FIVE ESTUARIES
OFFSHORE WIND FARM

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ENVIRONMENTAL STATEMENT

VOLUME 6, PART 3, CHAPTER 10: AIR QUALITY

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GLOSSARY OF TERMS

Term	Definition
Affected Road Network	Public roads where assessed vehicle movements are above the numerical screening thresholds, and further detailed assessment is required. This network forms the basis of the modelled road network.
Air Quality Strategy	The 2023 Air Quality Strategy for England, Scotland, Wales and Northern Ireland provides details of national air quality objectives for air pollutants.
Ancient Woodland	Typically, a woodland that has existed continuously since 1600 or before (this can include areas where trees have been cut down and/or replanted).
Array Areas	The areas where the WTGs will be located. These should be referred to as the northern and southern arrays to differentiate them.
Critical Level	The concentration of an air pollutant above which adverse effects on ecosystems may occur based on present knowledge.
Critical Load	Deposition flux of an air pollutant below which significant harmful effects on sensitive ecosystems do not occur, according to present knowledge.
DCO	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact in question with the sensitivity of the receptor in question, in accordance with defined significance criteria.
ES	The documents that collate the processes and results of the EIA.
European sites	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Evidence Plan	A voluntary consultation process with specialist stakeholders to agree the approach to the Environmental Impact Assessment.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial, resulting

Term	Definition
	from the activities associated with the construction, operation and maintenance, or decommissioning of the project.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2010.
HDV	Vehicles ≥3.5 tonnes. Includes Heavy Goods Vehicles and buses.
LDV	Vehicles <3.5 tonnes. Includes Light Goods Vehicles and cars.
Landfall	The area where the Export Cables come ashore and transition from the marine environment to the terrestrial environment.
Local Nature Reserve	Statutory designation for places with wildlife or geological features that are of special interest locally.
Maximum Design Scenario (MDS)	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures, or commitments, are commitments made by the project to reduce and/or eliminate the potential for significant effects to arise as a result of the project.
Objective	An Objective set by the UK Government's Expert Panel on Air Quality to be achieved either without exception or with a permitted number of exceedances within a specific timescale.
Onshore ECC	The Onshore ECC is the working area for the onshore cable construction.
OnSS	Where the power supplied from the wind farm is adjusted (including voltage, power quality and power factor as required) to meet the UK System-Operator Transmission-Owner Code for supply to the National Grid substation.
OnSS Access Zone	The area which will contain the final OnSS access route (both construction and operational).
OnSS Construction Zone	The area in which the final OnSS TCC footprint will be located.
OnSS TCC	Temporary Construction Compound associated with the OnSS.
SubstationZone	The area in which the final onshore substation (OnSS) footprint will be located.
Order Limits	The extent of development including all works, access routes, TCCs, visibility splays and discharge points.
PEIR	Preliminary Environmental Information Report. The PEIR was written in the style of a draft Environmental Statement (ES) and formed the basis of statutory consultation. Following that consultation, the PEIR documentation has been updated into the

Term	Definition
	final ES that is accompanying the application for the Development Consent Order (DCO).
Relevant Exposure	Locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period.
Review and Assessment	A statutory duty for all local authorities to review local air quality and assess whether health-based air quality Objectives will be achieved.
SSSI	A geological or biological conservation designation denoting a nationally protected area in the UK.
SAC	Area of protected habitats and species as defined in the European Union's Habitat Directive (92/43/EEC).
SPA	A designated area for birds under the European Union Directive on the Conservation of Wild Birds (2009/147/EC).
TCC	Temporary Construction Compounds (TCC) associated with onshore cable works.
TJB	An underground unit where the offshore cable joins the onshore cable. Transition Joint Bay, where the offshore cables are jointed to the onshore circuits.
Trackout	The transport of dust and dirt from the construction/ demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles leave the construction/ demolition site with dusty materials, which may then spill onto the road, and/or when heavy duty vehicles transfer dust and dirt onto the road having travelled over muddy ground on site.

DEFINITION OF ABBREVIATIONS AND ACRONYMS

Term	Definition
25YEP	25 Year Environment Plan
AADT	Annual Average Daily Traffic
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
AQSR	Air Quality Standards Regulations
ASNW	Ancient & Semi-Natural Woodland
AURN	Automatic Urban and Rural Network
BC	Base Case
CAS	Clean Air Strategy
CBC	Colchester Borough Council
CERC	Cambridge Environmental Research Consultants
CoCP	Code of Construction Practice
CTV	Crew Transfer Vessel
DCO	Development Consent Order
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DM	Do Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do Something
EACN	East Anglia Connection Node
ECA	Emission Control Area
ECC	Export Cable Corridor
EFT	Emission Factors Toolkit
EIA	Environmental Impact Assessment
EPUK	Environmental Protection UK
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union

Term	Definition
HDD	Horizontal Directional Drilling.
HDV	Heavy Duty Vehicle
HMSO	His Majesty's Stationary Office
IAQM	Institute of Air Quality Management
JNCC	Joint Nature Conservation Committee
LAQM	Local Air Quality Management
LAQM.TG(22)	LAQM Technical Guidance 2022
LBPC	Little Bromley Parish Council
LDV	Light Duty Vehicle
LNR	Local Nature Reserve
LoWS	Local Wildlife Site
MARPOL	The International Convention for the Prevention of Pollution from Ships
MCZ	Marine Conservation Zones
MDS	Maximum Design Scenario
MHCLG	Ministry of Housing, Communities & Local Government
NF OWF	North Falls Offshore Wind Farm
NGET	National Grid Electricity Transmission
NOx	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
NPS	National Policy Statements
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
OnSS	Onshore Substation
OWF	Offshore Wind Farm
PAWS	Plantations on Ancient Woodland Site
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PM_{10}	Particulate Matter
$PM_{2.5}$	Fine Particulate Matter

Term	Definition
PPG	Planning Practice Guidance
SAC	Special Areas of Conservation
SI	Statutory Instrument
SPA	Special Protection Area
SRN	Strategic Road Network
SSSI	Sites of Special Scientific Interest
TCC	Temporary Construction Compounds
TDC	Tendring District Council
UK	United Kingdom
VE	Five Estuaries Offshore Wind Farm
VE OWFL	Five Estuaries Offshore Wind Farm Limited
WTG	Wind Turbine Generator

1 AIR QUALITY

1.1 INTRODUCTION

1.1.1 This chapter of the Environmental Statement (ES) has been prepared by SLR for GoBe on behalf of Five Estuaries Offshore Wind Farm Ltd (VE OWFL) (the Applicant) and presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of the Five Estuaries Offshore Wind Farm (VE) associated with the onshore elements of VE, on air quality. Specifically, this chapter considers the potential impact of VE from the landfall, along the onshore Export Cable Corridor (ECC) and incorporating the Onshore Substation (OnSS) during the construction, operation and maintenance (O&M), and decommissioning phases.

1.1.2 VE is a Nationally Significant Infrastructure Project (NSIP). An ES is provided as part of a Development Consent Order (DCO) application under the Planning Act 2008.

1.1.3 VE is a proposed extension to the operational Galloper Offshore Wind Farm (OWF). Full details of the development proposals are set out in Volume 6, Part 1, Chapter 1: Introduction, of this ES.

1.1.4 This chapter describes the scope, relevant legislation, assessment methodology, and the baseline conditions existing at the site and its surroundings. It considers any potential significant environmental effects VE would have on the baseline environment, the mitigation measures required to prevent, reduce or offset any significant adverse effects, and the likely residual effects after these measures have been implemented. Consideration has also been given to potential cumulative air quality effects with other proposed developments.

1.1.5 The chapter is complemented with the following technical annexes:

- Volume 6, Part 6, Annex 10.1: Air Quality - Construction Dust Assessment Methodology;
- Volume 6, Part 6, Annex 10.2: Air Quality - Non-Road Mobile Machinery (NRMM) Emissions Assessment;
- Volume 6, Part 6, Annex 10.3: Air Quality - Offshore Activities Assessment; and
- Volume 6, Part 6, Annex 10.4: Air Quality - Road Traffic Dispersion Modelling.

1.1.6 This chapter has been informed by the following ES chapters:

- Volume 6, Part 2, Chapter 1: Offshore Project Description;
- Volume 6, Part 3, Chapter 1: Onshore Project Description; and
- Volume 6, Part 3, Chapter 8: Traffic and Transport.

1.1.7 Compensatory measures are proposed at an onshore locations for Lesser Black Backed Gull (LBBG) to compensate for the predicted worst-case impacts of VE on this species in relation to Habitats Regulation Assessment. Further details of the location of these measures and an assessment of the potential impacts are available in Volume 6, Part 8: LBBG EIA.

1.2 STATUTORY AND POLICY CONTEXT

LEGISLATION

1.2.1 A dual set of regulations, separately applicable to National and Local Government, are currently operable within the United Kingdom (UK).

HUMAN HEALTH

NATIONAL OBLIGATIONS

1.2.2 The Air Quality Standards Regulations 2010 (AQSR) (His Majesty's Stationery Office (HMSO), 2010) transpose both the European Union (EU) Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation. The AQSR includes Limit Values which are legally binding ambient concentration thresholds which, however, are only applicable at specific locations (Schedule 1: AQSR)[1].

1.2.3 Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (HMSO, 2020) was introduced to mirror revisions to supporting EU legislation. As a result, the fine particulate matter ($PM_{2.5}$) Limit Value was reduced to 20 µg/m^3 (to be met by 2020).

1.2.4 The responsibility of achieving the AQSR (and European equivalent Directives) is a national obligation for Central Government who undertake assessments on an annual basis. Local Authorities have no statutory obligation to achieve the AQSR or the equivalent European Directives.

1.2.5 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (HMSO, 2023) introduced an annual mean concentration target of 10 µg/m^3 to be met across England by 2040. Central Government is responsible for meeting this future target, whereas Local Authorities have no statutory obligation to achieve this target.

LOCAL OBLIGATIONS

1.2.6 Part IV of the Environment Act 1995 (as amended) (HMSO, 1995) established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within their respective administrative areas.

1.2.7 The Air Quality (England) Regulations 2000 (as amended) (the Regulations) (HMSO, 2000a) provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England. $PM_{2.5}$ is not currently cited within the Regulations; Local Authorities are however required to work towards reducing $PM_{2.5}$.

1.2.8 The Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (defined as 'relevant exposure'). Table 1.2 provides an indication of those locations.

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

[1] Schedule 1 of the 2010 AQSR provides the locations of the sampling points where the AQSR Limits Values can be assessed.

1.2.10 Of particular importance to local authorities is the Department for Environment Food and Rural Affairs' (Defra's) 2023 Air Quality Strategy (AQS) (Defra, 2023a). The 2023 AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

APPLIED AIR QUALITY ASSESSMENT LEVELS

1.2.11 The ambient air quality standards of relevance to human receptors in this assessment (collectively called Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table 1.1.

1.2.12 The human AQALs are primarily based upon the Air Quality Objectives Local Authorities are responsible for achieving – reflective of the Local Planning Authority's duties. The $PM_{2.5}$ AQSR AQAL has, however, also been included for completeness and to support the Local Authorities statutory duties in reducing $PM_{2.5}$. The outcomes are considered indicative (as the sampling point may not comply with the siting locations prescribed under Schedule 1: AQSR).

Table 1.1: Relevant ambient AQALs

Pollutant	Standard (µg/m^3)	Measured As
Nitrogen Dioxide (NO_2)	200	1-hour mean not to be exceeded more than 18 times a year.
	40	Annual mean.
Particulate Matter (PM_{10})	50	24-hour mean not to be exceeded more than 35 times a year.
	40	Annual mean.
$PM_{2.5}$	20	Annual mean.

Table 1.2: Human health relevant exposure

Averaging Periods	Should Apply At	Should Not Apply At
Annual Mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices. Hotels. Gardens of residences. Kerbside sites.
24-hour mean	As above together with hotels and gardens of residential properties.	Kerbside sites where public exposure is expected to be short term.
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access.

ECOLOGICAL DESIGNATIONS

1.2.13 Ecological designations vary in terms of their sensitivity, perceived ecological value, geographic importance, and level of protection. Within the UK, there are three types of nature conservation designations: international, national and local designations.

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

1.2.15 The Habitats Regulations (HMSO, 2017) protect Special Areas of Conservation (SAC) and Special Protection Areas (SPA), previously termed the Natura 2000 network, and now collectively called the national site network.

1.2.16 Other sites of international significance are Ramsar sites, which are wetlands protected under the 1971 Ramsar Convention[2]. Many of these sites in the UK were initially selected on the basis of their importance to waterbirds and are therefore also classified as SPAs.

1.2.17 The Countryside and Rights of Way Act 2000 (HMSO, 2000b) provides protection to Sites of Special Scientific Interest (SSSI) to ensure that developments are not likely to cause damage.

1.2.18 In the UK, sites of ecological importance are provided environmental protection from activities through the application of standards known as Critical Levels and Critical Loads.

1.2.19 Eutrophication and acidification Critical Loads are site specific (dependant on habitat type and/ or soil chemistry). These are detailed in Table 1.3.

Table 1.3: Relevant ecological critical loads/ levels

Type	Pollutant	AQAL	Averaging Period
Critical Level	Oxides of Nitrogen (NO_x)	30 µg/m^3	Annual mean
Critical Load	Eutrophication	Site Specific	Annual mean
	Acidification	Site Specific	Annual mean

[2] Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat.

POLICY

NATIONAL POLICY

NATIONAL PLANNING POLICY

1.2.20 The 2023 update to the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government (MHCLG), 2023a) sets out relevant planning policy for England.

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

1.2.22 The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG) (MHCLG, 2023b) which includes guiding principles on how planning can take account of the impacts of new development on air quality.

1.2.23 Details of the policies of relevance to this assessment are provided in Table 1.4 together with an indication of where each requirement is addressed.

NATIONAL POLICY STATEMENTS

1.2.24 The National Policy Statements (NPS) are a series of principal decision-making documents to appropriately assess NSIPs. As such, this assessment has made explicit reference to the relevant Energy NPS requirements. The latest suite of NPS came into force in January 2024.

1.2.25 Those relevant to this VE are:

- Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2024a);
- NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2024b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2024c).

1.2.26 Details of the policies of relevance to this assessment are provided in Table 1.4 together with an indication of where each requirement is addressed. Where any part of the NPS has not been followed, an explanation as to why the requirement is not deemed relevant, or has been met in another manner, is provided.

1.2.27 Policies that are relevant to air quality considerations for wind farm developments are set out within EN-1. Policies EN-3 and EN-5 do not specifically include details on the assessment of air quality.

THE CLEAN AIR STRATEGY

1.2.28 The Clean Air Strategy (CAS), published in 2019 (Defra, 2019), sets out a wide range of actions by which the UK Government, in partnership with the Devolved Administrations will seek to reduce pollutant emissions and deliver cleaner air across the UK. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air, focussing on transport, domestic, farming and industry.

ENVIRONMENT IMPROVEMENT PLAN 2023

1.2.29 The 2023 Environment Improvement Plan is the first revision of the UK Government's 25 Year Environment Plan (25YEP) – planned on a five-year rolling cycle. This document sets out the 5-year delivery plan to improve the natural environment. The 2023 Environment Improvement Plan builds on the 2019 Clean Air Strategy by setting environmental targets and commitments to reduce air pollution. Goal 2 of the 25YEP is Clean Air – which relates to improving air quality.

LOCAL POLICY

1.2.30 The Tendring District Council (TDC) Local Plan 2013-2033 and Beyond: Section 2 (TDC, 2022) was adopted in January 2022. The following policies are applicable to air quality:

- Policy SPL 3 Sustainable Design;
- Policy PPL 4 Biodiversity and Geodiversity; and
- Policy PPL 10 Renewable Energy Generation and Energy Efficiency Measures.

1.2.31 Details of the policies of relevance to this assessment are provided in Table 1.4 together with an indication of where each requirement is addressed.

GUIDANCE

1.2.32 The air quality assessment has been carried out in accordance with the principles contained within the following guidance documents:

- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Institute of Air Quality Management (IAQM), 2020);
- Design Manual for Roads and Bridges (DMRB) LA 105 (Highways England *et al*., 2019);
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2023);
- Joint Nature Conservation Committee (JNCC): Guidance on Decision-making Thresholds for Air Pollution (JNCC, 2021);
- LAQM Technical Guidance 2022 (TG22) (LAQM.TG(22)) (Defra, 2022); and
- Land-Use Planning and Development Control: Planning for Air Quality (Environmental Protection UK (EPUK) & IAQM, 2017).

1.2.33 These documents relate to the latest best-practice techniques for the consideration of air quality within the development control process.

Table 1.4: Legislation and policy context

Legislation / Policy	Key Provisions	Section Where Comment Addressed
NPS EN-1 (DESNZ, 2024a)	Paragraph 5.2.9 of the EN-1 states that *"The ES should describe:* > *existing air quality concentrations and the relative change in air quality from existing levels;* > *any significant air quality effects, mitigation action taken 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 emissions, concentration change and absolute concentrations as a result of the proposed project, after mitigation methods have been applied;* > *any potential eutrophication impacts."*	See Section 1.7 for characterisation of the existing environment and future baseline conditions. See Section 1.10 to 1.16 for the investigation of potential impacts. This includes the consideration of impacts associated with road traffic emissions generated by VE for all phases, where information is available. The assessment has considered measures detailed in Table 1.21 that are part of the project design. Based upon the outcomes of the assessment, no additional mitigation is needed. Road traffic movements generated by VE have been assessed, where available and requested via the consultation process. This has comprised an initial screening exercise to determine if further detailed assessment to quantify impacts is necessary. Further detailed assessment has been undertaken with respect to potential impacts on human receptors as a result of construction road traffic movements. This has comprised the prediction of absolute road traffic emissions, concentration changes and absolute concentrations. These are presented in full in Volume 6, Part 6, Annex 10.4: Road Traffic Dispersion Modelling and summarised in Section

Legislation / Policy	Key Provisions	Section Where Comment Addressed
		1.10. The assessment outcomes indicate resultant effects are considered not significant. The assessment has considered all relevant impacts on sensitive ecological designations. Based upon the outcomes of the assessment, there are not considered to be any eutrophication impacts.
NPS EN-1 (DESNZ, 2024a)	Paragraph 5.2.10 of the EN-1 states that *"applicants should consider the Environment Targets (Fine Particulate Matter) (England) Regulations 2022 and associated Defra guidance".*	A summary of legislative regimes currently in effect within England is provided in Section 1.2. This has informed the selection of AQALs considered in this assessment. Due consideration has been given to legislation that will be operable throughout the VE lifecycle. In instances where AQALs have been considered, they are based on the legislative regimes anticipated to be in operation at the time of the activity under consideration. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (HMSO, 2023) introduced an annual mean $PM_{2.5}$ concentration target of 10 µg/m^3 to be met across England by 2040. The likelihood for air quality impacts to arise throughout the lifecycle of VE are higher during the construction phase – as it represents worst-

Legislation / Policy	Key Provisions	Section Where Comment Addressed
		case air quality conditions for assessment. This is attributed to the anticipated enhancement in air quality conditions over the VE lifecycle, coupled with the understanding that construction activities will be greater than the operational and decommissioning phases (if cables are left *in situ*). Quantitative assessment of the AQALs is therefore conducted with respect to the construction phase assessment only. Construction of the onshore elements are due to commence in 2027 and last up to 24 months only. The 2040 $PM_{2.5}$ target will not be operable during this period and has therefore not been considered. Based upon the VE timeline, the $PM_{2.5}$ 2040 target is not considered applicable for detailed consideration. Further to the above, Central Government is responsible for meeting this future target, whereas Local Authorities have no statutory obligation to achieve this target.
NPPF (MHCLG, 2023a)	Chapter 15 (Conserving and Enhancing the Natural Environment) states the following in specific relation to air quality: *"Preventing new and existing development from contributing to, being put at unacceptable risk from,*	See Section 1.7 for characterisation of the existing environment. This includes the consideration of AQMAs which have been fully considered within the impact assessment where relevant (Section 1.10 to 1.16), Impacts

Legislation / Policy	Key Provisions	Section Where Comment Addressed
	or being adversely affected by, unacceptable levels of […] air […] pollution […]. Development should, wherever possible, help to improve local environmental conditions such as air […] quality […] " *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*	associated with road traffic movements generated by VE construction activities have been considered. There are no clean air zones in the air quality study areas. See Section 1.10 to 1.16 for the investigation of potential impacts. This includes the consideration of cumulative impacts associated from individual sites in the local area (Section 1.13). The assessment has considered measures detailed in Table 1.21 that are part of the project design. Based upon the outcomes of the assessment, no additional mitigation is needed.
PPG (MHCLG, 2023b)	In regards to air quality, the PPG states: *"The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to*	See Section 1.7 for characterisation of the existing environment. See Section 1.10 to 1.16 for the investigation of potential impacts.

Legislation / Policy	Key Provisions	Section Where Comment Addressed
	determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified." *"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."* The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that:	The assessment has considered measures detailed in Table 1.21 that are part of the project design. Based upon the outcomes of the assessment, no additional mitigation is needed.

Legislation / Policy	Key Provisions	Section Where Comment Addressed
	"…assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions). […] Mitigation options [..] will depend on the proposed development and should be proportionate to the likely impact".	
TDC, 2022: Policy SPL 3 Sustainable Design	*"Part A: Design. All new development (including changes of use) should make a positive contribution to the quality of the local environment and protect or enhance local character. The following criteria must be met: […]* *d. the design and layout of the development maintains or enhances important existing site features of […] ecological, […] or amenity value; […]* *Part C: Impacts and Compatibility. New development (including changes of use) should be compatible with surrounding uses and minimise any adverse environmental impacts. The following criteria must be met: […]* *b. the development, including any additional road traffic arising, will not have unacceptable levels of pollution on: air, […] amenity, health or safety through […] smell, dust, […] fumes or other forms of pollution or nuisance;*	See Section 1.10 to 1.16 for the investigation of potential impacts. Mitigation measures detailed in Table 1.21 are part of the project design. Based upon the outcomes of the assessment, no additional mitigation is needed.

Legislation / Policy	Key Provisions	Section Where Comment Addressed
	c. the health, safety or amenity of any occupants or users of the proposed development will not be materially harmed by any pollution from an existing or committed use; […] *e. during the construction phase, developers must comply with a 'considerate constructors' scheme' which employs reasonable measures and techniques to minimise and mitigate impacts and disturbance to neighbours and the existing wider community and any damage to public and private property. […]* *When considering new development, applicants and developers should avoid adverse impacts upon the environment. Where this is not possible, mitigation measures should be put forward. As a last resort, compensate for adverse environmental impacts."*	
TDC, 2022: Policy SPL 4 Biodiversity and Geodiversity	*"Sites designated for their international, European and national importance to nature conservation: including Ramsar sites; Special Protection Areas (SPAs); Special Areas of Conservation (SACs); Marine Conservation Zones (MCZs); National Nature Reserves (NNRs); and Sites of Special Scientific Interest (SSSIs) will be protected from development likely to have an adverse effect on their integrity."*	See Section 1.10 to 1.16 for the investigation of potential impacts.

Legislation / Policy	Key Provisions	Section Where Comment Addressed
TDC, 2022: Policy SPL PPL 10 Renewable Energy Generation and Energy Efficiency Measures	*"Proposals for renewable energy schemes will be considered having regard to their scale, impact (including cumulative impact) and the amount of energy which is to be generated."*	See Section 1.10 to 1.16 for the investigation of potential impacts.

1.3 CONSULTATION

AIR QUALITY CONSULTATION

1.3.1 Consultation is a key part of the DCO application process. To date, consultation with regards to the scope of the air quality assessment has included:

- Submission of a Scoping Report (VE OWFL, 2021);
- VE Evidence Plan (Air Quality Expert Topic Group (ETG)) process, comprising discussions with Natural England and Essex County Council; and
- Statutory consultation that was accompanied by a PEIR (VE OWFL, 2023).

1.3.2 Essex County Council has been co-ordinating responses from TDC as part of the consultation process.

1.3.3 A Scoping Opinion for VE was sought from the Planning Inspectorate (PINS) which included relevant responses from statutory consultees. This included responses to the proposed assessment methodology for further consideration (PINS, 2021).

1.3.4 In fulfilment of the VE Evidence Plan process, a Technical Note (SLR, 2022) was issued to relevant Air Quality ETG members detailing the extent of the methodology proposed for the PEIR. Natural England and TDC (via Essex County Council) both agreed to the proposed approach via email.

1.3.5 A PEIR was published (VE OWFL, 2023) as part of formal consultation which provided preliminary information on Air Quality within Volume 3, Chapter 10: Air Quality. Following submission of the PEIR, no material comments were received from statutory consultees with respect to the assessment approach. The scope and methodology of PEIR is considered to be appropriate and has formed the basis of the ES. Non-statutory consultation comments have been reviewed and considered within the ES.

1.3.6 Based on the extensive consultation process conducted to date, there appears to be general agreement in the proposed approach and scope of the air quality assessment with no points of disagreement identified.

1.3.7 The outcomes of the consultation process discussed above have formed the basis of the air quality assessment.

1.3.8 An overview of the technical consultation process is presented within Volume 6, Part 1, Chapter 1: Introduction and further consultation detail is presented in the Consultation Report (Volume 5, Report 5.1). As identified in Volume 6, Part 1, Chapter 4: Site Selection and Alternatives and Volume 6, Part 3, Chapter 1: Onshore Project Description, the VE design envelope has been refined from the design envelope presented at the PEIR stage. This refinement has been based on stakeholder consultation feedback.

1.3.9 Table 1.5 provides a summary of consultation comments received to date relating to Air Quality, and associated responses, together with how these issues have been considered within the ES.

1.3.10 Given the changes in the project design between Preliminary Environmental Information Report (PEIR) and ES, some areas of land will be affected differently by the proposals than consulted on at PEIR. Changes were made following feedback from the PEIR consultation, increased understanding of the local environment from dedicated surveys and coordination work with the North Falls project. To comply with the requirements of the Planning Act 2008, a targeted consultation was held with those affected by the changes from 5 December 2023 to Wednesday 31 January 2024.

Table 1.5: Summary of consultation relating to air quality

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
PINS, Scoping Opinion, November 2021 (PINS, 2021)	**NRMM emissions during construction:** As per the Scoping Report (VE OWFL, 2021), it was initially proposed to scope out impacts associated with emissions generated from NRMM used within the construction phase. This was based on advice provided within LAQM.TG(22) (Defra, 2022) which states that providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. A series of controls were included within the Scoping Report (VE OWFL, 2021). PINS indicated that following the implementation of appropriate controls/ measures it is possible that significant effects from emissions generated by NRMM would be avoided. However, PINS believed there was insufficient information to fully validate this opinion – with the recommendation to undertake an assessment or provide evidence demonstrating agreement with the relevant consultation bodies and the absence of likely significant effects occurring.	Essex County Council, within the consultation response contained within the Scoping Opinion (PINS, 2021) agreed NRMM emissions could be scoped out following the implementation of suitable mitigation. According to LAQM.TG(22), providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. These controls are detailed in the CoCP (Volume 9, Report 9.21) developed to set procedural standards for proposed onshore construction activities – see Table 1.21. In accordance with LAQM.TG(22), following application of these controls, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. Natural England, within the consultation response contained within the Scoping Opinion (PINS, 2021) raised no comment with regards to the scoping out impacts associated with emissions generated from NRMM. Based on the above consultation outcomes (received to date), it can be concluded that relevant consultation bodies are in agreement that NRMM

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
		can be scoped out from assessment, providing suitable controls are applied. Notwithstanding this, a qualitative assessment of NRMM emissions has been undertaken – in recognition of PINS request. See Section 1.10 and Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment. This assessment was conducted for PEIR (VE OWFL, 2023). No comments or recommendations were made in response to the proposed approach, and it is considered suitable. Furthermore, no comments were raised during the ETG process regarding NRMM emissions.
PINS, Scoping Opinion, November 2021 (PINS, 2021)	**Operational phase traffic movements and other works/ activities:** PINS agreed that road traffic movements generated by the operational activities can be scoped out – given the negligible increase in road traffic vehicles compared to baseline conditions. However, to validate this, PINS requested comparison of operations and maintenance (O&M) flows to screening criteria set out in the EPUK & IAQM guidance (EPUK & IAQM, 2017). Furthermore, PINS suggested that there is insufficient information to scope out effects	Following PINS comments, road traffic vehicles generated by operational activities have been presented and compared against EPUK & IAQM screening criteria (EPUK & IAQM, 2017). See Section 1.11. As established above, it is considered likely that consultee bodies are in agreement that NRMM construction phase impacts can be scoped out from assessment, providing suitable controls are applied. O&M activities are not anticipated to exceed the construction phase worst case criteria assessed (activities will be limited to maintenance activities). A

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	associated with potential emissions generated from plant/ NRMM used during the O&M phase. PINS recommended to undertake an assessment or provide evidence demonstrating agreement with the relevant consultation bodies and the absence of likely significant effect occurring.	qualitative assessment of construction phase NRMM emissions has been undertaken. Notwithstanding the above, the extent of operational activities has been discussed and assessed. See Section 1.11 and Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment. This assessment was conducted for PEIR (VE OWFL, 2023). No comments or recommendations were made in response to the proposed approach, and it is considered suitable.
PINS, Scoping Opinion, November 2021 (PINS, 2021)	**Project specific air quality surveys:** As per the Scoping Report (VE OWFL, 2021), it was initially proposed to establish the baseline for air quality through the use of Defra background mapping and Defra/ TDC monitoring data. Within their adopted Scoping Opinion (PINS, 2021), PINS agreed to this approach in principle. However, it requested that the suitability of these publicly available datasets be reviewed throughout the Environmental Impact Assessment lifecycle and confirmed with relevant consultation bodies. PINS requested that the Environmental Statement should be carried out with reference to a robust baseline position reflecting the relevant study area,	Following receipt of traffic data and finalisation of the Order Limits, the suitability of the publicly available data has been reviewed. Consistent with the approach outlined within the Scoping Report (VE OWFL, 2021), publicly available datasets have been used to characterise the baseline environment. This has involved the use of the latest representative datasets recorded by Colchester Borough Council (CBC) and TDC. Publicly available datasets have been reviewed to determine suitability with respect to the study area. The coverage of existing local monitoring networks is considered sufficient. Supporting justifications are provided Section 1.7. Section 1.1 details the extent of data sources used within the assessment. The

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	including an understanding of relevant pollutant concentrations.	use of publicly available datasets to characterise the baseline environment will be reviewed throughout the EIA lifecycle. Use of publicly available datasets has been discussed with statutory consultees during the Air Quality ETG process – whereby no comments/ responses have been raised. Further, publicly available datasets were used for the purposes of characterising baseline conditions within the PEIR (VE OWFL, 2023). No comments or recommendations were made in response to this approach. Use of publicly available datasets are considered suitable, and no project surveys have been conducted. Figure 10.1 provides an illustration of the publicly available monitoring locations used in the baseline characterisation process.
PINS, Scoping Opinion, November 2021 (PINS, 2021)	**Transboundary impacts:** PINS agree this matter can be scoped out of further assessment. Given air quality impacts will be localised within Essex County Council and TDC administrative areas and not experienced across international boundaries, PINS agrees VE is unlikely to give rise to significant transboundary air quality effects.	Transboundary impacts have been scoped out of further assessment within Section 1.16.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
PINS, Scoping Opinion, November 2021 (PINS, 2021)	**Offshore air quality impacts:** PINS have requested the ES include information about any potential emissions from offshore activity, e.g. from vessels, including the type and expected volume of emissions. It should explain whether there are any impact pathways to relevant human and ecological receptors. Where significant effects are likely to occur, an assessment of this matter should be included within the ES.	Following PINS comments, an assessment of offshore activities impacts on onshore receptors has been undertaken. See Section 1.10 to 1.13 and Volume 6, Part 6, Annex 10.3: Offshore Activities Assessment. This assessment was conducted for PEIR (VE OWFL, 2023). No comments or recommendations were made in response to the proposed approach, and it is considered suitable.
PINS, Scoping Opinion, November 2021 (PINS, 2021)	**Study area:** PINS requested the ES should include a figure/ figures to identify the study areas for each element of the air quality assessment including considered human and ecological receptors.	Figures illustrating the study areas for each assessment (inclusive of human and ecological receptors) have been prepared, where feasible. See Figure 10.2 to Figure 10.6
Essex County Council, Scoping Opinion, November 2021 (PINS, 2021)	**Scoping in of assessments:** Essex County Council agree to items proposed to be scoped into assessment. It is considered by Essex County Council that these matters are potentially significant in terms of impacts.	No response needed. All scoped in assessments have been undertaken. See Sections 1.10 to 1.13.
Essex County Council, Scoping	**NRMM emissions:** In order to agree scoping out of emissions from NRMM – it requires reassurance that robust	A series of construction phase control measures will be included within the CoCP (Volume 9, Report

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
Opinion, November 2021 (PINS, 2021)	measures will be implemented and enforced effectively.	9.21) to minimise NRMM emissions - see Table 1.21. Nonetheless, as discussed above, a full qualitative assessment of NRMM for construction has been undertaken and the extent of operational activities considered. The assessment is presented in Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment.
ETG Presentation, November 2022	**Approach to air quality assessment:** No consultation feedback received.	-
ETG Technical Note, November 2022 (SLR, 2022)	**Approach to air quality assessment:** No comments on proposed approach from Natural England at this stage (email dated 5th January 2023). Agreement on proposed approach from TDC on behalf of Essex County Council (email dated 17th January 2023).	-
Air Quality PEIR Chapter (March 2023) (VE OWFL, 2023)	**Air quality assessment (PEIR):** No comments on assessment from statutory consultees.	-
Air Quality PEIR Chapter (March 2023) – Section 42	**Forestry Commission Response:** The Forestry Commission are particularly concerned about any impact on Ancient & Semi-	The impact on ASNW designations has been assessed in the ES where they are located within the study areas.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
Non-Statutory Response	Natural Woodland (ASNW). They note that while there are several ASNW designations in the vicinity of the proposed cable route corridor, which may be affected by an increase in traffic and reduced air quality during construction. The boundary of the proposal runs alongside the approx. 3.2 ha, Plantations on Ancient Woodland Site (PAWS) of Simon's Wood.	Impacts on Simon's Wood PAWS have been considered, where relevant. See Section 1.10 to 1.13.
Air Quality PEIR Chapter (March 2023) – Section 42 Non-Statutory Response	**Little Bromley Parish Council (LBPC) Response:** LBPC has concerns around construction dust and mud. Residential properties and gardens as well as roads will be affected. LBPC would like to understand how VE plan to mitigate this.	Impacts associated with construction dust generated by onshore construction activities have been assessed in the ES in accordance with best-practice techniques. See Section 1.10. The outcomes of this exercise indicate a series of controls and measures are required to be implemented to ensure that any potential impacts arising from any onshore construction works are minimised and, where possible, completely removed. These measures are included within the CoCP (Volume 9, Report 9.21).
ETG Presentation, October 2023	**Approach to air quality assessment:** No consultation feedback received.	-

1.4 SCOPE AND METHODOLOGY

SCOPE OF THE ASSESSMENT

1.4.1 The assessment scope has been informed by both national and local planning policy and guidance, established best practice and experience, as well as via the consultation process from relevant consultees (Section 1.3).

