MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

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Figure number	Figure title
9.1	Construction dust assessment buffers
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Glossary

Term	Meaning
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
400 kV grid connection cable corridor	The corridor within which the 400 kV grid connection cables will be located.
Air Quality Management Area	An area declared by a local authority where its review and assessment of air quality shows that an air quality objective is likely to be exceeded.
Annoyance (Dust)	Loss of amenity due to dust deposition or visible dust plumes, often related to people making complaints, but not necessarily sufficient to be a legal nuisance, as defined by the Institute of Air Quality Management.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
Baseline	The status of the environment without the Transmission Assets in place.
Code of Construction Practice	A document detailing the overarching principles of construction, contractor protocols, construction-related environmental management measures, pollution prevention measures, the selection of appropriate construction techniques and monitoring processes.
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in the ES.
Cumulative Effects	The combined effect of the Transmission Assets in combination with the effects from other proposed developments, on the same receptor or resource.
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
Dust	Solid particles suspended in air or settled out onto a surface after having been suspended in air, as defined by the Institute of Air Quality Management.
Earthworks	Covers the processes of soil-stripping, ground-levelling, excavation, and landscaping, as defined by the Institute of Air Quality Management.
Effect	The term used to express the consequence of an impact. The significance of effect is determined by correlating magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Generation Assets	The generation assets associated with the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm include the offshore wind turbines,

Term	Meaning
	inter-array cables, offshore substation platforms and platform link (interconnector) cables to connect offshore substations.
Impact	Change that is caused by an action/proposed development, e.g., land clearing (action) during construction which results in habitat loss (impact).
Inter-related effects	Inter-related effects arise where an impact acts on a receptor repeatedly over time to produce a potential additive effect or where a number of separate impacts, such as noise and habitat loss, affect a single receptor.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bays inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils, District Councils and County Borough Councils.
Maximum design scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Transmission Assets.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Onshore substations	The onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
Scoping Opinion	Sets out the Planning Inspectorate's response (on behalf of the Secretary of State) to the Scoping Report prepared by the Applicants. The Scoping Opinion contains the range of issues that the Planning Inspectorate, in consultation with statutory stakeholders, has identified should be considered within the Environmental Impact Assessment process.
Special Protection Areas	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly

Term	Meaning
	occurring migratory species. Special Protection Areas contribute to the national site network.
Study area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
The Secretary of State for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Transmission Assets.
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, as defined by the Institute of Air Quality Management.
Transboundary effects	Effects from a project within one state that affect the environment of another state(s).
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).
Transmission Assets Order Limits	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning.
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.

Acronyms

Acronym	Meaning
AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling System
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Areas
AQS	Air Quality Strategy
CEA	Cumulative Effects Assessment
CoCP	Code of Construction Practice
CTMP	Construction Traffic Management Plan
Defra	Department for Environment, Food & Rural Affairs
DCO	Development Consent Order

Acronym	Meaning
DESNZ	Department for Energy Security and Net Zero
DMP	Dust Management Plan
EIA	Environmental Impact Assessment
EPUK	Environmental Protection UK
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
IEMA	Institute for Environmental Management and Assessment
LAQM	Local Air Quality Management Technical Guidance
LDV	Light Duty Vehicle
LNR	Local Nature Reserve
NPS	National Policy Statement
NO_2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
PEIR	Preliminary Environmental Information Report
PM_{10}	Particulate matter with diameters of 10 micrometres or smaller
$PM_{2.5}$	Particulate matter with diameters of 2.5 micrometres or smaller
PPG	Planning Practice Guidance
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

Units

Unit	Description
$\mu g.m^{-3}$	Microgram per cubic metre
nm	Nautical mile
m	Metre
m^2	Square Metre
m^3	Cubic Metre
mph	Miles per hour

9 Air quality

9.1 Introduction

9.1.1 Overview

9.1.1.1 This chapter of the Environmental Statement (ES) presents the findings of the Environmental Impact Assessment (EIA) undertaken for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. For ease of reference, the Morgan and Morecambe Offshore Wind Farms Transmission Assets are referred to in this chapter as the 'Transmission Assets'. This ES accompanies the application to the Planning Inspectorate for development consent for the Transmission Assets.

9.1.1.2 The purpose of the Transmission Assets is to connect the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (referred to collectively as the 'Generation Assets') to the National Grid. A description of the Transmission Assets can be found in Volume 1, Chapter 3: Project description of the ES.

9.1.1.3 This chapter considers the likely impacts and effects of the Transmission Assets on air quality during the construction, operation and maintenance and decommissioning phases. Specifically, it relates to the onshore elements of the Transmission Assets landward of Mean High Water Springs as there are no receptors that would be affected by offshore or intertidal elements.

9.1.1.4 This ES chapter:

- identifies the key legislation, policy and guidance relevant to air quality;
- details the EIA scoping and consultation process undertaken to date for air quality;
- confirms the study area for the assessment, the methodology used to identify the baseline environmental conditions and sets out the existing and future environmental baseline conditions, established from desk studies, surveys and consultation;
- identifies the scope of assessment;
- details the mitigation and/or monitoring measures that are proposed to prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process;
- defines the project design parameters used to inform the impact assessment;
- identifies the impact assessment methodology and presents the assessment of the likely impacts and effects in relation to the construction, operation and maintenance and decommissioning phases of the Transmission Assets on air quality (and, where relevant, the impacts and effects of air quality on the Transmission Assets); and

- identifies any cumulative, transboundary and/or inter-related effects in relation to the construction, operation and maintenance and decommissioning phases of the Transmission Assets on air quality.

9.1.1.5 The assessment presented is informed by the following technical chapters and should be read in conjunction with:

- Volume 1, Annex 5.1: Human health of the ES;
- Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES; and
- Volume 3, Chapter 7: Traffic and transport of the ES.

9.1.1.6 This chapter also draws upon additional information to support the assessment contained within Volume 3, Annex 9.1: Air quality impacts on ecologically designated sites of the ES.

9.2 Legislation, policy and guidance

9.2.1 Legislation

Air Quality Standards Regulations

9.2.1.1 The Air Quality Standards Regulations 2000 (2000 Regulations) and Air Quality Standards Regulations 2010 (2010 Regulations), amended by The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, set limit values for ambient air concentrations for the main air pollutants: particulate matter with diameters of 10 micrometres or smaller (PM_{10}), particulate matter with diameters of 2.5 micrometres or smaller ($PM_{2.5}$), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide (CO), lead (Pb) and benzene (C_6H_6), certain toxic heavy metals arsenic (As), cadmium (Cd), nickel (Ni) and polycyclic aromatic hydrocarbons (PAH).

9.2.1.2 These limit values are legally binding on the Secretary of State. The UK Government and devolved administrations operate various national ambient air quality monitoring networks to measure compliance and develop plans to meet the set limit values for the main air pollutants.

9.2.1.3 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets out an annual-mean $PM_{2.5}$ target of 10 $\mu g.m^{-3}$ to be met by the end of 2040. As the proposed opening year of the development is before 2040 this lower target has not been considered further.

The Environment Act

9.2.1.4 The Environment Act 1995, as amended by the Environment Act 2021, established the requirement for the Government and the devolved administrations to produce a National Air Quality Strategy for improving ambient air quality, the first being published in 1997 and having been revised several times since, with the latest published in 2023 (Department for Environment, Food & Rural Affairs (Defra), 2023).

9.2.1.5 The National Air Quality Strategy sets UK air quality standards[1] and objectives[2] for the pollutants in the 2010 Regulations plus 1,3-butadiene, and recognises that action at a national, regional and local level may be needed, depending on the scale and nature of the air quality problem. There is no legal requirement to meet objectives set within the UK Air Quality Strategy except where equivalent limit values are set within the 2010 Regulations.

