significant.

20.4.3.3.3 Assessment scenarios

69. The onshore construction works for North Falls are expected to occur over an approximate 21 to 27 month period from 2027 at the earliest.

70. The assessment has therefore considered the following three scenarios:

- Verification / base year (2022);
- Earliest year of construction (2027) without North Falls; and,
- Earliest year of construction (2027) with North Falls.

71. A base year of 2022 has been used in the assessment as it is the most recent year of air quality monitoring data available for the purpose of model verification.

20.4.3.3.4 Background pollutant concentrations

72. The assessment requires the derivation of background pollutant concentration data that are factored to the year of assessment, to which contributions from the assessed roads are added.

73. Tendring District Council and Colchester Borough Council undertake urban background monitoring of NO_2. To understand whether the Defra background map concentrations are representative of the study area, a comparison was made between the 2022 annual mean monitored concentrations and the Defra background maps (Defra, 2020a) for the corresponding grid square, as detailed in Table 20.12.

Table 20.12: Comparison of monitored concentrations at urban background sites within Tendring District Council and Colchester District Council against Defra background maps (Defra, 2020a)

Local Authority	Site ID	Distance from modelled road network	2022 annual mean concentration (µg m^{-3})	
			Monitored concentration	Defra background maps
Tendring District Council	DT11, DT12, DT13	3.5km south	13.2	9.9
Colchester District Council	CBC2	3.3km southeast	19.8	13.7
	CBC20	2.3km southeast	11.9	17.1
	CBC91	1.2km south	14.1	9.5
	CBC142	4.3km southeast	10.3	10.4

74. As shown in Table 20.12, the Defra background maps are predicting lower concentrations for the grid square the triplicate site DT11, DT12, DT13 as well as CBC2 and CBC91 are located. Whereas the background maps are predicting higher concentrations at the location of CBC20 and accurately predicting at CBC142.

75. The study area is largely rural in nature, whereas the majority of the urban background monitoring sites are located at distance from the study area within an urban area. Therefore, a sensitivity test was undertaken to understand whether the monitored urban background concentrations were appropriate to use in the detailed assessment. Table 20.13 details the road contribution of NO_2 at each of the roadside monitoring sites within the study area when both the closest urban background monitored concentration and the Defra background map concentration for the corresponding grid square were applied.

Table 20.13: Sensitivity test for background concentrations – comparing the road NO_2 contribution when the monitored background concentrations and Defra background maps are applied (Defra, 2020a)

Site ID	Site type	2022 annual mean monitored concentration of NO_2 ($\mu g\ m^{-3}$)	Closest urban background monitored site	2022 annual mean background concentration of NO_2 ($\mu g\ m^{-3}$)		Road contribution of NO_2 at the roadside monitoring site ($\mu g\ m^{-3}$)[A]	
				Monitored concentration at closest urban background monitoring site	Defra background maps concentration for the corresponding grid square	Monitored concentration at closest urban background monitoring site	Defra background maps concentration for the corresponding grid square
DT14	Roadside[B]	23.8	DT11, DT12, DT13	13.2	7.9	10.6	15.9
DT20	Roadside[B]	15.9	DT11, DT12, DT13	13.2	7.8	2.7	8.1
CBC131	Roadside	24.5	CBC91	14.1	12.8	10.4	11.7
CBC132	Roadside	22.6	CBC91	14.1	12.8	8.5	9.8

Notes: A – The road NO_2 contribution was calculated by subtracting the background concentration from the annal mean concentration recorded at the roadside site.

B – From satellite imagery the diffusion tube appears to be located within 1m of the kerb of A133 adjacent to tall mature vegetation. With reference to the Defra Technical Guidance (Defra, 2022), this site would therefore be classed as a kerbside site.

76. The roadside diffusion tube site DT20 is located adjacent to the A120. As detailed in Table 20.13, when the monitored concentration recorded at the urban background site DT11, DT12, DT13 was deducted from the monitored concentration recorded at the roadside site DT20, it resulted in a road contribution of 2.7 µg m^{-3}. This is not realistic, given the location of the diffusion tube adjacent to a major A road. The Defra background maps are therefore considered more representative of the study area. In addition, the use of the Defra background map concentrations results in a higher contribution of road NO_2 at all monitoring sites. It is therefore considered conservative to use the Defra background map as it results in a higher verification factor, discussed further in ES Appendix 20.4 (Document Reference: 3.3.26).

77. Therefore, background concentrations of NO_2, PM_{10}, $PM_{2.5}$ were obtained from the latest 2018- based Defra background maps (Defra, 2020a) for the grid square corresponding to sensitive receptor locations were used in the assessment, for the for the 2022 and 2027 assessment years.

78. Background NH_3, nutrient nitrogen and acid deposition concentrations were obtained from the APIS website (CEH, 2024) and are provided for 5km x 5km grid squares. The data are provided as three-year averages (2019-2021) and are not factored forward to future years.

20.4.3.3.5 Human receptor assessment methodology

Detailed modelling

79. Full details of the assessment methodology used to assess potential impact of exhaust emissions from construction-generated road vehicles accessing the onshore project area are provided in ES Appendix 20.4 (Document Reference: 3.3.26).

80. Detailed dispersion modelling has not been undertaken for ecological receptors as a semi-quantitative approach has been taken, using data provided by the JNCC (Chapman & Kite, 2021a and 2021b) to consider impacts at designated sites. This is discussed in further detail in Section 20.4.3.3.6.

Sensitivity

81. The sensitivity of a human receptor is not considered in the assessment of air quality impacts; the air quality Objectives in Table 20.5, which are health-based, only apply at locations where there is relevant public exposure as detailed in Table 20.14.

Table 20.14 Examples of where the air quality objectives should and should not apply

Averaging Period	Objectives should apply to:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes, etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other

Averaging Period	Objectives should apply to:	Objectives should generally not apply at:
		location where public exposure is expected to be short term.
24-hour mean	All locations where the annual mean Objective would apply, together with hotels and gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual and 24-hour mean Objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

82. Sensitive receptor locations that experience pollutant concentrations close to, or in exceedance of the Objectives experience a larger impact magnitude with a smaller change in pollutant concentrations, as detailed below.

Magnitude and significance

83. Guidance is provided by the IAQM and EPUK (IAQM and EPUK, 2017) on determining the magnitude and significance of a project's effects on local air quality. The guidance was developed specifically for use in planning and assessing air quality effects associated with mixed-use and residential developments. However, the criteria detailed below were utilised in the assessment to provide consideration of the effects associated with North Falls.

84. The effect descriptors that take account of the magnitude of changes in pollutant concentrations, and the concentration in relation to the air quality Objectives, are detailed in Table 20.15.

Table 20.15 Impact descriptors for individual receptors

Long term average concentration at receptor in assessment year	% Change in Concentration Relative to the Air Quality Objective			
	1	2 to 5	6 to 10	>11
75% or less of Objective	*Negligible*	*Negligible*	*Slight*	*Moderate*
76 – 94% of Objective	*Negligible*	*Slight*	*Moderate*	*Moderate*
95 – 102% of Objective	*Slight*	*Moderate*	*Moderate*	*Substantial*
103 – 109% of Objective	*Moderate*	*Moderate*	*Substantial*	*Substantial*
110% or more of Objective	*Moderate*	*Substantial*	*Substantial*	*Substantial*
Note: Figures are to be rounded up to the nearest round number. Any value less than 1% after rounding (effectively less than 0.5%) will be described as "Negligible".				

85. Further to the determination of the effects upon individual receptors, the guidance recommends that assessment is made of the overall significance of the effects from a development on local air quality, which should be a binary

judgement (i.e. significant or not significant). The overall significance will need to take into account the following factors:

- The existing and future air quality in the absence of North Falls;
- The extent of current and future population exposure to the effects; and
- The influence and validity of any assumptions adopted when undertaking the prediction of effects.

86. The guidance also states that a judgement of the significance should be made by a competent professional who is suitably qualified. This air quality assessment and determination of the significance of North Falls on local air quality have been undertaken by members of the IAQM.

20.4.3.3.6 Ecological receptor assessment methodology

87. The JNCC published a suite of documents (Chapman & Kite, 2021a and 2021b) which provide guidance on cumulative and in-combination effects assessment for projects and plans which generate increases in atmospheric nitrogen emissions. The reports deal with identifying thresholds for road traffic flow increases, above which detailed assessment of the effects upon Critical Level and/or Critical Loads for nitrogen at nearby designated sites would be required. The reports were solely concerned with the effects arising as a result of permanent and lasting changes (increases) in operational phase road traffic flows, associated exhaust emissions of NH_3 and NOx and consequent permanent effects on designated sites.

88. While any likely significant effects of North Falls traffic emissions on ecological sites during construction will not be permanent, but short-term, transient and temporary, the guidance, screening criteria and methodology provided in JNCC reports were used for this assessment of ecological receptors. The JNCC reports provide data on the magnitude of increases in pollutant concentrations and deposition (NOx, NH_3, nitrogen deposition (N-dep) and Acid-dep) with different levels of traffic generation experienced, at varying distances from the road, based on detailed modelling and monitoring measurements. The JNCC Technical Report (Chapman & Kite, 2021b) states that the road-relevant approach provided in the report is expected to provide robust and representative, albeit indicative, information which will often be better than a detailed model if that model has not been verified against measurements. As such, the consideration of effects on designated ecological sites has been undertaken using a semi-quantitative approach, using the data provided within the JNCC reports, without project-specific detailed dispersion modelling.

89. Use of the JNCC guidance has allowed for a more conservative assessment of any potential road traffic emission impacts on ecological receptors, as the 0.15% increase in AADT screening criterion (or DMT) is more stringent than the screening criteria of a 1,000 AADT or 200 HGV increase provided in Natural England (2018), IAQM (2020) and Highways England (2019). As such, a greater number of road links, and therefore a greater number of ecological receptors, have been screened into the assessment.

90. As discussed in Section 20.4.3.3.1, and provided in Table 20.10, the first step of the ecological assessment was to screen the road links for increases in AADT (inclusive of (a) North Falls-generated traffic, (b) 2022 to 2027 baseline traffic

growth – see the following section, and (c) cumulative traffic) greater than a DMT of 0.15% of existing 2022 AADT flows. This resulted in the screening in of all road links considered in the assessment. Following this, a search of ecological receptors within 200m of these road links with habitats/features sensitive to air pollutants has then been undertaken. The ecological receptors present within 200m of road links are presented in Table 20.23, as well as reasoning for their inclusion/exclusion in the assessment.

In-combination assessment

91. A project or plan in isolation may not lead to significant effects, however the 2017 EIA Regulations require the consideration of effects associated with a project or plan both in isolation, and in addition to other plans or projects which may affect the same designated site (an 'in-combination' assessment). The outcome of relevant court judgements (notably the Wealden Judgement (Wealden DC v SoS and Lewes DC [2017] EWHC 351 (Admin)) in 2017) has led to the requirement for the 1% criterion to be applied to the in-combination effect to determine whether effects remain insignificant, or whether further ecological investigation is required. As such, effects on ecological sites are therefore inherently considered cumulatively.

92. The road links which pass alongside the designated sites considered in the assessment will experience background traffic growth between the base year (2022) and the year of earliest construction (2027), which may increase NOx, NH_3 and/or nutrient nitrogen/acid deposition at the designated sites. These in-combination effects have been considered in the impact assessment (see Section 20.6.1.3.2).

93. In addition, any consented agricultural or industrial projects in the vicinity of designated sites which may be affected by traffic generated by North Falls may also contribute to in-combination nutrient nitrogen/acid deposition and NOx concentrations. Natural England developed SSSI Impact Risk Zones (IRZs) which specify the types of projects which may impact on SSSIs based on the distance from the site, as shown in Table 20.16. These IRZ criteria were applied to relevant habitats and features within Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ancient Woodlands (Aws), Local Nature Reserves (LNRs) and Local Wildlife Sites (LWSs), in addition to SSSIs, to provide a conservative in-combination assessment.

Table 20.16 Natural England's SSSI IRZ

Distance from Designated Site	Proposals, permissions and permits	
	Air Pollution	Combustion
0 to 0.05km	All planning applications, except householder applications	
0.05 to 0.2km	Any development that could cause air pollution or dust either in its construction or operation (including industrial/commercial processes, livestock and poultry units, slurry lagoons and digestate stores, manure stores).	All general combustion processes. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
0.2 to 0.5km	Any development that could cause air pollution (including industrial/commercial	

Distance from Designated Site	Proposals, permissions and permits	
	Air Pollution	Combustion
	processes, livestock and poultry units, slurry lagoons and digestate stores, manure stores).	
0.5 to 2km	Any industrial/agricultural development that could cause air pollution (including industrial processes, livestock and poultry units with floorspace > 500m², slurry lagoons and digestate stores > 200m², manure stores > 250t).	General combustion processes >20 megawatt (MW) energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion.
2 to 3km	Any industrial/agricultural development that could cause air pollution (including industrial processes, livestock and poultry units with floorspace > 500m², slurry lagoons and digestate stores > 750m², manure stores > 3500t).	General combustion processes >50MW energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion.
3 to 5km	Livestock & poultry units with floorspace > 500m^2, slurry lagoons & digestate stores > 750m^2, manure stores > 3500t.	

94. A search was carried out for projects within the relevant distances of each ecological receptor screened into the assessment (see Table 20.23) which meet the above criteria. Additional contributions of nutrient nitrogen from these sources (from both NO_2 and NH_3) and airborne NOx and NH_3 were considered and included in the 'in-combination' assessment, where relevant and where sufficient information is included within the application to quantify these emissions.

95. This approach to the assessment also accords with the requirements of IAQM Guidance on the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (IAQM, 2020).

Sensitivity

96. Designated ecological sites were considered only where they are sensitive to the effects of air pollution. Whilst Critical Levels (see Table 20.6) apply regardless of habitat type, Critical Loads are habitat-specific and take into account the sensitivity of each habitat to nitrogen or acidifying effects (see Table 20.26).

Magnitude and significance

97. It should be noted that European sites are considered in the Project's Habitats Regulations Assessment (HRA) Screening Report and Report to Inform Appropriate Assessment, published alongside this ES. This assessment has considered the impact on the qualifying features and habitats within those sites.

98. An increase in Critical Load or Level of less than 1% is typically considered to be insignificant, as a change of this magnitude is likely to be within the natural range of fluctuations in deposition and is unlikely to be perceptible. The 1% threshold of insignificance is referenced in Natural England (2018), IAQM (2020) and Chapman & Kite (2021a, 2021b). The exceedance of a threshold is not decisive in and of itself, nor does it suggest that damage is likely to occur

(in the case of SSSIs) or that it will not be possible to avoid adverse effects to site integrity (in the case of European sites) (Chapman & Kite, 2021a).

99. Using the JNCC reports (Chapman & Kite, 2021a and 2021b), it is possible to apply a road-relevant approach based on the distance between the affected road and the nearest boundary of a (European) designated site. The thresholds proposed in the JNCC reports focus on SSSI and European designated sites (i.e. SACs and SPAs); however, they have also been applied to Aws, LNRs and LWSs in this assessment in order to provide a conservative and robust assessment.

100. Table 20.17 provides the AADT change which is required to trigger an exceedance of 1% of the Critical Level for NOx and NH_3 at different distances from a roads edge. Table 20.18 contains similar values for nutrient N-dep Critical Loads at different distances from a road edge. As discussed above, the 1% threshold is taken from the Natural England (2018) guidance document on the assessment of traffic emissions as the threshold of insignificance to be applied as part of an in-combination assessment.

101. It should be noted that AADT changes required to cause a change of 1% of Critical Level or Load in these tables are based on an average vehicle fleet mix in 2019 for NOx and 2015 for NH_3; as such, changes in emissions of these pollutants into the future is not accounted for. Consideration of the change in vehicle fleet from 2015/2019 to 2027 is provided in Section 20.4.6.2.

Table 20.17 AADT changes (for a typical fleet composition) required to cause a change of 1% of Critical Levels (Cle) as a function of distance from the edge of a road (Chapman & Kite, 2021b)

Distance from Road Edge (m)*	AADT		
	1% of Cle for NOx (30µg m-3)	1% of lower Cle for NH3 (1µg m-3)	1% of higher Cle for NH3 (3µg m-3)
1	120	91	274
5	171	259	776
10	278	405	1,214
25	547	731	2,194
50	917	1,145	3,434
100	1,620	1,791	5,372
150	2,410	2,327	6,980
200	3,424	2,802	8,406

*Approximate AADT change required to cause a change of 1% of the Critical Level at each metre distance back from the roads edge has also been calculated. From the equation of the line between each Cle distance band. For example, 1% of Cle for NOx equation of the line between 1 m (120 AADT) and 5 m (171 AADT) is:

$$y = 12.75x + 107.25$$

where y is the AADT change required at x distance from the roads edge.

Table 20.18 AADT changes (for a typical fleet composition) required to cause a change of 1% of N-dep Critical Loads (CL) as a function of distance from the edge of a road (Chapman & Kite, 2021b)

Distance from Road Edge (m)*	AADT			
	1% of CL (5 kgN ha-1 yr-1)	1% of CL (10 kgN ha-1 yr-1)	1% of CL (15 kgN ha-1 yr-1)	1% of CL (20 kgN ha-1 yr-1)
Deposition to Woodland				
1	35	71	106	142
5	86	171	257	343
10	125	251	376	502
25	207	415	622	829
50	303	606	909	1,212
100	443	887	1,330	1,773
150	554	1,108	1,661	2,215
200	648	1,297	1,945	2,594
Deposition to Short Vegetation				
1	59	118	177	236
5	145	291	436	582
10	215	429	644	858
25	359	717	1,076	1,434
50	529	1,058	1,587	2,116
100	780	1,561	2,341	3,121
150	980	1,959	2,939	3,918
200	1,151	2,302	3,453	4,604

*Approximate AADT change required to cause a change of 1% of the Critical Load at each metre distance back from the roads edge has also been calculated. From the equation of the line between each CL distance band. For example, 1% of 5 kgN ha^{-1} yr^{-1} CL (for woodland habitat) equation of the line between 1 m (35 AADT) and 5 m (86 AADT) is:

$$y = 12.75x + 22.25$$

where y is the AADT change required at x distance from the roads edge.

102. As an example, whereby an affected road with an existing AADT of 5,000 is located 100m from the boundary of an ecological site (for which a Critical Load to a woodland feature of 10 kgN ha^{-1} yr^{-1} applies), a DMT of 7.5 vehicles applies (i.e., 0.15% of 5,000). However, the DMT is derived on a precautionary basis which assumes that a designated site is immediately adjacent to the road concerned. It can be seen from Table 20.18 that a change in AADT of 887 vehicles would be required to trigger the 1% exceedance of the N-dep Critical Load at the site boundary, for this particular example. In this example, if the predicted change in traffic along the road from the development is 150 AADT, it may be reasonable to assert that there is no credible evidence that the effects of other plans and projects would ever be such to lead to an overall change of 887 AADT over the lifetime of the Project, in spite of the fact that the DMT (7.5 vehicles) is exceeded.

103. The distances from ecological receptor boundaries to affected road edges has therefore been taken into consideration in the next stage of ecological receptor screening. AADT flows (inclusive of (a) North Falls-generated traffic, (b) background 2022 to 2027 traffic growth, and (c) cumulative project traffic) were compared to those in Table 20.17 and Table 20.18, and ecological receptors were brought forward into the next stage of the ecological assessment if they exceeded thresholds corresponding to a 1% increase in the Critical Level or Load for the relevant habitat present in designated site.

104. These initial ecological receptor screening stages are shown in ES Appendix 20.3 (Document Reference: 3.3.25) for North Falls. Site-specific Critical Levels and Critical Loads are presented in Table 20.26, and these have been taken into consideration in the comparison to AADT flows shown in Table 20.17 and Table 20.18. Only links with ecological receptors within 200m of project-affected roads edge are presented in ES Appendix 20.3 (Document Reference: 3.3.25).

105. Of the 30 ecological sites initially screened in (i.e., for being within 200m of affected road link(s)), 21 ecological sites have been brought forward for further assessment. This is because the AADT at the relevant distance from the road edge to the ecological site boundary exceeded those representative of greater than 1% increase in Critical Level and/or Load (see Table 20.17 and Table 20.18). Not all of the 21 ecological sites exceed the representative 1% AADT flows for all Critical Level and Critical Load values (for example, there may be an impact of greater than 1% of the n-dep Critical Load but not the NOx Critical Level); therefore, ecological sites have only been assessed further for Critical Levels and/or Loads shown to be in exceedance of 1%. In addition, for some ecological sites not all of the designated features and Critical Load classes are exceeded, so only those in exceedance have been considered further in this assessment.

106. Following this detailed initial screening of ecological sites, those sites screened in for further assessment were assessed for effects from traffic emissions using the guidance and methodology provided in the JNCC reports (Chapman & Kite, 2021a and 2021b). Table 11 of the JNCC Technical Report (Chapman & Kite, 2021b) provides changes in concentrations (2019) and fluxes (2015) that could reasonably be expected from an increase of 1,000 AADT on a typical road. The guidance also states that these can be scaled to represent alternative increases in traffic flows, for example an increase in 250 AADT results in 25% of the impact of the values shown in Table 20.19.

107. This approach has been adopted to quantify increases in annual mean NOx and NH_3, and N-dep in this assessment. The relationship between N-dep and its acidifying potential is linear, so a 1 kgN ha^{-1} yr^{-1} reduction will always deliver a 0.07 keq.ha^{-1}.yr^{-1} reduction in acidity. Therefore, increases in nitrogen-driven acidity, i.e., those from road traffic vehicle emissions, is directly proportional to increases in N-dep (Chapman & Kite, 2021b). Acid deposition has therefore been quantified in the assessment by multiplying the N-dep flux by 0.07.