IMPACTS SCOPED IN FOR ASSESSMENT

1.4.2 Consistent with PINS (and other statutory consultee) recommendations contained within the Scoping Opinion (PINS, 2021) and presented in Table 1.5, the following items are scoped in for assessment:

- Construction dust assessment;
- Road traffic emissions assessment;
- NRMM emissions assessment; and
- Offshore activities emissions assessment.

1.4.3 These assessments have considered all phases of VE, where relevant.

1.4.4 Within the Scoping Opinion PINS indicated that following the implementation of appropriate controls/ measures it is possible that significant effects from emissions generated by NRMM would be avoided. However, it believed there was insufficient information to fully validate this opinion – with the recommendation to undertake an assessment or provide evidence demonstrating agreement with the relevant consultation bodies and the absence of likely significant effect occurring.

1.4.5 Essex County Council (representing TDC) within its consultation response contained within the Scoping Opinion agreed NRMM emissions could be scoped out following the implementation of suitable mitigation. A series of controls are detailed in the CoCP (Volume 9, Report 9.21), developed to set procedural standards for proposed onshore construction activities. Furthermore, Natural England within their consultation response contained within the Scoping Opinion raised no comment with regards to scoping out impacts associated with emissions generated from NRMM.

1.4.6 Notwithstanding this, a qualitative assessment of NRMM emissions has been undertaken – in recognition of PINS request. See Section 1.10 and Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment. This assessment was conducted for PEIR (VE OWFL, 2023). No comments or recommendations were made in response to the proposed approach, and it is considered suitable.

1.4.7 Details surrounding the decommissioning phase are yet to be fully clarified. In addition, it is also recognised that policy, legislation and local sensitivities evolve. Despite this, decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given forecast improvements to air quality and the potential for cables to remain *in situ* reducing the volume of works in comparison. Consideration of decommissioning activities is included following assessment of construction phase activities. See Section 1.12.

IMPACTS SCOPED OUT OF ASSESSMENT

1.4.8 Consistent with the recommendations from PINS contained within the Scoping Opinion (PINS, 2021) and presented in Table 1.5, the following item is scoped out for assessment:

- Transboundary impacts – on the basis that impacts will be localised within Essex County Council and TDC administrative areas and not experienced across international boundaries. This is consistent with PINS outcome associated with the Transboundary Screening Consultation Request which states transboundary effects from onshore activities associated with VE are unlikely (PINS, 2022).

STUDY AREA

CONSTRUCTION DUST ASSESSMENT

1.4.9 The spatial extent of the study area for the construction dust assessment has been defined on the following threshold distances outlined in IAQM construction guidance (IAQM, 2023):

- Human receptors within 250 m of the Order Limits and human receptors within 50 m of routes used by construction vehicles on the public highway up to 250 m from the Order Limits; and
- Ecological receptors within 50 m of the Order Limits and ecological receptors within 50 m of routes used by construction vehicles on the public highway up to 250 m from the Order Limits.

1.4.10 Further detail is provided in Section 1.5. It is also reproduced in full in Volume 6, Part 6, Annex 10.1: Construction Dust Assessment Methodology.

1.4.11 Figure 10.2 provides an illustration of the construction dust assessment study area.

ROAD TRAFFIC ASSESSMENT

1.4.12 The spatial extent of the study area for the road traffic assessment has been initially defined using a series of established screening criteria to determine the extent of the affected road network. The screening criteria utilised is dependent on the application (human vs. ecological). These are discussed further in Section 1.5.

1.4.13 The criteria applied as part of this assessment relates to increases in development-generated traffic. Traffic data used for the purposes of this screening exercise has been informed by analysis undertaken and presented as part of Volume 6, Part 3, Chapter 8: Traffic and Transport.

1.4.14 Human and ecological receptors within 200 m of roads expected to experience increases in traffic flows as a result of the proposed VE onshore activities have been assessed, where appropriate. If an ecological and/ or human receptor is located >200 m from the affected road network, further consideration is not required.

1.4.15 The 200 m distance screening threshold is supported in various guidance documents (IAQM, 2020 and Highways England *et al*., 2019) and is therefore considered appropriate.

1.4.16 To minimise uncertainty associated with the dispersion modelling outcomes, a verification exercise has been undertaken utilising 2019 monitoring data collected by TDC and CBC (the latest year which has not been impacted by the COVID-19 pandemic).

1.4.17 Further detail is provided in Volume 6, Part 6, Annex 10.4: Road Traffic Dispersion Modelling. Figure 10.3 provides an illustration of the human receptor study area. Figure 10.4 provides an illustration of the study area considered within the ecological screening assessment.

NRMM ASSESSMENT

1.4.18 Human and ecological receptors within 50 m of potential NRMM have been assessed. The maximum design parameters/ extents of any proposed construction area (Order Limits) have been used for the purposes of defining the locations of potential NRMM.

1.4.19 This approach is considered conservative – as it assumes that all NRMM will be operated on the boundary of the Order Limits (inclusive of all design options), and therefore increases the opportunity for interactions with sensitive receptors. However, this approach ensures all potential scenarios and associated impacts have been assessed. Further detail is provided in Section 1.8.

1.4.20 If an ecological and/ or human receptor is located >50 m from the Order Limits, further consideration is not required.

1.4.21 Use of a 50 m distance screening threshold in relation to NRMM emissions where extensive onshore construction activities are proposed has been accepted by statutory consultees and PINS for other NSIPs e.g. The Northampton Gateway Rail Freight Interchange Order 2019 (Statutory Instrument (SI) 2019/1358, 2019). Use of a 50 m distance screening threshold has been agreed with Natural England and TDC via the ETG process.

1.4.22 Further detail is provided in Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment. Figure 10.5 provides an illustration of the NRMM assessment study area.

OFFSHORE ACTIVITIES ASSESSMENT

1.4.23 Onshore human and ecological receptors within 1 km of vessel movements generated by VE have been assessed, consistent with the distance screening thresholds prescribed within LAQM.TG(22) (Defra, 2022).

1.4.24 The offshore wind farm array is located 37 km off the coast of England at the closest point. Given this separation distance, vessel movements associated with all phases of VE are therefore only likely to interact with onshore sensitive receptors where they are:

- Used to facilitate the installation, maintenance and decommissioning of cabling infrastructure at landfall; and/ or
- Exiting/ entering a port.

1.4.25 The specific port location(s) to be utilised by vessels are yet to be determined, however all movements will be compliant/ in line with the relevant port's operational constraints and management plans. Therefore, further consideration of vessels exiting/ entering a port has not been given.

1.4.26 The study area therefore relates to onshore human and ecological receptors located within 1 km of vessels used to facilitate the installation, maintenance and decommissioning cabling infrastructure at landfall.

1.4.27 For the purposes of informing the study area it has been assumed that vessel movements occur up to the point of the coastline – irrespective of logistical constraints (i.e. shallow water). This is conservative and increases the spatial extent of the onshore study area – as vessels movements are likely to occur some distance from the coast.

1.4.28 Further detail is provided in Volume 6, Part 6, Annex 10.3: Offshore Activities Assessment. Figure 10.6 provides an illustration of the vessel emissions assessment study area.

DATA SOURCES

1.4.29 The characterisation of the existing environment has been undertaken using the latest publicly available data sources collected prior to the COVID-19 pandemic (i.e. pre-2020). Subsequent years (i.e. beyond 2019) may be influenced by the COVID-19 pandemic and may not fully be representative of long-term baseline conditions.

1.4.30 There appears to be sufficient coverage of publicly available data sources covering the spatial extents of the study areas defined for each assessment. Use of publicly available datasets for the purposes of characterising baseline conditions were found to be sufficient, therefore no project specific surveys have been undertaken.

1.4.31 The data sources are listed in Table 1.6.

Table 1.6: Summary of data sources

Data	Source	Year Released	Coverage
2020 Air Quality Status Report (2019 annual monitoring) (TDC, 2020)	TDC	2020	Local
2020 Air Quality Status Report (2019 annual monitoring) (CBC, 2020)	CBC	2020	Local
Automatic Urban and Rural Network (AURN) (Defra, 2024)	Defra	2024	National (England)
2018-Based background mapped concentration estimates (Defra, 2020)	Defra	2020	National (England)

ASSESSMENT METHODOLOGY

COORDINATED APPROACH

1.4.32 In accordance with the provisions of NPS EN-5 (DESNZ, 2024c) to seek to develop co-ordination solutions for onshore grid connections, since PEIR, VE has been collaborating with North Falls OWF (NF OWF) on a co-ordinated solution to reduce the overall environmental and community impacts of the proposals. The project includes almost fully overlapping or combined onshore ECCs and a co-located site for the OnSS to the west of Little Bromley. It is proposed the two projects' ducts will be installed adjacent to each other within the corridor. The level of co-ordination between the two projects has led to a higher degree of understanding and interactions with the NF OWF.

1.4.33 As this collaboration commenced after PEIR, reasonable attempts have been made to align with NF OWF insofar as possible, without compromising the integrity of the consultation process conducted to date.

1.4.34 Due to the independent timescales for each project, three delivery scenarios have been developed (details of each scenario can be found within Volume 6, Part 3, Chapter 1: Onshore Project Description).

1.4.35 In order for VE to connect to the National Grid, the proposed National Grid electricity transmission (NGET) Norwich to Tilbury Reinforcement project and the associated East Anglia Connection Node (EACN) substation must be operational. National Grid has defined a construction and operational zone within which their EACN substation will be situated. This is adjacent to the VE substation zone.

1.4.36 Despite its stage in the planning process, due to VE's reliance on the NGET Norwich to Tilbury Reinforcement project for its connection to the National Grid, it has been given detailed consideration and treated with more certainty than other projects at similar stage in the planning process. To assist with the assessment, it has been necessary to make assumptions as to the siting, scale, form and construction of the project, particularly the EACN substation. These assumptions have been checked and agreed to be appropriate and reasonable by National Grid. For the purposes of the cumulative assessment of VE and National Grid Norwich to Tilbury Project, the worst-case delivery scenario, with limited co-ordination has been assessed for the direct and indirect impacts.

1.4.37 Further detail is described in Volume 6, Part 3, ES Chapter 1: Onshore Project Description.

1.4.38 In instances where each activity has been assessed across various phases of VE a description of the methodology complementing each phase has been provided where it differs across the phases.

CONSTRUCTION DUST ASSESSMENT

1.4.39 The assessment of dust generated by potential construction activities on nearby sensitive human and ecological receptors has been undertaken in accordance with the IAQM construction guidance (IAQM, 2023).

1.4.40 The likely unmitigated dust emission magnitude associated with four activities (demolition, earthworks, construction and trackout) is used in conjunction with the sensitivity of the surrounding area to determine the risk of impact for each activity. These sensitivities are:

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

1.4.41 The risk of impact is then used to determine proportionate mitigation requirements, whereby through effective application, residual effects are considered to be not significant in terms of the EIA Regulations.

1.4.42 Full details of the assessment methodology are provided in Section 1.5.

CONSTRUCTION PHASE

1.4.43 For the assessment of construction phase road traffic emissions on ecological and human receptors, an initial screening exercise has been conducted to determine whether detailed modelling is required.

1.4.44 This has comprised the comparison of road traffic volumes generated by VE on the public road network (construction access routes) with reference to numerical screening thresholds prescribed within relevant guidance. The screening criteria utilised is dependent on the application (these are different criteria for human and ecological receptors). These are discussed further in Section 1.5.

1.4.45 Where road traffic movements cannot be screened out and a sensitive receptor is located within 200 m, further detailed assessment has been undertaken with use of the Cambridge Environmental Research Consultants (CERC) ADMS-Roads v5 dispersion model. Based on the outcomes of the initial screening exercise, detailed assessment has been conducted in relation to human receptors only.

1.4.46 The dispersion modelling human health assessment has considered the following scenarios:

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

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

1.4.48 To ensure potential air quality impacts that may arise throughout the construction phase are understood, 2027 has been adopted for the purposes of dispersion modelling (i.e. earliest date of potential construction). Use of 2027 is therefore conservative, in recognition of the forecast reductions in vehicle emission factors and background pollutant concentrations – following the introduction of legislative and policy initiatives, alongside low emission technologies/ fuels. See Section 1.6.

1.4.49 Traffic data used for the purposes of the road traffic emissions assessment has been informed by analysis undertaken and presented as part of Volume 6, Part 3, Chapter 8: Traffic and Transport.

1.4.50 The basis of the modelled road network relates to the affected road network. The spatial extent of the affected road network has been extended to ensure all possible interactions with nearby sensitive receptors have been assessed. This is likely to represent a conservative assessment, as assumes there is no reduction in vehicle movements generated by onshore activities with distance from the construction access routes.

1.4.51 Additionally, other road links within proximity of the affected road network have also been included for completeness and provide a robust prediction of modelled concentrations (where possible). This approach avoids relying on their individual contributions being represented within the appropriate background datasets.

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

1.4.53 The dispersion modelling assessment has incorporated the potential maximum traffic flows that are likely to occur in the future assessment year (i.e. 2027) should VE receive consent (based upon information currently available). The traffic flows used for the assessment includes vehicle movements associated with relevant developments in the assessment area, including:

- Committed developments (see Volume 6, Part 3, Chapter 8: Traffic and Transport);
- NF OWF; and
- NGET Norwich to Tilbury Reinforcement project.

1.4.54 NF OWF and NGET Norwich to Tilbury Reinforcement project are live projects that are yet to receive consent.

1.4.55 As described in Volume 6, Part 3, ES Chapter 1: Onshore Project Description, a co-ordinated approach with the adjacent NF OWF project is sought. NF OWF is not a consented project, so there is uncertainty regarding future collaboration. To address this uncertainty, a series of scenarios are proposed, encompassing potential construction options.

1.4.56 In relation to potential impacts that could arise as a result of road traffic vehicle movements generated by VE construction activities, co-ordination Scenario 1 is considered to result in the worst-case assessment criteria for air quality. It has therefore been adopted as the primary assessment scenario, to ensure all potential scenarios and impacts are understood.

1.4.57 Co-ordination Scenario 1 comprises VE proceeding to construction and undertaking the additional onshore cable trenching and ducting works for NF OWF as part of a single civils campaign (ducting for four electrical circuits). VE would undertake the cable installation and OnSS build for its project only (two electrical circuits). Whilst this scenario assumes the two projects would share accesses from the public highway for cable installation and substation construction, NF OWF traffic data considered in this assessment where relevant includes reinstatement of the accesses.

1.4.58 As VE will be undertaking additional works on behalf of NF OWF, higher road traffic vehicle movements are expected vs. other scenarios. Furthermore, it is assumed that NF OWF and VE are constructed concurrently in the same year, and peak construction vehicle trips will overlap and affect the same road links simultaneously. The combination of these parameters will result in worst-case impacts.

1.4.59 The dispersion modelling exercise is inherently cumulative, incorporating the assumption that committed schemes become fully operable at the time of assessment. Moreover, it assumes that NF OWF and EACN substation, part of the NGET Norwich to Tilbury Reinforcement project will all receive consent. This presupposes that peak construction activities linked with VE, NF OWF, and the EACN substation will coincide and impact the same road links simultaneously. This assumption is considered highly unlikely.

1.4.60 A package of transport infrastructure upgrades along Bentley Road are proposed by VE to facilitate the construction works. These comprise the widening of Bentley Road, junction works with the A120 and enforcement of a temporary speed limit. As these infrastructure schemes relate to VE, they have been included in the 2027 DS modelled scenario only (i.e. associated with VE receiving consent).

1.4.61 As established in paragraph 1.4.53, vehicle movements associated with NF OWF and the NGET Norwich to Tilbury Reinforcement project have been considered in the 2027 DM and 2027 DS scenario. This includes movements along Bentley Road. Infrastructure enhancements along Bentley Road would be required to support these movements, in the event VE doesn't receive consent (2027 DM).

1.4.62 However, at present, there is no detailed design available in the public domain regarding the scale and nature of the infrastructure improvements proposed to independently support these projects in the event VE does not receive consent. It has not been possible to replicate these improvements in the 2027 DM scenario. However, despite this, vehicle movements along Bentley Road have been considered in the 2027 DM scenario.

1.4.63 The basis of the modelling assessment is to replicate future air quality conditions and impacts, insofar as possible i.e. based on the latest publicly available information.

1.4.64 Further details regarding the maximum design scenario (MDS) considered are discussed in Section 1.8.

1.4.65 The dispersion modelling exercise has been undertaken in accordance with LAQM.TG(22) (Defra, 2022).

1.4.66 With respect to human receptors, consideration has been given to the relevant AQALs (Table 1.1). Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been predicted at locations of relevant exposure at existing sensitive receptors – adjacent to the affected road network.

1.4.67 The assessment criteria outlined within Section 1.5 has been used to determine the overall significance of VE, with respect to construction road traffic modelled impacts on human receptors.

1.4.68 Full details of the assessment methodology are provided within Volume 6, Part 6, Annex 10.4: Road Traffic Dispersion Modelling.

OPERATIONAL PHASE

1.4.69 In response to PINS explicit request (PINS, 2021), road traffic flows generated by operational phase activities have been compared against EPUK & IAQM screening thresholds (EPUK & IAQM, 2017) to determine whether further assessment is required.

1.4.70 These screening thresholds are outlined within Section 1.5.

NRMM ASSESSMENT

1.4.71 A qualitative assessment of potential construction phase NRMM emissions on sensitive human and ecological receptors has been undertaken in accordance with guidance prescribed within LAQM.TG(22) (Defra, 2022).

1.4.72 As per LAQM.TG(22), qualitative consideration of NRMM emissions is likely to provide sufficient screening of impacts.

1.4.73 In response to PINS request (PINS, 2021), the extent of planned operational activities/ works have been discussed to determine whether further assessment in relation to NRMM emissions is required. Further, potential decommissioning impacts have also been considered, where possible.

1.4.74 The outcomes of the construction assessment have been used as an appropriate benchmark to identify potential operational and decommissioning impacts.

1.4.75 Full details of the assessment methodology are provided within Volume 6, Part 6 Annex 10.2: Non-Road Mobile Machinery Emissions Assessment.

OFFSHORE ACTIVITIES ASSESSMENT

1.4.76 Vessel movements generated by VE during all stages of development have been compared against screening thresholds prescribed within LAQM.TG(22) (Defra, 2022) and outlined in Section 1.5.

1.4.77 The screening thresholds indicate that sensitive receptors up to 1 km from vessel movements can be affected by vessel emissions. The offshore wind farm array is located at the closest 37 km off the coast of England. Given the separation distance, vessel movements associated with all phases of VE are therefore only likely to interact with onshore sensitive receptors where they are:

- Used to facilitate the installation, maintenance decommissioning of cabling infrastructure at landfall; and/ or
- Exiting/ entering a port.

1.4.78 The specific port location(s) to be utilised by vessels are yet to be determined, however all movements will be compliant/ in line with the relevant port's operational constraints and management plans. Therefore, further consideration of vessels exiting/ entering a port has not been given.

1.4.79 The focus of this assessment thus relates to the potential extent of vessels used to facilitate the installation, maintenance decommissioning of cabling infrastructure at landfall and their interaction with onshore sensitive receptors. In relation to this, the majority of vessel movements affecting these receptors would occur in the construction phase (and potentially the decommissioning phase, if infrastructure is not left *in situ*). Nearshore activities during O&M are expected to be very limited, relating to cable maintenance for example.

1.4.80 Vessel movements used for the purposes of this screening assessment are consistent with the analysis undertaken, and presented within Volume 6, Part 2, Chapter 1: Offshore Project Description.

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

1.4.82 Full details of the assessment methodology are provided within Volume 6, Part 6, Annex 10.3: Offshore Activities Assessment.

1.5 ASSESSMENT CRITERIA AND ASSIGNMENT OF SIGNIFICANCE

1.5.1 Whilst Volume 6, Part 1, Chapter 3: EIA Methodology provides an indicative EIA assessment matrix, it also identifies that assessment methodologies will reflect the prevailing technical area guidance and specific requirements of receptor groups. As such, the following sections provide a description of the assessment criteria and assessment methodologies used to assess air quality, which are derived from best practice guidance documents.

CONSTRUCTION DUST ASSESSMENT

1.5.2 The IAQM construction dust assessment methodology provides a framework to establish the unmitigated risk of construction dust impacts associated with a development at both human and ecological receptors.

1.5.3 This risk is based on a relationship between the anticipated dust emission magnitude and the sensitivity of the surrounding area. These have been defined with use of criteria provided within the IAQM construction guidance (IAQM, 2023).

1.5.4 Following determination of these risks, proportionate mitigation is recommended, with the aim of rendering residual effects as not significant in terms of the EIA Regulations.

1.5.5 Significance is only assigned to the effect after considering the construction activity with mitigation. This is because for construction activities, the aim is to prevent significant effects on receptors through the use of effective mitigation.

1.5.6 The IAQM construction guidance therefore does not provide a framework to determine the significance of unmitigated effects, as is not considered appropriate nor relevant in this context. For these reasons, the significance of the unmitigated effect of construction dust cannot be defined.

1.5.7 Full details of the assessment methodology are provided in the following sections. It is also reproduced in full in Volume 6, Part 6, Annex 10.1: Construction Dust Assessment Methodology.

STEP 1: SCREENING THE NEED FOR A DETAILED ASSESSMENT

1.5.8 A detailed construction dust assessment is required where a:

- Human receptor is located within 250 m of the development site, and/ or within 50 m of routes used by construction vehicles, up to 250 m from the site entrance(s); and/ or
- Ecological receptor is located within 50 m of the development site, and/ or within 50 m of routes used by construction vehicles, up to 250 m from the site entrance(s).

1.5.9 Where the need for a more detailed assessment is screened out, effects are not believed to be significant, and no further assessment is required.

1.5.10 These thresholds have been used to inform the study area (Section 1.4).

STEP 2A: DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

1.5.11 The dust emission magnitude is defined for the following construction activities, based on anticipated works:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

1.5.12 This is determined using criteria provided within the IAQM guidance (Table 1.7), in combination with professional judgment.

Table 1.7: Criteria Used for the Determination of the Dust Emission Magnitude for Each Activity

Activity	Dust Emission Magnitude		
	Small	Medium	Large
Demolition	> Total building volume <12,000 m^3 construction > Material with low potential for dust release (e.g. metal cladding or timber) > Demolition activities <6 m above ground, demolition during wetter months.	> Total building volume 12,000 – 75,000 m^3 > Potentially dusty construction material > Demolition activities 6-12 m above ground level	> Total building volume >75,000 m^3 > Potentially dusty construction material (e.g. concrete) > On-site crushing and screening demolition activities >12 m above ground level
Earthworks	> Total site area <18,000 m^2 > <5 heavy earth moving vehicles active at any one time	> Total site area 18,000 to 110,000 m^2 > 5-10 heavy earth moving vehicles active at any one time	> Total site area >110,000 m^2 > >10 heavy earth moving vehicles active at any one time
Construction	> Total building volume <12,000 m^3 > Construction material with low potential for dust release (e.g. metal cladding or timber)	> Total building volume 12,000 to 75,000 m^3 > Potentially dusty construction material (e.g. concrete) > On site concrete batching	> Total building volume >75,000 m^3 > On site concrete batching; sandblasting
Trackout	> <20 outward heavy-duty vehicles (HDV) trips in any one day > Unpaved road length <50 m	> 20-50 outward HDV trips in any one day > Unpaved road length 50-100 m	> >50 outward HDV trips in any one day > Unpaved road length >100 m

STEP 2B: DEFINE THE SENSITIVITY OF THE AREA

1.5.13 The sensitivity of the area is defined in relation to each assessed impact. This is informed by several parameters such as the proximity and number of receptors in relation to construction activities, as well as their individual sensitivity.

1.5.14 Receptors can demonstrate different sensitivities to changes in their environment, dependent on location, use and perceived value. The sensitivities for individual receptors are determined using the approach outlined in Table 1.8. Sensitivities are provided for each assessed impact.

1.5.15 Once the sensitivity of each individual receptor has been established, this is used to determine the sensitivity of the surrounding area.

1.5.16 Table 1.9 to Table 1.11 illustrates how the sensitivity of the area may be determined for dust soiling, human health and ecosystem impacts, respectively. The highest level of sensitivity from each table should be recorded.

1.5.17 The quoted distances relate to the nearest dust emission source(s). In the context of construction, demolition and earthworks these activities will occur on-site. Where these activities are not known, receptor distances are determined from the site boundary.

1.5.18 Given that trackout relates to the resuspension of dust from HDV on the public road network, these distances relate to proximity to likely routes constructions traffic will use. The extent of those links affected by trackout relates is determined by the calculated trackout dust emission magnitude as per Step 2A: Define the Potential Dust Emission Magnitude.

1.5.19 Without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit(s).

Table 1.8: Criteria for Defining Sensitivity of Receptors

Sensitivity of Area	Human Receptors Dust Soiling Effects	Human Receptors Health Effects of PM_{10}	Ecological Receptors (A)
High	> Users can reasonably expect an enjoyment of a high level of amenity. > The appearance, aesthetics or value of their property would be diminished by soiling. > The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. > Indicative examples include dwellings, museums and other culturally important collections-, medium- and long-term car parks and car showrooms.	> Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). > Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	> Locations with an international or national designation and the designated features may be affected by dust soiling. > Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. > Indicative examples include a SAC designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	> Users would expect to enjoy a reasonable level of amenity, but would not	> Locations where the people exposed are workers, and exposure is over a time period relevant to the	> Locations where there is a particularly important plant species, where its dust

Sensitivity of Area	Human Receptors Dust Soiling Effects	Health Effects of PM_{10}	Ecological Receptors (A)
	reasonably expect to enjoy the same level of amenity as in their home. > The appearance, aesthetics or value of their property could be diminished by soiling. > The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. > Indicative examples include parks and places of work.	air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). > Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	sensitivity is uncertain or unknown. > Locations with a national designation where the features may be affected by dust deposition. > Indicative example is a SSSI with dust sensitive features.
Low	> The enjoyment of amenity would not reasonably be expected. > Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling.	> Locations where human exposure is transient. > Indicative examples include public footpaths, playing fields, parks and shopping streets.	> Locations with a local designation where the features may be affected by dust deposition. > Indicative example is a local Nature Reserve with dust sensitive features.

Sensitivity of Area	Human Receptors Dust Soiling Effects	Health Effects of PM_{10}	Ecological Receptors (A)
	> There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. > Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.		
Notes: (A) Only applicable if ecological habitats are present which may be sensitive to dust effects.			

Table 1.9: Sensitivity of Area to Dust Soiling Effects on People and Property

Data	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Low	Low
	10 – 100	High	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 1.10: Sensitivity of Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	<350
High	>32 µg/m^3	>100	High	High	High	Medium
		10 – 100	High	High	Medium	Low
		1 – 10	High	Medium	Low	Low
	28 – 32 µg/m^3	>100	High	High	Medium	Low
		10 – 100	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low
	24 – 28 µg/m^3	>100	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low
		1 – 10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10 – 100	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1 – 10	Medium	Low	Low	Low
	28 – 32 µg/m^3	>10	Medium	Low	Low	Low
		1 – 10	Low	Low	Low	Low
	24 – 28 µg/m^3	>10	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m) <20	<50	<100	<350
		1 – 10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 1.11: Sensitivity of Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m) <20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

STEP 2C: DEFINE THE RISK OF IMPACTS

1.5.20 The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area.

1.5.21 Table 1.12 to Table 1.15 illustrates how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk of impacts with no mitigation measures applied.

Table 1.12: Risk of Dust Impacts: Demolition

Sensitivity of Area	Dust Emission Magnitude Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 1.13: Risk of Dust Impacts: Earthworks

Sensitivity of Area	Dust Emission Magnitude Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 1.14: Risk of Dust Impacts: Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 1.15: Risk of Dust Impacts: Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Negligible
Low	Low Risk	Low Risk	Negligible

STEP 3: MITIGATION

1.5.22 Mitigation, as provided within the IAQM guidance is then recommended based upon the calculated risks i.e. low, medium or high-risk.

STEP 4: DETERMINE SIGNIFICANT EFFECTS

1.5.23 Following the effective application of the recommended mitigation measures, residual effects from construction dust are considered to be not significant, in accordance with the IAQM guidance.

1.5.24 As per IAQM guidance, significance is only assigned to the effect after considering the construction activity with mitigation. This is because for almost all construction activities, the aim is to prevent significant effects on receptors through the use of effective mitigation. The IAQM guidance therefore recommends that the significance of the unmitigated effect is not defined, as is not considered appropriate nor relevant in this context.

ROAD TRAFFIC ASSESSMENT

HUMAN RECEPTORS

1.5.25 The assessment procedure outlined within the EPUK & IAQM guidance document (EPUK & IAQM, 2017) has been used in relation to the assessment of road traffic emissions generated by VE (for all stages of development) on human receptors.