9.2.1.6 The Environment Act 1995 also established the UK system of Local Air Quality Management (LAQM), that requires local authorities to go through a process of review and assessment of air quality in their areas, identifying places where objectives are not likely to be met, then declaring Air Quality Management Areas (AQMAs) and putting in place Air Quality Action Plans to improve air quality. These plans also contribute, at local level, to the achievement of the limit values in the 2010 Regulations.

9.2.1.7 The limit values and objectives relevant to this assessment are summarised in **Table 9.1** of this chapter below. Where the limit values and the Air Quality Strategy (AQS) objectives differ, the more stringent objective/limit value has been used.

Table 9.1: Summary of relevant air quality limit values and objectives

Pollutant	Averaging period	Objectives/Limit Values (micrograms per cubic metre, $\mu g.m^{-3}$)	Not to be exceeded more than
Nitrogen Dioxide (NO_2)	1 hour	200 $\mu g.m^{-3}$	18 times per calendar year
	Annual	40 $\mu g.m^{-3}$	-
Particulate Matter (PM_{10})	24 Hour	50 $\mu g.m^{-3}$	35 times per calendar year
	Annual	40 $\mu g.m^{-3}$	-
Particulate Matter ($PM_{2.5}$)	Annual	20 $\mu g.m^{-3}$	-
		10 $\mu g.m^{-3}$ to be met by 31 December 2040	-

Clean air strategy

9.2.1.8 The Clean Air Strategy 2019 (Department for Energy Security and Net Zero *et al*., 2019) sets out actions that the UK Government intends to take to reduce emissions arising from transport, in the home, from farming and from industry.

[1] Standards are concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. Standards, as the benchmarks for setting objectives, are set purely with regard to scientific evidence and medical evidence on the effects of the particular pollutant on health, or on the wider environment, as minimum or zero risk levels.

[2] Objectives are policy targets expressed as a concentration that should be achieved, all the time or for a percentage of time, by a certain date.

9.2.2 Planning policy context

9.2.2.1 The Transmission Assets will be located in English offshore waters (beyond 12 nautical miles (nm) from the English coast) and inshore waters (within 12 nm from the English coast), with the onshore infrastructure located wholly within England. As set out in Volume 1, Chapter 1: Introduction of the ES, the Secretary of State for the Department for Business, Energy and Industrial Strategy (the department which preceded the Department for Energy Security and Net Zero (DESNZ)) has directed that the Transmission Assets are to be treated as development for which development consent is required under section 35 of the Planning Act 2008, as amended.

National Policy Statements

9.2.2.2 There are currently six energy National Policy Statements (NPSs), three of which contain policy relevant to offshore wind development and the Transmission Assets, specifically:

- overarching NPS for Energy (NPS EN-1) which sets out the UK Government's policy for the delivery of major energy infrastructure (DESNZ, 2023a);
- NPS for Renewable Energy Infrastructure (NPS EN-3) (DESNZ, 2023b); and
- NPS for Electricity Networks Infrastructure (NPS EN-5) (DESNZ, 2023c).

9.2.2.3 **Table 9.2** sets out a summary of the policies within the current NPSs, relevant to air quality. There are no policies specific to air quality and offshore wind in NPS EN-3 or NPS EN-5.

9.2.2.4 The policies within the current NPSs relevant to all topics in the ES can be viewed in the National Policy Statement tracker (document reference J26) and Planning Statement (document reference J28) submitted with the application.

Table 9.2: Summary of the NPS EN-1 provisions relevant to air quality

Summary of NPS EN-1 provisions	How and where considered in the ES
NPS EN-1	
'At the application stage of an energy NSIP, possible sources of nuisance under section 79(1) of the EPA 1990 and how they may be mitigated or limited should be identified by the applicant so that appropriate requirements can be included in any subsequent order granting development consent (see Section 5.7 on dust, odour, artificial light etc. and Section 5.12 on noise and vibration)' (paragraph 4.15.5 of NPS EN-1).	An assessment of dust generated during the construction and decommissioning phases is considered in **section 9.11** and mitigation measures are outlined in **Table 9.15**.
'At the application stage of an energy NSIP, possible sources of nuisance under section 79(1) of the EPA 1990 and how they may be mitigated or limited should be considered by the Secretary of State so that appropriate requirements can be included in any subsequent order granting development consent (see Section 5.7 on dust, odour, artificial light etc. and	

Summary of NPS EN-1 provisions	How and where considered in the ES
Section 5.12 on noise and vibration)' (paragraph 4.15.6 of NPS EN-1).	
'The Secretary of State should note that the defence of statutory authority is subject to any contrary provision made by the Secretary of State in any particular case in a Development Consent Order (section 158(3) of the Planning Act 2008). Therefore, subject to Section 5.7 and Section 5.12, the Secretary of State can disapply the defence of statutory authority, in whole or in part, in any particular case, but in so doing should have regard to whether any particular nuisance is an inevitable consequence of the development' (paragraph 4.15.7).	
NPS EN-1 includes generic guidance on the assessment of air quality impacts for major energy projects: 'Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the Environmental Statement.' (paragraph 5.2.8 of NPS EN-1). This requires the ES to 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; and* • *any potential eutrophication impacts*.' (paragraph 5.2.9 of NPS EN-1).	The air quality impacts during the construction and decommissioning phases of the Transmissions Assets have been described and considered within **section 9.11.2** (dust) and **section 9.11.3** (emissions from traffic) of this chapter. The chapter sets out the mitigation proposed at **Table 9.15**. Impacts during the operation and maintenance phase are not likely and have been scoped out, as outlined in **section 9.7** of this chapter. The impacts at ecological sites have been considered. The predicted concentrations at ecological sites are provided in Volume 3, Annex 9.1: Air quality impacts on ecologically designated sites of the ES, with an assessment provided in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES .
NPS EN-1 also states that: 'applicants should consider the Environment Targets (Fine Particulate Matter) (England) Regulations 2022 and associated Defra guidance' (paragraph 5.2.10 of NPS EN-1).	Air quality targets are considered in **section 9.2.1**. Impacts on air quality are assessed in **section 9.11.2**.
The NPS EN-1 highlights that 'Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling and evaluation to demonstrate local and national impacts. If an applicant believes they have robust additional supporting evidence, to the extent they could affect the conclusions of the assessment, they should include this in their representations to the Examining Authority along with the source.' (paragraph 5.2.11 of NPS EN-1) It goes on to explain that 'Where a proposed development is likely to lead to a breach of any relevant statutory air quality limits, objectives or targets, or affect the ability of a non-compliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan/strategy at	The latest Defra mapped concentration estimates are used in **section 9.5**. The results of traffic modelling show that the development will not lead to a breach of any limits or targets.

Summary of NPS EN-1 provisions	How and where considered in the ES
the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those statutory limits, objectives or targets are not breached.' (paragraph 5.2.12 of NPS EN-1)	
'The Secretary of State should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage. In doing so the Secretary of State should have regard to the Air Quality Strategy in England, or the Clean Air Plan for Wales in Wales, or any successors to these and should consider relevant advice within Local Air Quality Management guidance and PM2.5 targets guidance.' (paragraph 5.2.13 of NPS EN-1) 'The mitigations identified in Section 5.14 on traffic and transport impacts will help mitigate the effects of air emissions from transport.' (paragraph 5.2.14 of NPS EN-1)	Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). These measures are secured through the DCO, as set out in **Table 9.15**.
'Many activities involving air emissions are subject to pollution control. The considerations set out in Section 4.12 on the interface between planning and pollution control therefore apply. The Secretary of State must also consider duties under other legislation including duties under the Environment Act 2021 in relation to environmental targets and have regard to policies set out in the Government's Environmental Improvement Plan 2023.' (paragraph 5.2.15 of NPS EN-1)	The air quality impacts during the construction and decommissioning phases of the Transmissions Assets have been described and considered within **section 9.11.2** (dust) and **section 9.11.3** (emissions from traffic) of this chapter. Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). The Outline Dust Management Plan (document reference J1.2) sets out the mitigation measures that will be implemented to control dust impacts to a level that the effect would not be significant These measures are secured through the DCO, as set out in **Table 9.15**. Impacts during the operation and maintenance phase are not likely and have been scoped out, as outlined in **section 9.7** of this chapter..
'The Secretary of State should give air quality considerations substantial weight where a project would lead to a deterioration in air quality. This could for example include where an area breaches any national air quality limits or statutory air quality objectives. However, air quality considerations will also be important where substantial changes in air quality levels are expected, even if this does not lead to any breaches of statutory limits, objectives or targets.' (paragraph 5.2.16 of NPS EN-1)	Modelling has been carried out to assess changes in air quality levels from traffic-related emissions. This is outlined in **section 9.11.3**.
'The Secretary of State should give air quality considerations substantial weight where a project is proposed near a sensitive receptor site, such as an education or healthcare	Sensitive receptors have been considered within the assessment as set out in **section 9.10.3**.