Table 20.19 Change in concentration (in 2019 for NOx and in 2015 for NH_3) and flux for an example flow of 1,000 AADT in a typical vehicle fleet (Chapman & Kite, 2021b)

Distance from Road Edge (m)*	Annual Mean NOx (µg m-3)	Annual Mean NH3 (µg m-3)	N-Dep to Forest (kgN ha-1 yr-1)	N-Dep to Short Vegetation (kgN ha-1 yr-1)
1	2.5	0.109	1.41	0.85
5	1.8	0.039	0.58	0.34
10	1.1	0.025	0.4	0.23
25	0.55	0.014	0.24	0.14
50	0.33	0.0087	0.16	0.095
100	0.19	0.0056	0.11	0.064
150	0.12	0.0043	0.09	0.051
200	0.093	0.0036	0.077	0.043

*Approximate change in concentration (in 2019) and flux (in 2015) for an example flow of 1,000 AADT in a typical vehicle fleet at each metre distance back from the roads edge have also been calculated from the equation of the line between each distance band provided in the JNCC report. For example, the annual mean NOx equation of the line between 1 m (2.5 µg/m^3) and 5 m (1.8 µg/m^3) is:

$$y = -0.175x + 2.675$$

where y is the concentration/flux change for a flow of 1,000 AADT at x distance from the roads edge.

108. As mentioned previously in this section, changes in concentrations and fluxes as a result of increases in AADT on affected road links are based on the 2019 and 2015 vehicle fleet and emissions, respectively. It is likely the changes detailed in Table 20.19 and used in the assessment are greater than those that would be anticipated during construction (start year: 2027) as the vehicle fleet evolves and more exhaust emission abatement equipment are employed. This is discussed further in Section 20.4.6.2.

North Falls alone compared to in-combination traffic flows

109. As detailed at the beginning of this section, an in-combination assessment has been undertaken to provide context around the proportion of AADT generated as a result of North Falls, and that from background traffic growth (2022 to 2027). And Table 20.20 provides comparison between project-generated construction traffic flows and background traffic growth between 2022 (base year) and 2027 on all road links where a designated ecological site is present within 200m.

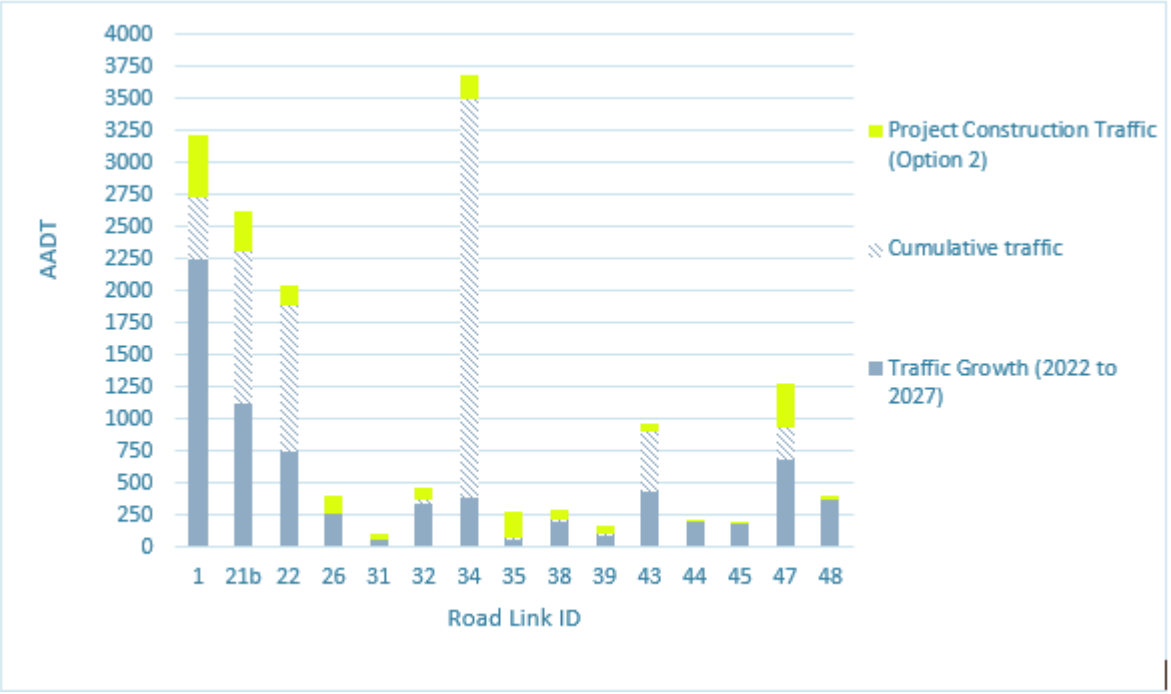

Plate 20.1 North Falls AADT flows compared to traffic growth (2022-2027) and cumulative development flows – context for in-combination Project flows considered in the assessment (2027)

Table 20.20 North Falls traffic flows as % of total cumulative traffic growth– context for in-combination Project flows considered in the assessment (2027)

Road Link	Link Description	North Falls traffic flows as % of total cumulative traffic growth (including traffic growth from 2022- 2027 and cumulative developments)
1	A120 from the A12 to the A133	20%
21b	A133 from Crown Lane to the B1034	18%
22	A133 south of the B1033 to Progress Way	11%
26	B1032 from Kings Parade to the south of Great Holland	46%
31	B1414 east of the B1033	42%
32	B1033 north of the B1414 through Thorpe-le-Soken	30%
34	B1033 from the A133 to the B1441	8%

Road Link	Link Description	North Falls traffic flows as % of total cumulative traffic growth (including traffic growth from 2022- 2027 and cumulative developments)
35	B1035 north of B1033 to Whitehall Lane	80%
38	B1035 through Goose Green	33%
39	B1035 north of Swan Road to the south of Tendring	47%
43	A133/Colchester Road from A133/Colchester Road roundabout to end of TTSA	8%
44	B1441 (Progress Way) from A133/St Osyth Road/Progress Way Roundabout to B1414	5%
45	B1414 east of B1441 to B1033 in Thorpe-le-Soken	2%
47	A120 from Parkeston Roundabout to St Nicholas Roundabout	31%
48	St John's Road from St Osyth Roundabout to end of TTSA	10%

110. As can be seen from Plate 20.1, North Falls -generated traffic contributes approximately 2% to 31% of overall in-combination AADT, with the exception of Links 26, 31, 35 and 39, which have lower total AADT and therefore Project traffic contributes to a higher proportion of AADT increase, but no greater than 311 vehicles as AADT.

111. It is worth noting the increase in traffic flows generated by North Falls will be temporary for the duration of construction which is anticipated to take 21 to 27 months. In addition, the traffic flows presented in Plate 20.1 and Table 20.20 are for the worst-case construction year. Therefore, for the remainder of construction the traffic flows generated by the Project will be lower. Whereas cumulative and growth traffic is permanent.

112. Any development-generated or in-combination values above 1% of the Critical Load or Level require additional assessment by an ecologist to determine whether any significant effects may be experienced at the affected habitats. The determination of the significance of effects associated with nutrient nitrogen/acid deposition and airborne NOx and NH_3 concentrations is detailed in ES Chapter 23 Onshore Ecology (Document Reference 3.1.25).

Haul road traffic

113. The potential impacts on designated ecological sites as a result of LDVs and HGVs travelling along the internal haul road have also been considered. The

average daily number of vehicles travelling along the haul road was calculated where the onshore project area is within 200m of a designated ecological site, as described in 20.4.3.3.2 and is detailed in Table 20.21.

Table 20.21 Traffic flows on the road within 200m of designated ecological sites

Designated ecological site	Distance from onshore project area*	Accesses	AADT generated during construction**
Simons Wood AW Simons Wood LWS	90m 80m	AC5	64
Great Holland Pits LWS	10m	AC2	84
Little Bromley Churchyard LWS	46m	AC10	174
*and therefore worst case distance from haul road as the haul road is unlikely to be directly adjacent to the closest boundary ** For further details please refer to ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29)			

114. As shown above, the numbers of vehicles travelling along the haul road do not exceed the screening criteria detailed that correspond to a 1% change in Critical Level or Load, at the respective distances from the (assumed worst-case) haul road edge, as detailed in Table 20.17 and Table 20.18. As such, impacts on designated sites as a result of haul road traffic were not considered further in the assessment, as they are considered to be insignificant.

20.4.4 Cumulative effects assessment methodology

115. The CEA considers other plans, projects and activities that may result in cumulation with North Falls. ES Chapter 6 EIA Methodology (Document Reference: 3.1.8) provides further details of the general framework and approach to the CEA.

116. For air quality, these activities include other projects which have the potential for a temporal and geographical overlap with similar effects arising from:

- Construction dust and fine PM;
- NRMM emissions; and
- Construction phase road traffic emissions.

117. The CEA utilised the same methodology as detailed above in Section 20.4.3. Further information is presented in Section 20.7.3.

20.4.5 Transboundary effects assessment methodology

118. There are no transboundary effects with regards to onshore air quality as the onshore development area is not sited in proximity to any international boundaries, and any effects would be localised. Transboundary effects are therefore scoped out of this assessment and were not considered further.

20.4.6 Assumptions and limitations

119. Traffic data were utilised in the prediction of impacts at sensitive human and ecological receptor locations. Any assumptions made in the derivation of the

traffic data are therefore applicable to the air quality assessment. For further details please refer to ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29).

20.4.6.1 Human health assessment

120. Diffusion tube monitoring is a standard indicative monitoring method used by local authorities to measure air quality within their administrative areas. Diffusion tubes do not provide the same level of precision and accuracy as automatic monitoring methods; however, good quality assurance and quality control processes will minimise uncertainties insofar as possible. Furthermore, annual mean diffusion tube monitoring results are adjusted for bias using a factor derived using the Monitoring Certification Scheme (MCerts) reference method monitoring equipment. The uncertainties and limitations to monitored air pollution data are therefore unlikely to significantly affect the certainty of the EIA.

121. Background pollutant concentrations within the air quality study area for NOx, PM_{10} and $PM_{2.5}$ were derived using the pollution maps provided by Defra for 1km x 1km grid squares across the UK. These data are derived using an empirical model, calibrated using monitoring data from the UK Automatic Urban and Rural Network and, as such, there are inherent uncertainties associated with modelled data. However, the use of these maps is an industry-standard approach and has been agreed with stakeholders during consultation (see Table 20.1). Uncertainties in these mapped background values are unlikely to significantly affect the certainty of the EIA and the conclusions of the assessment.

122. The latest version of Defra's air quality assessment tools, including the background pollutant maps, are based on assumptions prior to the Covid-19 pandemic. As such, the tools do not reflect any short or long-term changes to emissions which may have occurred as a result of behavioural change during the pandemic.

20.4.6.2 Ecological assessment

123. The worst case impacts are presented in Section 20.6.1.3 for the Project, as the closest boundary of ecological sites to affected road links was assessed and, at some sites, the affected road links about the designated sites. As can be seen from Table 20.17 to Table 20.19, impacts from road traffic rapidly decreases with distance from the roads edge. Section 20.6.1.3 also presents all Critical Levels and/or Loads for feature(s) under each designated ecological site; however, not all of these features (i.e. lichen and bryophytes in woodlands which are assessed to the lower NH_3 Critical Level) may be present at the closest designated site boundary to the affect road link.

124. As detailed in Section 20.4.3.3.6, the AADT change required to cause a change of 1% of CLe or CL presented in Table 20.17 and Table 20.18, and the corresponding concentration change in Table 20.19, are based on an average vehicle fleet mix in 2015 for NH_3 and N-dep and 2019 for NOx; as such, changes in emissions of these pollutants into the future is not accounted for. This is likely to provide a conservative assessment for some pollutants as the earliest year of construction is 2027. This means the increase in AADT required to cause a change of 1% of the CLe or CL (see Table 20.19 and ES Appendix 20.3 (Document Reference: 3.3.25)) are likely to be greater than those used in the

assessment and the impacts presented in Section 20.6.1.3 are greater than those that would be experienced at ecological receptors in 2027.

125. Fleet projections from the National Atmospheric Emissions Inventory (NAEI) are shown in Plate 20.2 (NAEI, 2019), the main change in fleet from 2015/2019 to 2027 is a large increase in electric cars and electric LGVs as a proportion of the total (from <0.4% of total fleet in 2015/2019 to 3.3% of total fleet in 2027), slight increase in petrol cars (by ~3% as a proportion of the total fleet in 2027 from 2015/2019) and a large decrease in diesel cars in the fleet (by 5.3% as a proportion of the total fleet in 2027 from 2015/2019). What these changes in fleet composition into the future mean in practice, can be estimated as follows:

- Replacement of petrol and diesel-powered vehicles with electric vehicles will bring about reductions in emissions of air pollutants nationally and, consequently, improvements in ambient air quality.
- The slight increase in petrol cars in 2027 will be outweighed by the larger reduction in diesel cars, in terms of pollutant emissions.

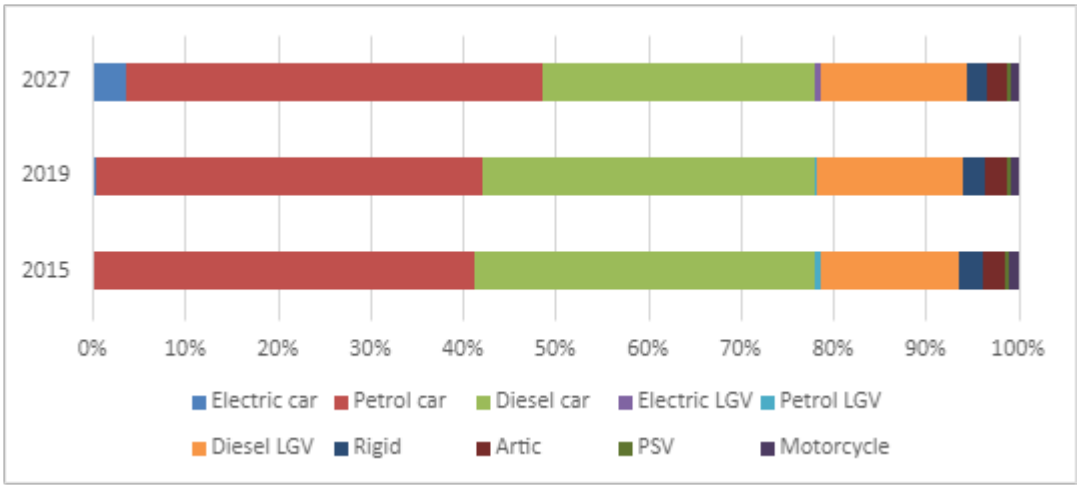

Plate 20.2 Fleet projections from 2015/2019 to 2027 (Rural; England (outside London))

20.5 Existing environment

126. A desk-based review has been undertaken to determine the air quality baseline within the study area. Monitoring data were obtained from Tendring District Council's website as well as supplied by the EPO for use in the assessment (Pers. comm., 9 November 2022).

127. The characterisation of the existing environment has been undertaken using data sources listed in Table 20.7. The baseline data sources are sufficient to provide an assessment of potential air quality impacts arising from North Falls and were agreed with Tendring District Council during technical engagement (pers. comm., 9 November 2022).

20.5.1 Local Air Quality Management (LAQM)

128. The onshore cable route neither passes through nor is adjacent to any statutory designated AQMAs. However, the statutory designated Area 4 - Lucy Lane North, Stanway was declared in 2012 by Colchester Borough Council for exceedances of the NO_2 annual mean, is located on the A120. The A120 which

forms part of the assessed road network and therefore this AQMA has been considered within the detailed assessment of construction traffic emissions.

129. Area 1 AQMA in Colchester, declared in 2018 by Colchester Borough Council for exceedances of the NO_2 hourly and annual mean, is located approximately 3.4km south of the A120; however, as North Falls-generated traffic would not pass through the AQMA itself, it is not anticipated that, given the separation distance, there would be any significant increases in pollutant concentrations within the AQMA as a result of North Falls.

20.5.2 Air quality monitoring data

130. Tendring District Council and Colchester Borough Council undertake ambient air quality monitoring within the air quality study area. The Tendring District Council monitoring network was amended in 2022 and 2020; therefore, results were obtained from the 2023, 2021 and 2019 ASR (Tendring District Council, 2019, 2021 and 2023) and are presented in Table 20.22.

Table 20.22 Annual mean NO_2 monitoring undertaken by Tendring District Council

Local Authority	Site ID	Location	Site Type	Monitored Annual Mean NO2 Concentration (µg.m-3)				
				2018	2019	2020	2021	2022
Tendring District Council	DT11, DT12, DT13	Town Hall Clacton	Urban Background	14.2	13.8	11.0	12.2	13.2
	DT14, DT15, DT16	Bypass A133	Roadside	33.1	31.5	-	-	-
	DT14	A133 Clacton Bypass	Roadside	-	-	17.4	23.4	23.8
	DT18	Bathside Bay	Roadside	14.9	13.9	-	-	-
	DT19	A120 Wix	Roadside	23.7	23.2	-	-	-
	DT20	A120	Roadside	20.3	20.7	15.8	15.5	15.9
	DT32	London Road, Clacton	Roadside	-	-	16.0	23.4	22.9
	DT33	High Street, Thorpe Le Soken	Roadside	-	-	17.3	19.8	18.9
	DT46	Landermere Road, Thorpe Le Soken	Roadside	-	-	-	18.3	19.5
Colchester Borough Council	CBC131	Lucy Lane North	Roadside	N/A	**41.0**	34.2	27.6	24.5
	CBC132	Lucy Lane South	Roadside	N/A	39.8	31.7	26.9	22.6
	CBC2	Fairfax Road, 21	Urban background	28	30	24.3	23.6	19.8
	CBC20	Papillon Road	Urban background	21.7	19.5	14.1	17.1	11.9
	CBC91	Blackberry Rd 2	Urban background	21.7	21.2	16.6	15.9	14.1
	CBC142	Colchester Crematorium	Urban background	N/A	N/A	N/A	10.9	10.3

131. The results in Table 20.22 show that the annual mean NO_2 Objective of 40µg m^{-3} has not been exceeded at any diffusion tube location within Tendring District Council across the five-year period.

132. The roadside monitoring sites CBC131 and CBC132 are located within or close to the Colchester Borough Council AQMA – 4. Annual mean concentrations of NO_2 recorded at CBC131 and CBC132 were close to or exceeding the air quality Objective in 2018. Concentrations have since dropped below the Objective and continue to decline. Annual mean concentrations of NO_2 recorded at all urban background sites were 'well below' (i.e., less than 75% of) the air quality Objective.

133. Monitoring data from 2020 and 2021 should be treated with caution as the Covid-19 pandemic had a significant impact on traffic levels as well as low levels of data capture. Despite this, monitoring still indicates a declining trend in annual mean concentrations of NO_2 since at least 2017.

134. Tendring District Council only undertakes PM_{10} or $PM_{2.5}$ monitoring at rural background site (CM1) located 7.7 km southwest of the study area and is therefore not considered representative. No monitoring of PM_{10} or $PM_{2.5}$ is undertaken by Colchester Borough Council.

20.5.3 Identification of receptors

20.5.3.1 Construction phase dust and fine particulate matter

135. Receptor locations were identified in the areas closest to the potential maximum impacts due to construction within the onshore project area (as defined in Table 20.2). The identified receptors are set out in the following sections.

20.5.3.1.1 Human Receptors

136. As detailed in ES Appendix 20.1 (Document Reference: 3.3.23), the number of receptors potentially exposed to dust impacts is a factor that determines the receptor sensitivity. The location of maximum impact along the onshore cable route, i.e., dustiest activities and greatest number of receptors within close proximity of the construction works, has been determined to be Great Holland. Therefore, this area has been the focus of the construction dust assessment for human receptors along the onshore cable route to provide a conservative assessment, as the combined sources of dust from both the TCCs and cable trenching activities is considered to represent the worst-case in terms of dust impact magnitude.

137. Impacts of construction dust at landfall and the onshore substation were considered in the assessment separately due to the large onshore project area footprint.

138. Impacts of Bentley Road improvement works were also considered separately due to the differing nature of construction works.

139. There are other areas along the onshore cable route where a greater number of human receptors are present within 250m of the onshore project area; however these receptors would either be further away from construction works relating to the worst-case scenario mentioned above, or closer to a reduced level of construction works (i.e. close to cable trenching but away from a

construction compound). It is therefore anticipated that the sensitivity of these receptors would be equal to, or less than, those located at landfall, Great Holland, Bentley Road or the onshore substation works area (ES Appendix 20.1 (Document Reference: 3.3.23) provides further details on how the sensitivity of human receptors to dust soiling and human health impacts are determined).

140. It should be noted that the embedded mitigation measures identified to suppress dust emissions (see Section 20.6.1.1.5) would be applied across the onshore project area and are not only applicable as mitigation for those receptors included within the assessment. As such, the assessment is considered to be robust.

20.5.3.1.2 Ecological Receptors

141. Designated ecological receptors that may be sensitive to dust impacts within 200m of the onshore construction works (or within 50m of access routes) are identified in Table 20.23, as well as the distance each ecological site is from the onshore project area. ES Figure 20.2 (Document Reference: 3.2.16) shows the location of the ecological receptors listed in Table 20.23.

Table 20.23 Designated sites within 200m of onshore project area

Designated Ecological Site	Distance from onshore project area
Holland Haven Marshes SSSI	0m from landfall HDD compound area
Holland Haven LNR	170m from landfall HDD compound area
Great Holland Pits LWS	10m from onshore project area
Simons Wood Ancient Woodland and LWS	8m from onshore project area (distance taken from the closest point of the two designations)
Little Bromley Churchyard	140m from onshore project area

142. Holland Haven Marshes SSSI has been chosen as the worst-case ecological receptor location for dust from earthworks, construction and trackout activities, as it is adjacent to the landfall HDD compound area as well as Link 27 (B1032 Clacton Road) and may be sensitive to dust. Its national designation also makes it more sensitive in accordance with IAQM guidance (IAQM, 2024).

20.5.3.2 Construction Phase NRMM Emissions Assessment

143. The NRMM assessment has been separated into landfall, onshore cable route, Bentley Road improvement works, and the onshore substation.

20.5.3.2.1 Landfall

144. There are no human receptors within 200m of the landfall HDD construction compound area. The closest ecological receptor is the Holland Haven SSSI located immediately adjacent to the landfall HDD compound area.

20.5.3.2.2 Onshore Cable Route

145. The closest human receptors to the works along the onshore cable route include the residential areas of Great Holland and Thorpe-le-Soken both located approximately 50m from the onshore cable route. The closest ecological receptors to works which may require NRMM (i.e. anywhere within the onshore project area) are listed in Table 20.23.