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

STEP 1: NUMERICAL SCREENING OF ROAD TRAFFIC FLOWS

1.5.27 The screening criteria provided in the EPUK & IAQM guidance document (EPUK & IAQM, 2017) has been used to determine whether further assessment of VE generated traffic on sensitive human receptor locations is required.

Specific to a development located outside of an AQMA:

- A change of light duty vehicle (LDV) flows of more than 500 annual average daily traffic (AADT); and/ or
- A change of heavy duty vehicle (HDV) flows of more than 100 AADT.

1.5.28 Specific to a development located within or adjacent to an AQMA:

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

1.5.29 If the traffic flows are not found to exceed any of the screening criteria presented, then effects are considered to be insignificant and can be screened out of further consideration. Where the screening criteria are exceeded (and relevant human receptors are located <200 m), detailed dispersion modelling is required.

STEP 2: DISPERSION MODELLING

1.5.30 Significance criteria as provided within EPUK & IAQM guidance (EPUK & IAQM, 2017) has been used for the purposes of informing effects arising from road traffic emissions on human receptors where dispersion modelling has been undertaken.

1.5.31 Whilst describing the impact at an existing human receptor, the resultant total concentration as well as the magnitude of change in relation to respective AQALs are both considered – using the approach detailed in Table 1.16.

Table 1.16: Impact descriptors

Concentration with development	**Percentage change in air quality relative to AQAL (%)**			
	1%*	**2-5%**	**6-10%**	**>10%**
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Note: *=changes less than 0.5% are considered to be 'negligible'.				

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

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts;

- The worst-case assumptions adopted when undertaking the prediction of impacts; and
- The extent to which the proposed development has adopted best practice to eliminate and minimise emissions.

ECOLOGICAL RECEPTORS

1.5.33 The ecological screening assessment has been informed by guidance documents prepared by the JNCC (JNCC, 2021) and IAQM (IAQM, 2020).

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

STEP 1: SCREENING

1.5.35 The first stage is to consider whether any ecological designations with sensitive qualifying features are located within 200 m of a road link projected to experience the following developmental-generated vehicle movements:

- >1,000 AADT; and/ or
- >200 HDVs.

1.5.36 For the purposes of assessing impacts on internationally designated ecological sites, screening of VE trips has been undertaken in-combination with other projects and plans following recent case law outcomes (e.g. the Wealden Judgement). This is also reinforced within the Habitats Regulations (HMSO, 2017). In-combination screening has also been conducted with respect to national ecological designations (SSSIs) following a review of consultation comments provided by Natural England on other projects.

1.5.37 The extent of relevant projects and plans considered within the in-combination screening exercise include:

- Relevant committed developments (see Volume 6, Part 3, Chapter 8: Traffic and Transport);
- NF OWF; and
- NGET Norwich to Tilbury Reinforcement project.

1.5.38 The in-combination assessment adopts a conservative approach, assuming that committed schemes will be fully operable at the assessment point. Moreover, it assumes that peak construction activities associated with both VE, NF OWF and the NGET EACN substation, part of the NGET Norwich to Tilbury Reinforcement project will overlap and affect the same road links simultaneously – considered highly unlikely.

1.5.39 Whilst assessing impacts on local ecological designations, it is appropriate to assess developmental trips in isolation. This is reflective of the level of protection afforded to these sites.

1.5.40 If the above conditions are not met, then impacts on ecological designations are likely to be imperceptible, whereby resultant effects are considered to be not significant. If the conditions are met/ exceeded, then detailed assessment through dispersion modelling is required to quantify the impact on Critical Levels and/ or Critical Loads.

1.5.41 As per the JNCC guidance (JNCC, 2021) road links associated with strategic 'trunk roads' (i.e. the Strategic Road Network (SRN)) have been excluded from the initial screening exercise. This is limited to the A12 and A120. The SRN forms the national transport system, central to long distance travel and connectivity as a consequence of predicted growth across the UK and does not need to be considered within assessments concerning individual developments. The effects of development on traffic flows on the SRN are more appropriately taken into account as part of national and regional strategic plan level assessments.

NRMM EMISSIONS ASSESSMENT

1.5.42 According to the IAQM construction guidance (IAQM, 2023) experience of assessing exhaust emissions from NRMM suggests that they are unlikely to make a significant impact on local air quality.

1.5.43 Furthermore, according to LAQM.TG(22) (Defra, 2022), experience of assessing the exhaust emissions from NRMM suggests that, with suitable controls and site management, they are unlikely to make a significant impact on local air quality. These controls represent standard practice and are included within the CoCP securing their implementation.

1.5.44 The CoCP also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. This goes beyond the LAQM.TG(22) standard suite of controls – ensuring impacts are avoided where possible.

1.5.45 Therefore, it can be reasonable to assume effects are not significant in terms of the EIA Regulations.

1.5.46 Despite this, a qualitative assessment has been conducted, with reference to LAQM.TG(22). This assessment has considered the following items:

- Duration of works and associated phasing;
- The type and number of plant to be used, and controls to be applied (including the emissions standards of NRMM);
- Operating hours of NRMM;
- Proximity of receptors to NRMM working areas – and spatial extent of affected areas; and
- Existing air quality conditions in the area and likelihood of an exceedance.

1.5.47 The likelihood for air quality impacts to arise throughout the lifecycle of VE are higher during the construction phase – as it represents worst-case air quality conditions for assessment. This is attributed to the anticipated enhancement in air quality conditions over the VE lifecycle, coupled with the expectation of increased construction activities compared to operational and decommissioning phases (if cables are left *in situ*). Construction phase impacts have been used as an appropriate benchmark to identify potential operational and decommissioning impacts.

1.5.48 If the qualitative NRMM assessment indicates impacts are found to be not significant during construction, then they can be considered not significant for other phases and a separate qualitative assessment is not required.

1.5.49 Full details of the assessment methodology are provided within Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment.

OFFSHORE ACTIVITIES ASSESSMENT

1.5.50 The screening criteria provided LAQM.TG(22) (Defra, 2022) has been used to determine whether further assessment of vessel movements on sensitive human and ecological receptors is required.

1.5.51 Annual vessel movements have been compared against the following screening thresholds:

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

1.5.52 Indicative large ship movements comprise cross-channel ferries, roll on-roll off ships, bulk cargo, container ships and cruise liners.

1.5.53 If annual vessel movements generated by VE are below the LAQM.TG(22) screening thresholds, then effects are considered to be not significant in terms of the EIA Regulations and can be screened out of further consideration.

1.6 UNCERTAINTY AND TECHNICAL DIFFICULTIES ENCOUNTERED

CONSTRUCTION DUST ASSESSMENT

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

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

1.6.3 The necessary air quality control measures and mitigation; are included as part of the CoCP (Volume 9, Report 9.21). The CoCP has been developed for the proposed onshore construction activities and adheres to construction industry good practice guidance for control measures and dust management.

1.6.4 Furthermore, the maximum design parameters/ extents of any proposed construction area have been used for the purposes of defining potential dust sources, where not finalised. This approach will increase the opportunity for greater derived sensitivities and dust emission magnitudes. As such, there is the potential for the assessment to exaggerate the potential impacts, which could result in a higher level of mitigation being recommended than would realistically be required. This ensures that all potential scenarios and associated impacts have been assessed. Further detail is provided in Section 1.8.

ROAD TRAFFIC ASSESSMENT

CONSTRUCTION PHASE

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

1.6.6 Following verification, all model output statistical parameters (used to evaluate model performance and uncertainty) are within LAQM.TG(22) (Defra, 2022) prescribed ideal tolerances.

1.6.7 In addition, there is a widely acknowledged disparity between emission factors and ambient monitoring data. To help minimise any associated uncertainty when forming conclusions from the results, this assessment has utilised the latest emission factors toolkit (EFT) version 12.0.1 (Defra, 2023b) utilising COPERT 5.6 emission factors, and associated tools/ datasets published by Defra.

1.6.8 Further detail on how uncertainty has been addressed is provided in Volume 6, Part 6, Annex 10.4: Road Traffic Dispersion Modelling.

1.6.9 Road traffic volumes are consistent with the analysis undertaken, and presented as part of Volume 6, Part 3, Chapter 8: Traffic and Transport. This chapter analyses a series of HGV routing scenarios.

1.6.10 Road traffic volumes used in this assessment are based on scenario A (100% HGVs from the A12 J29). Scenario B (100% HGVs from Harwich and via the A120 (east of the B1035 Horsley Cross roundabout)) is considered to be 'very unlikely' and has therefore been excluded. It is noted there are no ecological designations within 200 m of this excluded route.

1.6.11 Furthermore, a series of conservative assumptions relating to the assessment of an MDS have been adopted to facilitate a precautionary assessment and provide greater confidence in the road traffic emissions assessment outcomes. See Section 1.8 for further information.

OPERATIONAL PHASE

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

1.6.13 Use of peak vehicle movements within this context increases the confidence in the assessment outcomes. See Section 1.8 for further information.

NRMM EMISSIONS ASSESSMENT

CONSTRUCTION ASSESSMENT

1.6.14 The frequency and duration of NRMM that have been assessed are based on information presented in Volume 6, Part 2, Chapter 1: Offshore Project Description.

1.6.15 A 50 m distance screening threshold in relation to NRMM emissions has been applied to the Order Limits initially to inform the spatial extent of affected receptors (human and ecological). The use of a 50 m distance screening threshold in relation to NRMM emissions has been considered appropriate and accepted by statutory consultees and PINS for other NSIPs.

1.6.16 Use of the Order Limits for the purposes of informing the extent of NRMM emissions is conservative – as it relates to the maximum design parameters/ extents of any proposed construction area including design options. However, ensures all potential scenarios and associated impacts have been assessed.

1.6.17 Furthermore, use of the Order Limits assumes that all NRMM will be operated continuously at the maximum design parameters/ extents of any proposed construction area. This is highly unlikely to be the case, as NRMM locations will vary across the active construction area and will not typically be operated continuously at the boundary.

1.6.18 Use of the Order Limits in this context is likely to facilitate a conservative assessment, and therefore increases the opportunity for interactions with sensitive receptors. As per the CoCP (Volume 9, Report 9.21), site machinery will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible.

1.6.19 Furthermore, there is uncertainty and/ or optionality regarding the extent of specific construction activities within 50 m of a receptor, all possible construction activities have been considered for completeness.

1.6.20 Further detail about how these assumptions have been used to inform an MDS is provided in Section 1.8.

OFFSHORE ACTIVITIES ASSESSMENT

1.6.21 Vessel movements used for the purposes of this screening assessment are consistent with the analysis undertaken, and presented within Volume 6, Part 2, Chapter 1: Offshore Project Description. Vessel movements for all potential scenarios have been considered.

1.6.22 The LAQM.TG(22) (Defra, 2022) screening criteria relates to the number of large ships movements per year. Large ship movements comprise cross-channel ferries, roll on-roll off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by VE are unlikely to represent large ships, given the nature and location of works (within 1 km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels generated by VE will are large ships.

1.6.23 The extent of predicted construction vessels numbers for VE provided in Volume 6, Part 2, Chapter 1: Offshore Project Description relates to the total number of round trips. To derive the number of vessel movements per year for each phase, the total number of vessels movements (round trips) has been multiplied by two.

1.6.24 The number of predicted construction vessels movements provided in Volume 6, Part 2, Chapter 1: Offshore Project Description relates to the extent of vessels generated throughout the whole construction period. The construction period is expected to be greater than 1 year (18 months for onshore ECC including landfall). To increase the confidence in the screening exercise and minimise the use of assumptions, the total number of construction vessel movements estimated to occur throughout the whole construction phase has been used. This is believed to be conservative as the screening thresholds relate to the number of vessel movements permitted to occur in an annual period. Actual annual movements are believed to be lower than those values used for screening.

1.6.25 Construction vessel movements have been categorised based upon their likelihood to occur within 250 m or 1 km of an onshore sensitive receptor located in proximity of construction works to be consistent with the LAQM.TG(22) screening thresholds.

1.6.26 Where there is uncertainty regarding whether certain vessel movements will occur within 250 m or 1 km of an onshore sensitive receptor, all vessel movements have been considered for completeness.

1.6.27 The LAQM.TG(22) screening thresholds applied within the assessment (Section 1.5) relate explicitly to large ship movements which comprise cross-channel ferries, roll on-roll off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by VE are unlikely to represent large ships, given the nature and location of works (within 1 km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships.

1.6.28 For the purposes of informing the onshore study area, it has been assumed that these vessels operate at the onshore vs. offshore interface i.e. up to the point of the coastline – irrespective of logistical constraints (i.e. shallow water). This is unlikely given practical constraints.

1.6.29 Further detail about how these assumptions have been used to inform an MDS is provided in Section 1.8.

1.7 EXISTING ENVIRONMENT

1.7.1 The characterisation of the existing environment has been undertaken through reference to the latest available air quality datasets in the public domain, outlined in Table 1.6.

LAQM REVIEW AND ASSESSMENT

1.7.2 TDC and CBC, in fulfilment of statutory requirements, have conducted an on-going exercise to review and assess air quality within their administrative area, termed 'Review and Assessment'.

1.7.3 The nearest AQMA is located approximately 7.2 km west of the Order Limits boundary within the centre of Colchester, declared for exceedances of the annual mean NO_2 AQAL.

1.7.4 The road traffic emissions assessment has given consideration to potential interactions with generated road traffic movements and surrounding AQMAs, where relevant.

REVIEW OF AIR QUALITY MONITORING

AUTOMATIC MONITORING

1.7.5 The nearest automatic monitoring is located approximately 7.6 km west of the Order Limits in the centre of Colchester. As such, automatic monitoring locations are unlikely to be representative of baseline conditions of the receiving environment. No further consideration has therefore been given to automatic monitoring data.

NON-AUTOMATIC MONITORING

1.7.6 Passive NO_2 diffusion tube monitoring is undertaken by TDC and CBC within their administrative areas at numerous locations.

1.7.7 The details and results of the monitoring locations of relevance to this assessment are presented in Table 1.17 and Table 1.18 respectively, whilst their locations are illustrated in Figure 10.1.

1.7.8 As illustrated in Figure 10.1 these monitoring locations are all located at key roadside arterial locations – adjacent to road links where VE construction generated traffic is projected to pass. As such, use of these monitoring locations to inform baseline conditions with reference to potential road traffic effects is considered sufficient.

Table 1.17: Details of local non-automatic monitoring locations

Site ID	Site Type	X	Y	Closest Distance to Site (km)
DT14	Roadside	616062	218517	3.9
DT15	Roadside	616062	218517	3.9
DT16	Roadside	616062	218517	3.9
DT19	Roadside	613924	227789	0.3
DT20	Roadside	612619	227395	0.0
CBC131	Roadside	595025	225166	12.7
CBC132	Roadside	595106	225123	12.7
Table Note: DT14, DT15, DT16 monitoring locations are part of a triplicate set at the same location.				

Table 1.18: Results from local non-automatic monitoring locations

Site ID	2019 Data Capture (%)	Annual mean NO_2 Concentration µg/m^3				
		2015	2016	2017	2018	2019
DT14	100	34.9	34.2	42.7	32.8	31.5
DT15	100	37.6	36.3	42.0	32.7	32.0
DT16	100	36.7	23.9	42.3	33.7	31.4
DT19	100	26.0	23.4	30.9	23.7	23.2
DT20	100	21.0	21.9	24.2	20.3	20.7
CBC131	100	-	-	-	-	39.9
CBC132	100	-	-	-	-	32.5
Table Note: DT14, DT15, DT16 monitoring locations are part of a triplicate set at the same location and concentrations should be reported as a time weighted average.						

1.7.9 For the period assessed (2015-2019), annual mean NO_2 concentrations recorded at the non-automatic monitoring locations of relevance to the onshore construction working area were below the AQAL (40 µg/m^3) in all years except 2017 at the DT14/ DT15/ DT16 monitoring location. However, it is noted that CBC131 recorded an annual mean NO_2 concentration of 39.9 µg/m^3 within 2019. All monitoring locations presented are roadside of key arterial routes. As such, annual mean NO_2 concentrations presented are worst-case relative to the wider extent of the onshore receiving environment.

1.7.10 DT20 is located roadside of the A120 within the extent of the Order Limits. The annual mean NO_2 concentration at DT20 was 'well below' the annual mean AQAL for all years assessed.

1.7.11 As illustrated in Figure 10.1, all monitoring locations are all located at key roadside arterial locations – adjacent to road links included within the dispersion model (i.e., where VE generated traffic is projected to pass). Overall, annual mean NO_2 concentrations recorded at these locations have either remained stable or demonstrated a slight long-term reduction for the period assessed (where data exists); except for 2017. This overall demonstrates improvements at key roadside locations – validating the application of Defra supplied projections within the road traffic dispersion modelling exercise.

1.7.12 CBC131 and CBC132 are located in the vicinity of the A12, an arterial road where large volumes of traffic are expected (in comparison to those in proximity of the Order Limits). The annual mean NO_2 concentration at CBC131 in 2019 was 39.9 µg/m^3, just below the AQAL. CBC131 is located within an AQMA: Area 4 - Lucy Lane North, Stanway, declared for exceedance of NO_2 annual mean AQAL and as such elevated monitored concentrations are expected. Due consideration has been given to impacts associated with road traffic emissions upon this AQMA within the ES.

1.7.13 Furthermore, the empirical relationship given in LAQM.TG(22) (Defra, 2022) states that exceedances of the 1 hour mean AQAL for NO_2 is unlikely to occur where annual mean concentrations are <60 µg/m^3 at a location of relevant exposure. This indicates that an exceedance of the 1-hour mean AQAL is unlikely to have occurred at these sites between 2015 and 2019.

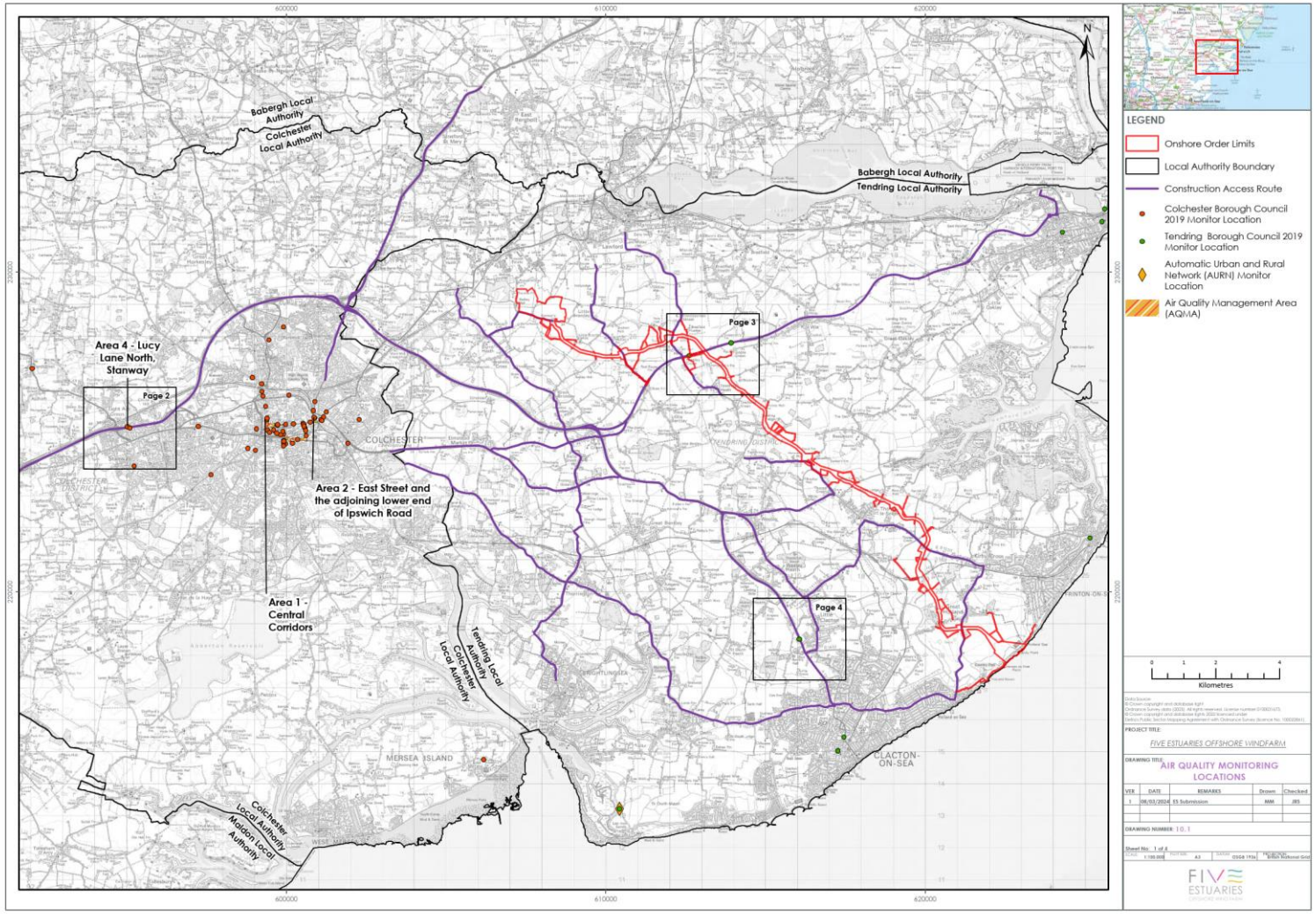

Figure 1.1a: Air Quality Monitoring Locations (part 1 of 4)

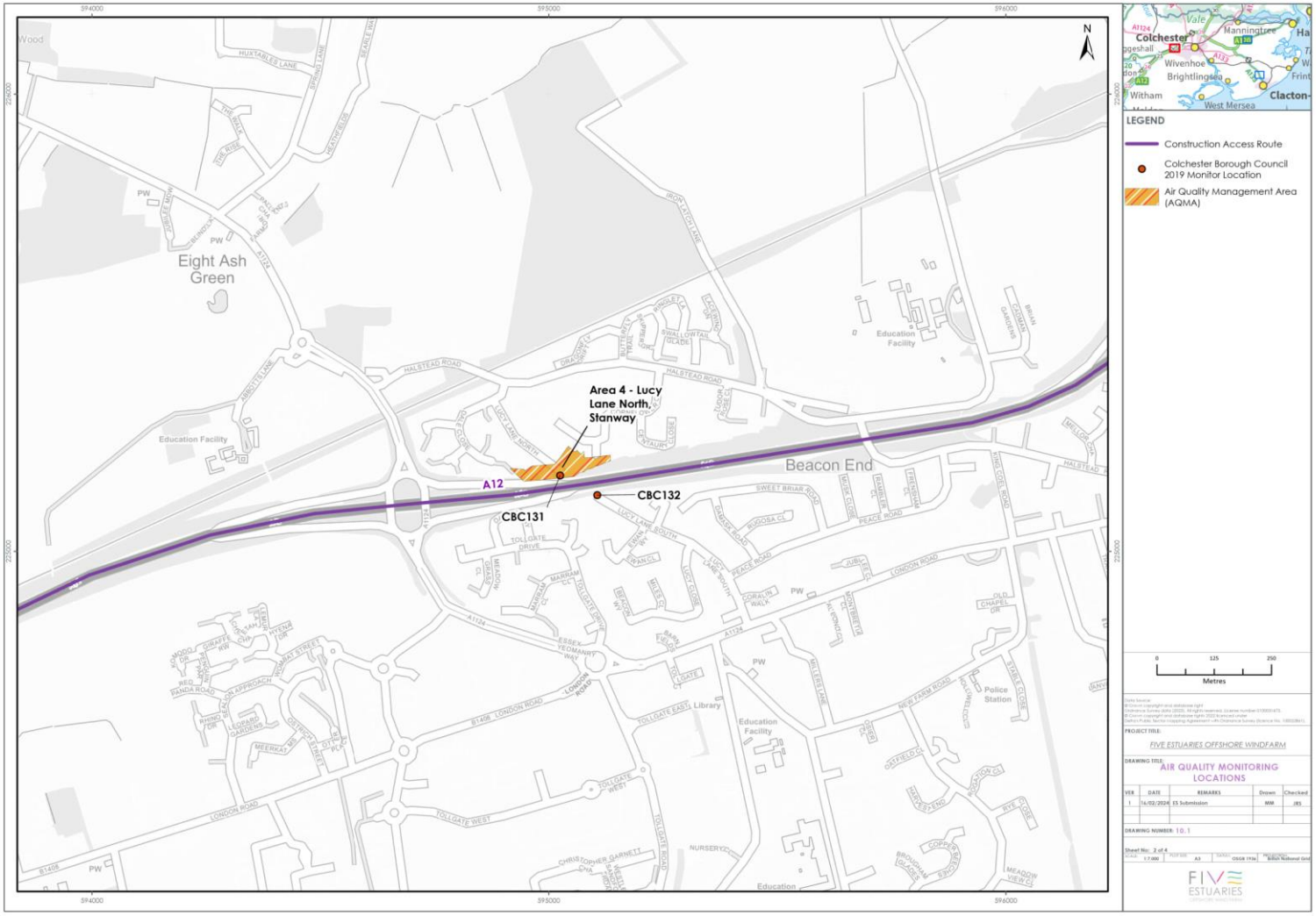

Figure 1.2b: Air Quality Monitoring Locations (part 2 of 4)

Figure 1.3c: Air Quality Monitoring Locations (part 3 of 4)

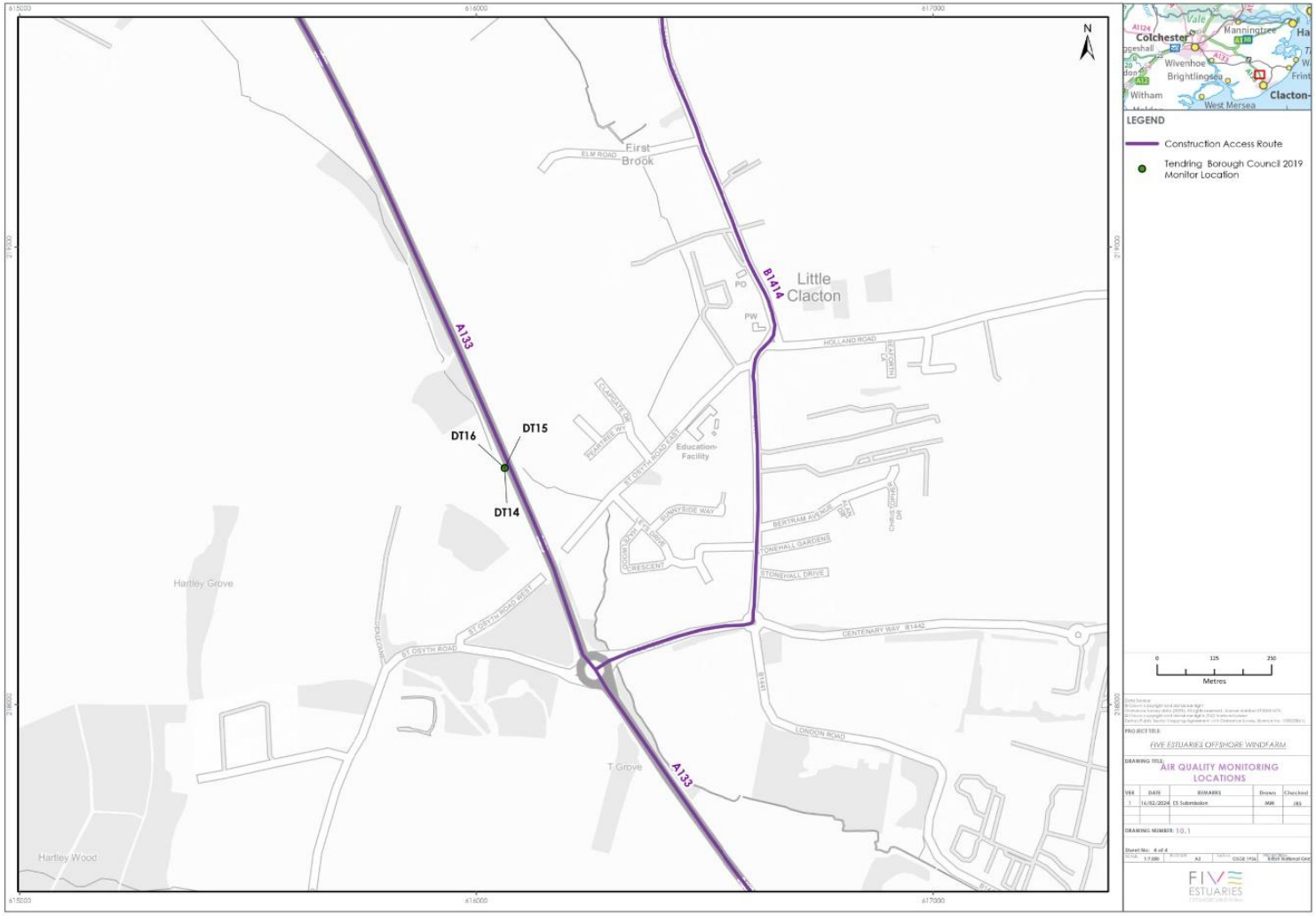

Figure 1.4d: Air Quality Monitoring Locations (part 4 of 4)

DEFRA MAPPED BACKGROUND CONCENTRATIONS

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

1.7.15 Annual mean background concentrations of NO_x, NO_2, PM_{10} and $PM_{2.5}$ have been obtained from the Defra published background maps (projected from a 2018 reference year), based on the 1 km grid squares which cover the modelled domain (Defra, 2020).

1.7.16 The maximum Defra mapped background concentrations across the Order Limits for the following milestone years are presented in Table 1.19:

- 2023 – Current year;
- 2027 – Indicative earliest construction start year; and
- 2030 – Indicative earliest operational start year.

1.7.17 The corresponding AQALs are provided as an example.

1.7.18 The full extent of background concentrations utilised within the dispersion modeling exercise are presented within Volume 6, Part 6, Annex 10.4: Road Traffic Dispersion Modelling.

Table 1.19: Maximum Defra mapped background pollutant concentrations

Year	Maximum Annual Mean Background Concentration (µg/m^3)			
	NO_x	NO_2	PM_{10}	$PM_{2.5}$
2023	9.8	7.6	15.9	9.1
2027	8.8	6.8	15.5	8.8
2030	8.3	6.5	15.6	8.8
AQAL	-	40	40	20

1.7.19 As shown in Table 1.19, all of the mapped background concentrations are below the respective annual mean AQALs.

1.8 KEY PARAMETERS FOR ASSESSMENT

1.8.1 The onshore elements of VE include optionality for the number of ducts for export cable circuits, footprint requirements for the proposed OnSS, siting of onshore infrastructure and construction methods etc.

1.8.2 Furthermore, as described in Volume 6, Part 3, ES Chapter 1: Onshore Project Description, a co-ordinated approach with NF OWF project is proposed. The aim is to reduce the overall environmental and community impacts of the proposals. For the purposes of the EIA, a series of co-ordination scenarios are proposed, encompassing potential construction options to be assessed.

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

1.8.4 The MDS identified in Table 1.20 have been selected as those having the potential to result in the greatest effect on an identified air quality receptor. These scenarios have been selected with use of information provided in the following documents:

- Onshore Project Description (Volume 6, Part 3, Chapter 1); and
- Traffic and Transport (Volume 6, Part 3, Chapter 8).