Summary of NPS EN-1 provisions	How and where considered in the ES
facility, residential use or a sensitive or protected habitat.' (paragraph 5.2.17 of NPS EN-1)	
'Where a project is proposed near to a sensitive receptor site for air quality, if the applicant cannot provide justification for this location, and a suitable mitigation plan, the Secretary of State should refuse consent.' (paragraph 5.2.18 of NPS EN-1)	Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). These measures are secured through the DCO, as set out in **Table 9.15**. These measures will be implemented to control dust impacts to a level that the effect would not be significant.
'In all cases, the Secretary of State must take account of any relevant statutory air quality limits, objectives and targets. If a project will lead to non-compliance with a statutory limit, objective or target the Secretary of State should refuse consent.' (paragraph 5.2.19 of NPS EN-1)	Assessment of statutory air quality limits in **section 9.11.3**. The Transmission Assets will not result in non-compliance with limits, objectives or targets.
'The applicant should assess the potential for insect infestation and emissions of odour, dust, steam, smoke, and artificial light to have a detrimental impact on amenity, as part of the ES. *In particular, the assessment provided by the applicant should describe:* • *the type, quantity and timing of emissions* • *aspects of the development which may give rise to emissions* • *premises or locations that may be affected by the emissions* • *effects of the emission on identified premises or locations* • *measures to be employed in preventing or mitigating the emissions*.' (paragraph 5.7.5 – 5.7.6 of NPS EN-1)	An assessment of dust generated during the construction and decommissioning phases is considered in **section 9.11** and mitigation measures are outlined in **Table 9.15**. Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). These measures are secured through the DCO, as set out in **Table 9.15**. The Transmission Assets would not result in any stack emissions and all operational emissions have been scoped out of the assessment, as agreed with the Planning Inspectorate (see **section 9.7**).
'The applicant is advised to consult the relevant local planning authority and, where appropriate, the EA about the scope and methodology of the assessment.' (paragraph 5.7.7 of NPS EN-1)	The consultation process and the responses (including the Scoping Opinion (document reference J25) received are outlined in **section 9.3**.
NPS EN-1 provides the following detail regarding mitigation, in relation to air quality: *'Mitigation measures may include one or more of the following:* • *engineering: prevention of a specific emission at the point of generation; control, containment and abatement of emissions if generated* • *lay-out: adequate distance between source and sensitive receptors; reduced transport or handling of material*	Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). A Construction Traffic Management Plan (CTMP) will be produced in accordance

Summary of NPS EN-1 provisions	How and where considered in the ES
• *administrative: limiting operating times; restricting activities allowed on the site; implementing management plans* *Construction should be undertaken in a way that reduces emissions, for example the use of low emission mobile plant during the construction, and demolition phases as appropriate, and consideration should be given to making these mandatory in Development Consent Order requirements.* *Demolition considerations should be embedded into designs at the outset to enable demolition techniques to be adopted that remove the need for explosive demolition.* *A construction management plan may help clarify and secure mitigation*.' (paragraphs 5.7.8 to 5.7.11 of NPS EN-1)	with the Outline CTMP provided as part of the application (document reference J5). These measures are secured through the DCO, as set out in **Table 9.15**.

The National Planning Policy Framework

9.2.2.5 The National Planning Policy Framework (NPPF) was published in 2012 and updated in 2018, 2019, 2021 and 2023 (Department for Levelling Up, Housing and Communities, 2023). The NPPF sets out the Government's planning policies for England.

9.2.2.6 At the heart of the NPPF is a presumption in favour of sustainable development, subject to caveats where a plan or project affects a site designated for its ecological value. When determining planning applications, this means approving development proposals if they accord with an up-to-date local development plan, unless material considerations indicate otherwise. If the development plan does not contain relevant policies, or the policies are out of date, then consent should be granted unless the application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason for refusing the development, or any adverse impacts would significantly outweigh the benefits.

9.2.2.7 The Government has published proposed reforms to the NPPF for consultation on 30 July 2024, with the consultation period ending on 24 September 2024 (Ministry of Housing, Communities and Local Government, 2024). Following consultation, the NPPF will be updated.

9.2.2.8 **Table 9.3** sets out a summary of the NPPF policies relevant to this chapter.

Table 9.3: Summary of NPPF requirements relevant to this chapter

Policy	Key provisions	How and where considered in the ES
Paragraph 8c	'An environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution and mitigating and adapting to climate change, including moving to a low carbon economy'	The air quality impacts during the construction and decommissioning phases of the Transmissions Assets have been described and considered within **section 9.11.2** (dust) and **section 9.11.3** (emissions from traffic) of this chapter. Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). A Construction Traffic Management Plan (CTMP) will be produced in accordance with the Outline CTMP provided as part of the application (document reference J5). These measures are secured through the DCO, as set out in **Table 9.15**. Impacts during the operation and maintenance phase are not likely and have been scoped out, as outlined in **section 9.7** of this chapter.
Paragraph 109	'The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making'.	
Paragraph 180	'Planning policies and decisions should contribute to and enhance the natural and local environment by:… Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; …'	
Paragraph 192	'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'.	

9.2.2.9 The consultation draft includes similar provisions as the designated NPPF. The consultation draft NPPF has been reviewed and there are no material updates for air quality.

9.2.2.10 The Planning Practice Guidance (PPG) (Department for Levelling Up, Housing and Communities, previously the Ministry of Housing, Communities and Local Government, 2023) supports the NPPF and provides guidance across a range of topic areas.

9.2.2.11 The Air Quality section of the PPG describes the circumstances when air quality, odour and dust can be a planning concern, requiring assessment.

9.2.2.12 The PPG advises that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations. This includes 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 states that when deciding whether air quality is relevant to a planning application, considerations could include the following:

- '*Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*
- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value*.' (Paragraph 006, ID: 32-006-20191101).

9.2.2.13 The PPG provides advice on how air quality impacts can be mitigated and notes the following.

'Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met.' (Paragraph 008)

Local planning policy

9.2.2.14 The onshore elements of the Transmission Assets are located within the administrative areas of Fylde Council, Blackpool Council, South Ribble Borough Council and Preston City Council (and Lancashire County Council at the County level).

9.2.2.15 The relevant local planning policies applicable to air quality based on the extent of the study areas for this assessment are summarised in **Table 9.4**. There are no relevant policies in the Fylde Local Plan to 2032 (incorporating Partial Review) (Fylde Council, 2021). Preston City Council and South Ribble Borough Council have a joint Local Plan (with Chorley Council) with air quality policies in the Central Lancashire Adopted Core Strategy (Preston City Council, South Ribble Borough Council and Chorley Council, 2012).