20.5.3.2.3 Bentley Road improvement works

146. There are eight residential properties within 20m of the Bentley Road improvement works, with the closest located immediately adjacent. There are no ecological receptors within 200m of Bentley Road improvement works.

20.5.3.2.4 Onshore Substation

147. The onshore substation works area is located approximately 1.7km south of Lawford, with the nearest human receptor to the onshore substation works area located 240m to the east (Norman's Farm). The nearest ecological receptor is an unnamed ancient woodland, approximately 210m south of the onshore substation works area.

20.5.3.3 Construction Phase Road Traffic Emissions Assessment

20.5.3.3.1 Human Receptors

148. Existing sensitive receptor locations were identified within the air quality study area for consideration in the assessment. Predicted changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of project-generated traffic were calculated at these locations.

149. The sensitive receptor locations were selected based on their proximity to road links affected by North Falls (as identified within ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29)) and exceeding the screening criteria detailed in Table 20.10, where the likely significant effect of project-generated traffic emissions on local air pollution would be most significant. These links are identified in Table 20.11.

150. As detailed in Section 20.5.1, the impact of North Falls generated traffic has been assessed on receptors located within Colchester Borough Council AQMA. These receptors are prefixed with 'CBC'. All other receptors remain unchanged from the PEIR.

151. Receptors were included in the dispersion model at a height of 1.5m to represent expected exposure (breathing height). All modelled receptors were representative of residential exposure.

152. The sensitive receptor locations included in the assessment are detailed in Table 20.24 and shown in ES Figure 20.3 (Document Reference: 3.2.16).

Table 20.24 Sensitive human receptor locations

Receptor ID	Link(s)
R1	33
R2	33
R3	21
R4	21
R5	20
R6	2 + 20
R7	1
R8	1
R9	3
R10	15

Receptor ID	Link(s)
R11	18
R12	18
R13	18
R14	19
R15	19
R16	19
R17	19
R18	3
R19	18
R20	4
R21	34
R22	33
CBCR1	1 (extended through Colchester Borough Council Area 4 AQMA)
CBCR2	1 (extended through Colchester Borough Council Area 4 AQMA)

20.5.3.3.2 Ecological receptors

153. As detailed in Section 20.4.3.3.6, a number of designated ecological sites are located within 200m of roads which are anticipated to experience increases in construction-related traffic flows above the criteria detailed in Table 20.10. The designated ecological sites that have been screened into the assessment (i.e. within 200m of affected road links) are detailed in Table 20.25, as well as reasoning for the exclusion of certain sites, and whether or not sites have been considered further in the assessment for exceeding the AADT flows (at the distance from the site boundary to the road edge) required to result in a 1% increase in the site-relevant Critical Level and/or Load.

154. Further details on this are provided in Section 20.4.3.3.6 and ES Appendix 20.3 (Document Reference: 3.3.25). The designated ecological sites listed in Table 20.25 are also shown in ES Figure 20.4 (Document Reference: 3.2.16).

Table 20.25 Sensitive ecological receptor locations

Link	Designated Ecological Site		Distance from affected road link (m)	Screened in for further assessment1?
	Site Type	Name		
1	AW	Kiln Wood	96	Yes
	AW	Walls Wood	6	Yes
	AW	Unnamed (Boudge Hill Wood)	164	Yes
21b	AW LWS	High Barn Wood	0	Yes
22	AW LWS	Guttridgehall Wood	31	Yes

Link	Designated Ecological Site		Distance from affected road link (m)	Screened in for further assessment1?
	Site Type	Name		
	AW LWS	Unnamed (Oakhurst Wood)	27	Yes
	LWS	Weeley Bypass	0	Yes
26	SSSI	Holland On Sea Cliff	131	No[2]
	SSSI	Holland Haven Marshes	0	Yes
31	LWS	Beaumont Bridge Verge	0	No
32	LWS	St Michaels Churchyard	7	Yes
	LWS	Thorpe Green	13	Yes
34	LWS	Thorpe Green	0	Yes
	LWS	Far Thorpe Green	0	Yes
35	LWS	Thorpe Green	0	Yes
38	LWS	Goose Green Verge	0	Yes
39	AW LWS	Simons Wood	14	No
	AW LWS	Tendring Grove	93	No
43	LWS	Alder Car	177	No
	AW	Captains Wood	8	Yes
	LWS	Fratinghall Wood	7	Yes
44	LWS	Burcarts Meadow	80	No
45	LWS	Upper Holland Brook	0	Yes
	LWS	St Michaels Churchyard	60	No
47	Ramsar	Stour and Orwell Estuaries	8	No[3]
	SPA	Stour and Orwell Estuaries	8	Yes
	SSSI	Stour Estuary	8	Yes
48	AW	Coppins Hall Wood	3	Yes

[1]See Section 20.4.3.3.6 and ES Appendix 20.3 (Document Reference: 3.3.25) for further details

[2]Site not sensitive to air quality impacts

[3]Ramsar sites are designated wetland sites and are not included in the APIS database for being sensitive to air quality impacts. Impacts on Ramsar sites have therefore been considered under the associated SPA designations for the same area.

155. The APIS website (CEH, 2024) has been consulted to identify any habitats or features of these designated sites that are sensitive to nutrient nitrogen and acid deposition. Where sensitive habitats or features were found, the Critical Loads for nutrient nitrogen and acid deposition were obtained. A full list of the designated ecological sites and associated Critical Level and Load values that

have been considered is presented in Table 20.26. The most sensitive habitat types have been included to provide a conservative assessment.

Table 20.26 Designated Ecological Sites and Critical Level and Load Values

Designated Ecological Site				Critical Level		Critical Load1		
Link	Site Type	Name	Feature Name or Critical Load Class	NOx (µg m-3)	NH3 (µg m-3)	N-dep (kgN ha-1 yr-1)	Acid deposition (kg .ha-1 yr-1) MinCLMaxN	MaxCLMaxN
1	AW	Kiln Wood	Deciduous woodland	30	1 to 3	10 to 15		1.684
	AW	Walls Wood	Deciduous woodland	30	1 to 3	10 to 15		1.684
	AW	Unnamed (Boudge Hill Wood)	Deciduous woodland	30	1 to 3	10 to 15		1.71
21b	AW LWS	High Barn Wood	Deciduous woodland N/A*	30	1 to 3	10 to 15 N/A*		2.883 N/A*
22	AW LWS	Guttridgehall Wood	Deciduous woodland N/A*	30	1 to 3	10 to 15 N/A*		1.798 N/A*
	AW LWS	Unnamed Woodland (Oakhurst wood)	Deciduous woodland N/A*	30	1 to 3	10 to 15 N/A*		1.798 N/A*
	LWS	Weeley Bypass	N/A*	30	1 to 3	N/A*		N/A*
26	SSSI	Holland Haven Marshes	Lowland ditch system; Vascular plant assemblage.	30	1 to 3	**	**	**
32	LWS	St Michaels Churchyard	N/A*	30	1 to 3	N/A*		N/A*
	LWS	Thorpe Green	N/A*	30	1 to 3	N/A*		N/A*
34	LWS	Thorpe Green	N/A*	30	1 to 3	N/A*		N/A*
	LWS	Far Thorpe Green	N/A*	30	1 to 3	N/A*		N/A*
35	LWS	Thorpe Green	N/A*	30	1 to 3	N/A*		N/A*
38	LWS	Goose Green Verge	N/A*	30	1 to 3	N/A*		N/A*
43	AW	Captains Wood	Deciduous woodland	30	1 to 3	10 to 15		1.681
	LWS	Fratinghall Wood	N/A*	30	1 to 3	N/A*		N/A*

Designated Ecological Site				Critical Level			Critical Load1	
Link	Site Type	Name	Feature Name or Critical Load Class	NOx (µg m-3)	NH3 (µg m-3)	N-dep (kgN ha-1 yr-1)	Acid deposition (kg .ha-1 yr-1)	
							MinCLMaxN	MaxCLMaxN
45	LWS	Upper Holland Brook	N/A*	30	1 to 3	N/A*		N/A*
47	SPA	Stour and Orwell Estuaries	Low and medium altitude hay meadows/ Calcareous grasslands (using base cation); Atlantic upper-mid & mid-low salt marshes	30	3	10 to 20	4.856 N/S***	5.071 N/S***
	SSSI	Stour Estuary	Low and medium altitude hay meadows/ Calcareous grasslands (using base cation); Atlantic upper-mid & mid-low salt marshes	30	3	10 to 20	4.856 N/S***	5.071 N/S***
48	AW	Coppins Hall Wood	Deciduous woodland	30	1 to 3	10 to 15		1.692

[1]The Critical Loads on the APIS website were revised on 25/05/2023 to align with the 'Review and revision of empirical critical loas of nitrogen Europe 2022' report (Bobbink et al., 2022)

*N/A = not assessed. LWS were assessed against Critical Levels only, as Critical Loads are not provided for LWSs on the APIS website and limited habitat information is provided in the Priority Habitats Inventory (Natural England, 2023) dataset for these designations.

**No comparable habitat with established Critical Load estimate available/No comparable acidity class.

***Salt marshes are not sensitive to acid deposition.

20.5.4 Background pollutant concentrations

20.5.4.1 Construction Phase NRMM Emissions Assessment

156. The onshore project area is largely rural in nature and, as shown in Table 20.27, the future 2027 background concentrations of NO_2, PM_{10} and $PM_{2.5}$ at landfall, along the onshore cable route, Bentley Road and at the onshore substation works area are 'well below' (i.e. less than 75% of) and no greater than 50% of their respective annual mean Objectives and are expected to continue to decrease into the future.

Table 20.27 Defra (2020a) background pollutant concentrations in 2027 along the onshore project area

Onshore works (landfall, onshore cable corridor and onshore substation) Background Concentrations		
NO2 (µg m-3)	PM10 (µg m-3)	PM2.5 (µg m-3)
5.9 to 6.8	12.8 to 15.2	7.9 to 8.7

20.5.4.2 Construction Phase Road Traffic Emissions Assessment

20.5.4.2.1 Human Receptors

157. The approach to deriving appropriate background pollutant concentrations for the assessment is set out in Section 20.4.3.3.4. The background concentrations used in the assessment are provided in Table 20.28.

Table 20.28 Background pollutant concentrations

Receptor ID	2022 concentration (µg m-3)			2027 concentration (µg m-3)		
	NO2	PM10	PM2.5	NO2	PM10	PM2.5
R1	7.4	14.4	8.7	6.5	13.9	8.3
R2	7.1	13.9	8.5	6.3	13.4	8.1
R3	7.8	15.1	8.9	6.7	14.6	8.5
R4	8.5	16.5	9.4	7.3	15.9	9.0
R5	8.7	14.9	9.0	7.4	14.3	8.6
R6	9.8	16.2	9.5	8.0	15.7	9.0
R7	10.9	14.9	9.4	9.0	14.3	9.0
R8	12.4	15.6	9.9	10.2	15.0	9.4
R9	7.8	15.4	9.1	6.8	14.8	8.7
R10	7.8	15.4	9.1	6.8	14.8	8.7
R11	7.6	16.0	9.2	6.6	15.5	8.8
R12	7.6	15.2	9.0	6.7	14.6	8.6
R13	7.8	14.9	8.8	6.8	14.3	8.4
R14	10.9	13.7	8.8	9.7	13.2	8.4
R15	11.9	13.9	9.1	10.6	13.4	8.7
R16	14.1	13.2	8.7	12.8	12.7	8.3
R17	14.1	13.2	8.7	12.8	12.7	8.3
R18	8.2	15.7	9.2	7.0	15.2	8.8

Receptor ID	2022 concentration (µg m-3)			2027 concentration (µg m-3)		
	NO2	PM10	PM2.5	NO2	PM10	PM2.5
R19	7.6	15.4	9.0	6.6	14.9	8.6
R20	7.8	15.4	9.1	6.8	14.8	8.7
R21	7.4	14.4	8.7	6.5	13.9	8.3
R22	7.0	14.3	8.6	6.2	13.7	8.2
CBCR1	12.8	16.7	10.4	10.3	16.1	9.9
CBCR2	12.8	16.7	10.4	10.3	16.1	9.9

158. As detailed in Table 20.28, background pollutant concentrations were 'well below' (less than 75% of) the relevant air quality Objectives. The background pollutant concentration at the receptors located within Colchester Borough Council are higher than those in Tendring District Council which is to be expected as Tendring District Council is more rural in nature.

20.5.4.2.2 Ecological receptors

159. Background concentrations for NOx have been obtained from the latest 2018-based Defra background maps (Defra, 2020a) for 2027 for the 1 x 1 km grid squares covering the study area.

160. Background NH_3 concentrations, nutrient nitrogen and acid deposition fluxes have been obtained from the APIS website and are also provided for 1 x 1 km grid squares. The data are provided as three-year averages (2019-2021) and are not factored forward. The Nitrogen Futures (Dragosits et al., 2020) study forecasts a minimum rate of improvement in background nitrogen of 0.07 $kgN.ha^{-1}.yr^{-1}$ at Ashdown forest, with other forecasts indicating a greater rate of reduction. In line with the forecast for Ashdown Forest, and therefore taking a precautionary approach, this assessment applies a projected decrease in background N-dep of 0.07 $kgN.ha^{-1}.yr^{-1}$. Over the five year period (i.e. from 2022 to 2027), this equates to a reduction in the APIS background N-dep (ranging from 10.8 to 25.3 $kgN.ha^{-1}.yr^{-1}$ depending on designated site and habitat type) of 0.42 $kgN.ha^{-1}.yr^{-1}$ by 2027. This decrease is also reflected in the total average acid deposition rate for nitrogen in 2027 (reduction per year of 0.0049 $keq.ha^{-1}.yr^{-1}$ N).

161. Background concentrations and fluxes considered in the ecological assessment are provided in Table 20.29. Only the ecological sites which have been screened in for further assessment have been included in Table 20.29.

Table 20.29 Ecological receptors - background pollutant concentrations and deposition rates

Link	Designated Ecological Site		Background concentration			
			2027	2019-2021	2027[1]	2027[1]
	Site Type	Name	NOx µg m^{-3}	NH_3 µg m^{-3}	N-Dep kgN ha^{-1} yr^{-1}	Acid-Dep kgN ha^{-1} yr^{-1}
1	AW	Kiln Wood	14.9	1.5	24.8*	1.9*
	AW	Walls Wood	11.7	1.4	24.5*	1.9*

Link	Designated Ecological Site		Background concentration			
			2027	2019-2021	2027[1]	2027[1]
	Site Type	Name	NOx µg m^{-3}	NH_3 µg m^{-3}	N-Dep kgN ha^{-1} yr^{-1}	Acid-Dep kgN ha^{-1} yr^{-1}
	AW	Unnamed (Boudge Hill Wood)	10.2	1.4	23.6*	1.8*
21b	AW LWS	High Barn Wood	8.6	1.4	22.9*	1.7*
22	AW LWS	Guttridgehall Wood	8.6	1.4	21.9*	1.6*
	AW LWS	Unnamed woodland (Oakhurst Wood)	8.6	1.4	21.9*	1.6*
	LWS	Weeley Bypass	8.6	1.4	N/A**	N/A**
26	SSSI	Holland Haven Marshes	8.2	1.0	10.3***	0.8***
32	LWS	St Michaels Churchyard	8.0	1.3	N/A**	N/A**
	LWS	Thorpe Green	7.8	1.3	N/A**	N/A**
34	LWS	Thorpe Green	7.8	1.3	N/A**	N/A**
	LWS	Far Thorpe Green	7.8	1.3	N/A**	N/A**
35	LWS	Thorpe Green	7.8	1.3	N/A**	N/A**
38	LWS	Goose Green Verge	8.0	1.4	N/A**	N/A**
45	LWS	Upper Holland Brook	7.8	1.3	N/A**	N/A**
47	SPA	Stour and Orwell Estuaries	14.0	1.2	11.4***	0.9***
	SSSI	Stour Estuary	14.0	1.2	11.4***	0.9***
48	AW	Coppins Hall Wood	8.7	1.2	20.3*	1.5*

[1] Average N-dep rate (kgN ha^{-1} yr^{-1}) projected to decrease by 0.42 kgN ha^{-1} yr^{-1} from base year (2020) to future year (2027) (i.e. 0.07 x 6 years = 0.42 kgN ha^{-1} yr^{-1}). This results in a corresponding decrease per year in Acid-dep of 0.0049 keq ha^{-1} yr^{-1} N.

*Forest

N/A = not assessed. LWS were assessed against NOx and NH_3 Critical Levels only, as discussed in **Section 20.5.3.3.2.

***Moorland (short vegetation)

162. As shown by comparing the Critical Levels and Loads in Table 20.26 with the existing background concentrations/fluxes presented in Table 20.29, NOx concentrations are well below (less than 75% of) the Critical Level (30µg m^{-3}). Existing NH_3 concentrations are above the lower Critical Level (1µg m^{-3}) but below the higher Critical Level (3µg m^{-3}) at all sites. At all sites with forest (or woodland) habitats, existing N-dep fluxes are above both the lower and upper site-specific N-dep Critical Loads; however, at sites with short vegetation, existing N-dep fluxes are below the site-specific upper Critical Loads. Existing Acid-dep fluxes vary at sites from being below to slightly above the site-specific Critical Load, regardless of habitat type.

20.5.5 Baseline Road Traffic Emissions

163. The Atmospheric Dispersion Modelling System for Roads (ADMS-Roads) model has been used to estimate contributions of vehicle exhaust emissions to annual and short term NO_2, PM_{10} and $PM_{2.5}$ concentrations for the 2022 base year and the 2027 without North Falls assessment. The 24-hour AADT flows and HGV percentages used in the assessment are detailed in ES Appendix 20.2 (Document Reference: 3.3.24).

164. Table 20.30 provides the results of the baseline assessment for the base year (2022) and the earliest year of construction without North Falls (2027), which is inclusive of background concentrations as well as the traffic contribution (including cumulative developments).

Table 20.30 Baseline road traffic emissions assessment base year (2022) and earliest year of construction (2027) without North Falls

Receptor ID	2022 concentration (µg m-3)			2027 concentration (µg m-3)		
	NO2	PM10	PM2.5	NO2	PM10	PM2.5
R1	11.3	15.3	9.2	9.1	14.9	8.9
R2	10.1	14.6	8.9	8.3	14.2	8.6
R3	12.5	15.8	9.3	9.5	15.3	8.9
R4	15.1	17.4	9.9	11.1	16.8	9.5
R5	12.1	15.4	9.3	9.3	14.8	8.9
R6	17.8	17.2	10.1	12.6	16.7	9.6
R7	18.8	15.7	10.0	13.5	15.2	9.5
R8	18.5	16.3	10.3	13.7	15.7	9.8
R9	13.3	16.4	9.7	9.9	16.0	9.3
R10	11.4	16.0	9.5	8.9	15.6	9.1
R11	10.1	16.5	9.5	8.1	16.1	9.1
R12	9.6	15.5	9.2	7.8	15.1	8.8
R13	10.5	15.4	9.1	8.4	14.9	8.7
R14	12.7	14.0	9.0	10.6	13.6	8.6
R15	14.4	14.4	9.4	11.9	14.0	9.0
R16	16.6	13.7	9.0	14.2	13.2	8.6
R17	16.3	13.7	9.0	14.1	13.3	8.6
R18	12.3	16.5	9.7	9.4	16.0	9.3
R19	11.3	16.1	9.4	8.7	15.7	9.1
R20	9.2	15.6	9.2	7.7	15.2	8.9
R21	10.0	14.9	9.0	8.3	14.5	8.7
R22	9.8	14.8	8.9	8.1	14.4	8.5
CBCR1	26.4	18.3	11.4	18.2	17.7	10.9
CBCR2	25.1	18.1	11.3	17.5	17.5	10.8

165. As detailed in Table 20.30, annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted to be below the relevant Objectives at all receptors in both baseline years.

166. All predicted NO_2 concentrations were 'well below' 60µg m^{-3} and therefore, in accordance with Defra guidance (Defra, 2022), the 1-hour mean Objective is unlikely to be exceeded (see Table 20.5). The short term PM_{10} Objective has been predicted to be met at all modelled locations (Objective being less than 35 exceedances annually of the daily mean objective of 50µg m^{-3}).

20.5.6 Future trends in baseline conditions

167. In the event that North Falls is not developed, an assessment of the future conditions for air quality has been carried out and is described within this section.

168. The baseline review of air quality in Sections 20.5.2, 20.5.4 and 20.5.5 provide a clear indication that air quality in the North Falls air quality study area is good, which is to be expected in an area which is largely rural in nature, with areas of air quality concern and monitoring confined to urban areas. Air quality is managed, and improvement driven, by EU, UK and local legislation and policies. The UK's national air quality strategy and standards are enacted locally through management actions at a local authority level including a LAQM framework, as detailed in Section 20.4.1. There is a policy trend towards the achievement and maintenance of good air quality across the UK, which is reflected in the local planning policies also detailed in Section 20.4.1.

169. Air pollution in the study area is generally dominated by emissions from road vehicles. The quantity and composition of vehicle emissions is dependent on the type of fuel used, engine type, size and efficiency, vehicle speeds and the type of exhaust emissions abatement equipment employed. As such, it is anticipated that future pollutant concentrations will be reduced from baseline levels, as reflected in the predicted background concentrations, obtained from Defra's UK Air website, shown in Table 20.28.

20.6 Assessment of significance

20.6.1 Likely significant effects during construction

20.6.1.1 Impact 1: Construction dust and fine particulate matter

170. A qualitative assessment of construction phase dust and PM_{10} emissions has been carried out in accordance with the latest IAQM guidance (IAQM, 2024). Full details of the methodology and dust assessment undertaken are provided in ES Appendix 20.1 (Document Reference: 3.3.23).

171. The assessment consisted of four steps (Step 1, Step 2A, Step 2B and Step 2C) as outlined below.

172. Further details are provided in Section 20.5.3.1 on the focus areas for the assessment in relation to the locations of the expected worst-case construction works (i.e., landfall, Great Holland, Bentley Road improvement works and the onshore substation works area for human receptors and Holland Haven SSSI for ecological receptors).

20.6.1.1.1 Step 1: Screen the need for a detailed assessment

173. As detailed in Section 20.5.3.1, human and ecological receptors are present within 250m and 200m respectively of the onshore project area, therefore a detailed assessment was required.