1.8.5 Table 1.20 describes the MDS in environmental terms.

Table 1.20: Maximum design scenario

Potential Effect	Maximum Adverse Scenario Assessed	Justification
Construction		
Dust/ PM_{10} generated from temporary construction activities.	Maximum design parameters/ extents of any proposed construction area have been used for the purposes of defining potential dust sources, where not finalised. This has included the use of the Order Limits to determine the extent of all potential dust sources.	This ensures that all potential scenarios and associated impacts have been assessed.
	For the purposes of trackout, all construction access points and subsequent access routes have been used.	
	Onshore construction areas have been assessed collectively, rather than in discrete sections. This aggregated approach will increase the opportunity for greater derived sensitivities and dust emission magnitudes, and therefore impacts.	
	Excavation activities comprise either trenchless techniques, such as Horizontal Directional Drilling (HDD) or open trench technology. Where optionality in excavation approach exists, open trench technology has been adopted in order to assess worst case dust impacts i.e. dust emitted at ground level.	
Temporary construction-generated road traffic volumes on human and ecological receptors.	To provide greater confidence in the road traffic emissions assessment outcomes, construction road traffic flows have been calculated with use of the maximum consecutive 12-month (representing annual) flows (HDVs) and employees (LDVs) separately) across the onshore cabling and OnSS construction programme. This ensures the highest average period of construction is captured for each section of the network. This approach is considered appropriate in comparison to averaging out road traffic values across the full onshore construction period to derive AADT flows (i.e. annualised average daily traffic flows), which would dilute the predicted datasets.	This ensures that all potential scenarios and associated impacts have been assessed.

Potential Effect	Maximum Adverse Scenario Assessed	Justification
	To ensure potential air quality impacts that may arise throughout the construction phase are understood, 2027 has been adopted for the purposes of dispersion modelling (i.e. earliest date of potential construction). Use of 2027 is therefore conservative in recognition of the forecast reductions in vehicle emission factors and background pollutant concentrations – following the introduction of legislative and policy initiatives, alongside low emission technologies/ fuels.	
	The above approach assumes that the maximum consecutive 12-month vehicle flows generated throughout the whole construction phase (for all scenarios) occur under worst case air quality conditions (vehicle emission factors and background pollutant concentrations) projected for the full construction period. This is considered conservative.	
	The dispersion modelling assessment has incorporated the potential maximum traffic flows that are likely to occur in the future assessment year (i.e. 2027) should VE receive consent (based upon information currently available) to facilitate a robust cumulative assessment. The traffic flows used for the assessment includes vehicle movements associated with relevant developments in the assessment area, including: > Committed developments (see Volume 6, Part 3, Chapter 8: Traffic and Transport); > NF OWF; and > NGET Norwich to Tilbury Reinforcement project. NF OWF and NGET Norwich to Tilbury Reinforcement project are live projects that are yet to receive consent. The dispersion modelling exercise is inherently cumulative, incorporating the assumption that committed schemes become fully operable at the time of assessment.	

Potential Effect	Maximum Adverse Scenario Assessed	Justification
	Moreover, it assumes that NF OWF and the NGET Norwich to Tilbury Reinforcement project will all receive consent. This presupposes that peak construction activities linked with VE, NF OWF, and EACN substation, part of the NGET Norwich to Tilbury Reinforcement project, will coincide and impact the same road links simultaneously. This assumption is considered highly unlikely.	
	As described in Volume 6, Part 3, ES Chapter 1: Onshore Project Description, a co-ordinated approach with the adjacent NF OWF project is sought. NF OWF is not a consented project, so there is uncertainty regarding future collaboration. To address this uncertainty, a series of scenarios are proposed, encompassing potential construction options. In relation to potential impacts that could arise as a result of road traffic vehicle movements generated by VE construction activities, co-ordination Scenario 1 is considered to result in the worst-case assessment criteria for air quality. It has therefore been adopted as the primary assessment scenario, to ensure all potential scenarios and impacts are understood. Co-ordination Scenario 1 comprises VE proceeding to construction and undertaking the additional onshore cable trenching and ducting works for NF OWF as part of a single civils campaign (ducting for four electrical circuits). VE would undertake the cable installation and OnSS build for its project only (two electrical circuits). Whilst this scenario assumes the two projects would share accesses from the public highway for cable installation and substation construction, NF OWF traffic data considered in this assessment where relevant includes reinstatement of the accesses. As VE will be undertaking additional works on behalf of NF OWF, higher road traffic vehicle movements are expected vs. other scenarios. Furthermore, it is assumed that NF OWF and VE are constructed concurrently in the same year, and peak construction vehicle trips will overlap and affect the same road links simultaneously). The combination of these parameters will result in worst-case impacts.	

Potential Effect	Maximum Adverse Scenario Assessed	Justification
Temporary NRMM emissions on human and ecological receptors.	The maximum design parameters/ extents of any proposed construction area (Order Limits) have been used for the purposes of defining the locations of potential NRMM. This is conservative – as it relates to the maximum design parameters/ extents of any proposed construction area. In respect of this, the assessed interactions may not necessarily occur collectively – as the Order Limits includes flexibility. Furthermore, the Order Limits include operational access routes. Use of the Order Limits for assessing impacts throughout all phases of VE increases the opportunity for interactions with sensitive receptors. However, ensures impacts throughout the VE lifecycle are understood.	This ensures that all potential scenarios and associated impacts have been assessed.
	Use of the Order Limits assumes that all NRMM will be operated continuously at the maximum design parameters/ extents of any proposed construction area. This is highly unlikely to be the case, as NRMM locations will vary across the active construction area and will not typically be operated continuously at the boundary. Use of the Order Limits in this context is likely to facilitate a conservative assessment, and therefore increases the opportunity for interactions with sensitive receptors. As per the CoCP (Volume 9, Report 9.21), site machinery will be positioned to maximise the separation distance(s) to sensitive receptors, as far as practically possible.	
	The use of a 50 m to screen impacts from NRMM is considered to be overly precautionary. This threshold relates to major sources of pollution. NRMM emissions generated by VE activity is not considered to be comparable to major sources of pollution (for example a large multi-storey car park).	
	Where there is uncertainty and/ or optionality regarding the extent of specific construction activities within 50 m of a receptor, all possible construction activities have been considered for completeness.	

Potential Effect	Maximum Adverse Scenario Assessed	Justification
	The detailed construction methodology for landfall activities are not currently decided. The locality has been considered to be intertidal as opposed to subtidal i.e. closer to receptors/beach as opposed to subtidal to facilitate a conservative assessment.	
	Furthermore, the number of NRMM and percentage use represent maximum values associated with the activities across the construction lifecycle, and therefore the actual number of plant or its percentage use could be less than this at certain times or during certain activities.	
Temporary construction offshore activity emissions on human and ecological receptors.	The maximum design parameters/ extents of any proposed construction area (Order Limits) have been used for the purposes of defining the locations of landfall. This is conservative – as it relates to the maximum design parameters/ extents of any proposed construction area.	This ensures that all potential scenarios and associated impacts have been assessed and increases the confidence in the overall assessment outcomes.
	Vessel movements used within this assessment derive from values provided within Volume 6, Part 2, Chapter 1: Offshore Project Description. As described in the chapter, flexibility in wind turbine generator (WTG) choice is required to ensure that anticipated changes in available technology and project economics can be accommodated within the project design. Therefore, the extent of vessel movements predicted to occur in relation to both WTG scenarios have been calculated (up to 41 large, or up to 79 smaller WTGs are planned for VE). These scenarios represent the maximum realistic worst-case scenarios against which environmental effects have been assessed.	

Potential Effect	Maximum Adverse Scenario Assessed	Justification
	The number of predicted construction vessels movements provided in Volume 6, Part 2, Chapter 1: Offshore Project Description relates to the extent of vessels generated throughout the whole construction period. The construction period is expected to be greater than 1 year (18 months for Onshore ECC including landfall). To increase the confidence in the screening exercise and minimise the use of assumptions, the total number of construction vessel movements estimated to occur throughout the whole construction phase has been used. This is believed to be conservative as the screening thresholds relate to the number of vessel movements permitted to occur in an annual period. Actual annual movements are believed to be lower than those values used for screening.	
	Construction vessel movements have been categorised based upon their likelihood to occur within 250 m or 1 km of an onshore sensitive receptor located in proximity of construction works to be consistent with the LAQM.TG(22) (Defra, 2022) screening thresholds. Where there is uncertainty regarding whether certain vessel movements will occur within 250 m or 1 km of an onshore sensitive receptor, all vessel movements have been considered for completeness.	
	For the purposes of informing the study area it has been assumed that vessel movements occur up to the point of the coastline – irrespective of logistical constraints (i.e. shallow water). This is conservative and increases the spatial extent of the onshore study area – as vessels movements are likely to occur some distance from the coast.	

Potential Effect	Maximum Adverse Scenario Assessed	Justification
	The LAQM.TG(22) screening thresholds applied within the assessment (Section 1.5) relate explicitly to large ship movements which comprise cross-channel ferries, roll on-roll off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by VE are unlikely to represent large ships, given the nature and location of works (within 1 km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships.	
Operation		
Operational-generated road traffic volumes on human and ecological receptors.	For the purposes of facilitating a conservative screening exercise, peak vehicle movements generated during the operational phase have been assessed.	This approach increases the confidence in the overall assessment outcomes.
Operational NRMM emissions on human and ecological receptors.	A description of all planned relevant operational activities has been provided.	This ensures that all potential design parameters and associated impacts have been assessed.
Operational offshore activity emissions on human and	The maximum design parameters/ extents of any proposed construction area (Order Limits) have been used for the purposes of defining the locations of landfall. This is conservative – as it relates to the maximum design parameters/ extents of any proposed construction area.	This ensures that all potential scenarios and associated impacts have been assessed and

Potential Effect	Maximum Adverse Scenario Assessed	Justification
ecological receptors.	Vessel movements used within this assessment derive from values provided within Volume 6, Part 2, Chapter 1: Offshore Project Description. As described in the chapter, flexibility in WTG choice is required to ensure that anticipated changes in available technology and project economics can be accommodated within the project design. Therefore, the extent of vessel movements predicted to occur in relation to both WTG scenarios have been calculated (up to 41 large, or up to 79 smaller WTGs are planned for VE). These scenarios represent the maximum and minimum realistic worst-case scenarios against which environmental effects have been assessed.	increases the confidence in the overall assessment outcomes.
	Operation vessel movements have been categorised based upon their likelihood to occur within 250 m or 1 km of an onshore sensitive receptor located in proximity of construction works to be consistent with the LAQM.TG(22) (Defra, 2022) screening thresholds. Where there is uncertainty regarding whether certain vessel movements will occur within 250 m or 1 km of an onshore sensitive receptor, all vessel movements have been considered for completeness.	
	The LAQM.TG(22) screening thresholds applied within the assessment (Section 10.5) relate explicitly to large ship movements which comprise cross-channel ferries, roll on-roll off ships, bulk cargo, container ships and cruise liners. Vessel movements generated by VE are unlikely to represent large ships, given the nature and location of works (within 1 km of the coast). For the purposes of facilitating an assessment, it has been assumed that all vessels will comprise large ships.	
Decommissioning		
Likely air quality impacts associated with decommissioning activities.	Details surrounding the decommissioning phase are not fully known, however, decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given forecast improvements to air quality and the potential for the cables to remain *in situ*. It was therefore agreed to assume that impacts associated with decommissioning activities will be similar/ lesser in comparison to those established for the construction phase.	

1.9 MITIGATION

1.9.1 The mitigation contained in Table 1.21 are mitigation measures or commitments that have been identified and adopted as part of the evolution of the project design of relevance to the topic, these include project design measures, compliance with elements of good practice and use of standard protocols.

1.9.2 The mitigation includes measures such as design changes and applied mitigation, which have been included within the project design but the implementation of which is subject to further study or approval of details; these include avoidance measures that will be informed by pre-construction surveys, and necessary additional consents where relevant. No additional mitigation is considered to be required on the basis of the current project information.

Table 1.21: Mitigation relating to air quality

Parameter	Mitigation Measures in VE Design
Project Design	
Site Selection	The Order Limits were developed in consideration of environmental factors, including air quality. This included avoiding, where possible, close proximity to sensitive receptors such as residential buildings and designated sites for the substation and onshore ECC. See Volume 6, Part 1, Chapter 4: Site Selection & Alternatives for further information.
Construction	
CoCP (Volume 9, Report 9.21)	Development of, and adherence to, a CoCP that sets out best practice air quality management measures, commitments and working standards proposed to be adopted and implemented throughout the construction process. The assessment outcomes have informed the selection of construction measures to minimise impacts.
Decommissioning	
Best practice construction measures	Decommissioning works would be undertaken in accordance with best practice measures that are proportional to the likely impacts.

1.10 ENVIRONMENTAL ASSESSMENT: CONSTRUCTION PHASE

CONSTRUCTION DUST ASSESSMENT

1.10.1 Where figures relating to area or volume of the Order Limits, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM construction guidance (IAQM, 2023). The principal purpose of these figures is to assist the assessor in the definition of the dust emissions magnitude and sensitivity of the area.

1.10.2 Criteria prescribed within the IAQM construction guidance has been used for the purposes of informing the dust emission magnitude and sensitivity of the area. See Section 1.5 for further information.

ASSESSMENT SCREENING

1.10.3 There are both human and ecological receptors within the relevant screening distances outlined in Section 1.4. Therefore, an assessment of construction dust on both human and ecological receptors has been undertaken.

1.10.4 Furthermore, onshore construction areas have been assessed collectively, rather than in discrete sections. This aggregated approach will increase the opportunity for greater derived sensitivities and dust emission magnitudes, and therefore impacts.

POTENTIAL DUST EMISSION MAGNITUDE

1.10.5 No major demolition activities are proposed as part of the onshore construction works. As such, impacts associated with demolition activities are considered to be limited/ negligible and have been scoped out of further consideration.

1.10.6 The total area where earthworks are required is greater than 110,000 m^2 across the whole Order Limits. The aggregated total of material exported/ excavated is >100,000 tonnes. In addition, >10 heavy earth moving vehicles will be active at any worst-case time. Therefore, the dust emission magnitude for earthworks is considered to be large.

1.10.7 Indicative building dimensions have been provided to inform the total building volume (>75,000 m^3) for the whole onshore construction works. Therefore, the dust emission magnitude for construction is considered to be large.

1.10.8 The number of outward HDV movements in any worst-case day is greater than 50. In addition, unpaved road lengths are likely to be greater than 100 m. Therefore, the dust emission magnitude for trackout is considered to be large.

1.10.9 Table 1.22 presents a summary of the assigned dust emission magnitude for each activity.

Table 1.22: Dust emission magnitude

Activity	Dust Emission Magnitude
Earthworks	Large
Construction	Large
Trackout	Large

SENSITIVITY OF THE AREA

HUMAN RECEPTORS

1.10.10 Overall, there is potential for >10 existing residential properties (highly sensitive receptors) to occur within 20 m of any worst-case working area of potential dust generation.

1.10.11 There are >10 high sensitivity receptors located within 20 m from road links within 500 m of any construction access point (commensurate of a large site).

1.10.12 Therefore, the sensitivity of the area with respect to dust soiling impacts on people and property is considered to be high in relation to earthworks, construction, and trackout.

1.10.13 To characterise sensitivity with respect to human health impacts, an indication of local annual mean background PM_{10} concentrations is required. As discussed in Section 1.7, no local background PM_{10} monitoring exists within proximity of the onshore elements of VE. For the purposes of characterising the local PM_{10} background concentration, the latest iteration of the Defra supplied background maps (2018 reference year) has been used (Defra, 2020) – in accordance with the recommendations contained within the IAQM construction guidance (IAQM, 2023).

1.10.14 The maximum 2019 mapped background PM_{10} concentration (projected from the 2018 reference year) for the 1 km^2 grid squares covering any potential onshore construction works is estimated to be 16.7 µg/m^3 (i.e. falls into the <24 µg/m^3 class). This value relates to 2019 – the baseline year, and as such is believed to be conservative, given that it does not take into account any forecast improvements to air quality that may occur in the interim period until 2027 (expected start of construction works). These improvements are illustrated in Table 1.19.

1.10.15 Given the number of highly sensitive receptors within 20 m of any potential construction works, and within 20 m of potential trackout routes, the sensitivity of the area with respect to human health impacts in relation to earthworks, construction and trackout is therefore considered to be low.

ECOLOGICAL RECEPTORS

1.10.16 With respect to ecological designations, areas of SSSI (Holland Haven Marshes), Local Nature Reserve (LNR) (Holland Haven Marshes), PAWS (Simon's Wood), and Local Wildlife Site (LoWS) (Simon's Wood, Great Holland Pits and Thorpe Green) are found within 20 m of the Order Limits and potential trackout routes.

1.10.17 For the purposes of defining a risk of dust impact, it has been conservatively assumed that the ecological designations contain dust sensitive features. Furthermore, the highest sensitivity across all the receptors has been applied. This relates to the SSSI which is considered a medium sensitivity receptor, as per the IAQM construction guidance (IAQM, 2023).

1.10.18 The sensitivity of the area with respect to ecological impacts in relation to earthworks, construction and trackout activities is therefore considered to be medium.

1.10.19 A summary of the sensitivity of the surrounding area is detailed in Table 1.23, whilst Figure 10.2 provides an illustration of the study area.

Table 1.23: Sensitivity of the area

Potential Impact	Sensitivity of Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	High	High	High
Human Health	Low	Low	Low
Ecological	Medium	Medium	Medium

RISK OF IMPACTS

1.10.20 The outcome of the assessment of the potential magnitude of dust emissions, and the sensitivity of the area are combined in Table 1.24 below to determine the risk of impact.

1.10.21 The defined level of risk is then used to inform the selection of appropriate mitigation.

1.10.22 The IAQM construction dust assessment methodology does not include the consideration of embedded mitigation measures when determining the potential risk of dust impacts.

Table 1.24: Risk of dust impacts

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling	High Risk	High Risk	High Risk
Human Health	Low Risk	Low Risk	Low Risk
Ecological	Medium Risk	Medium Risk	Medium Risk

1.10.23 Following the construction dust assessment, potential worst-case onshore construction works are found to be:

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

1.10.24 Potential dust effects during the construction phase are considered to be temporary and short-term (approximately 24 months for the OnSS construction and 18 months for Onshore ECC) and may only arise at particular times (i.e. certain activities and/ or meteorological conditions).

1.10.25 Nonetheless, commensurate with the above assessment of dust risk, mitigation measures, as identified by the IAQM construction guidance (IAQM, 2023) are required to ensure that any potential impacts arising from any onshore construction works are minimised and, where possible, completely removed. These measures are provided in the CoCP which is a project design measure (Table 1.21). This will therefore secure their effective application.

1.10.26 As such, in accordance with the IAQM construction guidance, dust impacts are considered to be removed or minimised. As such, residual effects are concluded to be **not significant** in terms of the EIA Regulations.

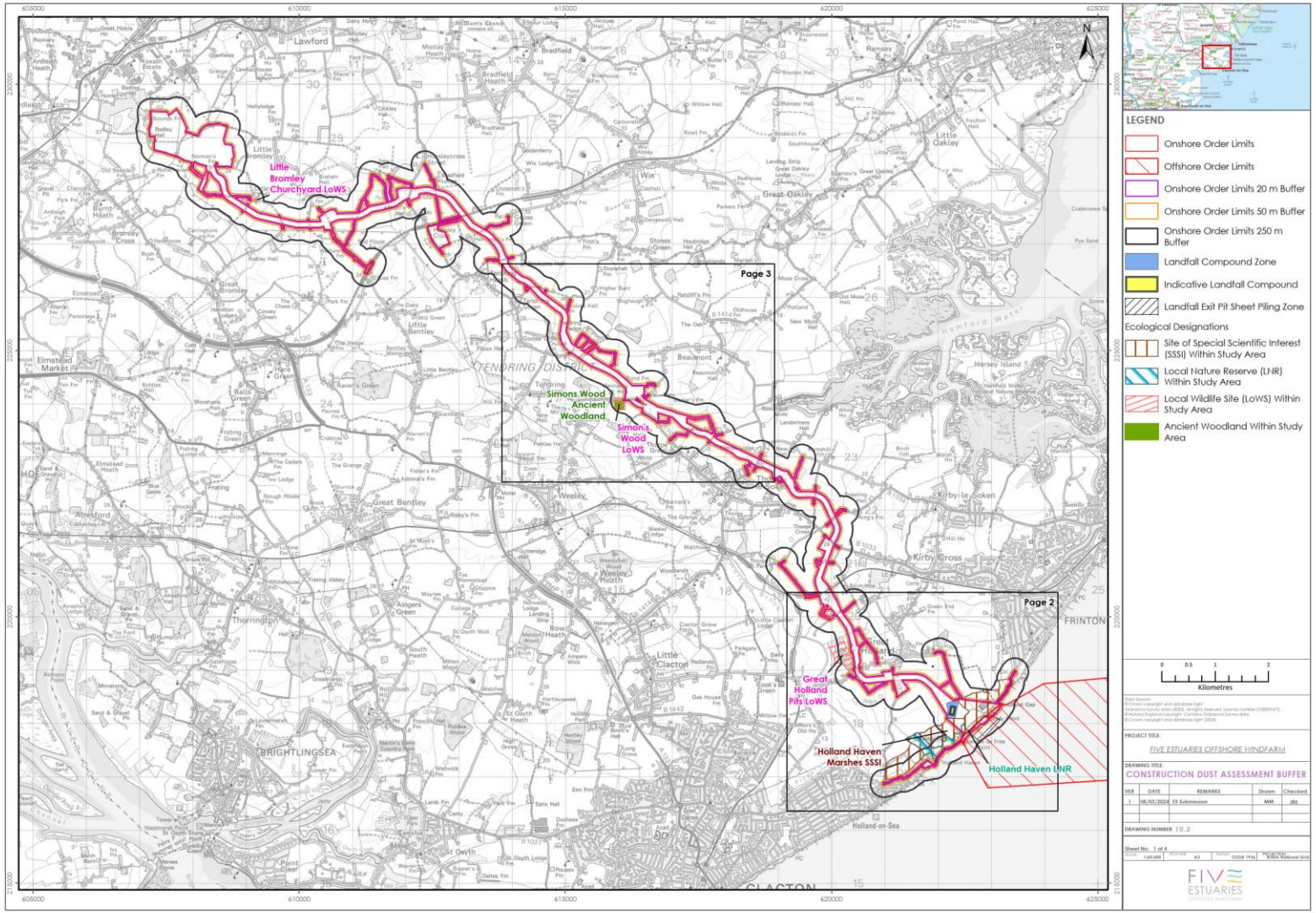

Figure 1.5a: Construction Dust DCO Order Limits Buffers (Part 1 of 4)

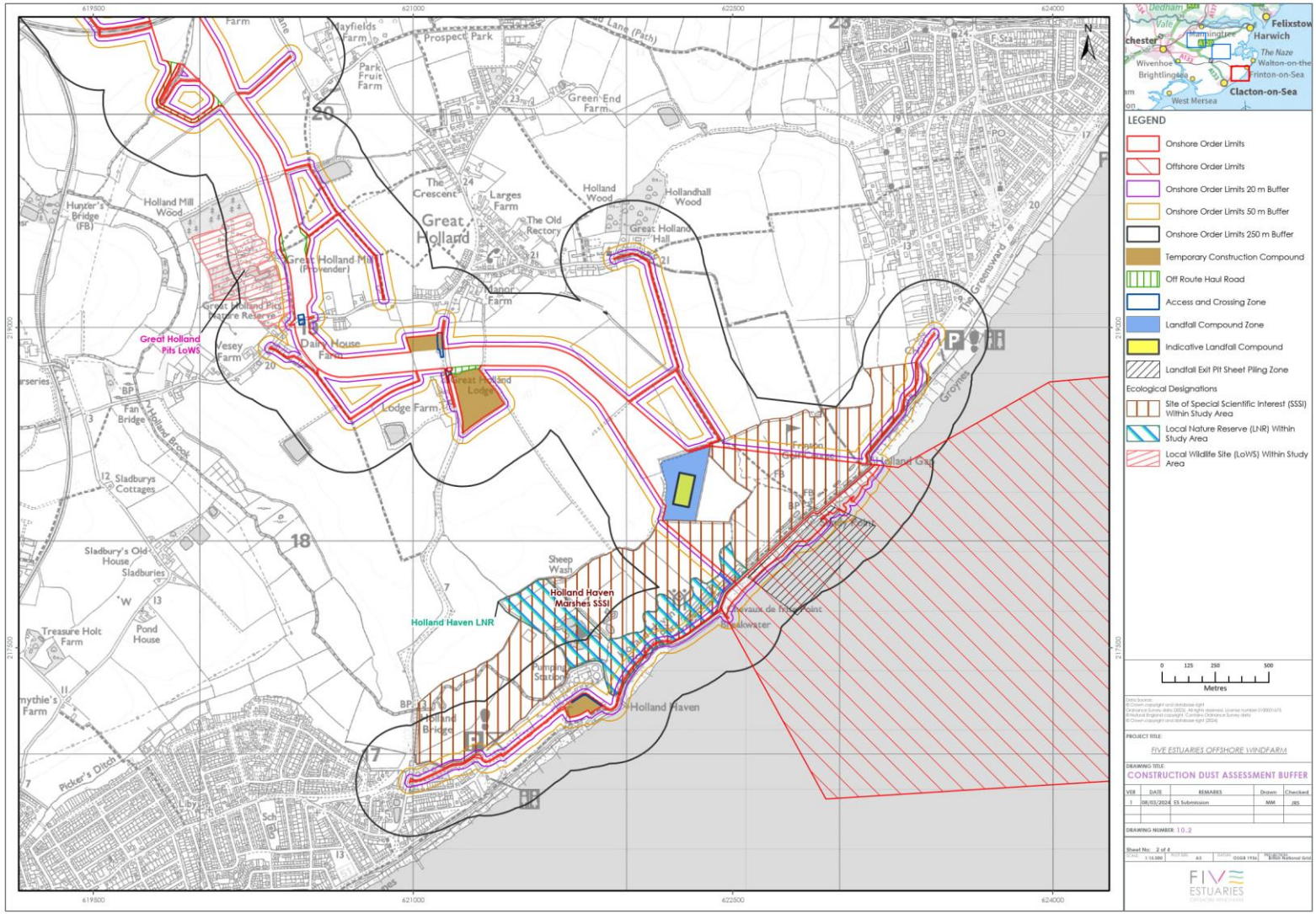

Figure 1.6b: Construction Dust DCO Order Limits Buffers (Part 2 of 4)

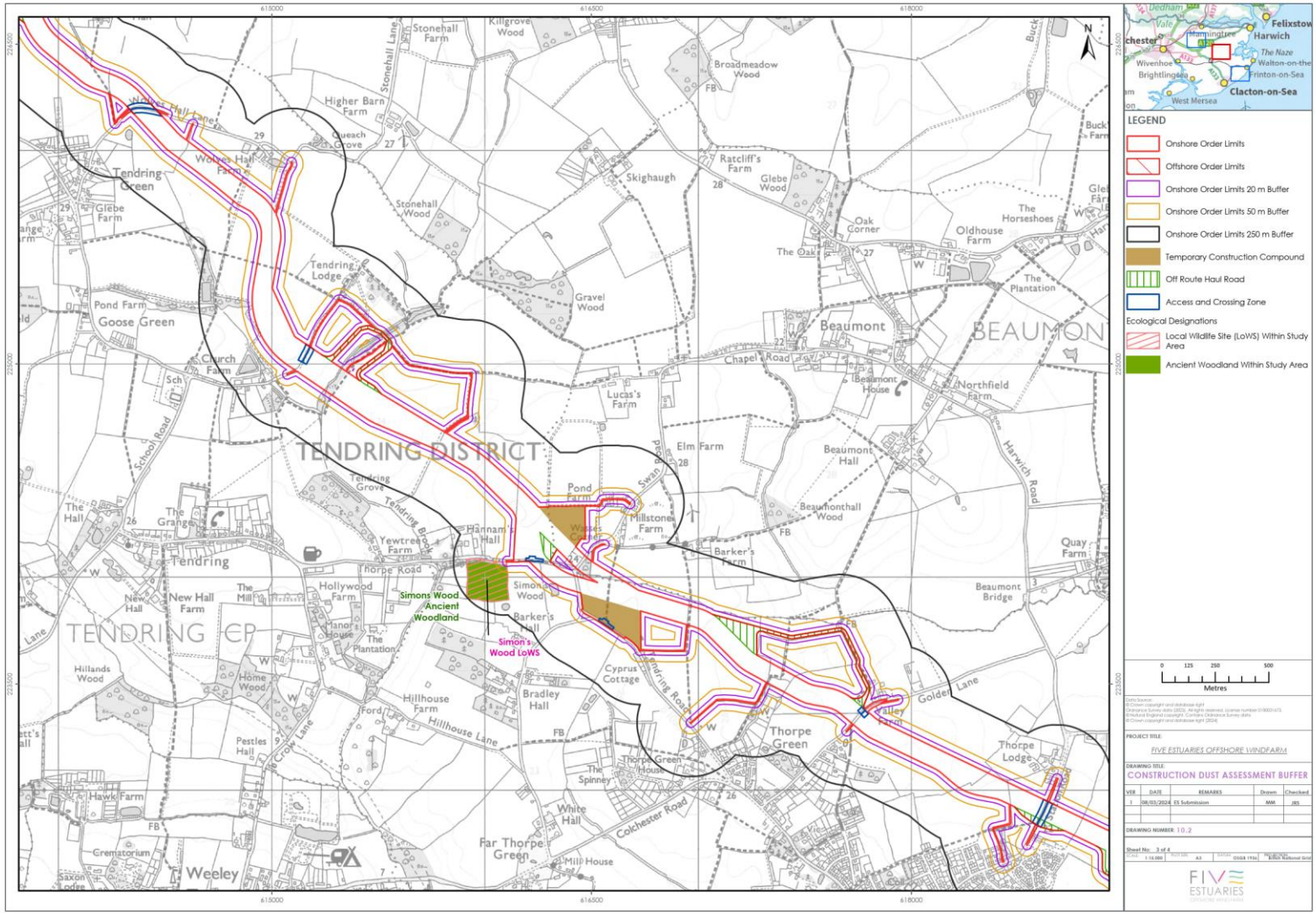

Figure 1.7c: Construction Dust DCO Order Limits Buffers (Part 3 of 4)

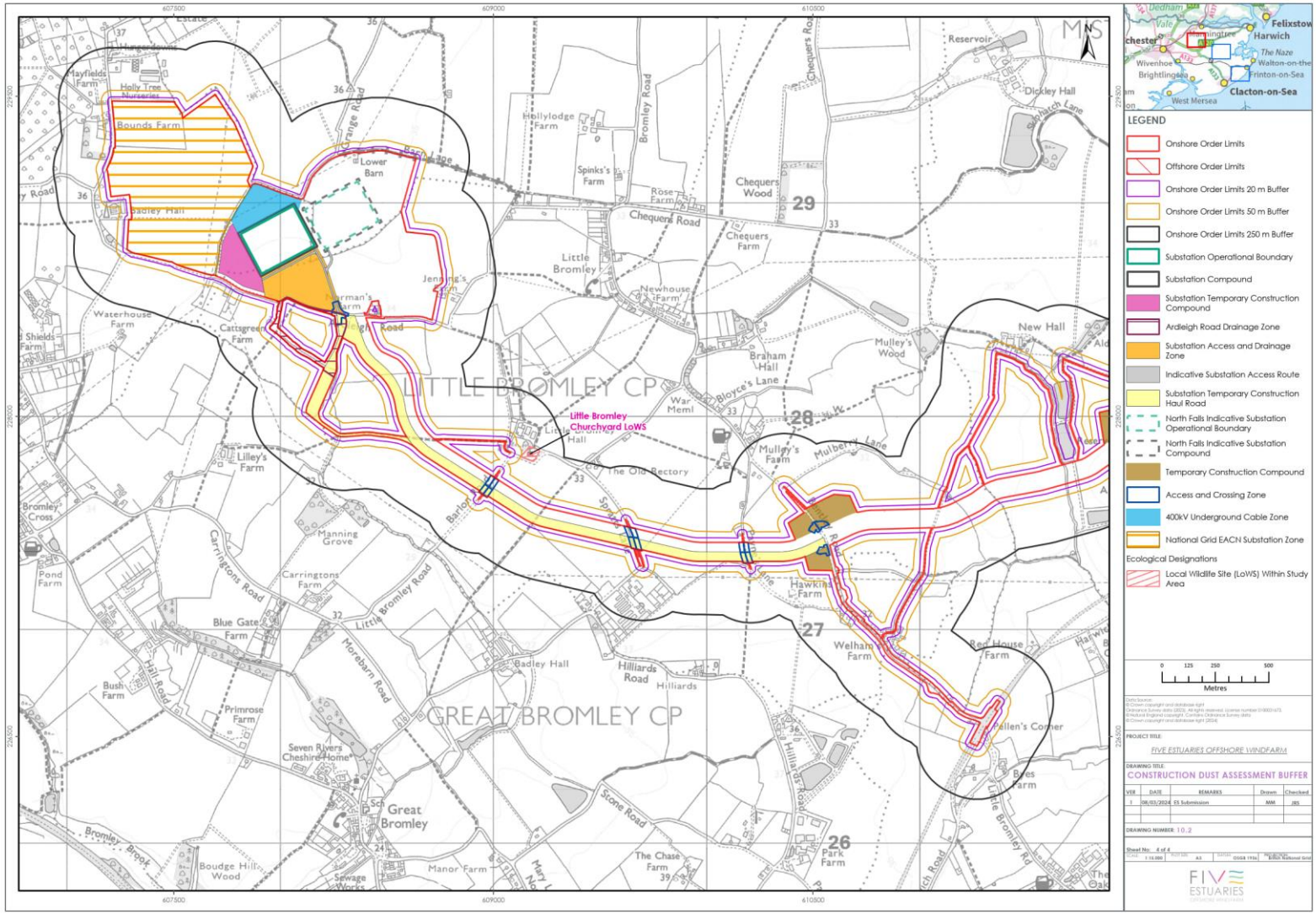

Figure 1.8d: Construction Dust DCO Order Limits Buffers (Part 4 of 4)

1.10.27 Consistent with the assessment criteria outlined in Section 1.5, road traffic flows generated by VE on the public road network (construction access routes) have been compared against the EPUK and IAQM prescribed screening thresholds (EPUK & IAQM, 2017).