Table 9.4: Summary of local planning policy relevant to this chapter

Policy	Key provisions	How and where considered in the ES
Central Lancashire Adopted Core Strategy July 2012* (Preston City Council, South Ribble Borough Council and Chorley Council, 2012).		
Policy 28: Renewable and Low Carbon Energy Schemes	'Proposals for renewable and low carbon energy schemes will be supported and planning permission granted where the following criteria are met: […] c) Any […] odour, traffic or other impact of development is mitigated so as not to cause unacceptable detriment to local amenity; d) Any significant adverse effects of the proposal are considered against the wider environmental, social and economic benefits, including scope for appropriate mitigation, adaptation and/or compensatory provisions.'	Traffic generated during the construction phase has been assessed using detailed dispersion modelling in **section 9.11.3**. There are no sources of odour associated with any phase of the Transmission Assets (no plant, stack or waste emissions). There is therefore no potential for odour impacts and this has been scoped out of the assessment. No significant adverse air quality effects have been predicted (**section 9.11**).
Policy 30: Air Quality	'Improve air quality through delivery of Green Infrastructure initiatives and through taking account of air quality when prioritising measures to reduce road traffic congestion'.	Traffic generated during the construction phase has been assessed using detailed dispersion modelling in **section 9.11.3**.
Blackpool Local Plan Part 2: Site Allocations and Development Management Policies February 2023 (Blackpool Council, 2023).		
Policy DM36: Controlling Pollution and Contamination	'1. Development will be permitted where in isolation or in conjunction with other planned or committed developments it can be demonstrated that the development: a. Will be compatible with adjacent existing uses and would not lead to unacceptable adverse effects on health, amenity, safety and the operation of surrounding uses and for occupants, users of the development itself or designated sites of importance for biodiversity, with reference to noise, vibration, odour, light, dust, other pollution or nuisance. Applications will be required to be accompanied, where appropriate by	Construction effects of the Transmission Assets are set out in **section 9.11**. Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2).

Policy	Key provisions	How and where considered in the ES
	relevant impact assessments and mitigation proposals;[…] c. Will not give rise to a deterioration of air quality in a defined Air Quality Management Area in Blackpool Town Centre or result in the declaration of a new AQMA. Where appropriate an air quality impact assessment will be required to support development proposals; d. Where development will result in, or contribute to, a deterioration in air quality, permission will only be granted where any such harm caused is significantly and demonstrably outweighed by other planning considerations and appropriate mitigation measures are provided to minimise any such harm.'	A Construction Traffic Management Plan (CTMP) will be produced in accordance with the Outline CTMP provided as part of the application (document reference J5). These measures are secured through the DCO, as set out in **Table 9.15**. The air quality impacts from traffic generated by the scheme are not significant (**see section 9.11.3**) of this chapter.

*Joint document prepared for Preston City Council, South Ribble Borough Council and Chorley Council.

Relevant Guidance

9.2.2.16 This air quality assessment covers the elements recommended in the PPG. The approach is consistent with the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning For Air Quality document (EPUK and IAQM, 2017), the IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2024), the IAQM A guide to the assessment of air quality impacts on designated nature conservation sites 2020 (IAQM,.2020) and, where relevant, Defra's LAQM TG22 (Defra, 2022a). These guidance documents form the basis for the assessment methodology, scoping criteria and significance criteria used in this chapter.

9.3 Consultation

9.3.1 Scoping

9.3.1.1 On 28 October 2022, the Applicants submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects for the construction, operation and maintenance and decommissioning phases of the Transmission Assets.

9.3.1.2 Following consultation with the appropriate statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on 8 December 2022.

9.3.2 Statutory consultation responses

9.3.2.1 The preliminary findings of the EIA process were published in the Preliminary Environmental Information Report (PEIR) in October 2023. The PEIR was prepared to provide the basis for formal consultation under the Planning Act

2008. This included consultation with statutory and non-statutory bodies under section 42 and 47 of the Planning Act 2008.

9.3.3 Summary of consultation responses received

9.3.3.1 A summary of the key items raised specific to air quality is presented in **Table 9.5**, together with how these have been considered in the production of this chapter. It should however be noted that formal responses are provided for all consultation responses received and can be accessed in the Consultation Report (document reference E1).

Table 9.5: Summary of key consultation comments raised during consultation activities undertaken for the Transmission Assets relevant to air quality

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
December 2022	Planning Inspectorate, Scoping Opinion	The Inspectorate considers that it is unlikely that the impact of air emissions arising from the offshore elements of the Proposed Development would result in significant effects and is content to scope this matter out.	Impacts arising from the offshore and intertidal elements of the Transmission Assets have been scoped out of the air quality assessment as agreed with the Planning Inspectorate.
December 2022	Planning Inspectorate, Scoping Opinion	The Scoping Report states that activities associated with the operation and maintenance of the onshore elements of the Transmission Assets are unlikely to generate dust and therefore this phase of the development is unlikely to result in significant effects. The Inspectorate agrees that these activities can be scoped out of the assessment based on the information provided.	Impacts arising from dust during the operation and maintenance phase of the Transmission Assets have been scoped out of the air quality assessment as agreed with the Planning Inspectorate.
December 2022	Planning Inspectorate, Scoping Opinion	The Scoping Report states that operation of the onshore elements of the Transmission Assets will generate a small number of additional two-way vehicle movements as a result of staff trips and occasional maintenance activities, but the vehicle movements would not exceed the Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) indicative criteria for an air quality assessment, irrespective of whether the air quality study area was located within or adjacent to an AQMA. The Inspectorate agrees that the potential impact on human or ecological receptors arising from air emissions generated by vehicle traffic during operation and maintenance of the onshore elements of the Transmission Assets is unlikely to be significant and that this can be scoped out of the assessment for air quality. The ES should describe the likely number and type of operational and maintenance vehicles that will be required.	As set out in Volume 1, Chapter 3: Project description of the ES, the onshore substations will be unmanned and traffic will be restricted to preventative and corrective works. Vehicular access will also be required to maintain the ecological mitigation areas (refer to Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES). Therefore, traffic flows during the operation and maintenance phase will be below the thresholds for air quality assessment. Operation of the onshore elements of the Transmission Assets will generate a small number of additional two-way vehicle movements as a result of staff trips and occasional maintenance activities.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			However, the additional two-way vehicle movements associated with operation and maintenance of the onshore elements of the Transmission Assets are unlikely to exceed the EPUK and IAQM indicative threshold criteria (see **section 9.10.3**) for an air quality assessment, irrespective of whether the study area was located within or adjacent to an AQMA. Therefore, the impact on human or ecological receptors arising from air emissions generated by vehicle traffic during operation and maintenance of the onshore transmission assets is unlikely to result in a significant effect and an air quality assessment has been scoped out. This approach was agreed with the Planning Inspectorate.
December 2022	Planning Inspectorate, Scoping Opinion	The Scoping Report states that the Transmission Assets do not include proposals for any plant or emissions stacks which could give rise to air emissions during operation of the onshore elements and this matter is therefore proposed to be scoped out of the assessment for air quality. The Inspectorate agrees that this matter can be scoped out of the assessment on the basis of the information presented in the Scoping Report.	Impacts arising from emissions from plant and stacks have been scoped out of the air quality assessment as agreed with the Planning Inspectorate.
December 2022	Planning Inspectorate, Scoping Opinion	The screening exercise undertaken to identify which ecological receptors are located within the air quality study area and which are specifically sensitive to air pollution should be clearly set out in the ES. Any ecological sites which are excluded from the air quality assessment in the ES should be fully justified based on evidence and in consultation with statutory consultation bodies and local authorities.	Ecological receptors within the relevant distances of the Onshore Order Limits are outlined in **Table 9.34** and have been considered in the assessment of construction dust. The impacts at ecological sites have been considered. The predicted concentrations at ecological sites are provided in Volume 3, Annex 9.1: Air quality impacts on