20.6.1.1.2 Step 2A: Define the potential dust emission magnitude

174. The potential dust emission magnitude for the onshore project area has been determined using the criteria detailed in ES Appendix 20.1 (Document Reference: 3.3.23). The dust emission magnitudes were determined from the worst-case assumptions identified in Table 20.2 and are detailed in Table 20.31.

Table 20.31 Defined dust emission magnitudes associated for each construction activity for the onshore project area

Construction activity	Dust emission magnitude	Rationale
Human Receptors (Worst-Case)		
Earthworks (site area and earth works)	Small (<18,000m^2)	**Landfall:** The proposed construction compound at landfall is anticipated to be 75 x 150m (i.e., 11,250m^2) and topsoil will be stripped within this area.
	Large (>110,000m^2)	**Great Holland (i.e., onshore cable route and TCCs):** The proposed TCCs near Great Holland will have a combined footprint of 51,500m^2. Earthworks within the onshore cable route will comprise removal and the storage of topsoil and subsoil separately at the side of the trench, followed by excavation of a trench approximately 2m deep and (max) 1.2m wide. The trench would be excavated in sections along the onshore cable route. The onshore cable route has conservatively been assessed as large to account for ancillary works.
	Medium (18,000m^2 to 110,000m^2)	**Bentley Road improvement works:** The proposed TCCs for the Bentley Road improvement works have a combined footprint of 51,500m^2. The road improvement works have an approximate working area of 40,000 m^2
	Large (>110,000m^2)	**Onshore substation:** The onshore substation platform maximum footprint will be 58,800m^2, in addition to a substation construction compound (37,500m^2) and soil will be stripped. The onshore substation has conservatively been assessed as large to account for ancillary works.
Construction (construction materials)	Medium	**All locations:** There are not anticipated to be any permanent buildings constructed within the TCCs (offices, etc. at the onshore substation would be prefabricated); however, it has been assumed that cement-bound sand (CBS) would be used to line the cable trench and pack around the ducts, and this is a potentially dusty construction material.
Trackout (no. HGV outward movements per day)	Medium	**Landfall, Great Holland, onshore substation:** There would be between 20 to 50 outward daily HGV movements*
	Large	**Bentley Road improvement works:**

Construction activity	Dust emission magnitude	Rationale
		There would be >50 outward daily HDV movements
Ecological Receptors (Worst-Case)		
Earthworks (site area and earthworks)	Small (<18,000m^2)	**Holland Haven SSSI:** The proposed construction compound at landfall is anticipated to be 75 x 150m (i.e. 11,250m^2) and topsoil will be stripped within this area.
Construction (construction materials)	Medium	**Holland Haven SSSI:** It has been assumed that CBS would be used to line the cable trench and pack around the ducts, which is a potentially dusty construction material.
Trackout (no. HGV outward movements per day)	Medium	**Simons Wood ancient woodland and LWS:** It is assumed as a worst-case that there would be between 10 and 50 outward daily HGV movements
*HGV outward movements per day have been estimated from the HGV traffic flows presented in Table 20.10 and ES Appendix 20.2 (Document Reference: 3.3.24), where the number of outward HGV movements per day is half the HGV (per day) flow. While some construction routes (up to 500m from the onshore project area) have more than 50 HDV outward movements per day, very few human receptors (<10) and no ecological receptors are located on these routes, therefore assessing fewer HGV movements on routes with >10 human receptors results in the same dust emission magnitude overall.		

20.6.1.1.3 Step 2B: Define the sensitivity of the area

175. The sensitivity of receptors to dust soiling, impacts on human health and ecological effects has been determined using the criteria in ES Appendix 20.1 (Document Reference: 3.3.23). ES Figure 20.2 (Document Reference: 3.2.16) details the distance bands from the onshore project area used in determining the sensitivity of the area.

176. The sensitivity of the area is defined as:

- Sensitivity of receptors to dust soiling on people and property:
  - **Earthworks and construction**:
    - There are no residential receptors located within 250m of the construction compound area at landfall.
    - There are between 1 to 10 high sensitivity residential receptors within 50m of the onshore cable route and TCCs at Great Holland.
    - There are between 1 to 10 high sensitivity residential receptors within 20m of the Bentley Road improvement works.
    - There are between 1 and 10 high sensitivity residential receptors within 250m of the onshore substation works area.
    - The sensitivity is therefore **medium at Bentley Road improvement works** and **low at Great Holland and the onshore substation works area**. There is **no impact of dust soiling from earthworks and construction at landfall** and therefore this has not been considered further.
  - **Trackout**:

        - There are no human receptors within 50m of roads used by construction vehicles up to 500m from the site at landfall.
        - There are between 10 and 100 high sensitivity residential receptors within 20m of roads used at Great Holland.
        - There are between 10 and 100 high sensitivity residential receptors within 20m of roads used at Bentley Road improvement works.
        - There are between 1 to 10 high sensitivity residential receptors within 20m of roads used to access the onshore substation works area.
        - The sensitivity is therefore **high at Great Holland and Bentley Road** and **medium at the onshore substation works area**. There is **no impact of dust soiling from trackout at landfall** and therefore this has not been considered further.
- Sensitivity of receptors to human health effects of PM_{10}:
    - The highest annual mean background PM_{10} concentration across the study area is less than 24µg m^{-3}.
    - **Earthworks and construction**:
        - The number of sensitive receptors located in proximity to Great Holland, Bentley Road, and the onshore substation works area results in a **low sensitivity for all assessed locations**.
    - **Trackout**:
        - The number of sensitive receptors located in proximity to the trackout route at Great Holland, Bentley Road, and the onshore substation works area results in a **low sensitivity for all assessed locations**.
- Sensitivity of receptors to ecological effects:
    - **Earthworks and construction**:
        - Holland Haven SSSI is of medium sensitivity and is within 20m of the landfall HDD compound area. The **sensitivity is therefore medium**.
    - **Trackout**:
        - The ancient woodland Simons Wood has been assumed to be of medium sensitivity and is within 20m of routes used by construction vehicles, up to 500m from the onshore project area. The **sensitivity is therefore medium**.

177. The sensitivity of receptors to dust soiling, human health impacts and ecological impacts (as an assessment of the worst-case scenario location) for each activity is summarised in Table 20.32.

Table 20.32 Sensitivity of the area to each activity

Potential impact	Sensitivity of the surrounding area		
	Earthworks	Construction	Trackout
Dust soiling	Medium – Bentley Road improvement works Low – Great Holland and onshore substation works area N/A - landfall	Medium – Bentley Road improvement works Low – Great Holland and onshore substation works area N/A - landfall	High - Great Holland and Bentley Road improvement works Medium - onshore substation works area N/A - landfall
Human health	Low – Bentley Road improvement works, Great Holland and onshore substation works area N/A - landfall	Low – Bentley Road improvement works, Great Holland and onshore substation works area N/A - landfall	Low – Bentley Road improvement works, Great Holland and onshore substation works area N/A - landfall
Ecological	Medium – all relevant locations	Medium – all relevant locations	Medium – all relevant locations

20.6.1.1.4 Step 2C: Define the risk of impacts

178. The dust and PM_{10} emission magnitude as defined in Step 2A (Section 20.6.1.1.2) and sensitivity of the area(s) as defined in Step 2B (Section 20.6.1.1.3) are combined, and the risk of impacts determined using ES Appendix 20.1 (Document Reference: 3.3.23). The risks for dust soiling, human health and ecological effects are shown in Table 20.33.

Table 20.33 Risk of dust impacts

Potential impact	Dust Risk		
	Earthworks	Construction	Trackout
Dust soiling	Medium Risk – Bentley Road improvement works Low Risk – Great Holland and onshore substation works area N/A - landfall	Medium Risk – Bentley Road improvement works Low Risk – Great Holland and onshore substation works area N/A - landfall	High Risk – Bentley Road improvement works Medium Risk – Great Holland Low Risk – onshore substation works area N/A - landfall
Human health	Low Risk N/A - landfall	Low Risk N/A - landfall	Low Risk N/A - landfall
Ecological	Low Risk	Low Risk	Medium Risk

179. It is anticipated that the risk of dust impacts would be high for dust soiling at Bentley Road from trackout. All other activities at Bentley Road result in a medium risk of dust soiling. The risk of dust soiling at Great Holland is medium for trackout. The risk of dust soiling at all other locations and during all activities is considered to be low.

180. The risk to human health is considered to be low during all activities.

181. The risk to ecological receptors is considered to be low during earthworks and construction and medium from trackout.

20.6.1.1.5 Mitigation – Step 3: Site specific mitigation

182. Step 3 of the IAQM guidance (2024) identifies the appropriate good practice mitigation measures required based on the findings of Step 2 of the assessment methodology. Step 2 of the dust assessment determined that the greatest risk of effects was 'high risk' under the worst-case scenario, without the implementation of mitigation measures. The aim of these mitigation measures is to achieve a residual effect that is not significant.

183. Recommended mitigation measures are listed in the IAQM guidance document according to the 'risk' of effects associated with the release of dust and PM_{10} from construction activities. Recommended mitigation measures include minimising the production and transmission of dust from construction activities, and the requirement to carry out regular visual on-site and off-site inspections of dust deposition levels, so that appropriate action can be taken in the event of any issues being identified.

184. A list of mitigation measures that are recommended for a high risk site, as determined by Step 2 of the dust assessment, by the IAQM are provided below. These measures are included within the Project's OCoCP submitted as part of the Project's DCO application (Document Reference: 7.13) and will be secured within the final CoCP submitted post-consent (secured by DCO Requirement).

- Communications:
    - Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
    - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
    - Display the head or regional office contact information.
- Dust Management:
    - Develop and implement a Dust Management Plan (DMP) to form part of the CoCP, which may include measures to control other emissions, approved by the local authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
    - Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
    - Make the complaints log available to the local authority when asked.
    - Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.
    - Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and PM emissions are minimised. It is important to understand the

interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Manage stockpiles to prevent wind whipping.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing). Further details provided in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29).

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/PM suppression/mitigation, using non-potable water where practicable and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Avoid bonfires and burning of waste materials.

- Construction:
  - Ensure sand and other aggregates are stored in appropriate manner to minimise dust generation for example the use of bunded areas.
  - Avoid scabbling (roughening of concrete surfaces) if possible.
  - Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
  - For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
- Earthworks:
  - Manage earthworks and exposed areas/soil stockpiles to stabilise surfaces.
  - Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Trackout:
  - Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
  - Avoid dry sweeping of large areas.
  - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
  - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
  - Record all inspections of haul routes and any subsequent action in a site logbook.
  - Install hard surfaced haul routes where practicable, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Locate access gates at least 10m from receptors where practicable.

20.6.1.1.6 Residual Effects – Step 4: Determine significant effects

185. With the implementation of the above mitigation measures, which will be secured in the final CoCP, the residual effects for dust and fine PM are considered to be **not significant in EIA terms**, in accordance with IAQM guidance (2024).

20.6.1.2 Impact 2: NRMM emissions

186. The effect on sensitive receptors of emissions from NRMM used at the landfall HDD compound area, the onshore cable route, Bentley Road Improvement works and the onshore substation works area are set out below.

20.6.1.2.1 NRMM at Landfall

187. NRMM at the landfall construction compound area will be associated with the HDD plant and construction activities within the proposed compound. As detailed in Table 20.2, the maximum number of HDD plant which could work simultaneously is two.

188. The duration of trenchless crossing (i.e., HDD) at landfall is anticipated to take up to six months. HDD works may, by necessity, be required to operate 24/7 rather than only during the Project's working hours (7am-7pm Monday to Saturday). As the duration of HDD works at landfall is expected to be approximately six months, emissions would not occur over a full year. As such, in consideration of annual mean pollutant concentrations, the impact would be reduced.

189. At this stage, the exact location of the works associated with HDD at landfall within the compound area is unknown, therefore the worst-case location for HDD works has been assessed i.e., assuming all NNRM are located at the closest edge of the landfall HDD compound area from the nearest receptor.

190. Works associated with the construction compound and transition joint bays would be intermittent in nature. Once construction of the landfall elements has been completed no pollution sources would be present (i.e. there are no operational phase impacts on local air quality) as a result of North Falls.

191. As discussed in Section 20.5.3.2, there are no residential receptors within 200m of the HDD compound area. Beyond this distance it is considered there would be sufficient dilution and dispersion of pollutant emissions from NRMM.

192. Holland Haven SSSI is located adjacent to the landfall HDD compound area (shown in ES Figure 20.4 (Document Reference: 3.2.16), while Holland Haven LNR is located 170m to the south-west.

193. With reference to the wind rose in ES Appendix 20.4 in (Document Reference: 3.3.26), the prevailing wind conditions will cause emissions from NRMM plant to disperse away from the SSSI for the majority of the year.

194. As the works at landfall would be short-term and temporary, and relevant control and management measures are embedded into the design of North Falls (see Table 20.3), it is considered the effect of emissions from NRMM on human and ecological receptors would be **not significant in EIA terms**.

20.6.1.2.2 NRMM along the cable route

195. The primary activities that would occur along the onshore cable route are temporary haul road construction and removal/excavation/backfilling works associated with the trench. There will also be construction activities associated with the construction of TCCs and HDDs for crossing of existing infrastructure and natural features.

196. The onshore cable corridor works would be undertaken in a practical, logical and sequential manner, e.g., topsoil stripping would be undertaken prior to construction of the haul road in advance of trench excavation. Furthermore, each item of plant present would not necessarily be fully utilised throughout the working day. Therefore, NRMM plant would be operational in the vicinity of a receptor for only a relatively short duration, and not for the full duration of the onshore export cable route construction programme (18 to 27 months).

197. As detailed in Table 20.2, the duration of HDD works at major crossings along the onshore cable route are expected to take four months and at minor crossings it is expected to take two months. As such, in each location HDD works are required, emissions would not occur over a full year. Therefore, in consideration of annual mean pollutant concentrations, the impact would be reduced.

198. As detailed in Section 20.5.3.2.2, the greatest concentration of human receptors is located at Great Holland approximately 50m from the onshore cable route. In this location, background pollutant concentrations are less than 50% of the relevant air quality Objectives for human exposure (as detailed in Section 20.5.4.1). Therefore, it is unlikely that the temporary use of NRMM along the onshore cable route during construction would have a significant impact on local air quality with the relevant control and management measures employed (see Table 20.3).

199. With regard to ecological receptors, Great Holland Pits LWS is located 10m to the west of the onshore cable route and Simons Wood Ancient Woodland and LWS is located 8m from a proposed access route on Thorpe Road and 120m from the main construction works associated with the cable route. Both designated ecological sites are located over 200m from a TCC. The intermittent and short-term nature of the plant usage during the construction of the onshore cable route would reduce the potential for significant effects at these locations.

200. It is therefore expected that with the employment of embedded management and control measures, particularly siting plant and other emission sources as far from human and designated ecological sites as is practicable (as detailed in Table 20.3), will mean that effects would be **not significant in EIA terms**.

20.6.1.2.3 NRMM at the Bentley Road Improvement works

201. The primary activities that would occur along the Bentley Road improvement works includes removal of vegetation and earthworks associated with road widening. It is not anticipated that NRMM required for Bentley Road improvement works would be in excess of that required on a ‘standard’

construction site due to the number of items of each type of plant which are anticipated to be active in the vicinity of receptors. In addition, background pollutant concentrations are less than 50% of the relevant air quality objectives. Therefore, it is unlikely that NRMM would have a significant impact on local air quality with the relevant control and management measures employed (see Table 20.3).

202. As detailed in Section 20.5.3.2, there are no ecological receptors within 200m of the proposed construction works.

203. The effect of NRMM emissions on sensitive receptors during the Bentley Road improvement work is **not significant in EIA terms**.

20.6.1.2.4 NRMM at the Onshore Substation

204. Construction activities in the onshore substation works area include site preparation and earthworks, and construction of the onshore substation and permanent access routes.

205. The onshore substation works area is located approximately 1.7km south of Lawford, with the nearest human receptor to the onshore substation works area off Ardleigh Road approximately 250m to the east. The nearest ecological receptor is an unnamed ancient woodland, approximately 220m south of the onshore substation works area. Beyond 200m it is considered there would be sufficient dilution and dispersion of pollutant emissions from NRMM. Therefore, it is unlikely NRMM in the onshore substation works area would have a significant effect on local air quality.

20.6.1.2.5 NRMM Significance

206. Defra technical guidance (Defra, 2022) states that emissions from NRMM used on construction sites are unlikely to have a significant impact and effect on local air quality where relevant control and management measures are employed, and a qualitative assessment of effects is sufficient for consideration of effects. The results of the qualitative assessment above demonstrates that intensive construction activities are **unlikely to have a significant effect** on local air quality with the implementation of the embedded mitigation measures detailed in Table 20.3.

20.6.1.2.6 Mitigation measures specific to NRMM

207. Given the assessment concludes there are no residual significant effects from NRMM emissions, additional mitigation measures specific to NRMM beyond those embedded mitigation measures which have been incorporated into the design of North Falls and detailed in Table 20.3 are not considered necessary.

20.6.1.3 Impact 3: Construction phase road vehicle exhaust emissions

20.6.1.3.1 Human Receptors

208. The 24-hour AADT flows and HGV percentages used in the air quality assessment are detailed in ES Appendix 20.2 (Document Reference: 3.3.24).

209. Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the earliest year of construction (2027) with North Falls scenario are detailed in Table 20.34 to Table 20.37. Concentrations for the without North Falls assessment are also shown for comparison purposes. All concentrations at each receptor are

inclusive of the background concentration and emissions from cumulative development flows.

Table 20.34 Predicted annual mean NO_2 concentrations and impact of North Falls at sensitive human receptors

Receptor	2027 Annual Mean NO2 Concentrations				
	Without North Falls (µg m-3)	With North Falls (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R1	9.1	9.2	0.1	0%	Negligible
R2	8.3	8.3	0.0	0%	Negligible
R3	9.5	9.5	0.0	0%	Negligible
R4	11.1	11.1	0.0	0%	Negligible
R5	9.3	9.3	0.0	0%	Negligible
R6	12.6	12.7	0.1	0%	Negligible
R7	13.5	13.5	0.0	0%	Negligible
R8	13.7	13.7	0.0	0%	Negligible
R9	9.9	10.1	0.2	0%	Negligible
R10	8.9	8.9	0.1	0%	Negligible
R11	8.1	8.1	0.0	0%	Negligible
R12	7.8	7.9	0.1	0%	Negligible
R13	8.4	8.5	0.1	0%	Negligible
R14	10.6	10.7	0.1	0%	Negligible
R15	11.9	12.0	0.1	0%	Negligible
R16	14.2	14.3	0.1	0%	Negligible
R17	14.1	14.2	0.1	0%	Negligible
R18	9.4	9.5	0.1	0%	Negligible
R19	8.7	8.8	0.1	0%	Negligible
R20	7.7	7.8	0.1	0%	Negligible
R21	8.3	8.3	0.0	0%	Negligible
R22	8.1	8.2	0.1	0%	Negligible
CBCR1	18.2	18.3	0.1	0%	Negligible
CBCR2	17.5	17.6	0.1	0%	Negligible

Table 20.35 Predicted annual mean PM_{10} concentrations and impact of North Falls at sensitive human receptors

Receptor	2027 Annual Mean PM10 Concentrations				
	Without North Falls (µg m-3)	With North Falls (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R1	14.9	15.0	0.1	0%	Negligible

Receptor	2027 Annual Mean PM10 Concentrations				
	Without North Falls (µg m-3)	With North Falls (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R2	14.2	14.3	0.1	0%	Negligible
R3	15.3	15.3	0.0	0%	Negligible
R4	16.8	16.8	0.0	0%	Negligible
R5	14.8	14.8	0.0	0%	Negligible
R6	16.7	16.7	0.0	0%	Negligible
R7	15.2	15.2	0.0	0%	Negligible
R8	15.7	15.7	0.0	0%	Negligible
R9	16.0	16.1	0.1	0%	Negligible
R10	15.6	15.7	0.1	0%	Negligible
R11	16.1	16.1	0.0	0%	Negligible
R12	15.1	15.1	0.0	0%	Negligible
R13	14.9	15.0	0.1	0%	Negligible
R14	13.6	13.6	0.0	0%	Negligible
R15	14.0	14.0	0.0	0%	Negligible
R16	13.2	13.3	0.1	0%	Negligible
R17	13.3	13.3	0.0	0%	Negligible
R18	16.0	16.1	0.1	0%	Negligible
R19	15.7	15.8	0.1	0%	Negligible
R20	15.2	15.2	0.0	0%	Negligible
R21	14.5	14.5	0.0	0%	Negligible
R22	14.4	14.4	0.0	0%	Negligible
CBCR1	17.7	17.7	0.0	0%	Negligible
CBCR2	17.5	17.6	0.1	0%	Negligible

Table 20.36 Short term PM_{10} results at sensitive human receptor locations

Receptor	2027 Number of Days >50µg m-3 (Objective being fewer than 35 exceedances per year)		
	Without North Falls	With North Falls	Change
R1	0	0	0
R2	0	0	0
R3	0	0	0
R4	1	1	0
R5	0	0	0
R6	1	1	0
R7	0	0	0

Receptor	2027 Number of Days >50µg m-3 (Objective being fewer than 35 exceedances per year)		
	Without North Falls	With North Falls	Change
R8	0	0	0
R9	0	0	0
R10	0	0	0
R11	0	0	0
R12	0	0	0
R13	0	0	0
R14	0	0	0
R15	0	0	0
R16	0	0	0
R17	0	0	0
R18	0	0	0
R19	0	0	0
R20	0	0	0
R21	0	0	0
R22	0	0	0
CBCR1	1	1	0
CBCR2	1	1	0

Table 20.37 Predicted annual mean $PM_{2.5}$ concentrations and impact of North Falls at sensitive human receptors

Receptor	2027 Annual Mean PM2.5 Concentrations				
	Without North Falls (µg m-3)	With North Falls (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R1	8.9	8.9	0.0	0%	Negligible
R2	8.6	8.6	0.0	0%	Negligible
R3	8.9	8.9	0.0	0%	Negligible
R4	9.5	9.5	0.0	0%	Negligible
R5	8.9	8.9	0.0	0%	Negligible
R6	9.6	9.6	0.0	0%	Negligible
R7	9.5	9.5	0.0	0%	Negligible
R8	9.8	9.8	0.0	0%	Negligible
R9	9.3	9.4	0.1	0%	Negligible
R10	9.1	9.1	0.0	0%	Negligible
R11	9.1	9.1	0.0	0%	Negligible
R12	8.8	8.8	0.0	0%	Negligible

Receptor	2027 Annual Mean PM2.5 Concentrations				
	Without North Falls (µg m-3)	With North Falls (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R13	8.7	8.7	0.0	0%	Negligible
R14	8.6	8.6	0.0	0%	Negligible
R15	9.0	9.0	0.0	0%	Negligible
R16	8.6	8.6	0.0	0%	Negligible
R17	8.6	8.6	0.0	0%	Negligible
R18	9.3	9.3	0.0	0%	Negligible
R19	9.1	9.1	0.0	0%	Negligible
R20	8.9	8.9	0.0	0%	Negligible
R21	8.7	8.7	0.0	0%	Negligible
R22	8.5	8.6	0.1	0%	Negligible
CBCR1	10.9	10.9	0.0	0%	Negligible
CBCR2	10.8	10.8	0.0	0%	Negligible

210. The results of the construction phase road traffic emissions assessment show that annual mean concentrations of NO_2 (see Table 20.34), PM_{10} (see Table 20.35) and $PM_{2.5}$ (see Table 20.37) are predicted to be well below (less than 75% of) the respective air quality Objectives in the earliest year of construction (2027). The predicted concentrations within Colchester Borough Council AQMA 4 are slightly higher than those predicted within Tendring District Council's area of jurisdiction however they are still well below the respective air quality Objectives.