1.10.28 Table 1.25 outlines the extent of road links where road traffic movements cannot be screened out (the affected road network).

Table 1.25: Construction-generated road traffic flows (affected road network)

Road Link	AADT	
	HDV	LDVs
Outside an AQMA		
A12 north of A120	192	102
A12 south of A120	192	98
A120 between A12 and A133	384	200
A120 between the A133 and Harwich Road	384	147
A120 between Harwich Road and Bentley Road	384	383
A120 between Bentley Road and B1035	384	362
A133 between A120 and A133 Main Road	168	233
A133 between A120 and B1033 Colchester Road	168	65
A133 between B1033 and B1027	188	216
B1033 Colchester Road (west of B1441)	108	147
Bentley Road south of OnSS temporary construction haul road	171	307
Within or Adjacent to an AQMA		
A12 south of A120	192	98

1.10.29 Dispersion modelling has therefore been undertaken for these links (affected road network). Additionally, other road links within proximity of the affected road network have also been included for completeness and provide a robust prediction of modelled concentrations (where possible). This approach avoids relying on their individual contributions being represented within the appropriate background datasets.

1.10.30 The spatial extent of the modelled domain (modelled road links and human receptors considered) is illustrated in Figure 10.3.

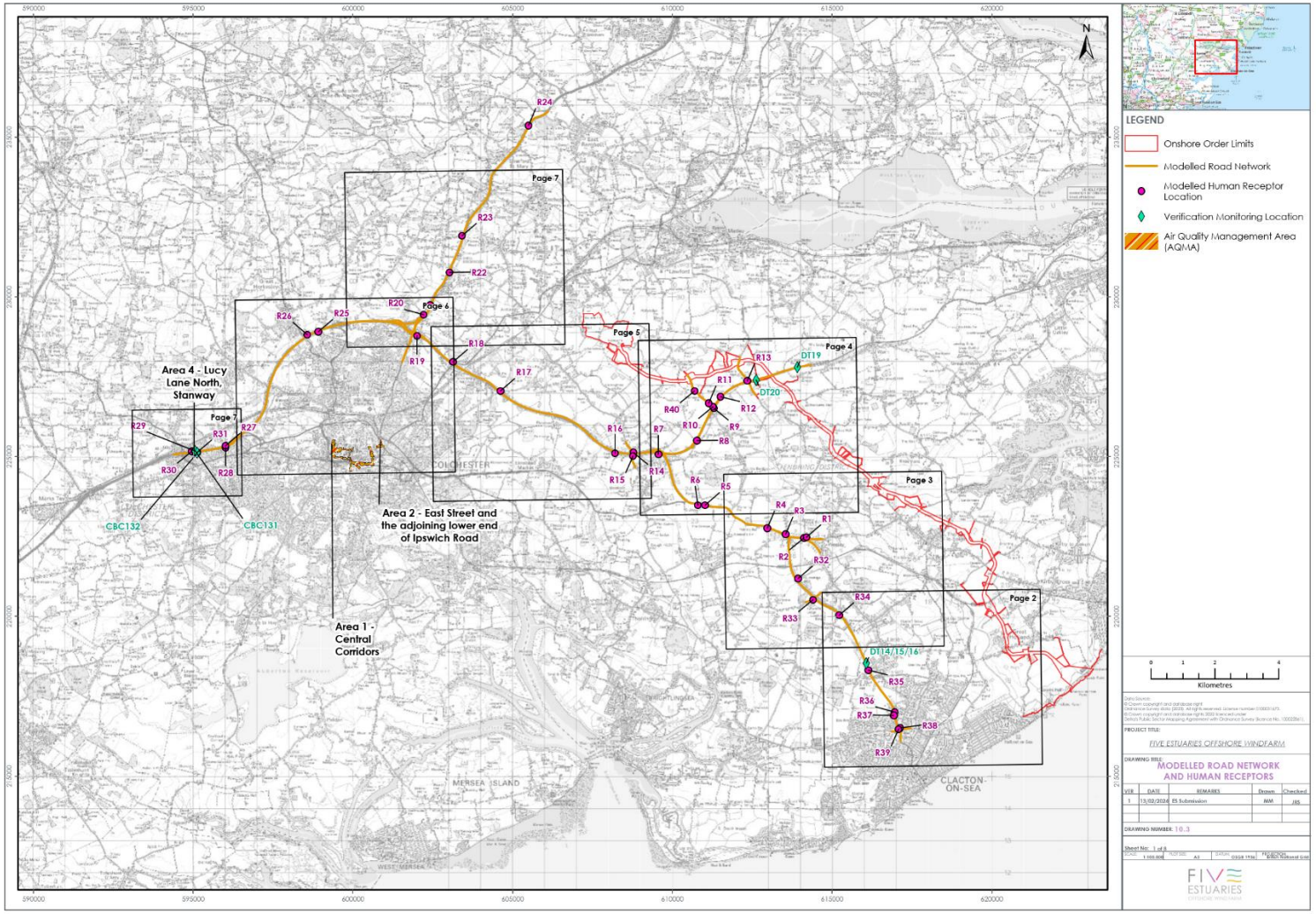

Figure 1.9a: Modelled Road Network and Human Receptors Details (Part 1 of 8)

Figure 1.10b: Modelled Road Network and Human Receptors Details (Part 2 of 8)

Figure 1.11c: Modelled Road Network and Human Receptors Details (Part 3 of 8)

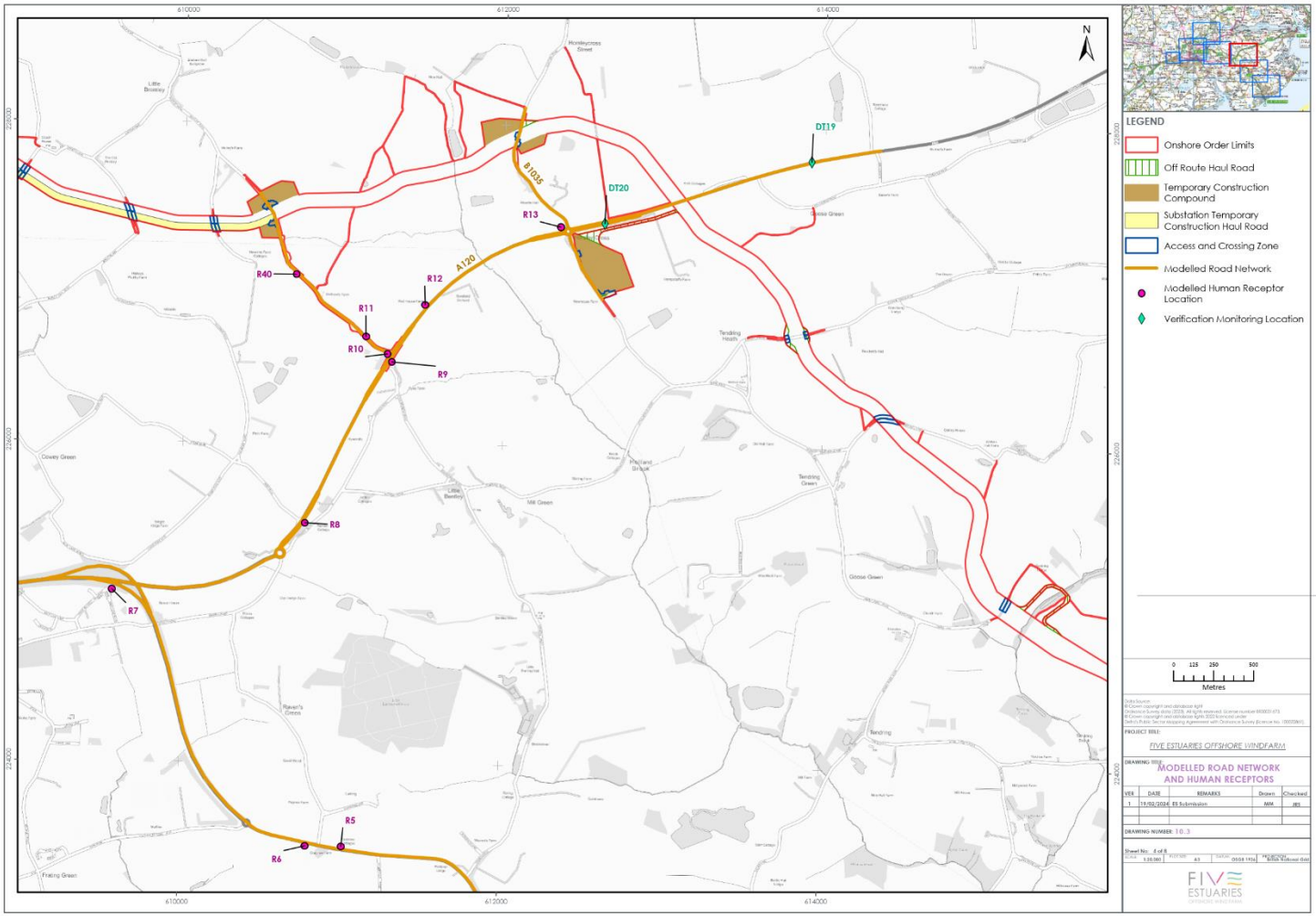

Figure 1.12d: Modelled Road Network and Human Receptors Details (Part 4 of 8)

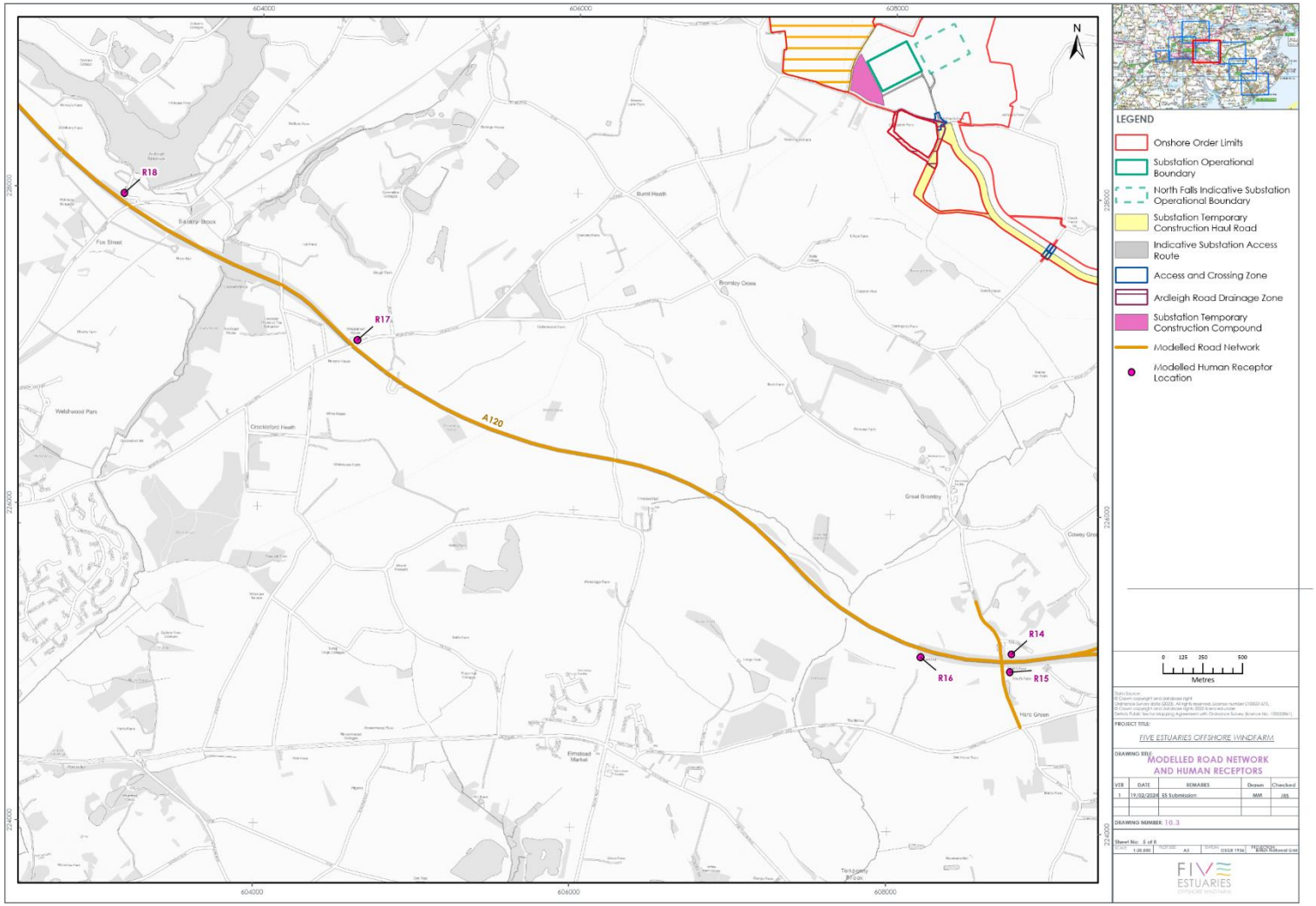

Figure 1.13e: Modelled Road Network and Human Receptors Details (Part 5 of 8)

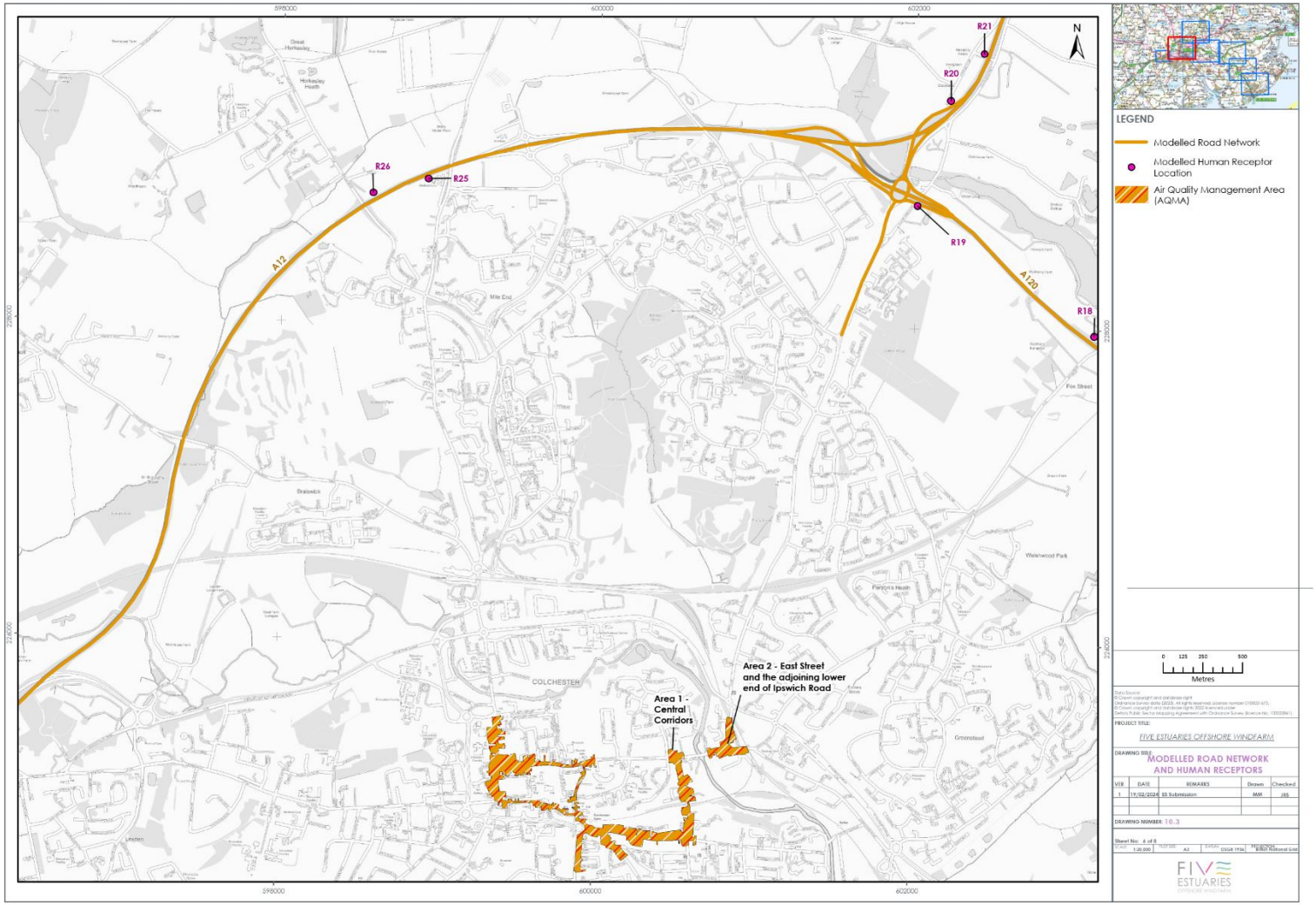

Figure 1.14f: Modelled Road Network and Human Receptors Details (Part 6 of 8)

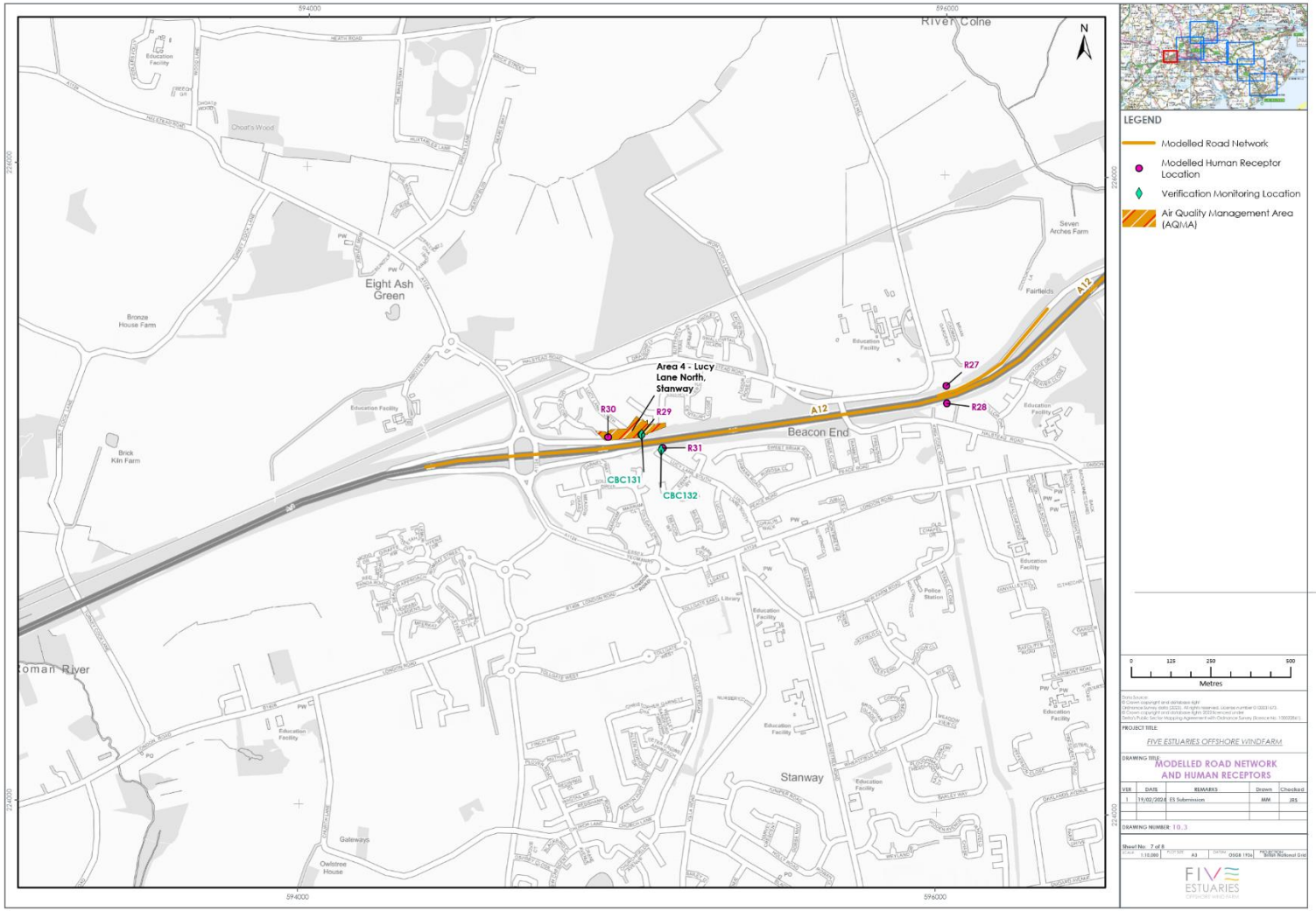

Figure 1.15g: Modelled Road Network and Human Receptors Details (Part 7 of 8)

Figure 1.16h: Modelled Road Network and Human Receptors Details (Part 8 of 8)

1.10.31 Exhaustive results are presented in Volume 6, Part 6, Annex 10.4: Road Traffic Dispersion Modelling. A summary of modelled results is provided below.

NO_2 MODELLING RESULTS

1.10.32 The NO_2 modelling outcomes are as follows:

- The impact of VE on annual mean NO_2 concentrations at all relevant existing receptors is 'negligible'; and
- VE is not likely to cause exceedances of either the annual mean or 1-hour mean NO_2 AQAL at any relevant existing receptor.

PM_{10} MODELLING RESULTS

1.10.33 The PM_{10} modelling outcomes are as follows:

- The impact of VE on annual mean PM_{10} concentrations at all relevant existing receptors is 'negligible'; and
- VE is not likely to cause exceedances of either the annual mean or 24-hour mean PM_{10} AQAL at any relevant existing receptor.

$PM_{2.5}$ MODELLING RESULTS

1.10.34 The $PM_{2.5}$ modelling outcomes are as follows:

- The impact of VE on annual mean $PM_{2.5}$ concentrations at all relevant existing receptors is 'negligible'; and
- VE is not likely to cause exceedances of either the annual mean $PM_{2.5}$ AQAL at any relevant existing receptor.

BENTLEY ROAD

1.10.35 Further detailed analysis of receptors located in proximity to Bentley Road has been conducted. This is limited to receptors R9, R10, R11 and R40. This is in response to the package of transport infrastructure upgrades proposed along Bentley Road (detailed in paragraph 1.4.60).

1.10.36 Receptor R11 experiences the greatest change in pollutant conditions as a result of VE (2027 DM vs. 2027 DS). VE is predicted to cause the following changes at R11 as a % of the respective AQALs:

- 0.7% increase in annual mean NO_2 concentrations;
- 0.6% increase in annual mean PM_{10} concentrations; and
- 0.5% increase in annual mean $PM_{2.5}$ concentrations.

1.10.37 The total resultant modelled concentrations are 'well below' the short and long-term AQALs for all pollutants. The maximum modelled concentrations predicted in the 2027 DS scenario (VE consent) at receptors within proximity to Bentley Road are as follows:

- 22.8% of the annual mean NO_2 AQAL;
- 39.8% of the annual mean PM_{10} AQAL; and
- 46.5% of the annual mean $PM_{2.5}$ AQAL.

1.10.38 Impacts at receptor locations affected by the Bentley Road upgrade works are negligible.

SUMMARY

1.10.39 Based on the modelling outcomes, impacts at all relevant receptor locations are negligible. Furthermore, exceedances of long and short-term AQALs are unlikely.

1.10.40 Road traffic effects associated with the construction of VE onshore elements are found to be **not significant** in terms of the EIA Regulations.

ECOLOGICAL RECEPTORS

1.10.41 Figure 10.4 provides an illustration of the proposed main public road network routing arrangements (construction access routes), along with 200 m buffers from these roads to understand the extent of potential interactions with nearby ecological designations.

1.10.42 The construction access routes are established as part of Volume 6, Part 3, Chapter 8: Traffic and Transport. The spatial extent of these links have been extended to ensure all possible interactions with nearby sensitive ecological designations have been assessed. This is likely to represent a conservative assessment, as assumes there is no reduction in vehicle movements generated by onshore activities with distance from the construction access routes.

1.10.43 Table 1.26 details the extent of ecological designations located within 200 m of the construction access routes. These road links have been reviewed further to understand if they are associated with strategic 'trunk roads' (SRN) which can be excluded from assessments concerning individual developments (JNCC, 2021).

Table 1.26: Ecological designations within 200 m of the construction access routes

ID	Name	Designation	SRN	Further Assessment?
ER1	Kiln Wood	PAWS	Yes	No
ER2	Kiln Wood	ASNW	Yes	No
ER3	Bullock Wood	ASNW	No	Yes
ER4	Birch Wood	ASNW	Yes	No
ER5	High Barn Wood	ASNW	No	Yes
ER6	Tendring Grove	ASNW	No	Yes
ER7	Simon's Wood	PAWS	No	Yes
ER8	Weeleyhall Wood	ASNW	No	Yes
ER9	Coppins Hall Wood	ASNW	No	Yes
ER10	Mill Wood	ASNW	No	Yes
ER11	Guttridgehall Wood	ASNW	No	Yes
ER12	Unnamed (4811)	ASNW	No	Yes
ER13	Unnamed (4837)	ASNW	No	Yes

ID	Name	Designation	SRN	Further Assessment?
ER14	Walls Wood	ASNW	Yes	No
ER15	Unnamed (4830)	ASNW	Yes	No
ER16	Hockley Wood	ASNW	No	Yes
ER17	Tenpenny Heath	ASNW	No	Yes
ER18	Thorringtonhall Wood	ASNW	No	Yes
ER19	Thorringtonhall Wood	PAWS	No	Yes
ER20	Captains Wood	ASNW	No	Yes
ER21	Home Wood	ASNW	No	Yes
ER22	Simon's Wood	LoWS	No	Yes
ER23	Upper Holland Brook	LoWS	No	Yes
ER24	St Michaels Churchyard	LoWS	No	Yes
ER25	Thorpe Green	LoWS	No	Yes
ER26	Far Thorpe Green	LoWS	No	Yes
ER27	Tendring Grove	LoWS	No	Yes
ER28	Furze Hill Complex	LoWS	No	Yes
ER29	Great Bromley Churchyard	LoWS	No	Yes
ER30	Mill Wood	LoWS	No	Yes
ER31	Manor House Meadow	LoWS	No	Yes
ER32	Springhead Corner Meadow	LoWS	No	Yes
ER33	Walls Wood	LoWS	Yes	No
ER34	High Barn Wood	LoWS	No	Yes
ER35	Weeley Bypass	LoWS	No	Yes
ER36	Gutteridge Wood	LoWS	No	Yes
ER37	Oakhurst Wood	LoWS	No	Yes
ER38	Burcarts Meadow	LoWS	No	Yes
ER39	Ardleigh Reservoir Wood	LoWS	Yes	No
ER40	Alder Car	LoWS	No	Yes
ER41	Tenpenny Farm Wood	LoWS	No	Yes
ER42	Hockley Wood	LoWS	No	Yes
ER43	Fratinghall Wood	LoWS	No	Yes
ER44	Gun Hill Place	LoWS	Yes	No

ID	Name	Designation	SRN	Further Assessment?
ER45	Black Brook	LoWS	Yes	No
ER46	The Coombs	LoWS	Yes	No
ER47	Birch Wood	LoWS	Yes	No
ER48	Home Wood	LoWS	No	Yes
ER49	Essex Estuaries	SAC	No	Yes
ER50	Colne Estuary (Mid-Essex Coast Phase 2)	SPA	No	Yes
ER51	Marks Tey Brickpit	SSSI	Yes	No
ER52	Bullock Wood	SSSI	No	Yes
ER53	Holland On Sea Cliff	SSSI	No	Yes
ER54	Holland Haven Marshes	SSSI	No	Yes
ER55	Weeleyhall Wood	SSSI	No	Yes
ER56	Colne Estuary	SSSI	No	Yes
ER57	Wivenhoe Gravel Pit	SSSI	No	Yes
ER58	St Osyth Pit	SSSI	No	Yes

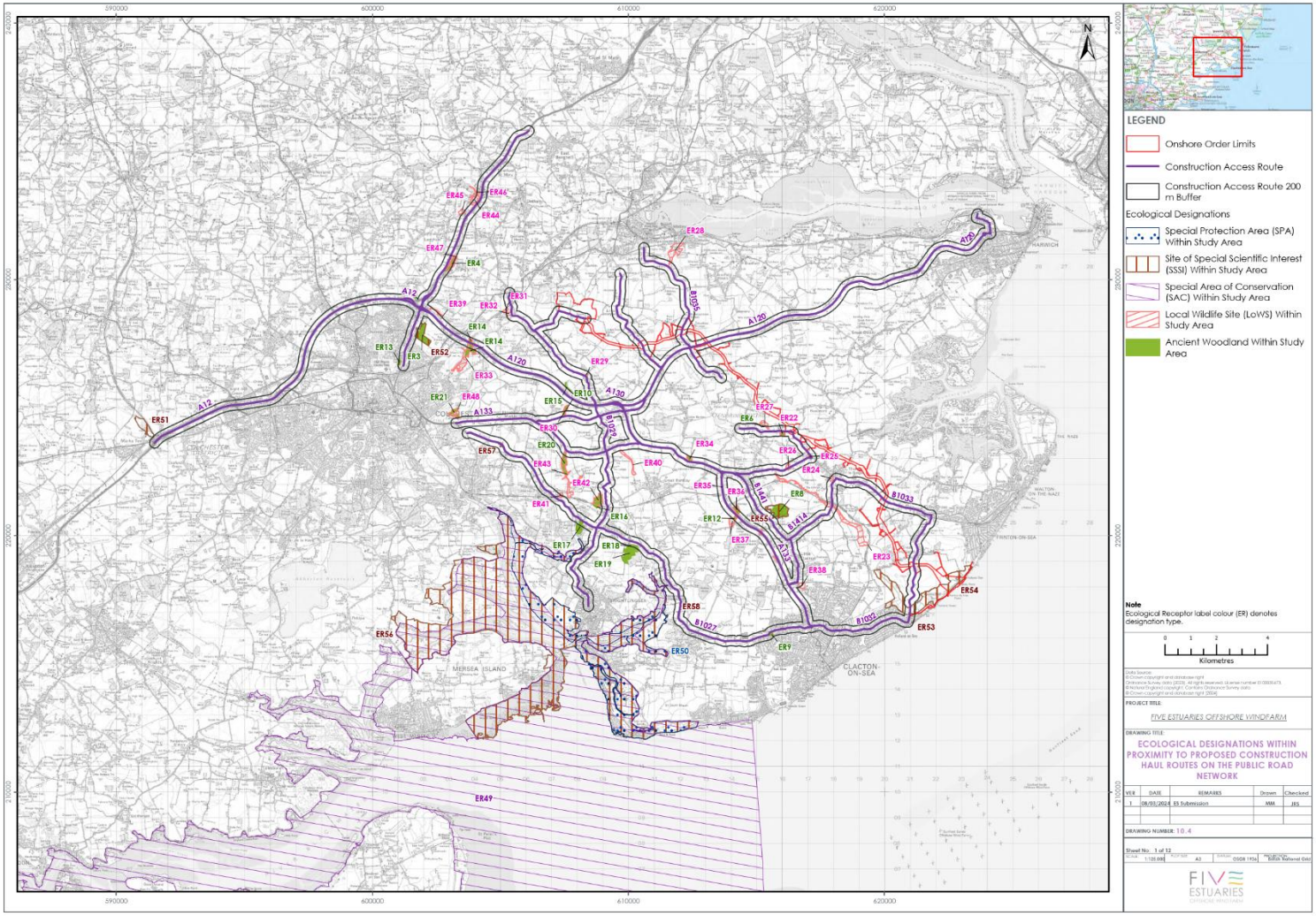

Figure 1.17a: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 1 of 12)