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			ecologically designated sites of the ES, with an assessment provided in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.
December 2022	Natural England, Scoping Opinion	Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example, over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (https://www.apis.ac.uk/). Further information on air pollution modelling and assessment can be found on the Environment Agency website.	Ecological receptors within the relevant distances of the Onshore Order Limits are outlined in **Table 9.34** and have been considered in the assessment of dust for the construction and decommissioning phases. As outlined in **Table 9.2** traffic generated during the construction phase has been assessed using detailed dispersion modelling in **section 9.11.3**. The impacts at ecological sites have been considered. The predicted concentrations at ecological sites are provided in Volume 3, Annex 9.1: Air quality impacts on ecologically designated sites of the ES, with an assessment provided in Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.
November 2023	Fylde Council, statutory consultation response	The location of the substations in relative close proximity to established residential settlements and individual residential properties is of concern to the council and the lack of detailed information to allow an assessment of these impacts heightens that concern. It also seems that the opportunity for those property owners to fully appreciate the potential location and scale of the infrastructure relative to their property undermines the value of the consultation process at this stage.	Once operational, the substations will not have any emissions to air (such plant/stack emissions). Impacts arising from emissions from plant and stacks have been scoped out of the air quality assessment as agreed with the Planning Inspectorate (see **Table** 9.14). Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			Outline Dust Management Plan (document reference J1.2). Volume 1, Chapter 4: Site selection and consideration of alternatives of the ES outlines the justification for the substation locations.
November 2023	Treales, Roseacre and Wharles Parish Council, statutory consultation response	The developer's documentation has currently failed to evidence that they have given weight to, or mitigation of the adverse impacts on the local: residents, communities, economies and environments on: i. amenity (disruption & destruction of the rural character of the area, disruption due to construction & traffic), ii. health & well-being (including emissions giving rise to: respiratory impacts- in construction & restoration; aural impacts– throughout the 6 decade programme life cycle from activity, plant and equipments; and potentially, electro-magnetic impacts - in operation throughout the life of the programme. iii. highway safety (through inadequate specification & control of traffic. Plus proposed use of narrow rural lanes, also used for residential & leisure access with consequential severe impacts on all users).	Traffic emissions have been considered in **section 9.11.3**. During construction, mitigation will be implemented to reduce impacts of dust (see **Table 9.15**). Effects on health are considered in Volume 1, Annex 5.1: Human health of the ES**.**
November 2023	Blackpool and The Fylde College, statutory consultation response	Will there be regular reports on air quality throughout the project available? Is there an alert system in place in case of any deterioration of air quality.	Impacts during construction will be controlled through the Code of Construction Practice (CoCP). An Outline CoCP is provided as part of the application (document reference J1). This includes an Outline Dust Management Plan (document reference J1.2). IAQM guidance indicates that implementation of these measures is effective.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			The assessment indicates that there would be no significant effects arising from air quality emissions from traffic during the construction or decommissioning phases. Effects during the operational phases are not likely and have been scoped out in agreement with the Planning Inspectorate (see **Table** 9.14). As set out in the Outline Dust Management Plan (document reference J1.2), complaints will be recorded and can be provided to the council on request.
November 2023	Cllr Bev Duckworth - Newton with Clifton Parish Council, statutory consultation response	The massive number of vehicle movements during the construction of this project will have a detrimental effect on communities. Transport links must not be through areas of high population density particularly Links 39, 43, 45, 46, 52, 53, 61 [set out within Volume 3, Chapter 7: Traffic and transport of the ES].	Traffic emissions have been considered in **section 9.11.3**

9.4 Study area

9.4.1.1 Guidance on the assessment of dust from demolition and construction (IAQM, 2024) indicates that there could potentially be nuisance dust and particulate matter (PM) with diameters of 10 micrometres or smaller (PM_{10}) effects on human heath receptors located within 250 m of onsite construction activities and ecological receptors located with 50 m of onsite construction activities.

9.4.1.2 The study area for dust has been defined with respect to construction dust and covers an area up to 250 m around the Onshore Order Limits. The location and geographic extent of the study area used to inform the dust assessment is presented in Figure 9.1 (see Volume 3, Figures).

9.4.1.3 In accordance with the LAQM Technical Guidance (Defra, 2022a), the assessment of traffic emissions includes all roads on which there is a significant change in traffic (over 100 Heavy Goods Vehicles (HGVs) or 500 Light Good vehicles (LGVs) in an area without an AQMA). It also includes ecological receptors within 200 m of a road where there is an increase in Annual Average Daily Traffic (AADT) flows of 1000 total vehicles or 200 HGVs. This is the study area used during traffic modelling.

9.5 Baseline methodology

9.5.1 Methodology for baseline studies

Desk studies

9.5.1.1 A comprehensive desk-based review was undertaken to inform the baseline for air quality. The existing studies and datasets referred to as part of the desk-based review are summarised in **Table 9.6** below.

Table 9.6: Summary of desk study sources

Title	Source	Year	Author
Blackpool Council 2023 Air Quality Annual Status Report (Blackpool Council, 2023)	Blackpool Council	2023	Blackpool Council
Fylde Council 2022 Air Quality Annual Status Report (Fylde Council, 2022)	Fylde Borough Council	2022	Fylde Borough Council
Preston City Council 2023 Air Quality Annual Status Report (Preston City Council, 2023)	Preston City Council	2023	Preston City Council
South Ribble 2024 Air Quality Annual Status Report (South Ribble Borough Council, 2024)	South Ribble Borough Council	2024	South Ribble Borough Council
Defra projections of pollutant concentrations for years from 2018 to 2030 for each 1 kilometre (km) grid square in the UK (Defra, 2018)	UK Air Information Source - Background Mapping data for local authorities - 2018	2018	Defra

9.6 Baseline environment

9.6.1 Desk study

9.6.1.1 Information on air quality surrounding the study areas was collected through a detailed review of existing studies and datasets. These are summarised at **Table 9.6**.

Review and assessment process

9.6.1.2 The nearest AQMAs are over 3 km to the east of the Onshore Order Limits in Penwortham, which have been designated due to elevated concentrations of NO_2. There is also an AQMA in Blackpool, near Talbot Road, also designated due to elevated concentrations of NO_2.

9.6.1.3 There are no AQMAs within the study area designated due to elevated concentrations of PM_{10}, which indicates that PM_{10} concentrations in the area are relatively low.

Local monitoring

9.6.1.4 There are two local monitoring stations where urban background concentrations are measured using continuous automatic instruments.

9.6.1.5 Preston City Council monitors NO_2, PM_{10}, and $PM_{2.5}$ at the PRA2 urban background location.

9.6.1.6 Additionally, Defra monitors NO_2, PM_{10}, and $PM_{2.5}$ at the Blackpool Marton monitoring site as part of the Automatic Urban and Rural Network. Measured PM_{10} concentrations are only available from July 2019 onwards. Concentrations measured during 2020 and 2021 may have been affected by the COVID-19 lockdowns and are not therefore necessarily representative of current concentrations as outlined in the IAQM Position Statement on '*Use of 2020 and 2021 Monitoring Datasets'* (IAQM, 2021). Nevertheless, measured concentrations have been considered to ensure the assessment is conservative.

Table 9.7: Automatically monitored urban background annual-mean concentrations

Monitor name	Distance from Transmission Assets (km)	Pollutant	PM_{10} concentrations ($\mu g.m^{-3}$)				
			2019	2020	2021	2022	2023
Blackpool Marton (UKA00488)	3.4	NO_2	12.2	9.2	10.1	9.8	8.4
		PM_{10}	13.4	14.8	12.2	13.6	12.2
		$PM_{2.5}$	9.2	8.2	7.3	7.9	7.0
Bootle Street (PRA2)	17.3	NO_2	23	18	20	18	-
		PM_{10}	12	13	13	14	-
		$PM_{2.5}$	9	7	8	8	-

9.6.1.7 In addition, Blackpool Council and South Ribble Council manually monitor NO_2 concentrations at a number of urban background locations using passive diffusion tubes and the most recently measured annual-mean concentrations are presented in **Table 9.8**.