211. The changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations were 1% or less at all receptors; this corresponded to a 'negligible' impact due to low total pollutant concentrations at all receptors, in accordance with IAQM and EPUK guidance (IAQM & EPUK, 2017).

212. All predicted annual average NO_2 concentrations were well below 60µg m^{-3} and therefore, in accordance with Defra guidance (Defra, 2021a), the 1-hour mean Objective is unlikely to be exceeded (see Table 20.5). Based on the calculation provided by Defra, as detailed in ES Appendix 20.4 (Document Reference: 3.3.26), the short-term PM_{10} Objective was predicted to be met at all modelled locations (the Objective being less than 35 exceedances of 50µg m^{-3} as a daily mean). As shown in Table 20.36, there was no change in the number of days exceeding the daily mean Objective between the without and with North Falls assessments, using the Defra (2022) calculation.

213. The assessment concluded that impacts and therefore effects of North Falls construction-generated road traffic upon local air quality at the location of human receptors are **not significant in EIA terms** based upon:

- A predicted negligible impact at all receptor locations;
- Predicted pollutant concentrations were well below the relevant air quality Objectives/target at all considered human receptor locations; and

- North Falls -generated traffic has not been predicted to cause a breach of any of the air quality Objectives at any identified sensitive receptor locations.

20.6.1.3.2 Ecological Receptors

214. Table 20.38 below presents the impact of North Falls and in-combination with cumulative developments (including traffic growth from 2022 to 2027 and traffic from cumulative developments identified in Section 20.7.3.2, on the most sensitive feature(s) under each designation, i.e., the most stringent Critical Levels and Loads of designated features have been presented below and may not all relate to the same feature. Values in exceedance of 1% of the Critical Load or Level, i.e., those which cannot be considered to be insignificant, are shown in **bold** text. Predicted total pollutant concentrations (including the relevant background pollutant concentrations) at the assessed sites alone and in-combination are detailed in Table 20.39. Values in exceedance of 100% of the Critical Level or Load are shown in **bold**.

215. It should be noted that the most sensitive Critical Levels and Loads for feature(s) under each designated ecological site are presented below and all features may not be present in each designated site, nor may they be located within 200m of the ARN.

216. Only ecological sites and pollutants screened in for further assessment (i.e., the AADT threshold representative of a 1% increase in Critical Level or Load is exceeded utilising in-combination traffic flows) in Table 1 of ES Appendix 20.3 (Document Reference: 3.3.25) are presented in the tables below. Further information on this is provided in ES Appendix 20.3 (Document Reference: 3.3.25).

Table 20.38 Maximum contribution of project-generated NOx, NH_3, N-dep and Acid-dep from traffic on designated ecological sites at closest point to road link edge – North Falls-alone and in-combination in 2027. Values in exceedance of 1% of the Critical Level or Load are shown in bold

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load							
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep		
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL	
			Project Alone											
1	AW	Kiln Wood	0.098	0.003	0.056	0.004	0.3%	0.3%	-	0.6%	0.4%	0.2%	0.2%	
	AW	Walls Wood	0.808	0.018	0.265	0.019	**2.7%**	**1.8%**	0.6%	**2.6%**	**1.8%**	**1.1%**	**1.1%**	
	AW	Unnamed (Boudge Hill Wood)	0.055	0.002	0.042	0.003	0.2%	0.2%	-	0.4%	0.3%	0.2%	0.2%	
21b	AW LWS	High Barn Wood	0.798	0.035	-	-	**2.7%**	**3.5%**	**1.2%**	-	-	-	-	
22	AW LWS	Guttridgehall Wood	0.076	0.002	0.034	0.002	0.3%	0.2%	-	0.3%	0.2%	0.1%	0.1%	
	AW LWS	Unnamed (Oakhurst Wood)	0.082	0.002	0.036	0.003	0.3%	0.2%	-	0.4%	0.2%	0.1%	0.1%	
	LWS	Weeley Bypass	0.383	0.017	-	-	**1.3%**	**1.7%**	0.6%	-	-	-	-	
26	SSSI	Holland Haven Marshes	0.341	0.015	-	-	**1.1%**	**1.5%**	0.5%	-	-	-	-	
32	LWS	St Michaels Churchyard	0.144	0.003	-	-	0.5%	0.3%	-	-	-	-	-	
	LWS	Thorpe Green	0.094	-	-	-	0.3%	-	-	-	-	-	-	
34	LWS	Thorpe Green	0.470	0.020	-	-	**1.6%**	**2.0%**	0.7%	-	-	-	-	
	LWS	Far Thorpe Green	0.470	0.020	-	-	**1.6%**	**2.0%**	0.7%	-	-	-	-	

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
35	LWS	Thorpe Green	0.508	0.022	-	-	**1.7%**	**2.2%**	0.7%	-	-	-	-
38	LWS	Goose Green Verge	0.180	0.008	-	-	0.6%	0.8%	0.3%	-	-	-	-
43	AW	Captains Wood	0.066	0.008	0.023	0.002	0.2%	0.1%	-	0.2%	0.2%	0.1%	0.1%
	LWS	Fratinghall Wood	0.073	0.008	-	-	0.2%	0.2%	0.1%	-	-	-	-
45	LWS	Upper Holland Brook	0.005	0.008	-	-	0.0%	0.0%	0.0%	-	-	-	-
47	SPA[1]	Stour and Orwell Estuaries	0.455	0.010	0.090	0.006	**1.5%**	-	0.3%	0.9%	0.5%	0.1%	0.1%
		Stour and Orwell Estuaries*	0.176	-	0.045	-	0.6%	-	-	0.4%	0.2%	-	-
	SSSI[1]	Stour Estuary	0.455	0.010	0.090	0.006	**1.5%**	-	0.3%	0.9%	0.5%	0.1%	0.1%
		Stour Estuary*	0.176	0.004	0.045	-	0.6%	-	0.1%	0.4%	0.2%	-	-
48	AW	Coppins Hall Wood	0.039	0.001	0.018	0.001	0.1%	0.1%	0.0%	0.2%	0.1%	0.1%	0.1%
In-Combination[2]													
1	AW	Kiln Wood	0.645	0.019	0.366	0.026	**2.2%**	**1.9%**	-	**3.7%**	**2.4%**	**1.5%**	**1.5%**
	AW	Walls Wood	5.325	0.116	1.745	0.122	**17.7%**	**11.6%**	**3.9%**	**17.5%**	**11.6%**	**7.3%**	**7.3%**
	AW	Unnamed (Boudge Hill Wood)	0.361	0.013	0.277	0.019	**1.2%**	**1.3%**	-	**2.8%**	**1.8%**	**1.1%**	**1.1%**
21b	AW	High Barn Wood	6.550	0.286	-	-	**21.8%**	**28.6%**	**9.5%**	-	-	-	-

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
	LWS												
22	AW LWS	Guttridgehall Wood	1.012	0.026	0.449	0.031	**3.4%**	**2.6%**	-	**4.5%**	**3.0%**	**1.7%**	**1.7%**
	AW LWS	Unnamed (Oakhurst Wood)	1.084	0.028	0.475	0.033	**3.6%**	**2.8%**	-	**4.8%**	**3.2%**	**1.9%**	**1.9%**
	LWS	Weeley Bypass	5.089	0.222	-	-	**17.0%**	**22.2%**	**7.4%**	-	-	-	-
26	SSSI	Holland Haven Marshes	1.000	0.044	-	-	**3.3%**	**4.4%**	**1.5%**	-	-	-	-
32	LWS	St Michaels Churchyard	0.697	0.015	-	-	**2.3%**	**1.5%**	-	-	-	-	-
	LWS	Thorpe Green	0.454	-	-	-	**1.5%**	**1.0%**	-	-	-	-	-
34	LWS	Thorpe Green	9.218	0.402	-	-	**30.7%**	**40.2%**	**13.4%**	-	-	-	-
	LWS	Far Thorpe Green	9.218	0.402	-	-	**30.7%**	**40.2%**	**13.4%**	-	-	-	-
35	LWS	Thorpe Green	0.706	0.031	-	-	**2.4%**	**3.1%**	**1.0%**	-	-	-	-
38	LWS	Goose Green Verge	0.732	0.032	-	-	**2.4%**	**3.2%**	**1.1%**	-	-	-	-
43	AW	Captains Wood	1.319	0.029	0.451	0.032	**4.4%**	**2.9%**	-	**4.5%**	**3.0%**	**1.9%**	**1.9%**
	LWS	Fratinghall Wood	1.453	0.032	-	-	**4.8%**	**3.2%**	**1.1%**	-	-	-	-
45	LWS	Upper Holland Brook	0.475	0.021	-	-	**1.6%**	**2.1%**	-	-	-	-	-

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			µg.m^{-3}		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
47	SPA[1]	Stour and Orwell Estuaries	1.751	0.039	0.348	0.024	**5.8%**	-	**1.3%**	**3.5%**	**1.7%**	0.5%	0.5%
		Stour and Orwell Estuaries*	0.676	-	0.173	-	**2.3%**	-	-	**1.7%**	0.9%	-	-
	SSSI[1]	Stour Estuary	1.751	0.039	0.348	0.024	**5.8%**	-	**1.3%**	**3.5%**	**1.7%**	0.5%	0.5%
		Stour Estuary*	0.676	0.017	0.173	-	**2.3%**	-	-	**1.7%**	0.9%	-	-
48	AW	Coppins Hall Wood	0.849	0.029	0.393	0.028	**2.8%**	**2.9%**	-	**3.9%**	**2.6%**	**1.6%**	**1.6%**

[1] The Stour and Orwell Estuaries SPA and Stour Estuary SSSI are designations which cover a large area (3,673 and 2,248 hectares, respectively), the majority of which is not affected by Project-generated traffic. The Priority Habitats Inventory (England) (Natural England, 2023) was reviewed and the only sensitive habitat designated under both sites present within 200 m of Link 47 was salt marsh, which is 27 m from the road edge at its closest location. To provide a conservative assessment, the most sensitive feature (low and medium altitude hay meadows) has also been assessed at the closest point of the designation to the road; however, it is likely this habitat is not present in this area and is located in other areas of the large SPA/SSSI designations. The SPA and SSSI has also been assessed for impacts on salt marsh habitat 27 m from the road edge (second row, identified with asterix (*))

[2] AADT change shown are inclusive of North Falls-generated traffic, in-combination traffic growth (from 2022 to 2027) and any relevant cumulative project traffic.

Table 20.39 Total pollutant concentrations at designated ecological sites closest point to the road link edge (including background concentrations) – Project-alone and in-combination. Values in exceedance of 100% of the Critical Level or Load are shown in bold

Link	Designated Ecological Site		Concentration or Flux					PC as % of Critical Level or Critical Load					
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
Project Alone													
1	AW	Kiln Wood	15.0	1.50	24.87	1.860	50%	**150%**	-	**249%**	**166%**	**110%**	**110%**
	AW	Walls Wood	12.5	1.42	24.77	1.844	42%	**142%**	47%	**248%**	**165%**	**110%**	**110%**
	AW	Unnamed (Boudge Hill Wood)	10.2	1.40	23.65	1.759	-	**140%**	-	**237%**	**158%**	**103%**	**103%**
21b	AW LWS	High Barn Wood	9.38	1.435	-	-	31%	**143%**	48%	-	-	-	-
22	AW LWS	Guttridgehall Wood	8.7	1.40	21.94	1.628	29%	**140%**	-	**219%**	**146%**	91%	91%
	AW LWS	Unnamed (Oakhurst Wood)	8.7	1.40	21.95	1.628	29%	**140%**	-	**219%**	**146%**	91%	91%
	LWS	Weeley Bypass	9.0	1.42	-	-	30%	**142%**	47%	-	-	-	-
26	SSSI	Holland Haven Marshes	8.5	1.01	-	-	28%	**101%**	34%	-	-	-	-
32	LWS	St Michaels Churchyard	8.1	1.30	-	-	27%	**130%**	-	-	-	-	-
	LWS	Thorpe Green	7.9	-	-	-	26%	-	-	-	-	-	-
34	LWS	Thorpe Green	8.2	1.32	-	-	27%	**132%**	44%	-	-	-	-
	LWS	Far Thorpe Green	8.3	1.32	-	-	28%	**132%**	44%	-	-	-	-
35	LWS	Thorpe Green	8.3	1.32	-	-	28%	**132%**	44%	-	-	-	-

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
38	LWS	Goose Green Verge	8.2	1.41	-	-	27%	**141%**	47%	-	-	-	-
43	AW	Captains Wood	8.5	1.30	22.93	1.717	28%	**130%**	-	**229%**	**153%**	**102%**	**102%**
	LWS	Fratinghall Wood	8.5	1.30	-	-	28%	**130%**	43%	-	-	-	-
45	LWS	Upper Holland Brook	7.8	1.30	-	-	26%	**130%**	-	-	-	-	-
47	SPA[1]	Stour and Orwell Estuaries	14.5	1.21	11.50	0.872	48%	40%	40%	**115%**	58%	18%	17%
		Stour and Orwell Estuaries*	14.2	-	11.45	-	47%	-	-	**115%**	57%	-	-
	SSSI[1]	Stour Estuary	14.5	1.21	11.50	0.872	48%	-	40%	**115%**	58%	18%	17%
		Stour Estuary*	14.2	-	11.45	-	47%	-	-	**115%**	57%	-	-
48	AW	Coppins Hall Wood	8.7	1.20	20.33	1.517	29%	**120%**	-	**203%**	**136%**	90%	90%
In-Combination[2]													
1	AW	Kiln Wood	15.6	1.52	25.2	1.88	52%	**152%**	-	**252%**	**168%**	**111%**	**111%**
	AW	Walls Wood	17.1	1.52	26.3	1.95	57%	**152%**	51%	**263%**	**175%**	**116%**	**116%**
	AW	Unnamed (Boudge Hill Wood)	10.5	1.41	23.9	1.78	57%	**141%**	-	**239%**	**159%**	**104%**	**104%**
21b	AW LWS	High Barn Wood	15.136	1.686	-	-	50%	**169%**	56%	-	-	-	-
22	AW LWS	Guttridgehall Wood	9.6	1.43	22.4	1.66	32%	**143%**	-	**224%**	**149%**	92%	92%

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load							
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep		
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL	
	AW LWS	Unnamed (Oakhurst Wood)	9.7	1.43	22.4	1.66	32%	**143%**	-	**224%**	**149%**	92%	92%	
	LWS	Weeley Bypass	13.7	1.62	-	-	46%	**162%**	54%	-	-	-	-	
26	SSSI	Holland Haven Marshes	9.2	1.04	-	-	31%	**104%**	35%	-	-	-	-	
32	LWS	St Michaels Churchyard	8.7	1.32	-	-	29%	**132%**	-	-	-	-	-	
	LWS	Thorpe Green	8.2	-	-	-	27%	-	-	-	-	-	-	
34	LWS	Thorpe Green	17.0	1.70	-	-	57%	**170%**	57%	-	-	-	-	
	LWS	Far Thorpe Green	17.1	1.70	-	-	57%	**170%**	57%	-	-	-	-	
35	LWS	Thorpe Green	8.5	1.33	-	-	28%	**133%**	44%	-	-	-	-	
38	LWS	Goose Green Verge	8.7	1.43	-	-	29%	**143%**	48%	-	-	-	-	
43	AW	Captains Wood	9.8	1.33	23.4	1.75	33%	**133%**	-	**234%**	**156%**	**104%**	**104%**	
	LWS	Fratinghall Wood	9.9	1.33	-	-	33%	**133%**	44%	-	-	-	-	
45	LWS	Upper Holland Brook	8.3	1.32	-	-	28%	**132%**	-	-	-	-	-	
47	SPA[1]	Stour and Orwell Estuaries	15.8	1.24	11.8	0.89	53%	-	41%	**118%**	59%	18%	18%	
		Stour and Orwell Estuaries*	14.7	-	11.6	-	49%	-	-	**116%**	58%	-	-	
	SSSI[1]	Stour Estuary	15.8	1.24	11.8	0.89	53%	-	41%	**118%**	59%	18%	18%	
		Stour Estuary*	14.7	-	11.6	-	49%	-	-	**116%**	58%	-	-	

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load							
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep		
			$\mu g.m^{-3}$		kgN ha^{-1} yr^{-1}	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL	
48	AW	Coppins Hall Wood	9.5	1.23	20.7	1.54	32%	**123%**	-	**207%**	**138%**	91%	91%	

[1] The Stour and Orwell Estuaries SPA and Stour Estuary SSSI are designations which cover a large area (2,337 and 2,248 hectares, respectively), the majority of which is not affected by Project-generated traffic. The Priority Habitats Inventory (England) (Natural England, 2023) was reviewed and the only sensitive habitat designated under both sites present within 200 m of Link 47 was salt marsh, which is 27 m from the road edge at it closest location. To provide a conservative assessment, the most sensitive feature (low and medium altitude hay meadows) has also been assessed at the closest point of the designation to the road; however, it is likely this habitat is not present in this area and is located in other areas of the large SPA/SSSI designations. The SPA and SSSI has also been assessed for impacts on salt marsh habitat 27 m from the road edge (second row, identified with asterix (*))

[2] AADT change shown are inclusive of North Falls -generated traffic, in-combination traffic growth (from 2022 to 2027) and any relevant cumulative project traffic.

217. As shown in Table 20.38, all sites are predicted to experience in-combination impacts in excess of 1% of the Critical Load or Level at the closest locations to the roads edge. However, comparison with 'Project alone' results (also in Table 20.38) shows that only a small percentage of impacts at almost all sites is due to the contribution from North Falls. Furthermore, as previously discussed, the impact of North Falls is temporary and would be experienced only during construction. The impact of other in-combination plans and projects, for example traffic generated as a result of residential and employment developments associated with regional Local Plan allocations, would be experienced over a significantly longer duration.

218. Nevertheless, effects at all sites where the NOx, NH_3, N-dep and/or Acid-dep were predicted to be above 1% of the relevant Critical Level or Load in, cannot be considered to be insignificant based on the use of the 1% screening criteria alone.

219. As shown in Table 20.39, due to elevated NH_3 concentrations and N-dep background fluxes in exceedance of the Critical Level and Load, respectively, total pollutant concentrations of NH_3 exceed the upper and lower Critical Level at woodland habitats and the lower Critical Level at short-vegetation habitats and total N-dep exceeds the upper and lower Critical Load at woodland habitats and exceeds the lower Critical Load at short-vegetation habitats. This is also the case at four AW sites for Acid-dep, where background fluxes are already in exceedance of the Critical Loads.

220. It is also worth noting the following:

- Results are presented for both the lower and upper NH_3 Critical Levels, and the lower Critical Level may not be applicable at every site as the more stringent Critical Level will only be relevant to woodland if lichen/bryophyte interest is 'an integral' part of the woodland;
- The worst case impacts are presented in Table 20.38 and Table 20.39, as the closest boundary of ecological sites to affected road links was assessed and at some sites the affected road links abut the designated sites. For example, at Holland Haven Marshes SSSI, in-combination impacts were predicted to reduce to <1% of all Critical Levels at 13m back from Link 26's road edge;
- As discussed in Section 20.4.3.3.6, Critical Levels and/or Loads for the most sensitive feature(s) under each designated ecological site are presented in Table 20.38 and Table 20.39. However not all of these features may be present at the closest designated site boundary to the affected road link. This is especially the case for the SPA and SSSIs assessed as they are of a very large sizes (Stour and Orwell Estuaries SPA: 36.73km^2, Stour Estuary SSSI: 22.48km^{2,} and Holland Haven Marshes SSSI: 2.11km^2) and a relatively small area of each of these sites are within 200 m of affected road links (<1% for the Stour and Orwell Estuaries SPA and Stour Estuary SSSI and approximately 6% of Holland Haven Marshes SSSI), nor may these features be located within 200 m of the ARN; and
- Finally, it should be noted that these results are based on average vehicle fleet mix in 2019 for NOx and 2015 for NH_3 and N-dep; as such, changes in emissions of these pollutants into the future is not accounted for.

Commentary on the change in vehicle fleet between 2015/2019 and 2027 is provided in Section 20.4.6.2.

221. The significance of effects is therefore discussed in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25). which concludes the following:

- Effects upon the qualifying / interest features of designated sites for nature conservation arising from changes to NOx, NH_3, N-Dep and acid dep. from road traffic emissions considered within ES Chapter 23 Onshore Ecology are **negligible, i.e. not significant in EIA terms**.

20.6.2 Likely significant during operation

222. Operational phase impacts were scoped out of the assessment, as agreed by the Planning Inspectorate (Planning Inspectorate, 2021; also see Table 20.1).