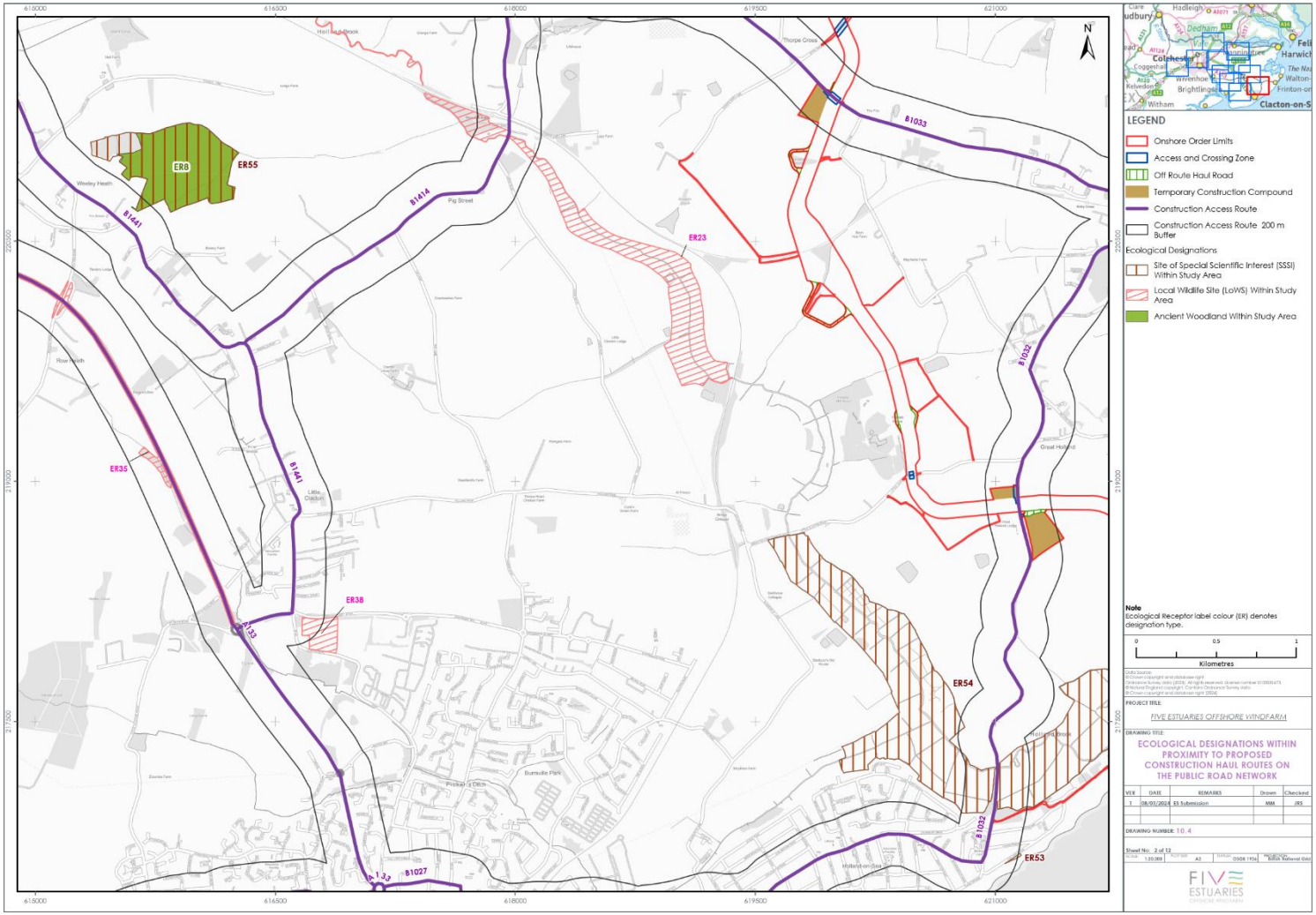

Figure 1.18b: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 2 of 12)

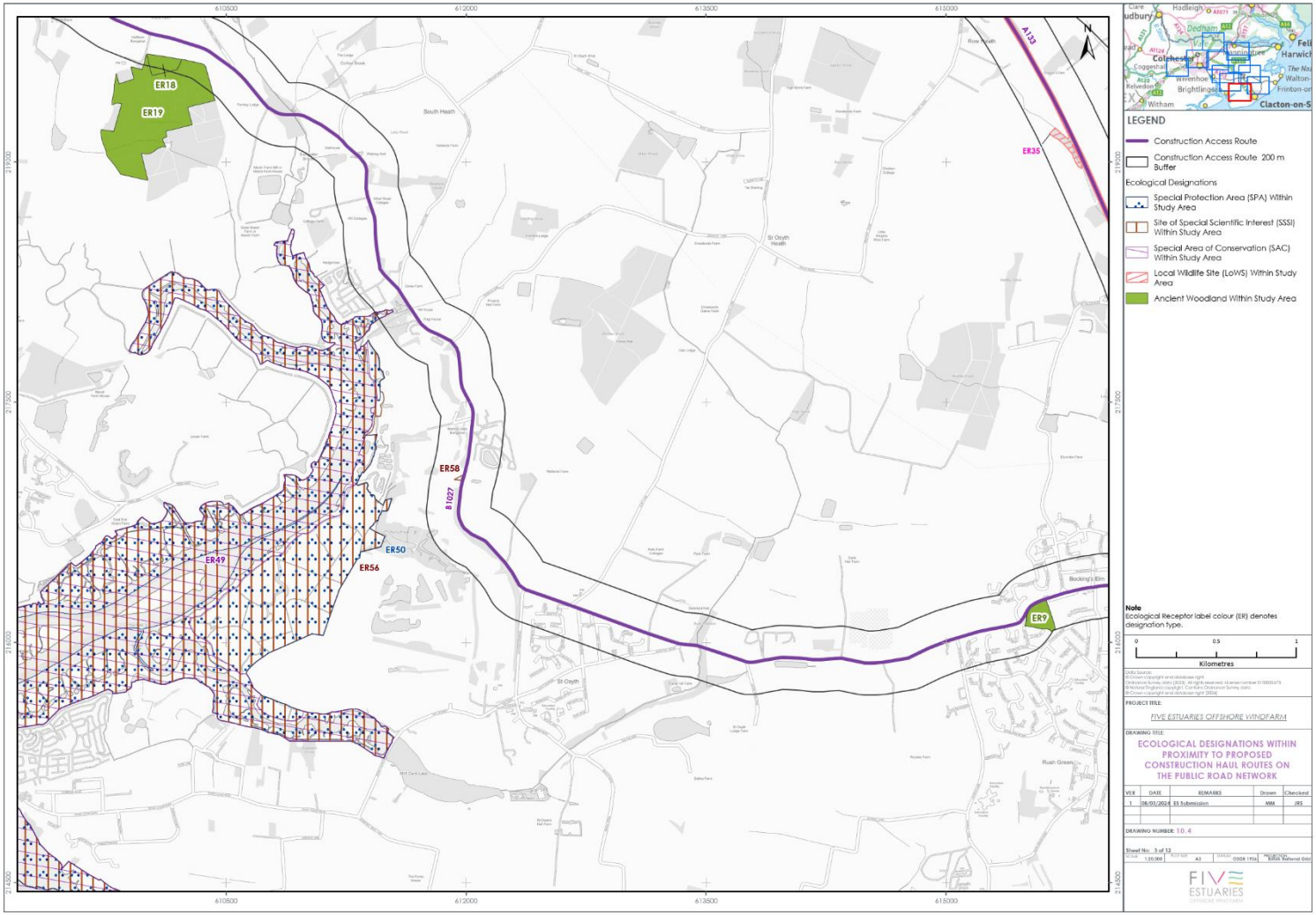

Figure 1.19c: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 3 of 12)

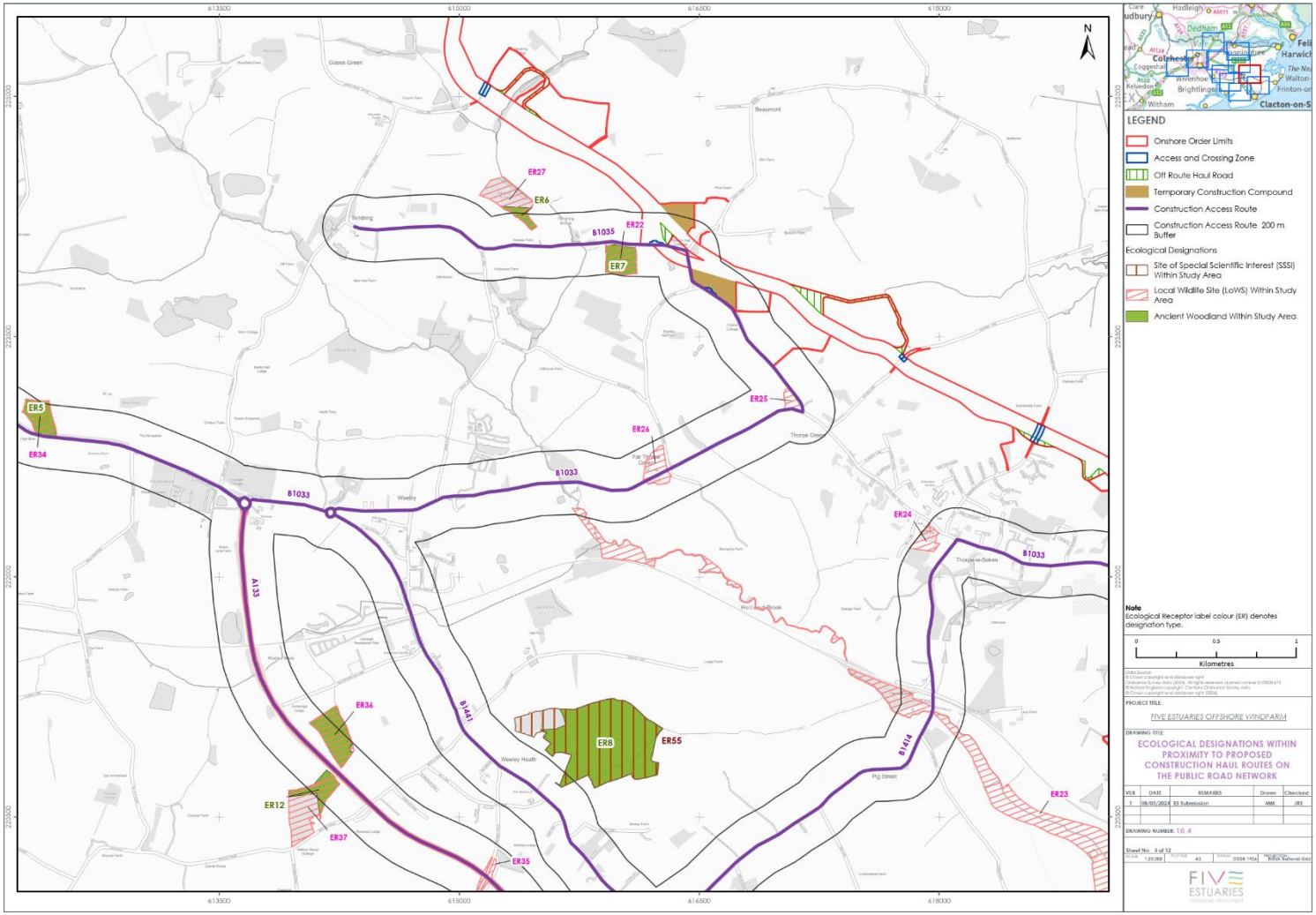

Figure 1.20d: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 4 of 12)

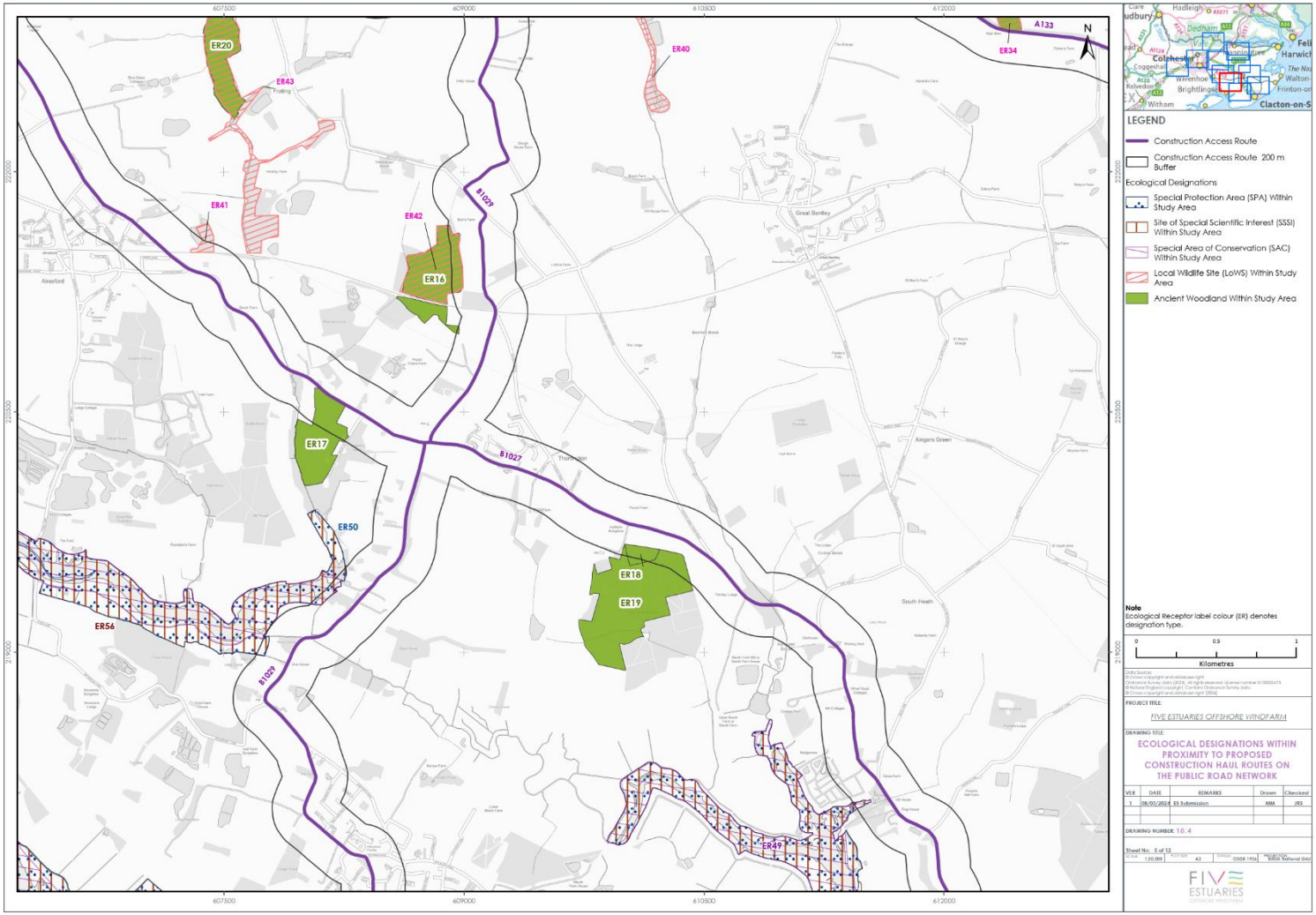

Figure 1.21e: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 5 of 12)

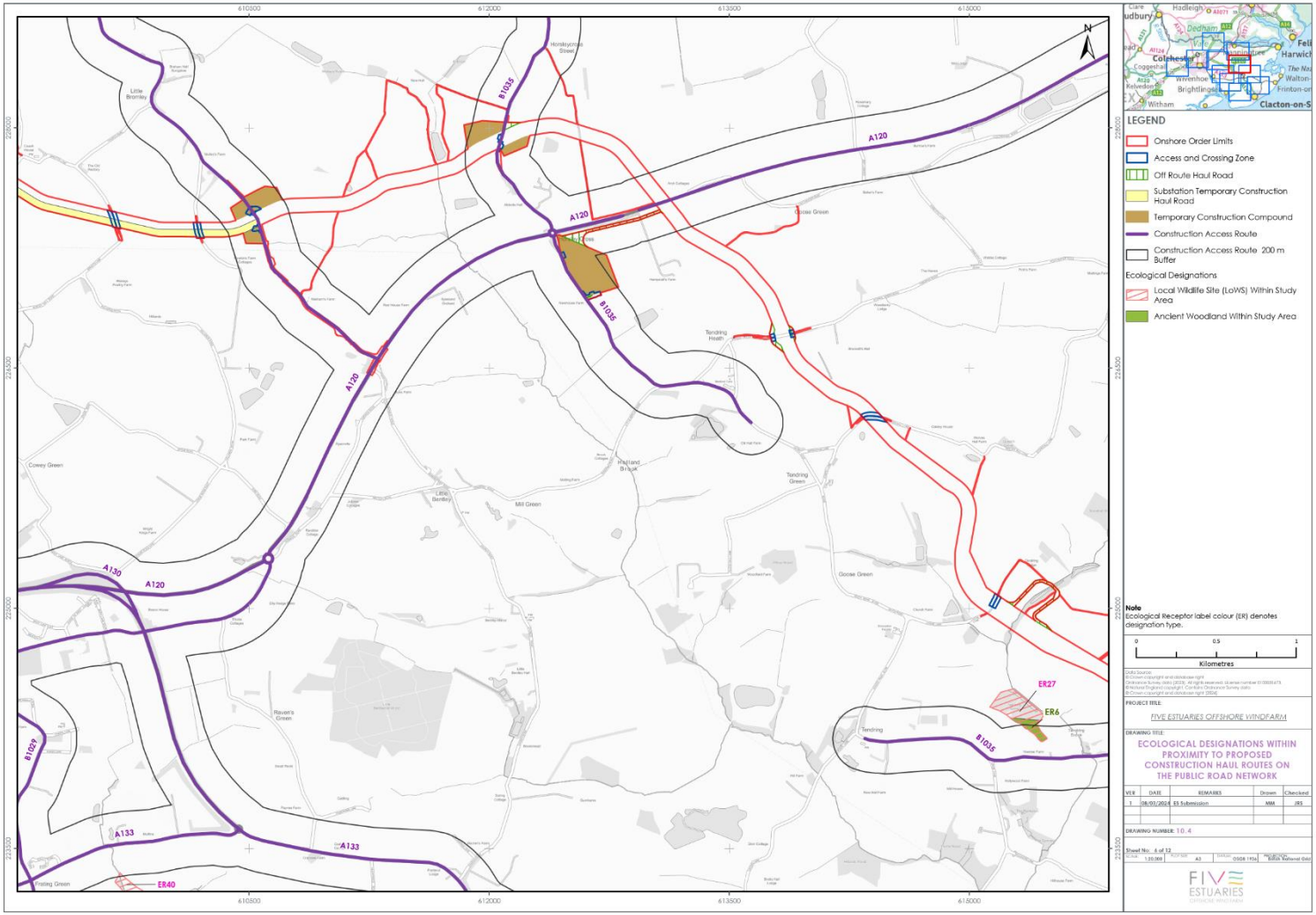

Figure 1.22f: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 6 of 12)

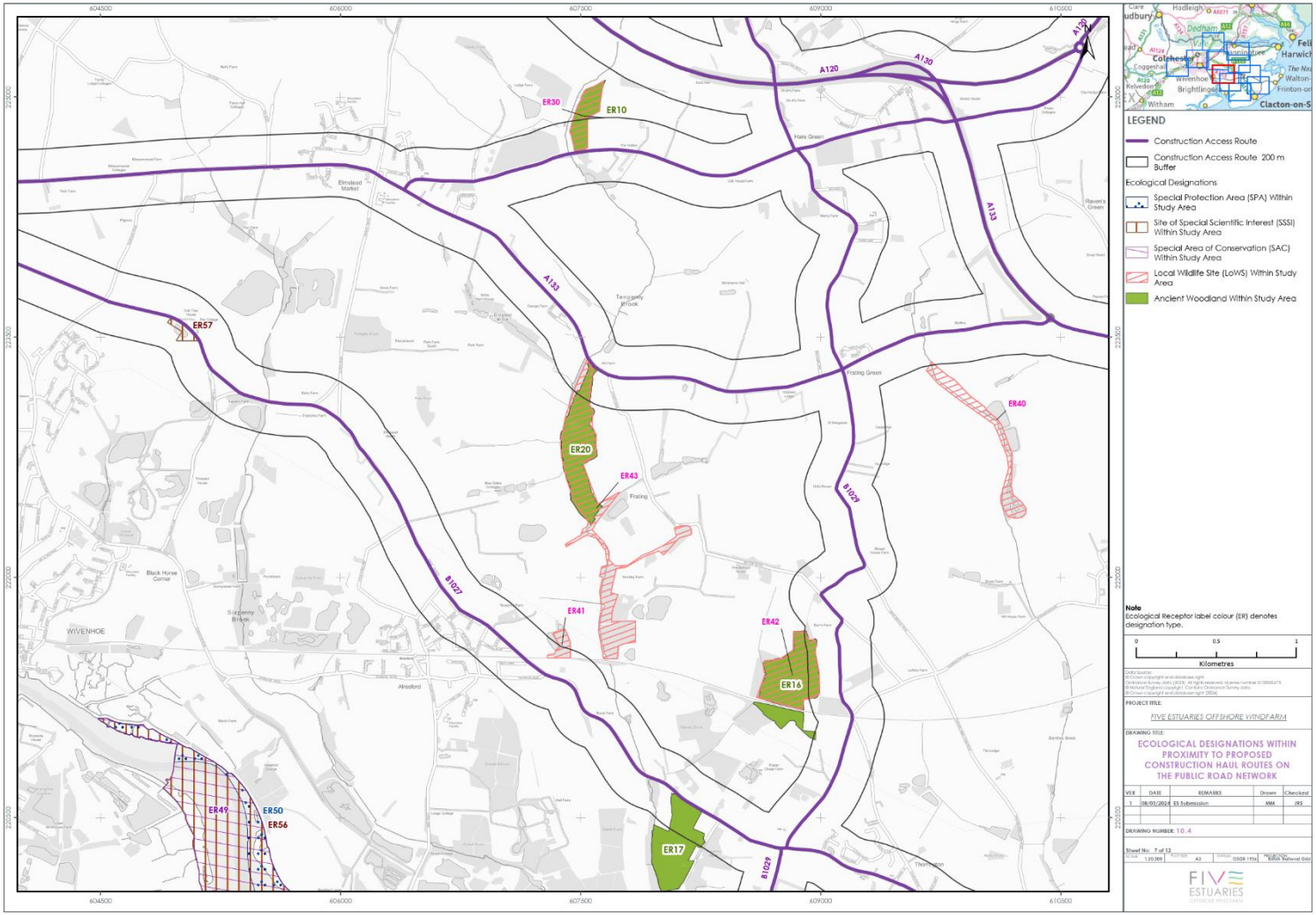

Figure 1.23g: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (part 7 of 12)

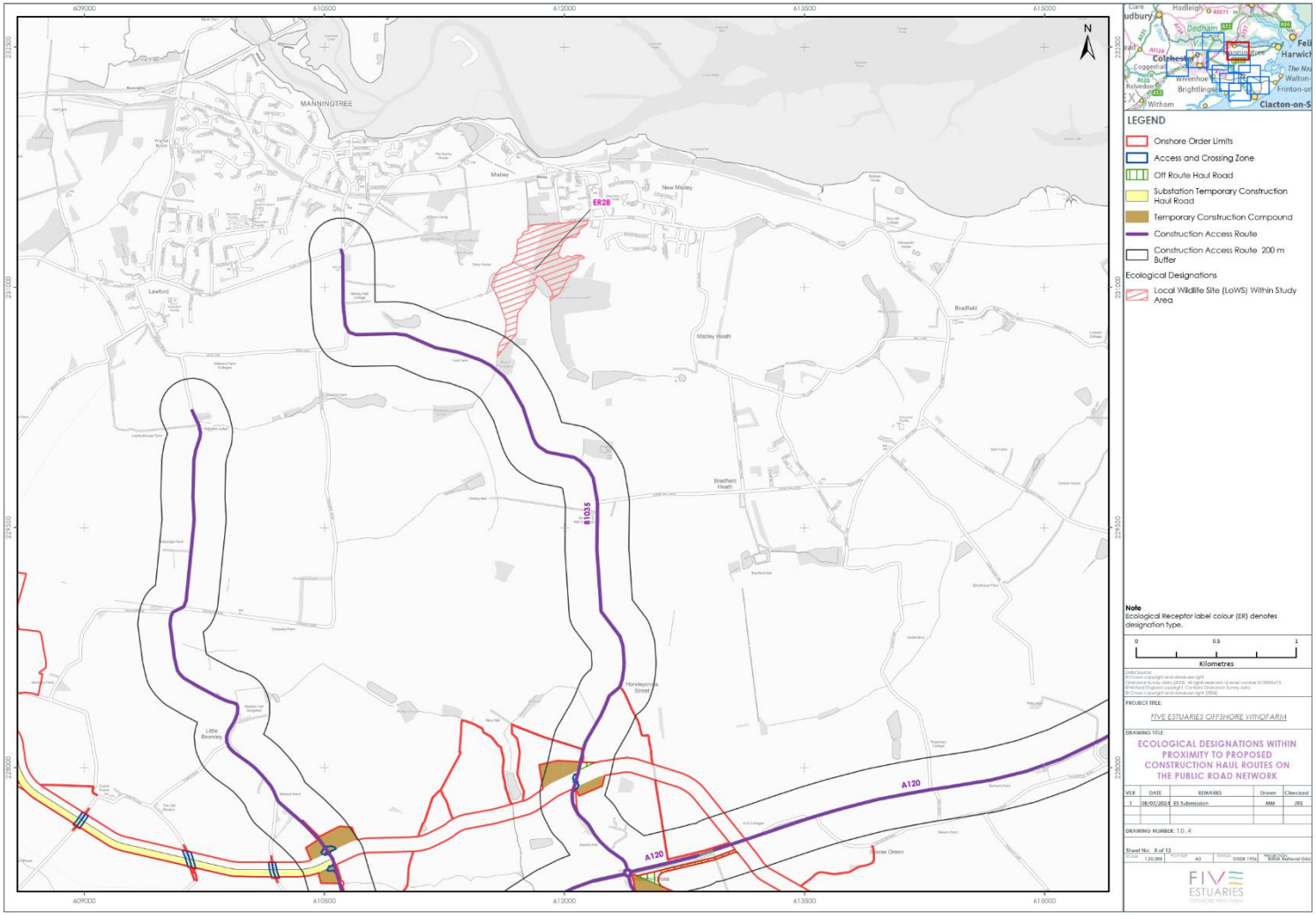

Figure 1.24h: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 8 of 12)

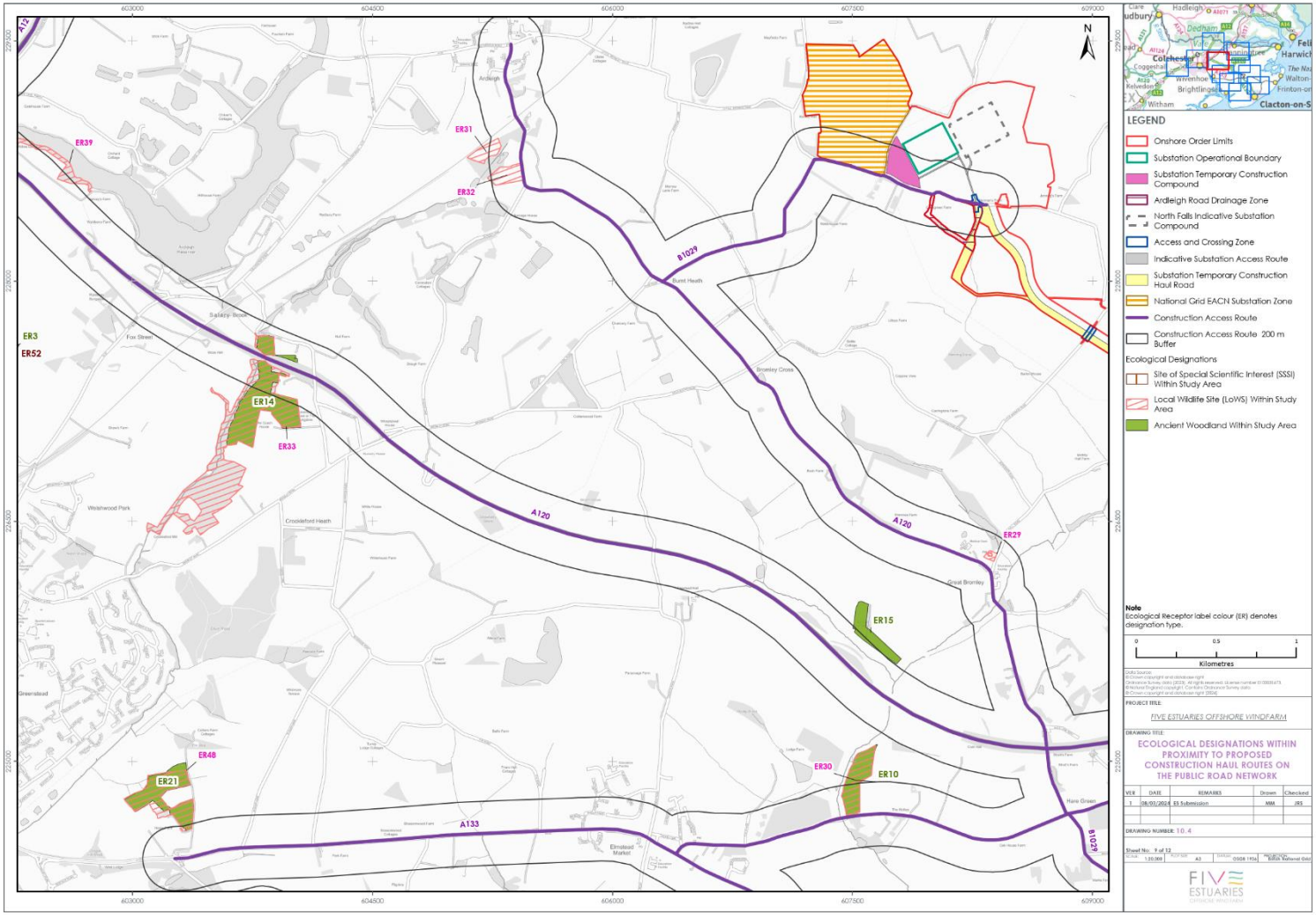

Figure 1.25i: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 9 of 12)

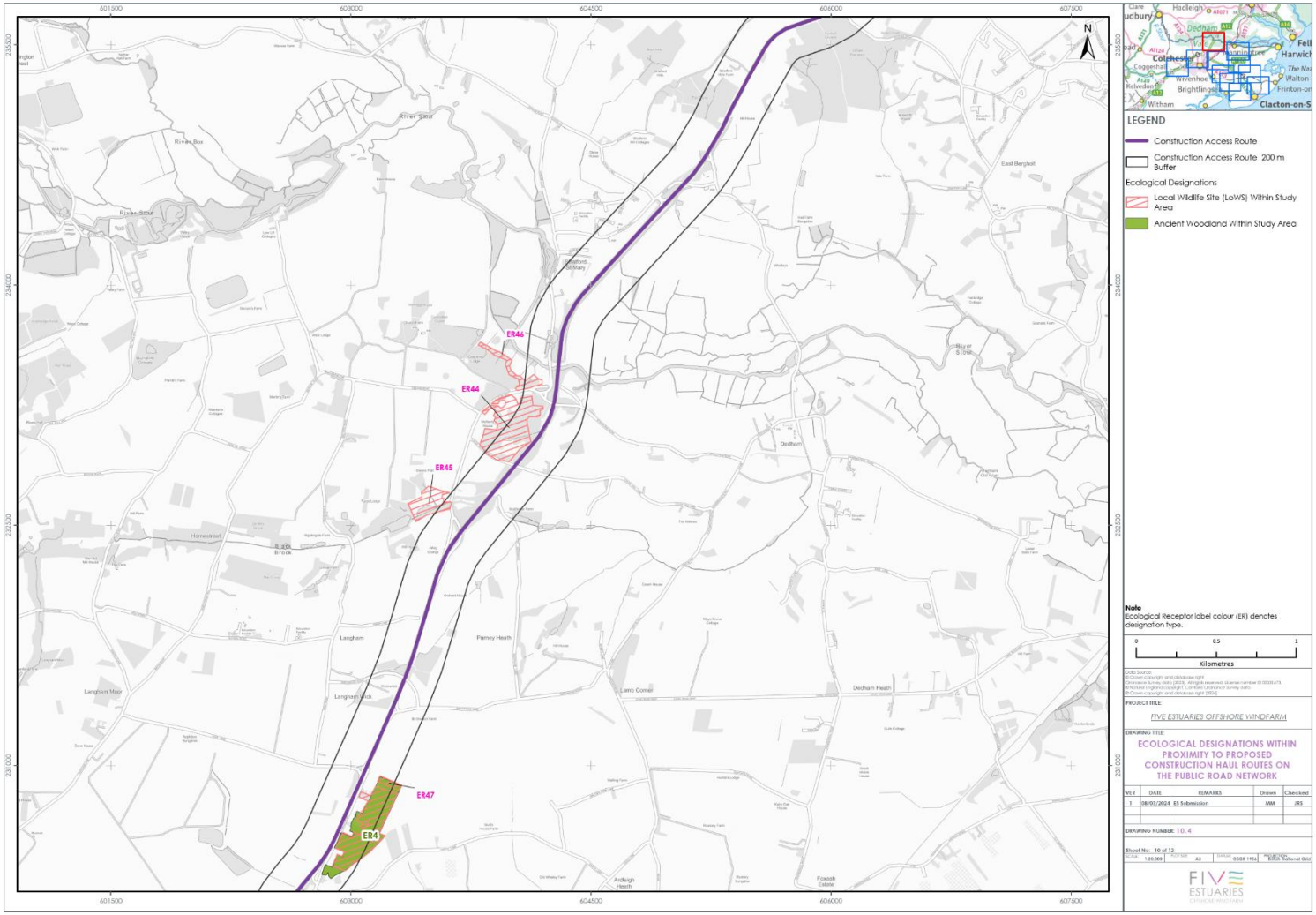

Figure 1.26j: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 10 of 12)

Figure 1.27k: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 11 of 12)

Figure 1.28l: Ecological Designations Within Proximity to Proposed Construction Haul Road on the Public Road Network (Part 12 of 12)

1.10.44 The road links associated under the SRN where construction vehicles are expected to travel along have been excluded. Ecological designations solely located within 200 m of these road links have not been considered further.