Table 9.8: Passively monitored urban background annual-mean NO_2 concentrations

Monitor code	Monitor name	Distance from Transmission Assets (km)	NO_2 concentrations ($\mu g.m^{-3}$)				
			2019	2020	2021	2022	2023
DF11	The Mitre	10.0	22.2	15.1	16.3	18.4	-
1, 2, 3	Civic Centre, Leyland	17.5	17.2	12.4	12.2	11.7	10.6

9.6.1.8 Defra's total annual-mean NO_2 concentration estimates have been collected for the 1 km grid square of the monitoring sites and are summarised in **Table 9.9**.

Table 9.9: Comparison of automatically monitored annual-mean NO_2 concentrations with Defra Mapped Concentration

Site ID	Site type	Distance from Transmission Assets (km)	NO_2 concentrations ($\mu g.m^{-3}$)					
			2019	2020	2021	2022	2023	Defra
UKA00488	Urban Background	3.4	12.2	9.2	10.1	9.8	8.4	15.0
DF11	Urban background	10.0	22.2	15.1	16.3	18.4	-	11.2
PRA2	Urban Background	17.3	23	18	20	18	-	14.5
1, 2, 3	Urban Background	17.5	17.2	12.4	12.2	11.7	10.6	10.6
Onshore Order Limits	-	-	-	-	-	-	-	5.5 – 10.4

9.6.1.9 Similarly, the Defra total annual-mean PM_{10} and $PM_{2.5}$ concentration estimates have been collected for the grid squares of the monitoring sites and are summarised in **Table 9.10**.

Table 9.10: Comparison of automatically monitored annual-mean PM_{10} and $PM_{2.5}$ concentrations with Defra Mapped Concentration

Site ID	Site Type	Pollutant	PM concentrations (µg.m^{-3})					
			2019	2020	2021	2022	2023	Defra
UKA00488	Urban Background	PM_{10}	13.4	14.8	12.2	13.6	12.2	10.7
		$PM_{2.5}$	9.2	8.2	7.3	7.9	7.0	7.5
PRA2	Urban Background	PM_{10}	12	13	13	14	-	13.3
		$PM_{2.5}$	9	7	8	8	-	9.2
Onshore Order Limits	-	PM_{10}	-	-	-	-	-	8.3 – 11.5
	-	$PM_{2.5}$	-	-	-	-	-	5.6 – 7.1

Appropriate background concentrations for the study area

9.6.1.10 For NO_2, the Defra mapped background concentration estimates are generally lower than the range of results from monitoring. On that basis, to ensure the assessment is conservative, the background NO_2 concentration used in the air quality assessment has been derived from the highest measured concentration at the nearest monitoring location - the Blackpool Marton Automatic Urban and Rural Network site of 12.2 µg.m^{-3}.

9.6.1.11 For PM_{10}, the Defra mapped background concentration estimate at Blackpool Marton is below the range of results from monitoring. On that basis, to ensure the assessment is conservative, the background PM_{10} concentration used in the air quality assessment has been derived from the highest measured concentration at the Blackpool Marton Automatic Urban and Rural Network site of 14.8 µg.m^{-3}.

9.6.1.12 For $PM_{2.5}$, the Defra mapped background concentration estimate is within the range of results from monitoring at the location closest to the site – Blackpool Marton. At Bootle Street, the Defra concentration estimate is slightly above the range. On that basis, to ensure the assessment is conservative, the background $PM_{2.5}$ concentration used in the air quality assessment has been derived from the highest measured concentration at the Blackpool Marton Automatic Urban and Rural Network site of 9.2 µg.m^{-3}.

9.6.2 Designated sites

9.6.2.1 All designated sites within the study area and qualifying interest features that could be affected by the construction and decommissioning phases of the Transmission Assets are set out in **Table 9.11**.

Table 9.11: Designated sites and relevant qualifying interests

Designated site	Distance to the Transmission Assets (nearest point)	Relevant qualifying interest
Ribble and Alt Estuaries Special Protection Area (SPA) and Ramsar site	Within Onshore Order Limits	Features sensitive to dust.
Ribble Estuary Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR)	Within Onshore Order Limits	Features sensitive to dust.
Newton Marsh SSSI	0.02 km	Features sensitive to dust.
Lytham St Annes Dunes SSSI	Within Onshore Order Limits	Features sensitive to dust.
Lytham St Annes Local Nature Reserve (LNR)	Within Onshore Order Limits	Features sensitive to dust.
Southern section of Fishwick Bottoms LNR	0.03 km	Features sensitive to dust.

9.6.3 Future baseline conditions

9.6.3.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) require that, as well as a description of the current baseline, the ES must include '*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*' is included within the ES. This section provides an outline of the likely future baseline conditions in the absence of the Transmission Assets.

9.6.3.2 With UK-wide initiatives such as those set out in the Clean Air Strategy (Defra, 2019), air quality is likely to improve over time. However, to ensure that the assessment presents conservative (worst case) results, no reduction in the background concentration has been assumed in future years.

9.6.4 Key receptors

9.6.4.1 **Table 9.12** identifies the receptors taken forward into the assessment. These are based on the study areas set out in **section 9.4.**

Table 9.12: Key receptors taken forward to assessment

Receptor	Description
All human health receptors within 250 m of the Onshore Order Limits	All human-health receptors within 250 m of the Onshore Order Limits.
All designated ecological receptors within 50 m of the Onshore Order Limits	All designated ecological receptors within 50 m of the Onshore Order Limits.
Highway links identified within Volume 3: Chapter 7: Traffic and transport of the ES.	Highway links on which there is a significant change in traffic (over 100 Heavy Goods Vehicles (HGVs) or 500 Light Good vehicles (LGVs) in an area without an AQMA) as a result of construction of the Transmission Assets: Onshore.
Designated ecological receptors within 200 m of highway links that exceed thresholds.	All ecological receptors within 200 m of road links where the change in AADT flows exceeds 1000 total vehicles or 200 heavy duty vehicles (HDVs).

9.7 Scope of the assessment

9.7.1.1 The scope of this ES has been developed in consultation with relevant statutory and non-statutory consultees as detailed in **Table 9.5.**

9.7.1.2 Taking into account the scoping and consultation process, **Table 9.13** summarises the impacts considered as part of this assessment.

Table 9.13: Impacts considered within this assessment

Activity	Impacts scoped into the assessment
Construction and decommissioning phase	
Construction and decommissioning of Transmission Assets – dust and suspended particulate matter	This chapter focuses on the potential impacts from dust soiling (nuisance) on property arising from dust emissions. It also focuses on the impact of an increase in suspended particulate matter on people and ecological receptors from dust emissions generated during construction of the Transmission Assets and considers mitigation and residual effects. This is covered in **section 9.11**.
Construction and decommissioning of Transmission Assets – vehicle emissions	Emissions from the construction vehicle movements have been assessed using detailed dispersion modelling as outlined in **section 9.11**.

9.7.1.3 Impacts that are not likely to result in significant effects have been scoped out of the assessment. A summary of the impacts scoped out, together with justification for scoping them out and whether the approach has been agreed with key stakeholders through either scoping or consultation, is presented in **Table 9.14**.