223. During operation, it is expected that there will be no further requirement for land to be disturbed or excavated, except in the event that onshore cables require repair or maintenance or the onshore substation access works needing to be reinstated. However, these activities would not extend beyond the construction footprint assessed above, and for the former would be relatively rare and localised in occurrence. For the latter, the haul road required to access the onshore substation, required in the unlikely event of transformer failure, would potentially be in place for up to 7 months, but its location would be over land already disturbed during construction. As such, direct and indirect physical impacts on air quality receptors during operation have been scoped out of further assessment, as impacts would have already occurred during the construction phase.

224. An exception to this is the reinstatement of the haul road connecting Bentley Road to Ardleigh Road to service Abnormal Indivisible Load (AIL) movements to the onshore substation in the unlikely event of transformer failure during the Project's lifetime. Reinstatement would require construction activity for a further 7 months involving HGV and plant movements, followed by removal of the haul road in this area. This construction activity would be within the impact envelope assessed during construction; therefore, no new receptors would be impacted during operation and the magnitude and significance of effects would be less than assessed during the construction phase. The significance of effect from construction works associated with Bentley Road was determined to be **not significant in EIA terms** for all likely significant effects.

20.6.3 Likely significant effects during decommissioning

225. No decision has been made regarding the final decommissioning policy for North Falls, as it is recognised that industry good practice, rules and legislation change over time. It is likely the cables would be pulled through the ducts and recycled, with the transition pits and ducts capped and sealed then left in situ.

226. The detailed activities and methodology for decommissioning would be determined later within the lifetime of North Falls in line with relevant policies at that time, but would be expected to include:

- Dismantling and removal of electrical equipment;

- Removal of cabling from site;
- Removal of any building services equipment;
- Demolition of the buildings and removal of fences; and
- Landscaping and reinstatement of the sites.

227. Whilst details regarding the decommissioning of the onshore substation are currently unknown, considering the worst-case assumptions for all scenarios which would be the removal and reinstatement of the current land use at the site, it is anticipated that the impacts would be similar to those during construction and therefore there would be **no likely significant effects**.

228. The decommissioning methodology cannot be finalised until immediately prior to decommissioning but would be in line with relevant policy at that time.

20.7 Cumulative effects

20.7.1 Identification of potential cumulative effects

229. The first step in the CEA process is the identification of which residual effects assessed for North Falls on their own have the potential for a cumulative effect with other plans, projects and activities. This information is set out in Table 20.40.

Table 20.40 Potential cumulative effects

Impact	Potential for cumulative effect	Rationale
Construction		
Construction Impact 1: Construction dust and fine PM	Yes	There is potential for cumulative construction dust impacts where projects occur within 700m of each other, as dust impacts are considered within a 350m buffer from each project, as detailed in Section 20.4.3.1. Therefore, two projects would need to be within 700m of each other for cumulative dust impacts to occur.
Construction Impact 2: NRMM Emissions	Yes	There is potential for cumulative NRMM emission impacts where projects overlap.
Construction Impact 3: Construction phase road traffic emissions	Yes	Where the construction phase of North Falls overlaps with other projects, there is the potential for cumulative impacts associated with North Falls-generated traffic emissions on the local road network.
Operation		
Operation impacts were scoped out of the assessment, as detailed in Section 20.6.2, therefore there would be no cumulative operational impacts.		
Decommissioning		
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan would be provided. As such, cumulative impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.		

20.7.2 Other plans, projects and activities

230. The second step in the cumulative assessment is the identification of the other plans, projects and activities that may result in cumulative effects for inclusion in the CEA (described as 'project screening'). This information is set out in Table 20.41 below, together with a consideration of the relevant details of each, including current status (e.g., under construction), planned construction period, closest distance to North Falls, status of available data and rationale for including or excluding from the assessment.

231. The North Falls screening has been informed by the development of a CEA project list which forms an exhaustive list of plans, projects, and activities within the study area (Section 20.3.1) relevant to North Falls. The list has been appraised, based on the confidence in being able to undertake an assessment from the information and data available, enabling individual plans, projects, and activities to be screened in or out.

Table 20.41 Summary of projects considered for the CEA in relation to air quality (project screening)

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
National Infrastructure Planning						
Five Estuaries Offshore Wind Farm EN010115	Pre-application	2028 - 2030	Five Estuaries onshore project area directly overlaps with North Falls onshore project area.	High	Yes	The onshore project area for Five Estuaries covers largely the same area as North Falls. There is also a possibility that both projects could be constructed at around the same time, therefore, cumulative effects may occur.
Norwich to Tilbury EN020027	Pre-application	2027 - 2031	Scoping area directly overlaps with North Falls onshore project area.	Low	Yes	The proposed substation area for Norwich to Tilbury is in close proximity to North Falls proposed onshore substation works area; and the proposed new substation operational access road overlaps with the Bentley Road improvement works. Therefore, cumulative impacts could occur.
East Anglia TWO Offshore Windfarm EN010078	Approved (DCO Issued 2022)	Mid 2020s	47	High	No	The onshore infrastructure for this project is not within 500 m of the onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference 3.1.29), the traffic and transport study area for these projects does not overlap with the North Falls onshore project area. Therefore, these schemes will not likely have a cumulative effect on air quality.
Bradwell B new nuclear power station EN010111	Pre-application	Predicted 9 – 12 years	21	High	No	
Ipswich Rail Chord TR040002	Approved (DCO issued 2012)	Built	17	High	No	Ipswich Rail Chord has already concluded construction and will therefore not contribute to cumulative effects during North Falls construction or decommissioning periods. Cumulative impacts are not expected during operation as Ipswich Rail Chord does not have

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						operational effects that could contribute to effects from North Falls.
Sizewell C Project EN010012	Approved (DCO issued 2022)	2022 – 2034	49	High	No	Sizewell C Project is located over 40km from the onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference 3.1.29), the traffic and transport study area for this project does not overlap with the North Falls onshore project area. Therefore, this scheme will not likely have a cumulative effect on air quality.
Nautilus Interconnector EN020023	Pre-application	Information unavailable	44	Medium	No	The location of onshore infrastructure associated with this project is not known, however, it is highly unlikely to be within close proximity to the onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), no traffic and transport assessment (e.g. a TA or ES traffic and transport chapter) have been provided in support of the planning application for the scheme and therefore by definition there is no potential for cumulative effects to occur; so will not likely have a cumulative effect on air quality.
Lake Lothing Third Crossing TR010023	Approved (DCO issued 2020)	Over 2 years	76	High	No	The project is over 75km away from the onshore project area. In addition, the project is scheduled to be complete by the end of 2024 and therefore it is considered to be no potential for temporal overlap of project's construction. The project will not likely have a cumulative effect on air quality.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Richborough Connection Project EN020017	Approved (DCO issued 2017)	Built	55	High	No	This project has already been built and is therefore now part of the existing baseline.
Manston Airport TR02002	Information unavailable	Information unavailable	53	N/A	No	The airport is over 50km from the onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), the traffic and transport study area for this project does not overlap with the North Falls onshore project area. Therefore, this scheme will not likely have a cumulative effect on air quality.
Kentish Flats Extension EN010036	Approved (DCO issued 2013)	Built	46	High	No	This project has already been built and is therefore now part of the existing baseline. No significant operational traffic movements are reported.
Sea Link EN020026	Pre-application	Information unavailable	20	N/A	No	The location of any onshore infrastructure associated with this project is not known, however, it is highly unlikely to be within close proximity to the onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), no traffic and transport assessment have been provided in support of the planning application for the scheme and therefore by definition there is no potential for cumulative effects to occur. The project is therefore not likely to have a cumulative effect on air quality.
Galloper Offshore Windfarm EN010003	Approved	Built	15	High	No	This project has already been built and any onshore infrastructure is now part of the baseline.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
A12 Chelmsford to A120 widening scheme TR010060	Pre-examination	Information unavailable	27	Medium	No	These projects are not in close proximity to the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), traffic and transport study area for these projects does not overlap with the North Falls onshore project area. Therefore, these schemes will not likely have a cumulative effect on air quality.
Rivenhall IWMF and Energy Centre EN010138	Pre-application	Information unavailable	27	Medium	No	
Essex County Council						
Elmstead Hall, Elmstead, Colchester, Essex ESS/24/15/TEN	Approved	Information unavailable.	5	N/A	No	The project is not within 500 m of the onshore project area for the Project. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), no traffic and transport assessment have been provided in support of the planning application for the scheme and therefore by definition there is no potential for cumulative effects to occur. The project is therefore not likely to have a cumulative effect on air quality.
St. George's Infant School and Nursery, Barrington Road, Colchester, Essex, CO2 7RW CC/COL/71/22	Approved	Information unavailable	9	N/A	No	This project is not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), the traffic and transport study area for this project does not overlap with the North Falls onshore project area. Therefore, this scheme will not likely have a cumulative effect on air quality.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Wilson Marriage Centre, Barrack Street, Colchester, Essex, CO1 2LR CC/COL/85/22	Approved	Information unavailable	9	N/A	No	The project is not within 500 m of the onshore project area for the Project. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), no traffic and transport assessment have been provided in support of the planning application for the scheme and therefore by definition there is no potential for cumulative effects to occur. The project is therefore not likely to have a cumulative effect on air quality.
Wivenhoe Quarry Alresford Road, Wivenhoe, Essex, CO7 9JU ESS/80/20/TEN/42/2	Report being prepared	Information unavailable	7	N/A	No	The project is not within 500 m of the onshore project area. The Transport Assessment for the scheme identifies that there would be no net increase in traffic movements above existing levels, there is no potential for cumulative effects to occur.
Elmstead Hall, Elmstead, Colchester, Essex, CO7 7AT ESS/24/15/TEN/55/1/NMA	Approved	Information unavailable.	5	N/A	No	These projects are not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference 3.1.29), a Transport Statement (TS) is provided for each project, however no assessment of traffic impacts is provided within the TS in support of each application. Therefore, by definition there is no potential for cumulative effects to occur.
Elmstead Hall, Elmstead, Colchester, Essex, CO7 7AT ESS/24/15/TEN/2/1/NMA	Approved	Information unavailable.	5	N/A	No	
Old Heath County Primary School, Old Heath Road, Colchester, Essex, CO2 8DD CC/COL/50/22	Approved	Information unavailable.	8	N/A	No	The project is not within 500 m of the North Falls onshore project area so will not likely have a cumulative effect on air quality, especially when considering the works' localised nature.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Crown Quarry (Wick Farm), Old Ipswich Road, Ardleigh, CO7 7QR ESS/57/04/TENLA4	Approved	Information unavailable.	6	N/A	No	The project is not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), a Transport Statement (TS) is provided for the project, however no assessment of traffic impacts is provided within the TS in support of the application. Therefore, there is no potential for cumulative effects on air quality to occur.
Wivenhoe Quarry, Alresford Road Wivenhoe, Essex CO7 9JU ESS/80/20/TEN/42/2	Approved	Information unavailable.	7	N/A	No	The projects are not within 500 m of the North Falls onshore project area. The Transport Assessment for each scheme identifies that there would be no net increase in traffic movements above existing levels. Therefore, there is no potential for cumulative effects on air quality to occur.
Martell's Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU ESS/42/22/TEN	Out for consultation	Information unavailable	3	N/A	No	
Land at: Elmstead Hall, Elmstead, Colchester, Essex ESS/105/21/TEN	Approved	Information unavailable.	5	N/A	No	The project is not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference 3.1.29), a Transport Statement (TS) is provided for the project, however no assessment of traffic impacts is provided within the TS in support of the application. Therefore, there is no potential for cumulative effects on air quality to occur.
Land at Martells Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU ESS/39/22/TEN	Approved	Information unavailable.	3	N/A	No	The project is not within 500 m of North Falls onshore project area. The schemes transport documents propose to scope out transport effects due to the forecast low numbers of additional traffic movements. Therefore, there is no potential for cumulative effects on air quality to occur.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Land to the south of Colchester Main Road, Alresford, Colchester, CO7 8DB ESS/17/18/TEN?NMA2	Report being prepared	Information unavailable	6	N/A	No	The project is not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference; 3.1.29), the Transport Assessment for the scheme identifies that there would be no net increase in traffic movements above existing levels. There is no potential for cumulative effects on air quality to occur.
Land at: Martells Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU ESS/39/22/TEN/NMA/1 ESS/39/22/TEN ESS/39/22/TEN/NMA/1	Approved	Information unavailable	3	N/A	No	The projects are not within 500 m of North Falls onshore project area. The schemes transport documents propose to scope out transport effects due to the forecast low numbers of additional traffic movements. Therefore, there is no potential for cumulative effects on air quality to occur.
Tendring Education Centre, Jaywick Lane, Clacton on Sea, Essex, CO16 8BE CC/TEN/40/21/3/1	Approved	Information unavailable.	6	N/A	No	The project is not within 500 m of the North Falls onshore project area so will not likely have a cumulative effect on air quality.
Tendring Education Centre, Jaywick Lane, Clacton on Sea, Essex, CO16 8BE CC/TEN/40/21/4/1	Approved	Information unavailable.	6	N/A	No	The project is not within 500 m of the North Falls onshore project area so will not likely have a cumulative effect on air quality.
Crown Quarry (Ardleigh Reservoir Extension), Wick Farm, Old Ipswich Road, Tendring, Colchester, CO7 7QR ESS/57/04/TENLA4	Approved	Information unavailable.	3	N/A	No	These projects are not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), a Transport Statement (TS) is provided for each

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Elmstead Hall, Elmstead, Colchester, Essex ESS/24/15/TEN	Approved	Information unavailable.	6	N/A	No	project, however no assessment of traffic impacts is provided within the TS in support of the application. Therefore, by definition there is no potential for cumulative to occur. These schemes will not likely have a cumulative effect on air quality.
Ardleigh Waste Transfer Station, A120, Ardleigh, Colchester, CO7 7SL ESS/04/17/TEN	Approved	Information unavailable.	5	N/A	No	This project is not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), the traffic and transport study area for this project does not overlap with the North Falls onshore project area. Therefore, this scheme will not likely have a cumulative effect on air quality.
35 Roach Vale, Colchester, CO4 3YN CC/COL/07/22	Approved	Information unavailable.	4	N/A	No	The project is not within 500 m of the North Falls onshore project area. No traffic and transport assessment (e.g. a TA or ES traffic and transport chapter) have been provided in support of the planning application for these schemes and therefore by definition there is no potential for cumulative effects to occur. These schemes will not likely have a cumulative effect on air quality.
Boxted Bridge, Boxted, Essex, CO4 5TB CC/COL/106/21	Report being prepared	Information unavailable	9	N/A	No	
Elmstead Hall, Elmstead, Colchester, Essex ESS/24/15/TEN	Approved	Information unavailable.	6	N/A	No	This project is not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), a Transport Statement (TS) is provided for the project, however no assessment of traffic

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						impacts is provided within the TS in support of the application. Therefore, by definition there is no potential for cumulative to occur. This scheme will not likely have a cumulative effect on air quality.
Lufkins Farm, Great Bentley Road, Frating CO7 7HN ESS/99/21/TEN/SO	EIA not required	Information unavailable.	6	N/A	No	These projects are not within 500 m of the North Falls onshore project area. No traffic and transport assessment (e.g. a TA or ES traffic and transport chapter) have been provided in support of the planning applications for these schemes and therefore by definition there is no potential for cumulative effects to occur. These schemes will not likely have a cumulative effect on air quality.
Lufkins Farm, Great Bentley Road, Frating CO7 7HN ESS/99/21/TEN	Resolution made/ awaiting legal agreement	Information unavailable.	6	N/A	No	
Elmstead Hall, Elmstead, Colchester ESS/24/15/TEN	Approved	Information unavailable.	5	N/A	No	These projects are not within 500 m of the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), a Transport Statement (TS) is provided for each project, however no assessment of traffic impacts is provided within the TS in support of the application. Therefore, by definition there is no potential for cumulative to occur. These schemes will not likely have a cumulative effect on air quality.
Elmstead Hall, Elmstead, Colchester, CO7 7EX ESS/24/15/TEN	Approved	Information unavailable.	5	N/A	No	
Tendring District Council						
Land Between the A120 and A133, To The East of Colchester and of Elmstead Market 21/01502/CMTR	Awaiting decision	Information unavailable.	3	N/A	No	The project is beyond 500m from the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), No

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						temporal overlap between the scheme and North Falls is identified as the scheme is due to be completed in 2026, thus is not considered for the cumulative assessment.
Hamilton Lodge Parsons Hill Great Bromley Colchester Essex CO7 7JB 20/00547/OUT	Approval-outline	Information unavailable.	2	N/A	No	The project is beyond 500m from the North Falls onshore project area. No traffic and transport assessment (e.g. a TA or ES traffic and transport chapter) have been provided in support of the planning applications for these schemes and therefore by definition there is no potential for cumulative effects to occur.
Land adjacent to Lawford Grid Substation Ardleigh Road Little Bromley Essex CO11 2QB 21/02070/FUL	Approved	Information unavailable.	0.3	N/A	No	The project will have been constructed and operational by the time of the North Falls construction. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), a Transport Statement (TS) is provided for the project, however no assessment of traffic impacts is provided within the TS in support of the application. Therefore, by definition there is no potential for cumulative to occur. This scheme will not likely have a cumulative effect on air quality.
Bathside Bay Stour Road Harwich Essex CO12 3HF	Awaiting decision	2026-2028 (For Green Energy Hub)		High	Yes	The project is beyond 500m from the North Falls onshore project area. As detailed in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29), a Transport Assessment and ES traffic and transport chapter is provided in support of this scheme. A review of these documents identifies

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						a potential temporal overlap and spatial and overlap between the schemes and North Falls traffic and transport study areas. Therefore, it is assessed that there is the potential for cumulative effects to occur.
Land South West of Horsley Cross Roundabout Clacton Road Horsley Cross Essex CO11 2NZ 13/00745/OUT	Approved – Outline (Aug 2014)	Information unavailable		Low	No	The project is beyond 500m from the North Falls onshore project area. A Transport Assessment is included in the application and presents operational traffic impacts of the project. Thus, the project is included in cumulative assessment.

20.7.3 Assessment of cumulative effects

232. The Five Estuaries is also in its application phase, having submitted a DCO to the Planning Inspectorate for the project, which was accepted on 22nd April 2024. Although subject to a separate DCO, the Five Estuaries shares the same landfall location and onshore cable route (including Bentley Road improvement works) as North Falls, with the two projects also having co-located onshore substations within the same onshore substation works area. The two projects also have the same national grid connection point.

233. Five Estuaries Offshore Wind Farm Limited and NFOW have sought to collaborate and coordinate where practicable, which has led to collaborative design of the projects' onshore infrastructure, and also to sharing of detailed project design information onshore. As a result, a detailed CEA for effects arising from the development of the Five Estuaries can be undertaken. The CEA section of this chapter is therefore split into two sections:

- The first describing a detailed CEA covering effects predicted to arise from development of Five Estuaries and North Falls;
- The second, detailing effects predicted to arise from the development Five Estuaries, North Falls and other projects.

234. The latter section will be based on the project information available for each scheme in the public domain, and by definition is therefore less detailed than the Five Estuaries and North Falls CEA section.

235. Full details on the approach to CEA used within this chapter are set out in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

20.7.3.1 Five Estuaries Offshore Wind Farm

20.7.3.1.1 Realistic worst case scenario

236. Using the design information provided by Five Estuaries Offshore Wind Limited, a realistic worst case cumulative scenario has been developed for the purpose of this chapter.

237. This realistic worst case cumulative scenario considers three potential cumulative build-out scenarios, as outlined in ES Chapter 5 Project Description (Document Reference: 3.1.7):

- **Scenario 1:** North Falls 'Option 2' build out is progressed, and Five Estuaries Offshore Wind Limited undertakes landfall, onshore substation construction and cable pull which overlaps with North Falls equivalent works. In this scenario, onshore cable route associated works, including temporary construction compounds, accesses and haul road, all remain in place and are used by the second project during its construction.
- **Scenario 2:** North Falls 'Option 1' build out is progressed, and Five Estuaries Offshore Wind Limited undertakes landfall, onshore substation and onshore cable route construction and cable pull, all of which does not overlap with North Falls' equivalent works. There would be a gap of between 1 and 3 years between each Projects' construction. In this scenario, onshore cable route associated works, including temporary construction compounds, accesses and haul road, all remain in place and are used by the second project during its construction.

- **Scenario 3:** North Falls 'Option 1' build out is progressed, and Five Estuaries Offshore Wind Limited undertakes a separate landfall, onshore substation and onshore cable route construction and cable pull with a multi-year (i.e. >3 year) gap between the two construction activities. In this scenario, there is no reuse in onshore temporary works between the two projects, and all onshore cable route associated works are rebuilt and reinstated in full by the second project.

238. Full details on the build out scenarios considered within this assessment are detailed in ES Chapter 5 Project Description (Document Reference: 3.1.7) and ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

239. The realistic worst case scenario for likely cumulative effects scoped into the EIA for the air quality assessment is considered to be Scenario 1 as summarised in Table 20.42. These are based on project parameters for Five Estuaries described in ES Chapter 5 Project Description (Document Reference: 3.1.7), which provides further details regarding specific activities and their durations.

240. Scenario 1 is considered the realistic worst case scenario for the air quality assessment as there is the potential for a greater magnitude of impact due to an increase in construction activities, and therefore pollutant emissions, over the same time period.

Table 20.42 Realistic worst-case scenario of cumulative effects arising from development of North Falls and Five Estuaries – (Scenario 1) (simultaneous build).

Potential impact	Parameter	Notes
Construction		
Impacts relating to the landfall	Landfall HDD (temporary works) physical parameters: Landfall construction compound dimensions = 150 x 300m Transition Joint Bay (TJB) dimensions = 4 x 15m for the Project, 5 x 20m for Five Estuaries No. of TJBs = 4 Maximum HDD depth = 20m Construction duration 13 months (of which HDD = 6 months) Maximum indicative length of HDD = 1.1 km Drill exit location = subtidal exit below MHWS (up to 8m depth) HDD to include 24 hour / 7 days working where required	Duration includes compound establishment, HDD, transition bays, and reinstatement
Impacts relating to the onshore cable route	Onshore cable route construction physical parameters: Indicative cable route width = 72m (open cut trenching), 90m (trenchless crossings), 130m (complex trenchless crossings) Route length = Up to 24km Cable trench dimensions = 3.5 – 1.2 x 2m (tapered top to bottom) No. of trenches = 4 Maximum cable trench depth = 2m Minimum cable burial depth = 0.9m Haul road width = 6m wide road, 10m wide total including verges, drainage and passing places. Jointing bays = Up to 192 (approximately every 500m) buried below ground Jointing bay construction footprint (per bay) = 15 x 4m Temporary construction compound footprint = 150 x 150m (main) to 100 x 100m (satellite). No. of compounds (est.) = 11 Trenchless crossing compound dimensions = 75 x 150m Maximum trenchless crossing depth = 20m	Overall duration includes establishing / reinstating temporary construction compounds (TCCs) and haul roads, cable installation (trench excavation, duct installation, cable jointing), HDD (includes compound establishment, HDD, and reinstatement).