1.10.45 The maximum number of construction trips projected to occur on the construction access routes within 200 m of an ecological designation (excluding strategic trunk roads associated with the SRN) have been compared to IAQM screening criteria (IAQM, 2020) to inform if further assessment is necessary (Table 1.27).

Table 1.27: Maximum construction trips on a link affecting an ecological designation

ID	Site	Designation	Project Alone		In-Combination	
			Total AADT	HDV	Total	HDV
ER3	Bullock Wood	ASNW	0	0	-	-
ER5	High Barn Wood	ASNW	233	168	-	-
ER6	Tendring Grove	ASNW	154	20	-	-
ER7	Simon's Wood	PAWS	154	20	-	-
ER8	Weeleyhall Wood	ASNW	131	56	-	-
ER9	Coppins Hall Wood	ASNW	64	0	-	-
ER10	Mill Wood	ASNW	140	0	-	-
ER11	Guttridgehall Wood	ASNW	404	188	-	-
ER12	Unnamed (4811)	ASNW	404	188	-	-
ER13	Unnamed (4837)	ASNW	0	0	-	-
ER16	Hockley Wood	ASNW	134	0	-	-
ER17	Tenpenny Heath	ASNW	17	0	-	-
ER18	Thorringtonhall Wood	ASNW	17	0	-	-
ER19	Thorringtonhall Wood	PAWS	17	0	-	-
ER20	Captains Wood	ASNW	108	0	-	-
ER21	Home Wood	ASNW	73	0	-	-
ER22	Simon's Wood	LoWS	154	20	-	-
ER23	Upper Holland Brook	LoWS	141	56	-	-
ER24	St Michaels Churchyard	LoWS	174	56	-	-

ID	Site	Designation	Project Alone		In-Combination	
			Total AADT	HDV	Total	HDV
ER25	Thorpe Green	LoWS	221	52	-	-
ER26	Far Thorpe Green	LoWS	141	52	-	-
ER27	Tendring Grove	LoWS	154	20	-	-
ER28	Furze Hill Complex	LoWS	0	0	-	-
ER29	Great Bromley Churchyard	LoWS	158	0	-	-
ER30	Mill Wood	LoWS	140	0	-	-
ER31	Manor House Meadow	LoWS	0	0	-	-
ER32	Springhead Corner Meadow	LoWS	0	0	-	-
ER34	High Barn Wood	LoWS	233	168	-	-
ER35	Weeley Bypass	LoWS	404	188	-	-
ER36	Gutteridge Wood	LoWS	404	188	-	-
ER37	Oakhurst Wood	LoWS	404	188	-	-
ER38	Burcarts Meadow	LoWS	3	0	-	-
ER40	Alder Car	LoWS	108	0	-	-
ER41	Tenpenny Farm Wood	LoWS	17	0	-	-
ER42	Hockley Wood	LoWS	134	0	-	-
ER43	Fratinghall Wood	LoWS	108	0	-	-
ER48	Home Wood	LoWS	73	0	-	-
ER49	Essex Estuaries	SAC	134	0	173	0
ER50	Colne Estuary (Mid-Essex Coast Phase 2)	SPA	134	0	173	0
ER52	Bullock Wood	SSSI	0	0	772	0
ER53	Holland On Sea Cliff	SSSI	238	81	307	115
ER54	Holland Haven Marshes	SSSI	237	81	304	115
ER55	Weeleyhall Wood	SSSI	131	56	578	86

ID	Site	Designation	Project Alone		In-Combination	
			Total AADT	HDV	Total	HDV
ER56	Colne Estuary	SSSI	134	0	173	0
ER57	Wivenhoe Gravel Pit	SSSI	17	0	20	0
ER58	St Osyth Pit	SSSI	17	0	20	0
IAQM Screening Thresholds			***1,000***	***200***	***1,000***	***200***

1.10.46 Construction road traffic flows generated by the VE (alone) are below the IAQM prescribed screening criteria on all relevant road links within 200 m of all affected ecological designations.

1.10.47 In-combination screening has been conducted with respect to SACs, SPAs and SSSIs (Section 1.4). With respect to the SAC, SPA and SSSIs, road traffic movements generated by VE (in-combination with live projects and plans) are all below the IAQM screening thresholds.

1.10.48 Impacts can therefore be considered insignificant, and no further assessment is necessary. The effects are considered to be **not significant** in terms of the EIA Regulations and no further assessment is required.

NRMM EMISSIONS ASSESSMENT

1.10.49 The IAQM construction guidance (IAQM, 2023) states that experience of assessing exhaust emissions from NRMM suggests that they are unlikely to make a significant impact on local air quality.

1.10.50 Furthermore, according to LAQM.TG(22) (Defra, 2022), providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. These controls represent standard practice and are included within the CoCP securing their implementation.

1.10.51 The CoCP also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. This goes beyond the LAQM.TG(22) standard suite of controls – ensuring impacts are avoided where possible.

1.10.52 Based upon consultation conducted to date, statutory consultees are in agreement that NRMM can be scoped out from assessment, providing suitable controls are applied. Further consultation background is provided in Table 1.5.

1.10.53 Notwithstanding the above, a qualitative assessment of NRMM emissions has been undertaken to inform the likelihood of a significant effect arising – Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment.

1.10.54 The spatial extent of the NRMM emissions assessment study area is illustrated in Figure 10.5. A summary of the assessment outcomes is provided below.

1.10.55 Whilst taking into account the extent of NRMM proposed to be used, associated control measures and sensitivity of the area, the likelihood for significant effects to occur are low.

1.10.56 Potential impacts from NRMM emissions would therefore be considered negligible, direct and short-term/ temporary, with the resultant effect **not significant** in terms of the EIA Regulations.

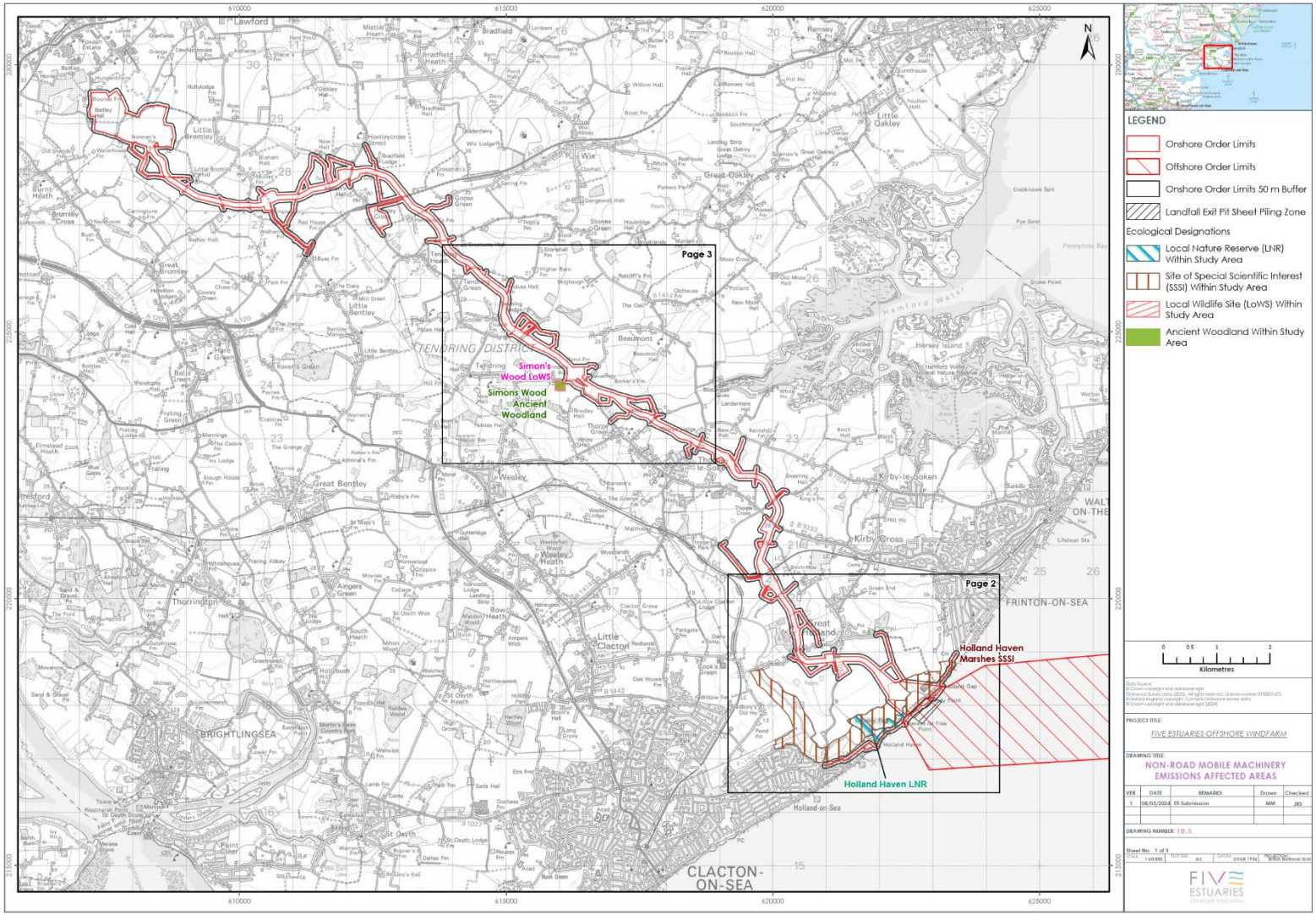

Figure 1.29a: Non-Road Mobile Machinery Emissions Affected Areas (Part 1 of 3)

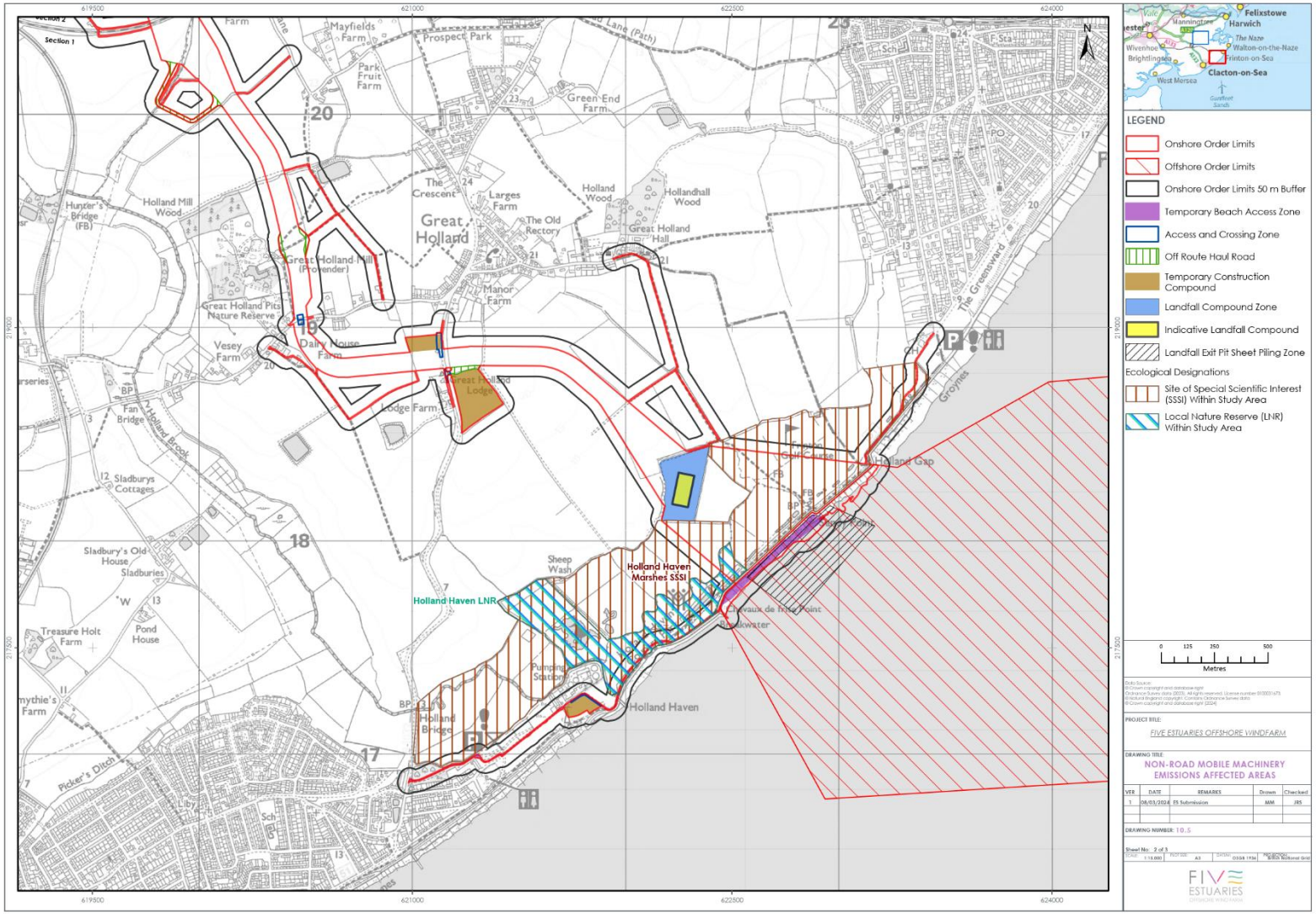

Figure 1.30b: Non-Road Mobile Machinery Emissions Affected Areas (Part 2 of 3)

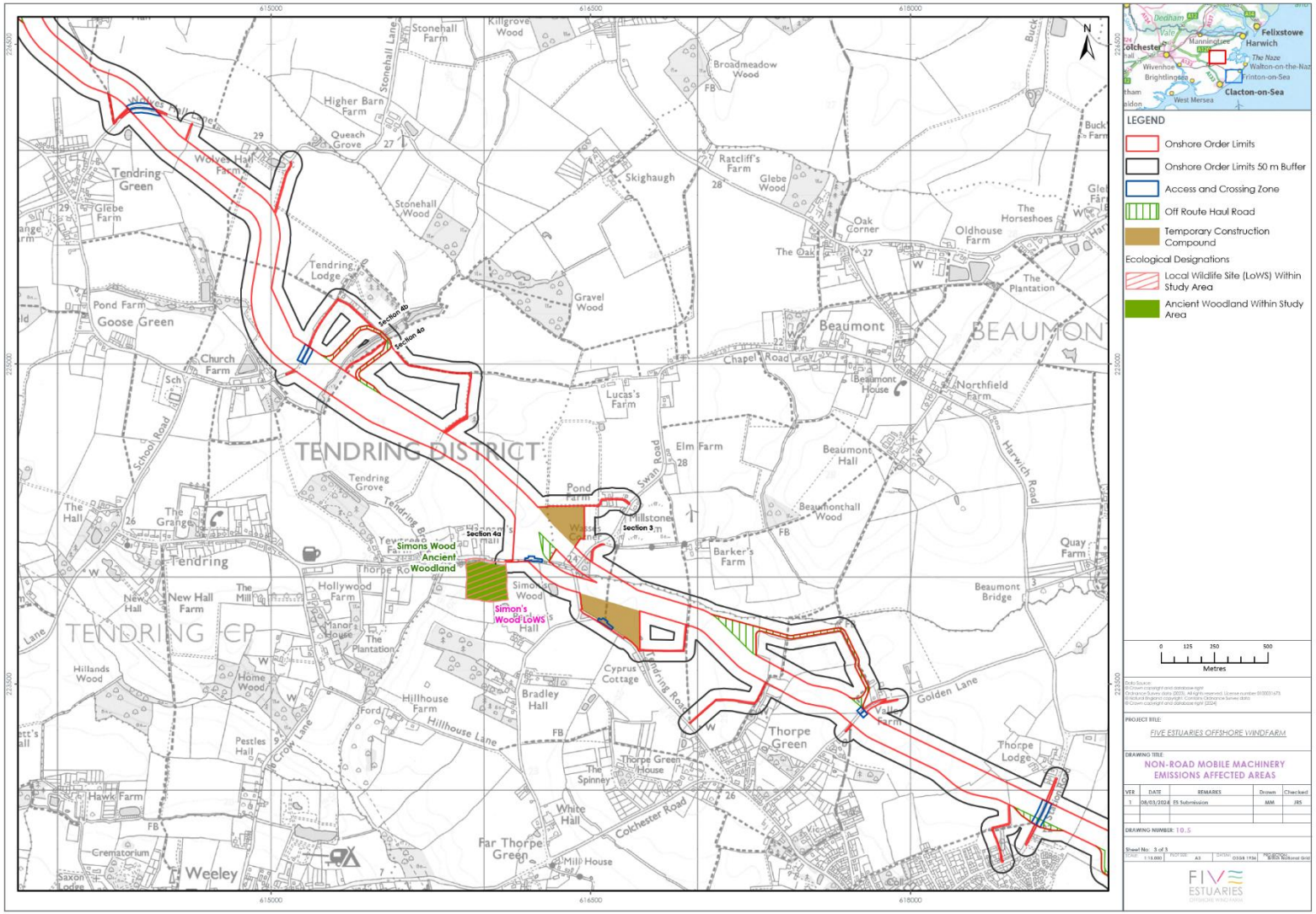

Figure 1.31c: Non-Road Mobile Machinery Emissions Affected Areas (Part 3 of 3)

OFFSHORE ACTIVITIES ASSESSMENT

1.10.57 An assessment of emissions generated by construction offshore activities is provided in Volume 6, Part 6, Annex 10.3: Offshore Activities Assessment. A summary of the assessment outcomes is provided below.

1.10.58 Offshore vessel movements associated with VE would represent a small number of overall vessel traffic in the North Sea (particularly smaller vessels) and therefore accounts for a small proportion of total North Sea emissions. Further information is provided within Volume 6, Part 2, Chapter 9: Shipping and Navigation.

1.10.59 Furthermore, vessel emissions within the North Sea are regulated by legislation. The North Sea is a designated Emission Control Area (ECA) under International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI, which applies strict pollutant emission limits. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy such as the Maritime 2050 and Clean Maritime Plan. These policies provide a strategy for the transition to zero emission shipping within the UK. Therefore, emission contributions from vessel emissions are expected to reduce even further.

1.10.60 In consideration of anticipated baseline conditions anticipated during the construction phase, the maximum background concentrations reported for the onshore locations likely to be affected by nearshore vessels are below the corresponding AQALs and Critical Levels.

1.10.61 Export cable vessels and landfall cable installation vessels will be used to facilitate the installation of cabling infrastructure at landfall. It is therefore assumed that these vessel movements will occur within 250 m and/ or 1 km of the onshore works and therefore potential sensitive onshore human and ecological receptors. The spatial extent of the vessel emissions onshore study area is illustrated in Figure 10.6.

1.10.62 All other vessels will predominantly be used to facilitate the construction of offshore infrastructure. The offshore wind farm array is located at 37 km off the coast at the closest point. It is highly unlikely that vessel movements used for the construction of the offshore array will therefore occur within 250 m and/ or 1 km of the onshore works.

1.10.63 The total number of vessel movements estimated to occur throughout the construction phase within 250 m and/ or 1 km of onshore works (assumed to be large ships – considered unlikely) are below the LAQM.TG(22) (Defra, 2022) screening thresholds presented in Section 1.5, despite the overly conservative assessment methodology applied. Actual annual movements are believed to be lower than those values used for screening.

1.10.64 Landfall operations (vessels within 1 km of the shore) are expected to last up to 18 months and as such impacts are believed to be temporary, with no long-term deterioration of conditions.

1.10.65 With respect to helicopters, up to 530 two-way movements by up to two helicopters may be undertaken on an annual basis during the construction phase. The likelihood for impacts to occur are low.

1.10.66 Impacts during the construction phase are believed to be temporary, with no long-term deterioration of conditions. It should be noted that helicopters may also be used for emergency situations, for training/ drills, and where requested by the relevant authorities.

1.10.67 Helicopters will use an existing onshore base/ helipad; all movements will be compliant/ in line with the relevant helipads operational constraints and management plans. The increased number of helicopter movements at the existing helipad will still likely be under the maximum assessed capacity of the existing onshore base/ helipad.

1.10.68 Whilst taking the above into account, effects associated with emissions generated from offshore activities during the construction phase are concluded to be **not significant** in terms of the EIA Regulations.

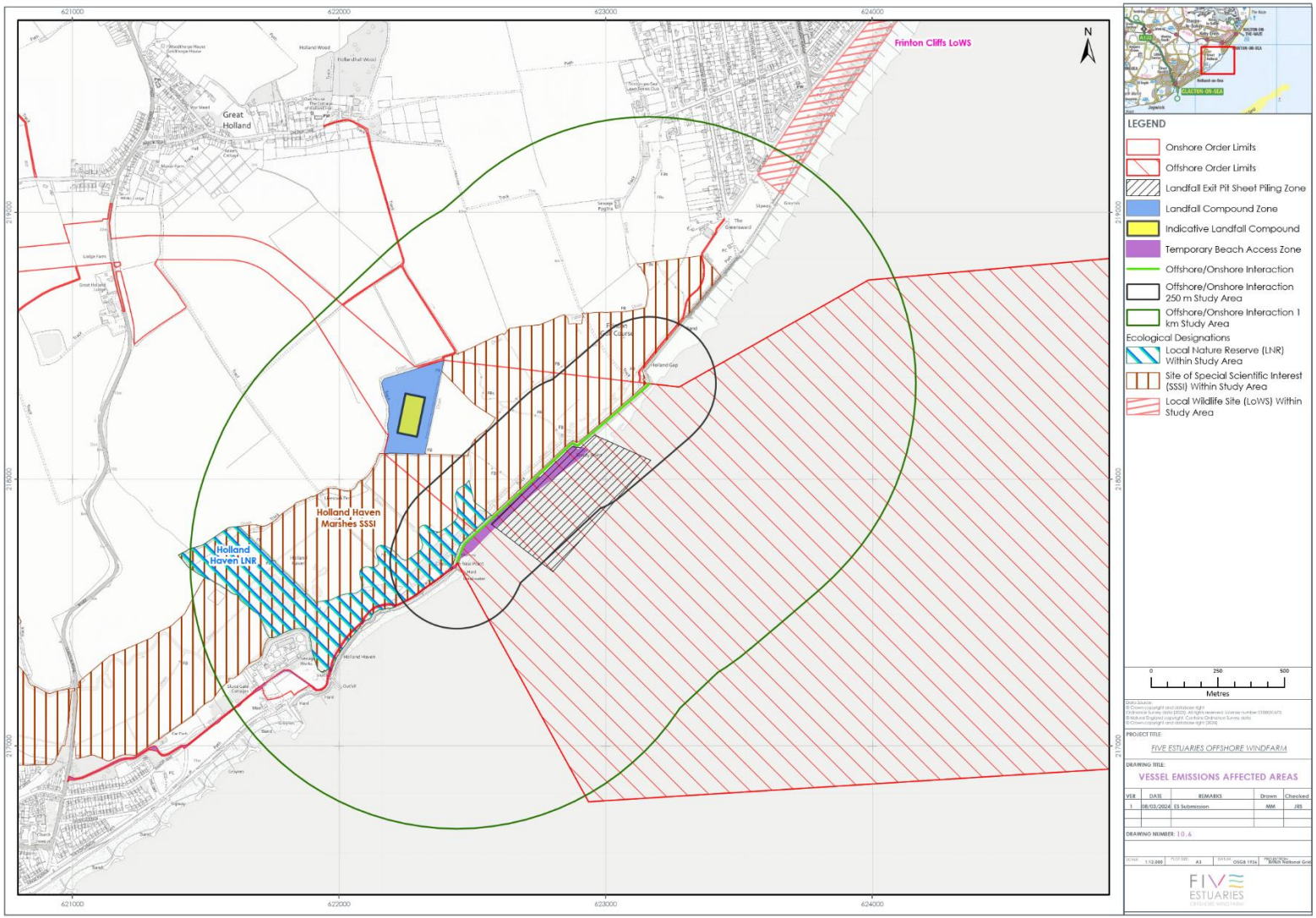

Figure 1.32: Vessel Emissions Affected Areas

1.11 ENVIRONMENTAL ASSESSMENT: OPERATIONAL PHASE

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

1.11.2 Effects associated with all construction phase assessment were considered to be not significant. For these reasons, operational activities are not anticipated to exceed the construction phase worst-case criteria assessed and impacts are likely to be not significant in terms of the EIA Regulations.

ROAD TRAFFIC ASSESSMENT

1.11.3 In relation to likely operational vehicle movements, it is anticipated that at a maximum, there would be approximately 4-8 traffic movements per day – however these would be limited to a 2-week period for annual testing. Outside of this period, there are likely to be approximately 4-8 traffic movements per week. In addition, there is expected to be 1 visit to each cable joint pit per year.

1.11.4 As such, based on the above information, operational road traffic impacts screen below the EPUK & IAQM criteria (EPUK & IAQM, 2017) outlined in Section 1.5 as requested by PINS as part of their Scoping Opinion (PINS, 2021). The effects are considered to be **not significant** in terms of the EIA Regulations and no further assessment is required.

NRMM EMISSIONS ASSESSMENT

1.11.5 An assessment of emissions generated by operational NRMM activities is provided in Volume 6, Part 6, Annex 10.2: Non-Road Mobile Machinery Emissions Assessment. A summary of the assessment outcomes is provided below.

1.11.6 Onshore operational activities limited to maintenance are expected to be intermittent/ infrequent in comparison to the assessed construction activities.

1.11.7 To give an indication of the extent of operational activities, planned maintenance to the OnSS would comprise 1 visit per week, which may increase to daily for a 2-week period per year during annual maintenance. In relation to the onshore cable route, planned maintenance may involve 1 visit to each cable joint pit per year. Furthermore, use of NRMM may not be required for the full extent of the maintenance activities.

1.11.8 The extent of NRMM proposed to be used during the operational phase is not expected to be greater in comparison to the construction phase. For these reasons, operational activities are not anticipated to exceed the construction phase worst-case criteria assessed, and impacts are likely to be lesser in comparison. Based on information presented in Section 1.10, effects associated with construction NRMM are **not significant** in terms of the EIA Regulations.

1.11.9 As detailed in Section 1.10, according to the IAQM construction guidance (IAQM, 2023), experience of assessing exhaust emissions from NRMM suggests that they are unlikely to make a significant impact on local air quality. Furthermore, the controls measures endorsed by LAQM.TG(22) (Defra, 2022) to minimise NRMM emissions will also be employed during the operational phase – as relate to standard practice. Following the application of these control, impacts on local air quality are unlikely.

1.11.10 As such, based on the above information, effects associated with operational NRMM emissions are considered to be **not significant** in terms of the EIA Regulations.

OFFSHORE ACTIVITIES ASSESSMENT

1.11.11 An assessment of emissions generated by operational offshore activities is provided in Volume 6, Part 6, Annex 10.3: Offshore Activities Assessment. A summary of the assessment outcomes is provided below.

1.11.12 Offshore activity generated by operational activities are expected to be limited to maintenance activities, expected to be intermittent and infrequent in comparison to the construction phase. Furthermore, baseline conditions are expected to be lower than those assessed as part of the construction phase. For these reasons, operational activities are not anticipated to exceed the construction phase worst-case criteria assessed.

1.11.13 As discussed in Section 1.10, offshore vessel movements associated with VE would represent a small number of overall vessel traffic in the North Sea (particularly smaller vessels) and therefore accounts for a small proportion of total North Sea emissions.

1.11.14 Furthermore, the North Sea is a designated ECA under MARPOL Annex VI, which applies strict pollutant emission limits. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy such as the Maritime 2050 and Clean Maritime Plan. Therefore, emission contributions from vessel emissions are expected to reduce even further.

1.11.15 The maximum background concentrations reported for the onshore locations likely to be affected by nearshore vessels are below the corresponding AQALs and Critical Levels.