Table 9.14: Impacts scoped out of the assessment

Impact	Justification
The impact on air quality of the offshore and intertidal areas.	Offshore and intertidal areas will not generate any dust or other pollutants (and no sources of highway emissions are present in these areas).
The impact on human and ecological receptors (dust soiling and human health) arising from fugitive dust emissions generated during operation and maintenance phase.	Activities associated with the operation and maintenance of the onshore elements of the Transmission Assets are unlikely to generate large quantities of dust. Therefore, the potential impact on human or ecological receptors arising from fugitive dust emissions generated during operation and maintenance phase of the onshore elements of the Transmission Assets is unlikely to be significant and has been scoped out of the assessment for air quality. This approach was agreed in the Scoping Opinion (see **section 9.3.1** and Volume 1, Annex 5.1: Human health of the ES).
The impact on human and ecological receptors arising from air emissions generated by vehicle traffic during operation and maintenance.	Operation of the onshore elements of the Transmission Assets will generate a small number of additional two-way vehicle movements as a result of staff trips and occasional maintenance activities. However, the additional two-way vehicle movements associated with operation and maintenance of the onshore elements of the Transmission Assets are unlikely to exceed the EPUK and IAQM indicative threshold criteria (see **section 9.10.3**) for an air quality assessment, irrespective of whether the study area was located within or adjacent to an AQMA. Therefore, the potential impact on human or ecological receptors arising from air emissions generated by vehicle traffic during operation and maintenance of the onshore elements of the Transmission Assets is unlikely to be significant and an air quality assessment has been scoped out. This approach was agreed in the Scoping Opinion (see **section 9.3.1).**
The impact on human and ecological receptors arising from air emissions generated by plants or stacks during operation and maintenance of the onshore Transmission Assets	The Transmission Assets do not include proposals for the construction of plants or stacks which could give rise to air emissions during operation of the onshore elements of the Transmission Assets. Therefore, the potential impact on human or ecological receptors arising from plant or stack emissions is unlikely to be significant and has been scoped out of the assessment for air quality. This approach was agreed in the Scoping Opinion (see **section 9.3.1).**

9.8 Measure adopted as part of the Transmission Assets (commitments)

9.8.1.1 For the purposes of the EIA process, the term ‘measures adopted as part of the Transmission Assets’ is used to include the following two types of mitigation measures (adapted from the Institute for Environmental Management and Assessment (IEMA), 2016). These measures are set out in Volume 1, Annex 5.3: Commitments register of the ES.

- Embedded mitigation. This includes the following:
  - Primary (inherent) mitigation – measures included as part of the project design. IEMA describes these as ‘modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional

action to be taken'. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and/or marine licences. For example, a reduction in footprint or height.

  - Tertiary (inexorable) mitigation. IEMA describes these as 'actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects'. It may be helpful to secure such measures through a Code of Construction Practice or similar.

- Secondary (foreseeable) mitigation. IEMA describes these as 'actions that will require further activity in order to achieve the anticipated outcome'. These include measures required to reduce the significance of environmental effects (such as lighting limits) and may be secured through environmental management plan.

9.8.1.2 In addition, where relevant, measures have been identified that may result in enhancement of environmental conditions. Such measures are clearly identified within the commitments register (see Volume 1, Annex 5.3: Commitments register of the ES). The measures relevant to this chapter are summarised in **Table 9.15**. Further details of the dust control measures to be adopted are provided in the Outline Dust Managememnt Plan (document refrence J1.2) based on the measures that are highly recommended by the IAQM for sites with high dust risk (IAQM, 2024).

9.8.1.3 Embedded measures that will form part of the final design (and/or are established legislative requirements/good practice) have been taken into account as part of the initial assessment presented in **section 9.11** below (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures to which the Applicants are committed are taken into account in the assessment of effects.

9.8.1.4 Where an assessment identifies likely significant adverse effects, further or secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by IEMA as actions that will require further activity in order to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES (referred to as secondary mitigation measures in IEMA, 2016). For further or secondary measures both pre-mitigation and residual effects are presented.

9.8.1.5 There are no secondary or tertiary measures required for the assessment.

Table 9.15: Measures (Commitments) adopted as part of the Transmission Assets

Commitment number	Measure adopted	How the measure will be secured
Embedded mitigation		
CoT33	An Outline Dust Management Plan (DMP) has been prepared as part of the Outline CoCP and submitted as part of the application for development consent. Detailed CoCP(s) will be developed in accordance with the Outline CoCP. The measures in the detailed DMP(s) will accord with guidance set out by the Institute of Air Quality guidance Management (IAQM, 2024) where appropriate and practicable, and will include measures for monitoring and reporting dust levels, and dust suppression and mitigation measures during construction and operation.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT35	An Outline Code of Construction Practice (CoCP) has been prepared and submitted with the application for development consent. Detailed CoCP(s) will be developed in accordance with the Outline CoCP. The Outline CoCP includes measures to maintain and address: • flood protection and control measures; • water environment and drainage; • pollution prevention; • geology and ground conditions; • ecology and nature conservation (including protected species and invasive species); • historic environment; • soil management; • traffic and transport; • noise management measures; • air quality and dust management; • landscape and visual; • recreation; and • bentonite breakout.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT36	Onshore Decommissioning Plan(s) will be developed prior to decommissioning. The Onshore Decommissioning Plan(s) will include provisions for the removal of all onshore above ground infrastructure and the decommissioning of below ground infrastructure (if and where relevant and practicable), and details relevant to flood risk, pollution prevention and avoidance of ground	DCO Schedules 2A & 2B, Requirement 22 (Onshore decommissioning)

Commitment number	Measure adopted	How the measure will be secured
	disturbance. The Onshore Decommissioning Plan(s) will be in line with the latest relevant available guidance.	
CoT38	"n Outline Construction Traffic Management Plan (CTMP) has been prepared and submitted with the application for development consent. CTMP(s) will be developed in accordance with the outline CTMP prior to construction. The detailed CTMP(s) will set out measures to include: 1. managing the numbers and routing of HGVs during the construction phase; 2. managing the movement of construction worker traffic during the construction phase; 3. details of measures to manage the safe passage of HGV traffic via the local highway network; and 4. details of localised road improvements if and where these may be necessary to facilitate safe use of the existing road network.	DCO Schedules 2A & 2B, Requirement 9 (Traffic and Transport)
CoT44	The Project Description (Volume 1, Chapter 3 of the Environmental Statement) sets out that the installation of the offshore export cables under Lytham St Annes SSSI and the St Annes Old Links Golf Course will be undertaken by direct pipe trenchless installation technique. The exit pits associated with the direct pipe installation will be at least 100 m seaward of the western boundary of the SSSI.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)

9.9 Key parameters for assessment

9.9.1 Maximum design scenario

9.9.1.1 The maximum design scenarios identified in **Table 9.16** have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope provided in Volume 1, Chapter 3: Project description of the ES. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g., different infrastructure layout), to that assessed here be taken forward in the final design.

Table 9.16: Maximum Design Scenario considered for the assessment of impacts

Impact	Phase [a]			Maximum Design Scenario	Justification
	C	O	D		
The impact of dust soiling (nuisance) on property arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	**Construction phase: landfall** • The offshore export cables between the transition joint bay working area within Blackpool Airport and the beach will be installed using the direct pipe trenchless technique for a maximum length of 1,500 m. It is anticipated the direct pipe exit will be 100 m from the boundary of Lytham St Annes Dunes SSSI. • Entry pits for the direct pipe will be situated within the transition joint bay area within Blackpool Airport: The maximum number of entry pits will be six, with a maximum direct drill entry pit area of 450 m2 per circuit with a depth of 6 m. The total duration of entry pit works which is included within the overall transition joint bay construction works is 29 months assuming a sequential construction scenario. • Exit pits on the beach: The maximum number of exit pits will be six, with a maximum area of drill exit pit of 875 m^2 per circuit, with a depth of 3 m. The maximum cofferdam area dimensions per pit is 75 m^2 (15 m x5 m). The total duration of exit pit works on the beach is 2 weeks per circuit. • For the offshore export cable installation between exit pits and MLWS, the burial at the of the offshore export cables seaward of the direct pipe exit pits will via open trenching. The maximum number of trenches will be six. The maximum width of the stepped trench is 10 m at the top and 3 m at the bottom and are each 3 m deep. The maximum length per trench is 300 m with a maximum working area each side of the trench of 25 m. • The open trench will transition to a beach trencher, this will be 3 m wide and up to 1,250 m long, the trench will be contained within a working corridor with a 50 m width. • Cable pull in and burial will take up to six weeks per circuit and the maximum total duration of cable pull in and burial is 36 weeks assuming a sequential construction scenario. • There will be up to four compounds required west of the transition joint bays to MLWS: – Compound 1 (welfare): 300 m^2 to be active for 36 weeks;	**Construction phase** Open cut trenching will result in the largest compound footprint and largest areas of disturbance. The combination of direct pipe (beneath the dunes) plus open cut trenching on the beach represents the Maximum Design Scenario in terms of the potential for dust soiling and suspended particulate matter generated by construction. In terms of areas affected by the onshore export and 400k V cables and onshore substations, the Maximum Design Scenario is represented by the largest working areas and number of trenches, which arise from the construction of the Transmission Assets. In terms of duration, the Maximum Design Scenario is represented by sequential construction of the Transmission Assets (rather than concurrent construction). **Decommissioning phase** Decommissioning is likely to operate within the parameters identified for construction.
The impact of an increase in suspended particulate matter on people arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓		
The impact of dust deposited on ecological receptors arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓		