Potential impact	Parameter	Notes
	Durations: Bentley Road improvement works = 6 – 9 months Cable route works = 18 – 27 months per project, with a 57 month gap in between i.e. 111 months start to finish months Cable installation = 12 months Major trenchless crossings (each location) = 8 months (of which HDD = 4 months) Minor trenchless crossings = 2 months Major HDD crossings to include 24 hour / 7 days working where required.	
Impacts relating to the onshore substation and national grid substation connection works	Onshore substation (temporary works) physical parameters: Permanent substation footprint = 280 x 210m (North Falls) + 280 x 210m (Five Estuaries) Construction compound footprint = 150 x 250m (North Falls) + 150 x 250m (Five Estuaries) Construction duration = 18 – 27 months per project, with a 57 month gap in between i.e. 111 months start to finish months	
	National grid substation connection works physical parameters (for two projects): All enabling work / platform constructed by national grid. Cable installation works as described above Equipment may include: cable sealing ends, surge arrestors, earth switch, disconnectors, circuit breakers, current transformers, voltage transformers, busbars.	
Road Vehicle Exhaust Emissions	Associated average movements and routeing (for landfall, onshore cable route and onshore substation): Average HGV movements = 443 HGV trips per day (inclusive of contingencies for incidental deliveries) Average LDV movements = 871 employee trips, 581 trips per day (applying an employee to vehicle ratio of 1.5 employees per vehicle) Construction routing = All HGV traffic is assumed to have an origin on either the A120, either east towards the port of Harwich or west towards Colchester and the A12 Rail or water transport = HGV numbers are based on all materials are delivered direct to the work area by road, i.e. no use of rail or water transport	

Potential impact	Parameter	Notes
	Backhauling = HGV numbers are based on no back-hauling, i.e. no reduction has been applied to take account of the potential that vehicles making deliveries could be used to export materials Contingencies = A contingency (reflecting the uncertainties in the design) has been applied to all material quantities and associated HGV movements Travel planning = LV movements have been based upon an average of 1.5 employees per vehicle Traffic reassignment = No reduction in traffic movements has been applied to account for the reassignment of traffic. For example, many HGVs would already be on the local network serving existing supply chains and would potentially reassign to serve North Falls without creating additional demand within the TTSA. However, within the assessment all HGV movements are assessed as 'new' trips.	
Operation		
Impacts relating to the onshore cable route	None	
Impacts relating to the onshore substation	None	
Decommissioning		
No final decision has yet been made regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable route and onshore substation. It is also recognised that legislation and industry good practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused, or recycled where practicable and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the purposes of a worst case scenario, the impacts will be no greater than those identified for the construction phase.		

20.7.3.1.2 During construction

Impact 1: Construction dust and fine particulate matter

241. There is the potential for cumulative dust impacts associated with Five Estuaries in addition to North Falls. A construction dust assessment has been undertaken as part of the air quality assessment to accompany the Five Estuaries. The assessment has been undertaken in accordance with the 2024 revision of IAQM guidance on the assessment of dust from demolition and construction (IAQM, 2024). The assessment concludes that with the implementation of industry good practice mitigation methods the **risk** impact from the construction phase would be **negligible**, which is not significant in EIA terms.

242. The specific mitigation measures to be implemented are detailed within Five Estuaries OCoCP. The IAQM guidance (IAQM, 2024) states that, with the implementation of the recommended mitigation, impacts would be not significant. It is therefore anticipated that there would be **no significant cumulative impacts**, in EIA terms, associated with construction phase dust emissions from the Five Estuaries combined with North Falls.

Impact 2: NRMM Emissions

NRMM at Landfall

243. The only anticipated additive effect at the landfall and nearshore due to the introduction of Five Estuaries is NRMM emissions from additional simultaneous HDD works.

244. The construction duration at landfall and the duration of HDD works remains unchanged for the simultaneous build out of Five Estuaries (13 months of which 6 months is for HDD). Therefore, although the maximum number of operational HDD would increase, emissions would still occur for less than a full year. As such, in consideration of annual mean pollutant concentrations, the impact would be reduced.

245. There are no residential receptors within 200m of the landfall construction compound. It is considered only minor cumulative effects could occur on Holland Haven Marshes SSSI, due to the use of HDD by both projects. However, both North Falls (as detailed in Table 20.3) and Five Estuaries (as detailed in the Five Estuaries Outline CoCP (Five Estuaries Document reference 9.21[2]) will implement embedded mitigation measures which will minimise any likely significant effects to **not significant**. An Outline HDD Method Statement and Contingency Plan (Document Reference: 7.15) has been provided with the DCO application for North Falls.

NRMM along the onshore cable route

246. As detailed in Table 20.42, the duration of the construction works for the onshore cable route is the same for North Falls alone and for the simultaneous build out of North Falls and Five Estuaries. In addition, the same number of

[2] Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010115/EN010115-000421-9.21%20Code%20of%20Construction%20Practice.pdf

HDD are required. Therefore, there are no anticipated additive effects at the onshore cable route due to the introduction of Five Estuaries. The effect of NRMM emissions at the cable route in the cumulative scenario is therefore no greater than for North Falls assessed alone which was determined to be **not significant**.

NRMM at the onshore substation works area

247. This cumulative assessment scenario assumes simultaneous construction of the North Falls and Five Estuaries onshore substations. As the nearest ecological and human receptors are located over 200m from the onshore substation works area, the effect of NRMM emissions associated with the onshore substations for North Falls and Five Estuaries would be **not significant**.

NRMM Significance

248. Defra technical guidance (Defra, 2022) states that emissions from NRMM used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed. The results of the qualitative assessment above demonstrates that construction activities associated with the simultaneous build out of North Falls and Five Estuaries are unlikely to have a significant effect on local air quality with the implementation of the embedded mitigation measures (as detailed in Outline CoCP for both projects (Document Reference: 7.13; Five Estuaries document reference: 9.21[3]). No additional mitigation measures are considered to be required.

Impact 3: Construction road vehicle exhaust emissions

249. There is the potential for cumulative traffic emissions impacts at human and ecological receptors associated with the simultaneous build out of Five Estuaries and North Falls (Scenario 1).

250. The 24-hour AADT flows and HGV percentages used in the air quality assessment are detailed in ES Appendix 20.2 (Document Reference: 3.3.24).

Human receptors

251. A cumulative assessment of North Falls and Five Estuaries-generated construction traffic has been undertaken. Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the earliest year of construction (2027) are detailed in Table 20.43 to Table 20.47. Concentrations for the without North Falls assessment are also shown for comparison purposes. All concentrations at each receptor are inclusive of the background concentration and emissions from cumulative development flows.

[3] Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010115/EN010115-000421-9.21%20Code%20of%20Construction%20Practice.pdf

Table 20.43 Cumulative effect of North Falls and Five Estuaries: Predicted annual mean NO_2 concentrations and impact at sensitive human receptors

Receptor	2027 Annual Mean NO2 Concentrations				
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R1	9.1	9.2	0.1	0%	Negligible
R2	8.3	8.3	0.0	0%	Negligible
R3	9.5	9.5	0.0	0%	Negligible
R4	11.1	11.1	0.0	0%	Negligible
R5	9.3	9.3	0.0	0%	Negligible
R6	12.6	12.7	0.1	0%	Negligible
R7	13.5	13.5	0.0	0%	Negligible
R8	13.7	13.7	0.0	0%	Negligible
R9	9.9	10.1	0.2	0%	Negligible
R10	8.9	9.0	0.1	0%	Negligible
R11	8.1	8.1	0.1	0%	Negligible
R12	7.8	7.9	0.1	0%	Negligible
R13	8.4	8.5	0.1	0%	Negligible
R14	10.6	10.7	0.1	0%	Negligible
R15	11.9	12.0	0.1	0%	Negligible
R16	14.2	14.3	0.1	0%	Negligible
R17	14.1	14.2	0.1	0%	Negligible
R18	9.4	9.5	0.1	0%	Negligible
R19	8.7	8.9	0.1	0%	Negligible
R20	7.7	7.8	0.1	0%	Negligible
R21	8.3	8.3	0.0	0%	Negligible
R22	8.1	8.2	0.1	0%	Negligible
CBCR1	18.2	18.3	0.1	0%	Negligible
CBCR2	17.5	17.6	0.1	0%	Negligible

Table 20.44 Cumulative effect of North Falls and Five Estuaries: Predicted annual mean PM_{10} concentrations and impact at sensitive human receptors

Receptor	2027 Annual Mean PM10 Concentrations				
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R1	14.9	15.0	0.0	0%	Negligible
R2	14.2	14.3	0.0	0%	Negligible
R3	15.3	15.3	0.0	0%	Negligible

Receptor	2027 Annual Mean PM10 Concentrations				
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R4	16.8	16.8	0.0	0%	Negligible
R5	14.8	14.8	0.0	0%	Negligible
R6	16.7	16.7	0.0	0%	Negligible
R7	15.2	15.2	0.0	0%	Negligible
R8	15.7	15.7	0.0	0%	Negligible
R9	16.0	16.1	0.1	0%	Negligible
R10	15.6	15.7	0.1	0%	Negligible
R11	16.1	16.1	0.0	0%	Negligible
R12	15.1	15.1	0.0	0%	Negligible
R13	14.9	15.0	0.1	0%	Negligible
R14	13.6	13.6	0.0	0%	Negligible
R15	14.0	14.0	0.0	0%	Negligible
R16	13.2	13.3	0.1	0%	Negligible
R17	13.3	13.3	0.1	0%	Negligible
R18	16.0	16.1	0.1	0%	Negligible
R19	15.7	15.8	0.1	0%	Negligible
R20	15.2	15.2	0.1	0%	Negligible
R21	14.5	14.5	0.0	0%	Negligible
R22	14.4	14.4	0.0	0%	Negligible
CBCR1	17.7	17.7	0.1	0%	Negligible
CBCR2	17.5	17.6	0.1	0%	Negligible

Table 20.45 Cumulative effect of North Falls and Five Estuaries: Short term PM_{10} results at sensitive human receptor locations

Receptor	2027 Number of Days >50µg m-3 (Objective being fewer than 35 exceedances per year)		
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change
R1	0	0	0
R2	0	0	0
R3	0	0	0
R4	1	1	0
R5	0	0	0
R6	1	1	0
R7	0	0	0
R8	0	0	0
R9	0	0	0

Receptor	2027 Number of Days >50µg m-3 (Objective being fewer than 35 exceedances per year)		
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change
R10	0	0	0
R11	0	0	0
R12	0	0	0
R13	0	0	0
R14	0	0	0
R15	0	0	0
R16	0	0	0
R17	0	0	0
R18	0	0	0
R19	0	0	0
R20	0	0	0
R21	0	0	0
R22	0	0	0
CBCR1	1	1	0
CBCR2	1	1	0

Table 20.46 Cumulative effect of North Falls and Five Estuaries: Predicted annual mean $PM_{2.5}$ concentrations and impact at sensitive human receptors

Receptor	2027 Annual Mean PM2.5 Concentrations				
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R1	8.9	8.9	0.0	0%	Negligible
R2	8.6	8.6	0.0	0%	Negligible
R3	8.9	8.9	0.0	0%	Negligible
R4	9.5	9.5	0.0	0%	Negligible
R5	8.9	8.9	0.0	0%	Negligible
R6	9.6	9.6	0.0	0%	Negligible
R7	9.5	9.5	0.0	0%	Negligible
R8	9.8	9.8	0.0	0%	Negligible
R9	9.3	9.4	0.1	0%	Negligible
R10	9.1	9.1	0.0	0%	Negligible
R11	9.1	9.1	0.0	0%	Negligible
R12	8.8	8.8	0.0	0%	Negligible
R13	8.7	8.8	0.0	0%	Negligible
R14	8.6	8.6	0.0	0%	Negligible

Receptor	2027 Annual Mean PM2.5 Concentrations				
	Without North Falls and Five Estuaries (µg m-3)	With North Falls and Five Estuaries (µg m-3)	Change (µg m-3)	Change as % of Objective	Impact Descriptor
R15	9.0	9.0	0.0	0%	Negligible
R16	8.6	8.6	0.0	0%	Negligible
R17	8.6	8.6	0.0	0%	Negligible
R18	9.3	9.4	0.0	0%	Negligible
R19	9.1	9.1	0.0	0%	Negligible
R20	8.9	8.9	0.0	0%	Negligible
R21	8.7	8.7	0.0	0%	Negligible
R22	8.5	8.6	0.0	0%	Negligible
CBCR1	10.9	10.9	0.0	0%	Negligible
CBCR2	10.8	10.8	0.0	0%	Negligible

252. The results of the construction phase road traffic emissions assessment for the cumulative assessment of North Falls and Five Estuaries at human receptors are comparable with those predicted for North Falls alone (detailed in Section 20.6.1.3.1). The additional traffic generated by North Falls and Five Estuaries compared to North Falls alone results in an increase of annual mean concentrations of less than 0.1 µg m^{-3} at all modelled receptors for NO_2, PM_{10} and $PM_{2.5}$. The cumulative effect of North Falls and Five Estuaries is therefore no worse than for North Falls alone.

253. The assessment concluded that impacts of North Falls and Five Estuaries construction-generated road traffic upon local air quality for **human receptors are not significant** based upon:

- A predicted negligible impact at all receptor locations;
- Predicted pollutant concentrations were well below the relevant air quality Objectives/target at all considered human receptor locations; and
- North Falls and Five Estuaries -generated traffic has not been predicted to cause a breach of any of the air quality Objectives at any identified sensitive receptor locations.

Ecological Receptors

254. Table 20.39 below presents the impact of the North Falls and Five Estuaries and in-combination with cumulative traffic (inclusive of traffic growth from 2022 to 2027 and cumulative developments), on the most sensitive feature(s) under each designation.

Table 20.47 Cumulative effect of North Falls and Five Estuaries: Maximum contribution of project-generated NOx, NH_3, N-dep and Acid-dep from traffic on designated ecological sites at closest point to road link edge – North Falls and Fiver Estuaries-alone and in-combination in 2027. Values in exceedance of 1% of the Critical Level or Load are shown in bold

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN $ha^{-}.yr^{-1}$	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
Project Alone													
1	AW	Kiln Wood	0.098	0.003	0.056	0.004	0.3%	0.3%	-	0.6%	0.4%	0.2%	0.2%
	AW	Walls Wood	0.808	0.018	0.265	0.019	**2.7%**	**1.8%**	0.6%	2.6%	1.8%	1.1%	1.1%
	AW	Unnamed (Boudge Hill Wood)	0.055	0.002	0.042	0.003	0.2%	0.2%	-	0.4%	0.3%	0.2%	0.2%
21b	AW LWS	High Barn Wood	0.798	0.035	0.450	0.032	**2.7%**	**3.5%**	**1.2%**	**4.5%**	**3.0%**	**1.1%**	**1.1%**
22	AW LWS	Guttridgehall Wood	0.076	0.002	0.034	0.002	0.3%	-	-	0.3%	0.2%	0.1%	0.1%
	AW LWS	Unnamed (Oakhurst Wood)	0.082	0.002	0.036	0.003	0.3%	-	-	0.4%	0.2%	0.1%	0.1%
	LWS	Weeley Bypass	0.383	0.017	-	-	**1.3%**	**1.7%**	0.6%	-	-	-	-
26	SSSI	Holland Haven Marshes	0.341	0.015	-	-	**1.1%**	**1.5%**	0.5%	-	-	-	-
32	LWS	St Michaels Churchyard	0.144	0.003	-	-	0.5%	0.3%	-	-	-	-	-
	LWS	Thorpe Green	0.094	-	-	-	0.3%	-	-	-	-	-	-
34	LWS	Thorpe Green	0.470	0.020	-	-	**1.6%**	**2.0%**	0.7%	-	-	-	-
	LWS	Far Thorpe Green	0.470	0.020	-	-	**1.6%**	**2.0%**	0.7%	-	-	-	-

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN $ha^{-1}.yr^{-1}$	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
35	LWS	Thorpe Green	0.508	0.022	-	-	**1.7%**	**2.2%**	0.7%	-	-	-	-
38	LWS	Goose Green Verge	0.180	0.008	-	-	0.6%	0.8%	0.3%	-	-	-	-
43	AW	Captains Wood	0.066	0.001	0.023	0.002	0.2%	0.1%	-	0.2%	0.2%	0.1%	0.1%
	LWS	Fratinghall Wood	0.073	0.002	-	-	0.2%	0.2%	0.1%	-	-	-	-
45	LWS	Upper Holland Brook	0.005	0.000	-	-	0.0%	0.0%	-	-	-	-	-
47	SPA[1]	Stour and Orwell Estuaries	0.455	0.010	0.090	0.006	**1.5%**	-	0.3%	0.9%	0.5%	0.1%	0.1%
		Stour and Orwell Estuaries*	0.176	0.004	4.5%	-	0.6%	-	-	0.4%	0.2%	-	-
	SSSI[1]	Stour Estuary	0.455	0.010	0.090	0.006	**1.5%**	-	0.3%	0.9%	0.5%	0.1%	0.1%
		Stour Estuary*	0.176	0.004	0.045	-	0.6%	-	-	0.4%	0.2%	-	-
48	AW	Coppins Hall Wood	0.039	0.001	0.018	0.001	0.1%	0.1%	-	0.2%	0.1%	0.1%	0.1%
In-Combination[2]													
1	AW	Kiln Wood	0.645	0.019	0.366	0.026	**2.2%**	**1.9%**	-	**3.7%**	**2.4%**	**1.5%**	**1.5%**
	AW	Walls Wood	5.325	0.116	1.745	0.122	**17.7%**	**11.6%**	**3.9%**	**17.5%**	**11.6%**	**7.3%**	**7.3%**
	AW	Unnamed (Boudge Hill Wood)	0.361	0.013	0.277	0.019	**1.2%**	**1.3%**	-	**2.8%**	**1.8%**	**1.1%**	**1.1%**
21b	AW	High Barn Wood	6.550	0.286	3.694	0.259	**21.8%**	**28.6%**	9.5%	36.9%	24.6%	9.0%	9.0%

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN $ha^{-1}.yr^{-1}$	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
	LWS												
22	AW LWS	Guttridgehall Wood	1.012	0.026	0.449	0.031	**3.4%**	**2.6%**	-	4.5%	3.0%	1.7%	1.7%
	AW LWS	Unnamed (Oakhurst Wood)	1.084	0.028	0.475	0.033	**3.6%**	**2.8%**	-	4.8%	3.2%	1.9%	1.9%
	LWS	Weeley Bypass	5.089	0.222	-	-	**17.0%**	**22.2%**	7.4%	-	-	-	-
26	SSSI	Holland Haven Marshes	1.000	0.044	-	-	**3.3%**	**4.4%**	1.5%	-	-	-	-
32	LWS	St Michaels Churchyard	0.697	0.015	-	-	**2.3%**	**1.5%**	-	-	-	-	-
	LWS	Thorpe Green	0.454	-	-	-	**1.5%**	**1.0%**	-	-	-	-	-
34	LWS	Thorpe Green	9.218	0.402	-	-	**30.7%**	**40.2%**	**13.4%**	-	-	-	-
	LWS	Far Thorpe Green	9.218	0.402	-	-	**30.7%**	**40.2%**	**13.4%**	-	-	-	-
35	LWS	Thorpe Green	0.706	0.031	-	-	**2.4%**	**3.1%**	**1.0%**	-	-	-	-
38	LWS	Goose Green Verge	0.732	0.032	-	-	**2.4%**	**3.2%**	**1.1%**	-	-	-	-
43	AW	Captains Wood	1.319	0.029	0.451	0.032	**4.4%**	**2.9%**	-	**4.5%**	**3.0%**	**1.9%**	**1.9%**
	LWS	Fratinghall Wood	1.453	0.032	-	-	**4.8%**	**3.2%**	**1.0%**	-	-	-	-
45	LWS	Upper Holland Brook	0.475	0.021	-	-	**1.6%**	**2.1%**	-	-	-	-	-

Link	Designated Ecological Site		Concentration or Flux				PC as % of Critical Level or Critical Load						
	Site Type	Name	NOx	NH_3	N-dep	Acid-dep	NOx	NH_3		N-dep		Acid-dep	
			$\mu g.m^{-3}$		kgN $ha^{-1}.yr^{-1}$	Keq ha^{-1} yr^{-1}	-	% of lower CL	% of upper CL	% of lower CL	% of upper CL	% of lower CL	% of upper CL
47	SPA[1]	Stour and Orwell Estuaries	1.751	0.039	0.348	0.024	**5.8%**	-	**1.3%**	**3.5%**	**1.7%**	0.5%	0.5%
		Stour and Orwell Estuaries*	0.676	0.017	-	-	**2.3%**	-	-	**1.7%**	0.9%	-	-
	SSSI[1]	Stour Estuary	1.751	0.039	0.348	0.024	**5.8%**	**1.3%**	1.3%	**3.5%**	1.7%	0.5%	0.5%
		Stour Estuary*	0.676	0.017	0.173	-	**2.3%**	-	-	**1.7%**	0.9%	-	-
48	AW	Coppins Hall Wood	0.849	0.029	0.393	0.028	**2.8%**	**2.9%**	-	**3.9%**	**2.6%**	**1.6%**	**1.6%**

[1] The Stour and Orwell Estuaries SPA and Stour Estuary SSSI are designations which cover a large area (3,673 and 2,248 hectares, respectively), the majority of which is not affected by Project-generated traffic. The Priority Habitats Inventory (England) (Natural England, 2023) was reviewed and the only sensitive habitat designated under both sites present within 200 m of Link 47 was salt marsh, which is 27 m from the road edge at it closest location. To provide a conservative assessment, the most sensitive feature (low and medium altitude hay meadows) has also been assessed at the closest point of the designation to the road; however, it is likely this habitat is not present in this area and is located in other areas of the large SPA/SSSI designations. The SPA and SSSI has also been assessed for impacts on salt marsh habitat 27 m from the road edge (second row, identified with asterix (*))

[2] AADT change shown are inclusive of North Falls and Five Estuaries-generated traffic, in-combination traffic growth (from 2022 to 2027) and any relevant cumulative project traffic.