1.11.16 Vessels will mainly be used for the maintenance of the offshore wind farm array – located 37 km off the coast, at its closest point. Cable maintenance vessels and auxiliary vessels (where used to support the cable maintenance vessels) have the potential to occur close to the shore. No extensive (planned) nearshore activities are expected to be required in the operational phase.

1.11.17 The total number of vessel movements estimated to occur throughout the operational phase within 250 m and/ or 1 km of onshore works (assumed to be large ships – considered unlikely) are below the LAQM.TG(22) (Defra, 2022) screening thresholds presented in Section 1.5, despite the overly conservative assessment methodology applied. The spatial extent of the vessel emissions onshore study area is illustrated in Figure 10.6

1.11.18 During the operational phase, helicopters will only be used for crew transfer during unplanned maintenance where crew transfer vessel (CTV) access is not possible. Up to 125 two-way movements (250 return) helicopter trips per year may be required. The likelihood for impacts to occur are low.

1.11.19 Helicopters will use an existing onshore base/ helipad; all movements will be compliant/ in line with the relevant helipads operational constraints and management plans. The increased number of helicopter movements at the existing helipad will still likely be under the maximum assessed capacity of the existing onshore base/ helipad.

1.11.20 Whilst taking the above into account, effects associated with emissions generated from offshore activities during the operational phase are concluded to be **not significant** in terms of the EIA Regulations.

1.12 ENVIRONMENTAL ASSESSMENT: DECOMMISSIONING PHASE

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

1.12.2 Decommissioning activities are expected to occur for up to 3 years – however this will be driven primarily by offshore works. Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given the following:

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

1.12.3 These elements (alone and/ or in-combination) would result in a reduction in the level of significance in comparison to the assessment of construction effects. The outcomes of the construction phase assessment indicate that all impacts assessed are not significant. Further assessment in relation to the decommissioning phase is therefore not required. Effects associated with decommissioning effects are believed to be **not significant** in terms of the EIA Regulations.

1.12.4 Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of VE, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees.

1.12.5 This will include an assessment of Air Quality impacts associated with the decommissioning phase. This ensures all potential impacts will be assessed at an appropriate stage – when information is available. Decommissioning works would be undertaken in accordance with best practice measures. This is a project design measure (Table 1.21).

1.12.6 Furthermore, the DCO includes a requirement to submit a written scheme of decommissioning 6 months before decommissioning starts.

1.13 ENVIRONMENTAL ASSESSMENT: CUMULATIVE EFFECTS

1.13.1 Cumulative effects have been considered where endorsed by technical guidance.

1.13.2 The cumulative effects assessment is based upon the list of developments contained within Volume 1, Annex 3.1: Cumulative Effects Assessment Methodology

CONSTRUCTION PHASE

CONSTRUCTION DUST ASSESSMENT

1.13.3 A construction dust assessment has been conducted relating to potential impacts of dust/ PM_{10} generated from construction activities. The outcomes of this exercise have informed the recommendation of controls to minimise or completely removed impacts. These measures are provided in the CoCP. This ensures their effective application. Effects are considered to be not significant in terms of the EIA Regulations.

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

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

1.13.6 These measures would be integrated into a CoCP or similar, to be adhered to during construction, as part of their own environmental responsibilities and commitment.

1.13.7 IAQM construction guidance (IAQM, 2023) states that, with the implementation of the recommended mitigation, effects will be not significant. Cumulative effects associated construction dust are therefore considered to be **not significant** in terms of the EIA Regulations.

1.13.8 Notwithstanding the above, the dust emission magnitude for all potential activity was found to be 'Large' i.e. the maximum level. This level of magnitude is deemed adequate for mitigating potential cumulative impacts from surrounding developments, in the event they are not appropriately mitigated.

1.13.9 Furthermore, it is acknowledged that a co-ordinated approach is being sought with NF OWF and the EACN substation associated with the NGET Norwich to Tilbury Reinforcement project, where possible (see Assessment Methodology above for further details). This may include the shared use of the substation construction haul road (Bentley Road to Ardleigh Road). The assessed risk of dust impacts for construction trackout for VE alone was found to be 'High Risk' (Section 1.10); the maximum level of risk in accordance with the IAQM construction guidance. Hence, the proportionate mitigation measures outlined in the CoCP are deemed adequate to address and mitigate the cumulative trackout risk of dust impacts arising from the substation construction haul road.

ROAD TRAFFIC ASSESSMENT

1.13.10 In consideration of the likely changes in road traffic flows that may occur on the local public road network as a result of VE, consideration has been given to the potential maximum traffic flows that could occur in the future assessment year (i.e. 2027), (based upon information currently available), where relevant.

1.13.11 As per analysis undertaken in Volume 6, Part 3, Chapter 8: Traffic and Transport, the traffic flows used for the assessment includes vehicle movements associated with:

- Relevant committed developments in the assessment area;
- NF OWF (OnSS installation and Cable installation works only); and
- NGET Norwich to Tilbury Reinforcement project.

1.13.12 These are summarised in Table 1.28 for completeness.

1.13.13 These developments are based upon the analysis presented in Volume 1, Annex 3.1: Cumulative Effects Assessment Methodology, however, have only been considered where they interact with the affected road network.

Table 1.28: Projects considered within the road traffic emissions assessment

Development type	Project	Status
OWF	East Anglia 2 OWF	Consented
Nuclear Station	Sizewell C	Consented
Mixed development – 280 dwellings, primary school, nursery	19/00524/OUT	Consented
Residential development – 50 dwellings	20/00179/FUL	Consented
Residential development – 122 dwellings	20/01130/FUL	Awaiting decision
Battery storage	21/020270/FUL Battery storage facility	Consented
Temporary use of Bathside Bay container terminal	23/01594/FUL	Awaiting decision
Substation	NGET Norwich to Tilbury Reinforcement project EACN substation	Not yet submitted
Offshore wind farm	North Falls	PEIR submitted, EIA not yet submitted

1.13.14 Consideration of committed schemes assumes they become fully operable at the point of assessment.

1.13.15 Moreover, it assumes that NF WF and NGET Norwich to Tilbury Reinforcement project will all receive consent. This presupposes that peak construction activities linked with VE, NF OWF, and the EACN substation, part of the NGET Norwich to Tilbury Reinforcement project will coincide and impact the same road links simultaneously. This assumption is considered highly unlikely.

HUMAN RECEPTORS

1.13.16 The dispersion modelling results are inherently cumulative in nature (based upon information currently available). The cumulative effect of VE on human receptors is therefore considered to be **not significant** in terms of the EIA Regulations.

ECOLOGICAL RECEPTORS

1.13.17 Consistent with the IAQM ecological guidance document (IAQM, 2020), screening of road traffic vehicle movements on local ecological designations has been undertaken in isolation (project alone) and are considered insignificant. No further assessment in relation to cumulative effects is therefore required.

1.13.18 In-combination screening has been conducted with respect to SSSIs, SACs and SPAs. Road traffic movements generated by VE (in-combination) are below the IAQM screening thresholds at all affected receptors. Effects are considered to be **not significant** in terms of the EIA Regulations and no further assessment is required.

NRMM EMISSIONS ASSESSMENT

1.13.19 Based on the outcomes of the NRMM qualitative assessment, effects are considered to be not significant in terms of the EIA Regulations, following the application of suitable controls and site management. These measures are prescribed within LAQM.TG(22) (Defra, 2022) and represent standard practice.

1.13.20 These measures are provided in the CoCP, a project design measure (Table 1.21). This secures their effective application. The CoCP also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. This goes beyond the LAQM.TG(22) standard suite of controls – ensuring impacts are avoided where possible. Effects are considered to be not significant.

1.13.21 Considering the 50 m distance threshold used to define the NRMM study area (Section 1.4), construction sites up to 100 m away from the DCO Order Limits could contribute to a potential cumulative effect, where extensive NRMM is proposed. This would likely represent long-term extensive construction schemes.

1.13.22 There is very low likelihood of NRMM activities from other developments to simultaneously overlap within 50 m of a sensitive receptor at any one time, given the spatial and temporal profile of onshore construction works.

1.13.23 Construction activities will be temporary/ mobile, and plant will not be fixed for the full duration of works. By way of example, construction activities along the Onshore ECC construction area will spatially vary as construction progresses. Exposure to NRMM emissions (in the majority of cases) will be transient.

1.13.24 In the event that construction activities did overlap, exposure would be temporary and not cause a long-term persistent deterioration of conditions.

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

1.13.26 Despite the above, construction sites within close proximity of VE will be expected to implement measures/ controls to minimise impacts, in fulfilment of their own environmental responsibilities and commitments.

1.13.27 The measures prescribed within LAQM.TG(22) represent standard practice which construction contractors will be able to meet. In most cases, construction sites will go beyond these controls. These controls are expected to be employed on all construction sites and integrated into a CoCP or similar, to be adhered to during construction. Further, construction is expected to occur between 2027-2029, where cleaner fuels/ technology may be available.

1.13.28 LAQM.TG(22) guidance states that, with the implementation of these controls mitigation, effects will be not significant. As such, it is not anticipated that there would be significant cumulative effects associated with construction phase NRMM emissions.

1.13.29 In consideration of the above, the cumulative effect of VE is therefore considered to be **not significant** in terms of the EIA Regulations.

OFFSHORE ACTIVITIES ASSESSMENT

1.13.30 A 1 km distance threshold has been used for the purposes of defining the onshore vessel emissions study area from landfall (Section 1.4). This threshold is based on the maximum exposure limits provided within LAQM.TG(22) (Defra, 2022) used for the assessment of large ships. This is conservative.

1.13.31 Developments that will generate large vessel movements within 2 km of landfall during construction (2027-2029) have the potential to cause cumulative effects.

1.13.32 From review of developments outlined within Volume 1, Annex 3.1: Cumulative Effects Assessment Methodology, the majority are unlikely to generate large vessel movements within 2 km of landfall, during construction.

1.13.33 The only development that could cause a potential cumulative effect is NF OWF. Vessel movements have been provided by NF OWF for the purposes of facilitating a cumulative assessment.

1.13.34 This approach theoretically assumes that peak construction activities associated with both VE and NF OWF will occur concurrently – considered highly unlikely. Furthermore, LAQM.TG(22) screening thresholds relate to the assessment of large ships. For the purposes of facilitating an assessment, it has been assumed that all vessels generated by VE and NF OWF are large ships and will operate at the onshore vs. offshore interface. This is unlikely.

1.13.35 The estimated maximum number of cumulative construction vessel movements that may occur within proximity of an onshore receptor are presented in Table 1.29.

Table 1.29: Estimated maximum number of construction vessel movements that may occur within proximity of an onshore receptor (cumulative)

Vessel Type	VE Vessel Movements		Cumulative Vessel Movements	
	Small WTG	Large WTG	Small WTG	Large WTG
Total Export Cable Vessels	555	555	1,419	1,419
LAQM.TG(22) Screening Criteria	Exposure Within 250 m		5,000	
	Exposure Within 1 km		15,000	

1.13.36 Cumulative vessel movements are below the LAQM.TG(22) screening criteria despite the overly conservative assessment methodology applied.

1.13.37 The maximum background concentrations across the onshore areas likely to be affected by nearshore vessel emissions are below the corresponding AQALs and Critical Levels.

1.13.38 Vessel emissions within the North Sea are regulated by legislation; the North Sea is an ECA. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy. Therefore, emission contributions from vessel emissions are expected to reduce even further.

1.13.39 With respect to helicopters, up to 660 NF OWF two-way helicopter movements may be undertaken on an annual basis during the construction phase. Cumulatively, up to 1,190 OWF two-way helicopter movements may be undertaken on an annual basis during the construction phase.

1.13.40 Helicopters will use an existing onshore base/ helipad; all movements will be compliant/ in line with the relevant helipads operational constraints and management plans. The increased number of helicopter movements at the existing helipad will still likely be under the maximum assessed capacity of the existing onshore base/ helipad. Impacts during the construction phase are believed to be temporary, with no long-term deterioration of conditions.

1.13.41 In consideration of the above (and overly conservative assessment methodology applied), cumulative effects associated with offshore activities on onshore receptors during construction are considered **not significant** in terms of the EIA Regulations.

OPERATIONAL PHASE

ROAD TRAFFIC ASSESSMENT

1.13.42 Consistent with PINS (PINS, 2021) recommendation, road traffic flows generated by operational activities have been compared against criteria outlined within the EPUK & IAQM guidance document (EPUK & IAQM, 2017) (Section 1.5). Screening of projected road traffic vehicle movements has been undertaken in isolation and are considered insignificant. No further assessment in relation to cumulative effects is therefore required and can be considered **not significant** in terms of the EIA Regulations.

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

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

NRMM EMISSIONS ASSESSMENT

1.13.45 Onshore operational activities limited to maintenance are expected to be intermittent/ infrequent in comparison to the assessed construction activities. The likelihood of cumulative effects arising are low and will not exceed the worst-case criteria assessed for the construction phase. The outcomes of the cumulative construction phase NRMM assessment indicate that there are no significant effects.

1.13.46 Furthermore, the controls measures endorsed by LAQM.TG(22) (Defra, 2022) to minimise NRMM emissions will also be employed during the operational phase – as relate to standard practice.

1.13.47 NRMM operable within close proximity of VE is expected to comply with standard practices, such as those endorsed by LAQM.TG(22). Cumulative effects can be concluded as being **not significant** in terms of the EIA Regulations.

OFFSHORE ACTIVITIES ASSESSMENT

1.13.48 Consistent with the approach conducted with respect to the cumulative assessment of construction vessels, NF OWF is the only development that could cause generate vessels within 2 km of landfall, and therefore a potential cumulative effect.

1.13.49 The remainder of developments outlined within Volume 1, Annex 3.1: Cumulative Effects Assessment Methodology are unlikely to generate large vessel movements within 2 km of landfall.

1.13.50 For the purposes of facilitating a cumulative assessment, vessel movements have been provided by NF OWF. This approach theoretically assumes that operational vessel movements associated with both VE and NF OWF will occur concurrently – considered highly unlikely. Furthermore, LAQM.TG(22) (Defra, 2022) screening thresholds relate to the assessment of large ships. For the purposes of facilitating an assessment, it has been assumed that all vessels generated by VE and NF OWF are large ships and will operate at the onshore vs. offshore interface. This is unlikely.

Table 1.30: Estimated maximum number of operational vessel movements that may to occur within proximity of an onshore receptor (cumulative)

Vessel Type	VE Vessel Movements		Cumulative Vessel Movements	
	Small WTG	Large WTG	Small WTG	Large WTG
Export Cable Vessels	2	2	4	4
Auxiliary Vessel	128	112	248	232
Total	130	114	252	236
LAQM.TG(22) (Screening Criteria	Exposure Within 250 m		5,000	
	Exposure Within 1 km		15,000	

1.13.51 Cumulative vessel movements are therefore below the LAQM.TG(22) screening criteria despite the overly conservative assessment methodology applied.

1.13.52 The maximum background concentrations across the onshore areas likely to be affected by nearshore vessel emissions are below the corresponding AQALs and Critical Levels.

1.13.53 Vessel emissions within the North Sea are regulated by legislation; the North Sea is an ECA. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy. Therefore, emission contributions from vessel emissions are expected to reduce even further.

1.13.54 With respect to helicopters, up to 100 NF OWF two-way helicopter movements may be undertaken on an annual basis during the operational phase. Cumulatively, up to 225 OWF two-way helicopter movements may be undertaken on an annual basis during the operational phase.

1.13.55 Helicopters will use an existing onshore base/ helipad; all movements will be compliant/ in line with the relevant helipads operational constraints and management plans. The increased number of helicopter movements at the existing helipad will still likely be under the maximum assessed capacity of the existing onshore base/ helipad. Impacts during the construction phase are believed to be temporary, with no long-term deterioration of conditions.

1.13.56 In consideration of the above (and overly conservative assessment methodology applied), cumulative effects associated with offshore activities on onshore receptors during construction are considered **not significant** in terms of the EIA Regulations.

1.14 CLIMATE CHANGE

1.14.1 Climate change is generally predicted to result in more frequent and extreme localised weather events within Essex. There is an increased potential for some events to create a worsening of air pollution. This section assesses the following aspects:

- The effect of climate change on the local area in which the proposed development will take place; and

- The likely impacts of climate change and the project in-combination on the receiving environment.

1.14.2 The information provided in this section will be drawn up to and summarised in Volume 6, Part 4, Chapter 1: Climate Change. As outlined in Volume 6, Part 4, Chapter 1: Climate Change, the operational phase of VE would enable the use of renewable electricity which would result in a positive greenhouse gas impact, resulting in a significant beneficial effect.

EFFECT OF CLIMATE CHANGE ON THE LOCAL ENVIRONMENT

1.14.3 Although there is an increased potential for extreme weather events to create a worsening of air pollution, these events would be considered at the regional scale and as such they are not currently modelled as a standard industry approach within air quality. It is also considered that local air quality would improve irrespective of potential localized meteorological evets. Potential interactions of climate change with air quality effects are therefore considered to be negligible.

EFFECT OF CLIMATE CHANGE AND THE PROJECT ON THE LOCAL ENVIRONMENT

1.14.4 Air quality effects on climate change associated with VE itself are considered to be negligible. The main effects are associated with the construction phase and are not significant in terms of the EIA regulations and are short term and temporary.

1.15 INTER-RELATIONSHIPS

1.15.1 The inter-related effects assessment considers likely significant effects from multiple impacts and activities from the construction, operation and decommissioning of VE on the same receptor, or group of receptors. Such inter-related effects include both:

- project lifetime effects: i.e. those arising throughout more than one phase of the project (construction, operation, and decommissioning) to interact to potentially create a more significant effect on a receptor than if just one phase were assessed in isolation; and
- receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor (or group). Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

1.15.2 A description of the likely inter-related effects arising from VE on air quality is provided in Volume 6, Part 2, Chapter 14: Inter-relationships. In summary, effects on air quality are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual project phase.

1.15.3 The operational phase dispersion modelling assessment is based on traffic flows presented in Volume 6, Part 3, Chapter 8: Traffic and Transport.

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

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

1.15.6 It is generally anticipated that climate change will lead to more frequent and extreme localised weather events including within Essex. There is an increased potential for some events to create a worsening of air pollution. However, these events would be considered at the regional scale and as such they are not currently modelled as a standard industry approach within air quality. It is also considered that local air quality would also improve irrespective of potential localised meteorological events. Potential interactions of climate change with air quality effects are therefore considered to be negligible.

1.15.7 Air quality effects on climate change associated with VE itself are considered to be negligible. The main effects are associated with the construction phase and are not significant in terms of the EIA Regulations, short term and temporary.

1.16 TRANSBOUNDARY EFFECTS

1.16.1 Further assessment has been scoped out consistent with PINS recommendation (PINS, 2021) as outlined in Table 1.5.

1.17 SUMMARY OF EFFECTS

1.17.1 This assessment has considered the potential air quality effects on onshore receptors arising from activities associated with VE. Consideration has been given to potential worst-case effects arising from construction, operational and decommissioning activities based upon available information. Worst-case parameters have been adopted to provide a robust assessment.

1.17.2 The approach undertaken was based upon:

- PINS Scoping Opinion (PINS, 2021);
- VE Evidence Plan (Air Quality ETG) process, comprising Natural England, Essex County Council and TDC; and
- Statutory consultation responses to the Air Quality PEIR chapter (VE OWFL, 2023).

1.17.3 In fulfilment of the VE Evidence Plan process, a Technical Note (SLR, 2022) was issued to relevant Air Quality ETG members detailing the extent of the methodology proposed for the PEIR. Natural England and TDC (via Essex County Council) both agreed to the proposed approach via email.

1.17.4 A PEIR (VE OWFL, 2023) was published as part of formal consultation which provided preliminary information on Air Quality within Volume 3, Chapter 10: Air Quality. Following submission of the PEIR, no material comments were received from statutory consultees with respect to the assessment approach. The scope and methodology of PEIR is considered to be appropriate and has formed the basis of the ES. Non-statutory consultation comments have been reviewed and considered within the ES.

1.17.5 Based on the extensive consultation process conducted to date, there appears to be general agreement in the proposed approach and scope of the air quality assessment with no points of disagreement identified.

1.17.6 In accordance with the provisions of NPS EN-5 (DESNZ, 2024c), VE has been working with NF OWF on a co-ordinated delivery scenario to reduce the overall environmental and community impacts of the proposals. As this collaboration commenced in detail following PEIR, reasonable attempts have been made to align the scope and extent of the air quality assessment with NF OWF insofar as possible, without compromising the integrity of the consultation process conducted to date.

1.17.7 A summary of the above assessment outcomes is provided in Table 1.31.

CONSTRUCTION PHASE

CONSTRUCTION DUST ASSESSMENT

1.17.8 A qualitative assessment of the potential dust effects associated with worst-case construction activities has been undertaken following IAQM construction guidance (IAQM, 2023).

1.17.9 Following the construction dust assessment, the onshore construction activities are found to be at worst high risk in relation to dust soiling impacts on people and property, medium risk in relation to ecological designations, and low risk in relation to human health impacts.

1.17.10 Effects will be temporary and are only likely to materialise if certain activities and/ or meteorological conditions coincide.

1.17.11 The outcomes of this exercise have informed the recommendation of controls to minimise or completely removed impacts. These measures are provided in the CoCP, which is a project design measure. This ensures their effective application. Effects are considered to be **not significant** in terms of the EIA Regulations.

1.17.12 Furthermore, construction sites within close proximity of VE will be expected to implement a similar suite of measures/ controls to minimise impacts, in fulfilment of their own environmental responsibilities and commitments. In recognition of the co-ordinated approach and shared use of the substation haul road (Bentley Road to Ardleigh Road) the assessed risk of dust impacts for construction trackout for VE alone was found to be 'High Risk'; the maximum level of risk in accordance with the IAQM construction guidance. Hence, the proportionate mitigation measures outlined in the CoCP are deemed adequate to address and mitigate the cumulative trackout risk of dust impacts arising from the substation construction haul road.

1.17.13 Cumulative effects associated are considered to be **not significant** in terms of the EIA Regulations.

ROAD TRAFFIC ASSESSMENT

1.17.14 Impacts associated with temporary increases in road traffic flows on the local public road network, generated by construction activities on sensitive human and ecological receptors have been assessed.

1.17.15 For the assessment of construction phase road traffic emissions on ecological and human receptors, an initial screening exercise has been conducted to determine whether further detailed assessment, with use of dispersion modelling, is required. This has comprised the comparison of road traffic volumes generated by VE on the public road network (construction access routes) with reference to numerical screening thresholds prescribed within relevant guidance.

1.17.16 The assessment procedure outlined within the IAQM ecological guidance document (IAQM, 2020) has been used in relation to the assessment of sensitive ecological receptors and road traffic. An in-combination screening assessment was conducted for international and national ecological designations. This assessment has considered relevant committed developments and live projects/ plans. Road links associated with the SRN have been excluded from the screening exercise as per JNCC guidance (JNCC, 2021).

1.17.17 Construction road traffic flows generated by VE (both project alone and in-combination with other relevant plans/ projects where relevant) are below the IAQM prescribed screening criteria on road links within 200 m of all ecological receptors. Impacts can therefore be considered insignificant.

1.17.18 With respect to human receptors, road traffic flows were initially compared against screening thresholds prescribed within the EPUK & IAQM guidance document (EPUK & IAQM, 2017).

1.17.19 Where road traffic movements cannot be screened, road traffic impacts generated by VE on human receptors have been quantified and assessed with use of the CERC ADMS-Roads v5 dispersion model.

1.17.20 Cumulative effects have been considered to replicate future air quality conditions and impacts that may occur upon completion of VE, insofar as possible i.e. where known / adequate level of detail to support an assessment. This has comprised the consideration of road traffic flows associated with relevant committed developments and live projects/ plans. As such, the dispersion modelling results are inherently cumulative in nature.

1.17.21 Predicted pollutant concentration changes at existing human receptor locations as a result of the peak construction activities were assessed using the EPUK & IAQM significance criteria. Impacts at all assessed existing receptor locations, including those affected by the Bentley Road infrastructure works, are considered to be 'negligible'. Effects on sensitive human receptors are therefore considered not significant in terms of the EIA Regulations.

1.17.22 In consideration of the above outcomes, road traffic impacts associated with construction activities on human and ecological receptors are concluded to be **not significant** in terms of the EIA Regulations. Furthermore, onshore construction works are expected to last approximately 24 months in one location and as such, any consequential impacts onto local road traffic flows are believed to be temporary, with no long-term deterioration of conditions.

NRMM EMISSIONS ASSESSMENT

1.17.23 The IAQM construction guidance (IAQM, 2023) states that experience of assessing exhaust emissions from NRMM suggests that they are unlikely to result in a significant effect in terms of the EIA Regulations.

1.17.24 Furthermore, according to LAQM.TG(22) (Defra, 2022), providing suitable controls are applied, emissions generated from NRMM are unlikely to contribute to a significant impact upon local air quality. These controls are included within the CoCP. The CoCP also includes a voluntary commitment for all NRMM to comply with Stage V emission standards as a minimum. This goes beyond the LAQM.TG(22) standard suite of controls – ensuring impacts are avoided where possible.

1.17.25 Based upon consultation conducted to date, statutory consultees are in agreement that NRMM can be scoped out from assessment, providing suitable controls are applied.

1.17.26 Notwithstanding the above, a qualitative assessment of NRMM emissions has been undertaken to inform the likelihood of a significant effect arising. Whilst taking into account the extent of NRMM proposed to be used, associated control measures and sensitivity of the area, the likelihood for significant effects to occur are low. Potential impacts from NRMM emissions would therefore be considered negligible, direct and short-term/ temporary, with the resultant effects being **not significant** in terms of the EIA Regulations.

1.17.27 Furthermore, construction sites within close proximity of VE will be expected to implement a similar suite of measures/ controls to minimise impacts, in fulfilment of their own environmental responsibilities and commitments. Cumulative effects associated are considered to be **not significant** in terms of the EIA Regulations.

OFFSHORE ACTIVITIES ASSSESSMENT

1.17.28 Construction vessel movements likely to occur within 250 m and/ or 1 km of assessed onshore sensitive receptors are below the LAQM.TG(22) (Defra, 2022) screening criteria. No further assessment is necessary.

1.17.29 Furthermore, vessel emissions within the North Sea are regulated by legislation; the North Sea is an ECA. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy.

1.17.30 Helicopters may be used as part of construction. However, given the number of projected movements, the likelihood for impacts to occur are low. Further, impacts are believed to be temporary, with no long-term deterioration of conditions. Helicopters will use an existing onshore base/ helipad. The increased number of helicopter movements at the existing helipad will still likely be under the maximum assessed capacity of the existing onshore base/ helipad.

1.17.31 Effects associated with emissions generated from offshore activities during the construction phase are concluded to be **not significant** in terms of the EIA Regulations.

1.17.32 Helicopter and vessel movements generated by live developments within proximity of the onshore Order Limits have been reviewed. This is limited to NF OWF. Based upon the analysis conducted, cumulative effects are concluded to be **not significant** in terms of the EIA Regulations.

OPERATIONAL PHASE

ROAD TRAFFIC ASSESSMENT

1.17.33 Operational road traffic impacts screen below the EPUK & IAQM criteria (EPUK & IAQM, 2017) outlined in Section 1.5 as requested by PINS (PINS, 2021). The effects are considered to be **not significant** in terms of the EIA Regulations, and no further assessment is required.

1.17.34 Screening of projected road traffic vehicle movements has been undertaken in isolation and are considered insignificant. No further assessment in relation to cumulative effects is therefore required and can be considered **not significant** in terms of the EIA Regulations.

NRMM EMISSIONS ASSESSMENT

1.17.35 Onshore operational activities limited to maintenance are expected to be intermittent/ infrequent in comparison to the assessed construction activities. The likelihood of effects arising are low and will not exceed the worst-case criteria assessed for the construction phase. The outcomes of the construction phase NRMM assessment indicate effects are considered to be **not significant** in terms of the EIA Regulations.

1.17.36 Based upon the extent of operational activities discussed, effects are considered to be **not significant** in terms of the EIA Regulations. Furthermore, cumulative effects can be concluded as being **not significant** in terms of the EIA Regulations.

OFFSHORE ACTIVITIES ASSESSMENT

1.17.37 Operational vessel movements likely to occur within 250 m and/ or 1 km of assessed onshore sensitive receptors are below the LAQM.TG(22) (Defra, 2022) screening criteria. No further assessment is necessary.

1.17.38 Furthermore, vessel emissions within the North Sea are regulated by legislation; the North Sea is an ECA. Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy.

1.17.39 Helicopters may be used as part of the operational phase. However, given the number of projected movements, the likelihood for impacts to occur are low. Further, impacts are believed to be temporary, with no long-term deterioration of conditions. Helicopters will use an existing onshore base/ helipad. The increased number of helicopter movements at the existing helipad will still likely be under the maximum assessed capacity of the existing onshore base/ helipad.

1.17.40 Based on the above, effects can be screened out from further consideration. Effects are concluded to be **not significant** in terms of the EIA Regulations.

1.17.41 Helicopter and vessel movements generated by live developments within proximity of VE have been reviewed. This is limited to NF OWF. Based upon the analysis conducted, cumulative effects are concluded to be **not significant** in terms of the EIA Regulations.

DECOMMISSIONING PHASE

1.17.42 Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, considering the given forecast improvements to air quality, and the potential for onshore cables and/ or ducts to remain *in situ*.

1.17.43 The outcomes of the construction phase assessment indicate that all impacts assessed are not significant. Further assessment in relation to the decommissioning phase is therefore not required. Effects are concluded to be **not significant** in terms of the EIA Regulations.

1.17.44 Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of VE, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees.

1.17.45 This will include an assessment of Air Quality impacts associated with the decommissioning phase. This ensures all potential impacts will be assessed at an appropriate stage – when information is available. Decommissioning works would be undertaken in accordance with best practice measures. This is a project design measure.

1.17.46 Furthermore, the DCO includes a requirement to submit a written scheme of decommissioning 6 months before decommissioning starts.

Table 1.31: Summary of effects

Description of Impact	Magnitude	Sensitivity of Receptor	Additional Mitigation Measures	Residual Effect
Construction				
Dust/ PM_{10} generated from temporary construction activities on human and ecological receptors.	High	High - Low	Not required	Not Significant
Temporary construction-generated road traffic volumes on human receptors.	Negligible	High	Not required	Not Significant
Temporary construction-generated road traffic volumes on ecological receptors.	Negligible (below screening criteria)	High - Low	Not required	Not Significant
Temporary construction NRMM emissions on human and ecological receptors.	Negligible	High - Low	Not required	Not Significant
Temporary construction offshore activity emissions on human and ecological receptors.	Negligible (below screening criteria)	High - Medium	Not required	Not Significant
Operation				
Operational road traffic volumes on human receptors.	Negligible (below screening criteria)	High	Not required	Not Significant
Operational road traffic volumes on ecological receptors.	Negligible (below screening criteria)	High - Low	Not required	Not Significant
Operational NRMM emissions on human and ecological receptors.	Negligible	High - Low	Not required	Not Significant

Description of Impact	Magnitude	Sensitivity of Receptor	Additional Mitigation Measures	Residual Effect
Operational offshore activity emissions on human and ecological receptors.	Negligible (below screening criteria)	High - Medium	Not required	Not Significant
Decommissioning				
Likely air quality impacts associated with decommissioning activities.	Comparable to construction, perhaps lesser given the forecast improvements to air quality given forecast improvements to air quality and the potential for the cables to remain *in situ*.			
Cumulative Effects				
Dust/ PM_{10} generated from temporary construction activities on human and ecological receptors.	High	High - Low	Not required	Not Significant
Cumulative road traffic volumes associated with committed developments on human receptors.	Negligible	High	Not required	Not Significant
Cumulative road traffic volumes associated with committed developments on ecological receptors (in-combination screening for national and international ecological designations).	Negligible (below screening criteria)	High - Medium	Not required	Not Significant

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