255. As shown in Table 20.47, both the project alone and the in-combination impact of traffic on ecological receptors from the simultaneous build out of North Falls and Five Estuaries is no greater than for North Falls alone (as detailed in Section 20.6.1.3.2).

256. The significance of impacts is discussed in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26) which concludes the following:

- Effects upon the qualifying / interest features of designated sites for nature conservation arising from changes to NOx, NH_3, N-Dep and acid dep. from road traffic emissions from North Falls and Five Estuaries considered within ES Chapter 23 Onshore Ecology are negligible, i.e. not significant in EIA terms.

20.7.3.1.3 Summary

257. Table 20.48 below provides a summary of the potential significant cumulative effects identified during the air quality CEA in relation to Five Estuaries.

Table 20.48 Summary of potential cumulative effects in relation to Five Estuaries

Potential impact	Cumulative effect	Additional mitigation
Construction		
Impact 1: Construction dust and fine PM	No cumulative effects anticipated. Not significant in EIA terms.	No additional mitigation measures necessary
Impact 2: NRMM emissions	No cumulative effects anticipated. Not significant in EIA terms	No additional mitigation measures necessary
Impact 3: Construction road vehicle emissions	No cumulative effects anticipated. Not significant in EIA terms	No additional mitigation measures necessary

20.7.3.2 North Falls, Five Estuaries and other projects

258. Based on the project screening in Table 20.41, in addition to Five Estuaries, three of the other listed projects will be included in the CEA for further assessment:

- Norwich to Tilbury
- Bathside Bay Stour Road Harwich Essex CO12 3HF
- Land South West of Horsley Cross Roundabout Clacton Road Horsley Cross Essex CO11 2NZ

20.7.3.2.1 During construction

259. Cumulative effects from other projects during construction are shown in Table 20.49.

Table 20.49 Cumulative effects from other projects on air quality during construction

Construction Impact 1: Construction dust and fine PM	Construction Impact 2: NRMM Emissions	Construction Impact 3: Construction phase road traffic emissions
There is the potential for cumulative dust impacts associated with Norwich to Tilbury, North Falls and Five Estuaries as they intersect the onshore Project boundary and therefore are located within 500m of each other: It is anticipated that a construction dust assessment would be undertaken and/or industry good practice mitigation methods will be recommended for the project. IAQM guidance (IAQM, 2024) states that, with the implementation of the recommended mitigation, impacts would be not significant. It is **therefore not anticipated that there would be significant cumulative impacts associated with construction phase dust emissions** from Norwich to Tilbury combined with North Falls and Five Estuaries.	Due to the potential for overlapping construction programmes and proximity of the Norwich to Tilbury proposed substation zone to the onshore project area, there is the potential (albeit unlikely) for NRMM associated with North Falls and Five Estuaries to be located and operating at the same time, and in the same area as NRMM associated with the aforementioned projects. However, pollutant concentrations at all receptors considered in this assessment were well below the relevant Objectives. It is anticipated that each project will employ mitigation measures to control and manage NRMM emissions and it is highly unlikely NRMM would be present in the same area at the same time for any extended period of time due to the sequential nature of North Falls and Five Estuaries and the other aforementioned projects. Therefore, **it is unlikely that there would be a significant cumulative effect associated with construction phase NRMM**. Inter-project engagement will seek to avoid temporal overlap.	As previously stated in Section 20.4.3.3.3 and Section 20.7.2, traffic associated with future residential and employment developments in the study area was included in the predicted future traffic growth, which were incorporated into the future baseline 2027 traffic flows used in the air quality assessment. A cumulative assessment has therefore inherently been carried out for these developments. As air quality impacts at human receptors were well below the relevant Objectives (see Section 20.6.1.3), therefore **no significant cumulative effects are anticipated.** As detailed in Section 20.4.3.3.6, as part of the road traffic emissions ecological assessment, in-combination impacts have been considered in the impact assessment, and therefore the assessment is inherently cumulative (Section 20.6.1.3). This includes background traffic growth (from 2022 to 2027, which represents regional growth due to residential and employment developments) in addition to any consented agricultural or industrial projects in the vicinity of designated sites which may be affected by traffic generated by North Falls and Five Estuaries. Using Natural England's SSSI IRZs to determine relevant projects for inclusion, no projects were identified to have the potential to result in in-combination impacts. The significance of air quality impacts on ecological receptors as a result of traffic emissions is provided in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) which concludes **no significant cumulative effects are anticipated.**

20.7.3.2.2 During decommissioning

260. Decommissioning strategies have not yet been finalised for North Falls, Five Estuaries or Norwich to Tilbury; however, the cumulative impacts are expected to be the same as those of the initial construction phase.

20.8 Transboundary effects

261. There are no transboundary effects with regards to air quality as the onshore project area would not be sited in proximity to any international boundaries. Transboundary effects are therefore scoped out of this assessment and are not considered further.

20.9 Interactions

262. The chapters detailed in Table 20.50 have been identified as having interactions with air quality.

Table 20.50 Air quality interactions

Topic and description	Related chapter (Volume 3.1)	Where addressed in this chapter	Rationale
Construction			
Impact 1: Construction dust and fine PM	ES Chapter 28 Human Health (Document Reference: 3.1.30)	Section 20.6.1.1.	There could be the potential for human health impacts associated with increases in pollutant concentrations at sensitive receptors.
	ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26)	Section 20.6.1.1.	Ecological receptors may be impacted by changes to air quality.
Impact 2: NRMM emissions	ES Chapter 28 Human Health (Document Reference: 3.1.30)	Section 20.6.1.2.	There could be the potential for human health impacts associated with NRMM emissions.
	ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26)	Section 20.6.1.2.	Ecological receptors may be impacted by changes to air quality resulting from NRMM emissions.
Impact 3: Construction road vehicle exhaust emissions	ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29)	Section 20.6.1.3	Pollutant emissions from traffic movements associated with North Falls have the potential to impact on air quality.
	ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26)	Section 20.6.1.3.1	Ecological receptors may be impacted by changes to air quality resulting from construction road vehicle exhaust emissions. Impacts and their significance are discussed in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Ornithology (Document Reference: 3.1.26).
	ES Chapter 28 Human Health (Document Reference: 3.1.30)	Section 20.6.1.3.2	There could be the potential for human health impacts associated with increases in pollutant concentrations at sensitive receptors.

20.10 Inter-relationships

263. The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. The areas of potential interaction between impacts are presented in Table 20.51. This provides a screening tool for which impacts have the potential to interact. For clarity the areas of potential interaction between impacts are presented in Table 20.51, along with an indication as to whether the interaction may give rise to synergistic impacts.

Table 20.51 Inter-relationships between impacts

Potential interactions between impacts			
Construction			
	Impact 1: Construction dust and fine PM	Impact 2: NRMM emissions	Impact 3: Construction road vehicle exhaust emissions
Impact 1: Construction dust and fine PM		Yes	Yes
Impact 2: NRMM emissions	Yes		Yes
Impact 3: Construction road vehicle exhaust emissions	Yes	Yes	
Operation			
Operational impacts on air quality have been scoped out.			
Decommissioning			
It is anticipated that the decommissioning impacts would be similar in nature to those of construction.			

264. Table 20.52 provides an assessment for each receptor group (i.e. human or ecological) as related to these impacts. Within Table 20.52 the impacts are assessed relative to construction (it is assumed decommissioning impacts would be no greater than those during construction, so have not been included to prevent repetition) to see if multiple construction impacts affecting the same receptor could increase the level of impact upon that receptor. The worst-case impacts assessed within the chapter take these interactions into account and for the impact assessments are considered conservative and robust.

Table 20.52 Inter-relationships between impacts during construction

Receptor	Highest significance level during construction	Construction phase assessment
Human receptors	Impact 1: **not significant** with the implementation of mitigation measures detailed in Section 20.6.1.1.5. Impact 2: **not significant** with the implementation of best available technique mitigation measures detailed in Section 20.6.1.2.6. Impact 3: **not significant** (negligible impact at all receptors)	**No greater than individually assessed impact** The proposed mitigation will minimise the potential for significant effects on human receptors (Impact 1 and 2) within the study area and no significant effects are predicted for Impact 3 during the construction phase of North Falls. Very few human receptors have the potential to be affected by all three construction impacts. Background pollutant concentrations in the study area are low (see Table 20.28) and therefore it is unlikely that the air quality Objectives would be exceeded even in the unlikely event of the impacts interacting. It is therefore considered that there will be no pathway for interaction to exacerbate the potential impacts associated with these activities during construction.
Ecological receptors	Impact 1: **not significant** with the implementation of mitigation measures detailed in Section 20.6.1.1.5. Impact 2: **not significant** with the implementation of best available technique mitigation measures detailed in Section 20.6.1.2.6.	**No greater than individually assessed impact** The proposed mitigation will minimise the potential for significant effects on ecological receptors (Impact 1 and 2) within the study area during the construction phase of North Falls.

Receptor	Highest significance level during construction	Construction phase assessment
	Impact 3: **not significant** with the implementation of best available technique mitigation measures detailed in Section 20.6.1.2.6 (see ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) and ES Chapter 24 Ornithology (Document Reference: 3.1.26)).	Very few ecological receptors (i.e. Holland Haven SSSI, Holland Haven LNR and Simons Wood ancient Woodland (near Links 26 and 37) have the potential to be affected by all three construction phase impacts. It is therefore considered that there will therefore be no pathway for interaction to exacerbate the potential impacts associated with these activities during construction.

20.11 Summary

265. A summary of the likely significant effects identified with relation to air quality is provided in Table 20.53 and of cumulative effects in Table 20.45.

266. The assessment draws on existing baseline data from Tendring District Council Air Quality ASRs and Defra local air quality management data. No primary air quality data was collected, as it has been agreed with Tendring District Council.

267. The study area for onshore air quality is defined as follows:

- Construction phase dust and fine particulate matter emissions:
  - Human receptors within 250m of the onshore project area and within 50m of routes used by construction vehicles (for track out up to 500m from the onshore project area); and
  - Ecological receptors within 200m of the onshore project area for construction related dust and within 50m of routes used by construction vehicles (for trackout up to 500m from the onshore project area).
- Construction phase non-road mobile machinery emissions:
  - Human and ecological receptors within 200m of the onshore project area boundary.
- Construction phase road traffic emissions:
  - Human and ecological receptors within 200m of routes which will experience traffic flows in exceedance of the relevant air quality screening criteria.

268. The study area for onshore air quality does not pass through, or adjacent to, any statutory designated AQMAs. The Tendring District Council monitoring network was amended in 2022 and 2020; therefore, results were obtained from the 2023, 2021 and 2019 ASRs show the annual mean nitrogen dioxide objective of 40µg m^{-3} has not been exceeded across the five-year period. The monitoring records indicate a declining trend in annual mean concentrations of nitrogen dioxide since 2017.

269. Impacts assessed for the construction and decommissioning phases include:

- Construction dust and fine particulate matter;
- NRMM emissions; and
- Construction phase road vehicle exhaust emissions.

270. Operational impacts on air quality have been scoped out. An exception to this is the reinstatement of the haul road connecting Bentley Road to Ardleigh Road to service AIL movements to the onshore substation in the unlikely event of transformer failure during the Project's lifetime.

271. To seek to minimise air quality effects through the design process, air quality considerations have been included in the site selection process (see ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference 3.1.6) for the onshore substation and associated infrastructure and using the shortest cable route length where practicable. Additionally North Falls will implement best practice dust mitigation measures, and follow mitigation measures specific to NNRM, which have been detailed in the OCoCP (Document Reference: 7.1.3) submitted with the DCO application, including a Dust Management Plan.

272. With the implementation of mitigation measures, North Falls is predicted to have no significant effects on air quality during all project phases.

273. There is potential for cumulative effects to occur with a number of other offshore wind farms and/or projects. However, when considering proposed mitigation measures, it is not anticipated that cumulative effects are likely to be significant in EIA terms.

Table 20.53 Summary of potential likely significant effects on air quality

Potential impact	Receptor	Sensitivity	Magnitude of impact	Significance of effect (including embedded mitigation)	Additional mitigation measures proposed	Residual effect
Construction						
Impact 1: Construction dust and fine PM	Human receptors within 250m of the onshore project area (and/or within 50m of HGV routes up to 500m from the onshore project area for trackout effects)	Dust soiling: low to high	Low to high risk	Assessment methodology does not assign significance before mitigation. Measures as recommended by the IAQM (see Section 20.6.1.1.5).	No additional mitigation measures required.	Not significant
		Human health: low	Low to medium risk			
	Ecological receptors within 200m of the onshore project area (and/or within 50m of HGV routes up to 500m from the onshore project area for trackout effects)	Ecological effects: high	Medium to high risk			
Impact 2: NRMM emissions	Human and ecological receptors within close proximity to NRMM works within the onshore project area	High	N/A	Defra technical guidance (Defra, 2022) states that emissions from NRMM used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed. Good practice mitigation measures (see Section 20.6.1.2.6).	No additional mitigation measures required.	Not significant
Impact 3: Construction road vehicle exhaust emissions	Residential properties, schools, hospitals and care homes within 200m of roads	High	The predicted impact of the Project at all receptors for all pollutants was 'negligible'.	Not significant.	No additional mitigation measures required.	Not significant
	Designated ecological sites within 200m of affected roads	High	The predicted impact of the Project at all receptors for all	Not significant.	No additional mitigation measures required.	Not significant

Potential impact	Receptor	Sensitivity	Magnitude of impact	Significance of effect (including embedded mitigation)	Additional mitigation measures proposed	Residual effect
			pollutants was 'negligible[4]'.			
Operation						
Operational impacts on air quality have been scoped out.						
Decommissioning						
As per construction						

Table 20.54 Summary of potential cumulative effects on air quality

Potential impact	Cumulative effect	Additional mitigation
Construction		
Cumulative effect 1: Impacts on designated statutory and non-statutory sites	No significant cumulative effects are anticipated	None
Cumulative effect 2: Impacts on habitats	No significant cumulative effects are anticipated	None
Cumulative effect 3: impacts on protected and notable species	No significant cumulative effects are anticipated	None
Operation		
Cumulative effect 1: Onshore substation operation	No significant cumulative effects are anticipated	None
Decommissioning		
Decommissioning strategies have not yet been finalised for North Falls, Five Estuaries Offshore Wind Farm or Norwich to Tilbury; however, the cumulative effects are expected to be the same as those of the initial construction phase.		

[4] See Chapters 23 Onshore Ecology (Document Reference: 3.1.25) and 24 Onshore Ornithology (Document Reference: 3.1.26) for details of how conclusions of 'negligible' impact magnitude was reached.

20.12 References

AEA Technology (2008). Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective, http://laqm.defra.gov.uk/documents/NO2relationship_report.pdf [Accessed February 2024].
Air Quality Consultants (2020). Comparison of EFT v10 with EFT v9. September 2020. [Accessed February 2024].
Bobbink, R., Loran, C., Tomassen, H., Aazem, K., Aherne, J., Alonso, R., Ashwood, F., Augustin, S., Bak, J., Bakkestuen, V., Braun, S., Britton, A., Brouwer, E., Caporn, S., Chuman, T., De Wit, H., De Witte, L., Dirnböck, T., Field, C., Gómez, H. G., Geupel, M., Velle, L. G., Hiltbrunner, E., James, A. C., Jones, L., Karlsson, P. E., Kohli, L., Manninen, S., May, L., Meier, R., Perring, M., Prescher, A., Remke, E., Roth, T., Scheuschner, T., Ssymank, A., Stevens, C., Thrane, J., Tömmervik, H., Tresch, S., Ukonmaanaho, L., Van den Berg, L., Vanguelova, E., Wilkins, K., Zappala, S. (2022). Review and revision of empirical critical loads of nitrogen for Europe. October 2022.
Centre for Ecology and Hydrology (CEH) (2022). Air Pollution Information System. [Accessed February 2024].
Chapman, C., Kite, B. (2021a). Guidance on Decision-Making Thresholds for Air Pollution. JNCC Report No.696 (Main Report), JNCC, Peterborough, ISSN 0963-8091. Air Quality Consultants Ltd. 2021. [Accessed February 2024].
Chapman, C., Kite, B. (2021b). Decision-Making Thresholds for Air Pollution. JNCC Report No. 696 (Technical Report), JNCC, Peterborough, ISSN 0963-8091. [Accessed February 2024].
Department for Energy Security and Net Zero (November 2023) Overarching NPS for Energy (EN-1) Available at: Overarching National Policy Statement for energy (EN-1) - GOV.UK (www.gov.uk) [Accessed February 2024].
Department for Energy Security and Net Zero (November 2023) NPS for Renewable Energy Infrastructure (EN-3) Available at: National Policy Statement for Renewable Energy Infrastructure (EN-3) (publishing.service.gov.uk) [Accessed February 2024].
Department for Energy Security and Net Zero (November 2023) NPS for Electricity Networks Infrastructure (EN-5) Available at: National Policy Statement for Electricity Networks Infrastructure (EN-5) (publishing.service.gov.uk) [Accessed February 2024].
Department for the Environment Food and Rural Affairs (Defra) (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London: HMSO. [Accessed February 2024].

Department for the Environment Food and Rural Affairs (Defra) (2017). UK plan for tackling roadside nitrogen dioxide concentrations, July 2017, Available at: https://uk-air.defra.gov.uk/library/no2ten/index [Accessed February 2024].
Department for the Environment Food and Rural Affairs (Defra) (2018). Supplement to the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations: Local Authorities Feasibility Studies. Available at: https://uk-air.defra.gov.uk/library/no2ten/2018-la-tfs-documents [Accessed February 2024].
Department for the Environment Food and Rural Affairs (Defra) (2019). Clean Air Strategy 2019. [Accessed February 2024].
Defra (2020a). Background Mapping data for local authorities – 2018. [online] Defra. Available at: https://uk-air.defra.gov.uk/data/laqm-background-home [Accessed February 2024].
Defra (2020b). NOx to NO2 Calculator, v8.1. [Accessed February 2024].
Defra (2023). Emission Factor Toolkit, v12.0 [Accessed February 2024].
Department for the Environment Food and Rural Affairs (Defra) (2022). Local Air Quality Management Technical Guidance (TG22) [Accessed February 2024].
Department of the Environment (DoE) (1997). The UK National Air Quality Strategy London: HMSO. [Accessed February 2024].
Department of the Environment, Transport and the Regions (DETR) (2000). Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London: HMSO. [Accessed February 2024].
Department of the Environment, Transport and the Regions (DETR) (2003). Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Addendum. London: HMSO. [Accessed February 2024].
Dragosits, U., Carnell, E.J., Tomlinson, S.J., Misselbrook, T.H., Rowe, E.C., Mitchell, Z., Thomas, I.N., Dore, A.J., Levy, P., Zwagerman, T., Jones, L., Dore, C., Hampshire, K., Raoult, J., German, R., Pridmore, A., Williamson, T., Marner, B., Hodgins, L., Laxen, D., Wilkins, K., Stevens, C., Zappala, S., Field, C. & Caporn, S.J.M. (2020). Nitrogen Futures. JNCC Report No. 665, JNCC, Peterborough, ISSN 0963-8091. [Accessed February 2024].
European Parliament (1996). Council Directive 96/62/EC on Ambient Air Quality Assessment and Management. [Accessed February 2024].
European Parliament (2008). Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe. [Accessed February 2024].
His Majesty's Stationary Office (HMSO) (1995). The Environment Act 1995 (c.25) London: TSO. [Accessed February 2024].
HMSO (2000). Statutory Instrument 2000 No. 928 The Air Quality (England) Regulations 2000 London: HMSO. [Accessed February 2024].
HMSO (2002). Statutory Instrument 2002 No. 3043 The Air Quality (England) (Amendment) Regulations 2002 London: HMSO. [Accessed February 2024].
HMSO (2010). The Air Quality Standards Regulations 2010. [Accessed February 2024].

HMSO (2016). The Air Quality Standards (Amendment) Regulations 2016.
HMSO (2023a). 'Statutory Instrument 2023 No. 96, The Environmental Targets (Fine particulate Matter) (England) Regulations 2023. London
HMSO (2023b). Environmental Improvement Plan 2023, First revision of the 25 Year Environment Plan.
Highways England (2019). LA 105 Air quality [Accessed February 2024].
Institute of Air Quality Management (IAQM) (2024). Guidance on the assessment of dust from demolition and construction. Version 2.2. [Accessed February 2024].
Institute of Air Quality Management (IAQM) (2020). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1, May 2020. [Accessed February 2024].
Institute of Air Quality Management (IAQM), Environment Protection UK (EPUK) (2017). Land-Use Planning & Development Control: Planning for Air Quality. January 2017. [Accessed February 2024].
Laxen and Marner (2003). Analysis of the Relationship Between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites. [Accessed February 2024].
National Atmospheric Emissions Inventory (NAEI) (2019). UK Fleet Composition Projections (Base 2019r/2017 NAEI). For the UK outside of London.
Natural England (2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations, Version: June 2018. [Accessed February 2024].
Natural England (2021). SSSI Impact Risk Zones (England). Available at: SSSI Impact Risk Zones (England) - data.gov.uk [Accessed February 2024].
Natural England (2023). Priority Habitats Inventory (England).
Tendring District Council (2019). Air Quality Annual Status Report.
Tendring District Council (2021a) Local Plan 2013-2033 and Beyond Section 1
Tendring District Council (2021b) Local Plan 2013-2033 and Beyond Section 2
Tendring District Council (2021c). Air Quality Annual Status Report.
The Planning Inspectorate (2021). SCOPING OPINION: Proposed North Falls Offshore Wind Farm
Tendring District Council (2022). Air Quality Annual Status Report.
Tendring District Council (2023). Air Quality Annual Status Report.

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