Impact	Phase [a]			Maximum Design Scenario	Justification
	C	O	D		
				– Compound 2: 2,500 m^2 to be active for 48 weeks; – Compound 3: 510 m^2 to be active for 48 weeks; and – Compound 4: 600 m^2 to be active for 36 months (in a sequential constriction scenario). • There will be two transition joint bay compounds (10,000 m2 for Morgan and 10,000 m2 for Morecambe) within Blackpool Airport to facilitate construction works, to be active for up to 29 months over a 45 month period. – Maximum working area of the transition joint bay: 4,900 m^2 for Morgan and 2,800 m^2 for Morecambe. **Construction phase: onshore export cables** • The maximum number of trenches will be six, with a target trench depth of 1.8 m. • Onshore export cable construction corridors width 100 m, with a length of up to 17 km. Width will include two haul roads. There will be up to 110 joint bays and 110 link boxes, with 1,000 m^3 and 8 m^3 of material excavated for each joint bay and link box respectively. • There will be up to ten construction compounds along the onshore export cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,500 m^2; – 6 type B compounds a maximum total area of 79,500 m^2; and – 2 type C compounds a maximum total area of 17,500 m2. • The maximum number of HDD locations is 120. Each major HDD location will have a compound, measuring up to 100 m x 50 m. Drilling mud will be stored and used at these compounds. • No excavation or intrusive works in the biodiversity benefit/mitigation areas. **Construction phase: onshore substations** • The combined permanent footprint of the Morecambe onshore substation and Morgan onshore substation 223,500 m^2, including eight main	

Impact	Phase [a]			Maximum Design Scenario	Justification
	C	O	D		
				buildings, with two access roads at 15 m width (each) and temporary substation compound. • The area of temporary compounds (combined) includes working and laydown areas (excludes permanent substation footprint) is 122,500 m^2 (additional to permanent footprint). Duration: enabling works 12 months, main construction 54 months, testing/commissioning 21 months (sequential construction scenario). **Construction Phase: 400 kV grid connection cables** • Open cut trenching: The maximum number of trenches will be four, with a target trench depth of 1.8 m. The width of the permanent cable corridor is 50 m. There will be a total of 60 joint bays and 60 link boxes. • The working area will include a construction corridor width of 76 m (which includes two haul roads), with a length of up to 13 km. Duration of installation of up to 66 months (sequential construction scenario). • There will be a maximum of 46 HDD crossings (excluding the Ribble Estuary crossing) and the HDD compound locations will be 100 m x 50 m. • Trenchless technologies will be used to cross the River Ribble. Micro-tunnelling is considered to represent the MDS due to the depth of the entry/exit pits. The temporary compound at the launch/exit (two compounds) area would be a maximum of 75 m x 400 m. There will be a maximum of four tunnels/bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. • There will be up to eight construction compounds along the 400 kV grid connection cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,270 m2; – 4 type B compounds a maximum total area of 52,540 m2; and – 2 type C compounds a maximum total area of 17,500 m2. • Duration of installation is up to 66 months (sequential). **Decommissioning phase**	

Impact	Phase [a]			Maximum Design Scenario	Justification
	C	O	D		
				• Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within the construction working areas and to requires no greater amount or duration of activity than assessed for construction).	
The impact on human receptors arising from air emissions generated by vehicles during the construction and decommissioning phase.	✓	×	✓	**Construction phase: landfall** • As above, except for duration of installation of up to 36 months (concurrent). **Construction phase: onshore export cables** • As above except for duration of installation of up to 36 months (concurrent). **Construction phase: onshore substations** • As above except for duration: 30 months (concurrent). • Construction traffic assumptions as set out in Volume 3, Chapter 7: Traffic and transport of the ES. **400 kV grid connection cables** • As above except for duration: 36 months (concurrent). **Decommissioning phase** • Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within the construction working areas and to requires no greater amount or duration of activity than assessed for construction).	Concurrent construction and therefore the shortest construction period represents the greatest potential for air emissions impacts generated by construction vehicles as a result of a larger numbers of HGV movements. Vehicle emissions during the earliest year of construction will be highest as vehicles emissions are expected to decrease in future years as more efficient vehicles become an increasing proportion of the fleet. The IAQM guidance (IAQM, 2024) requires that construction vehicle emissions will need to be assessed for large long-term construction sites that will generate HGV movements in excess of 25 AADT movements within an AQMA and 100 AADT movement elsewhere. Where the relevant EPUK and IAQM criteria thresholds are not exceeded, the impacts can be assumed negligible.
The impact on ecological receptors arising from air emissions generated by vehicles during the construction and decommissioning phase.	✓	×	✓		

[a] C = Construction, O = Operation and maintenance, D = Decommissioning

9.10 Assessment methodology

9.10.1 Overview

9.10.1.1 The approach to determining the significance of effects is a two-stage process that involves defining the magnitude of the impact and the sensitivity of the receptor. This section describes the criteria applied in this chapter to assign values to the magnitude of impacts and the sensitivity of the receptors.

9.10.1.2 The terms used to define magnitude and sensitivity for the assessment of dust effects are based on those which are described in the IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2024). This is because the IAQM guidance has specific definitions and criteria when describing magnitude and sensitivity. These are then used to determine the risk of dust impacts.

9.10.1.3 Similarly, for traffic emissions, the EPUK and IAQM Land-Use Planning & Development Control: Planning for Air Quality guidance document (EPUK and IAQM, 2017) provides specific significance criteria that have been used to inform the assessment of effects on air quality from traffic emissions (thresholds outlined in **Table 9.12**)

9.10.1.4 The following durations are used throughout this chapter.

- Short term: a period of months, up to one year.
- Medium term: a period of more than one year, up to five years.
- Long term: a period of greater than five years.

9.10.2 Dust

9.10.2.1 An assessment of the risk of dust impacts during the construction phase on human-health and ecological receptors has been undertaken in accordance with the method set out in the ‘Guidance on the assessment of dust from demolition and construction’ (IAQM, 2024).

9.10.2.2 The following types of activities could result in fugitive dust emissions during construction of the Transmission Assets.

- Earthworks.
- Handling and disposal of spoil.
- Wind-blown particulate material from stockpiles.
- Handling of loose construction materials.
- Movement of vehicles, both on and off site (trackout).

9.10.2.3 No demolition is proposed and therefore dust emissions arising from demolition are not considered within the assessment.

9.10.2.4 The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating

activity, weather conditions and the effectiveness of dust suppression methods.

9.10.2.5 The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, following the implementation of proper control and good practice methods (as set out within the Outline CoCP (document reference J1) and Outline Dust Management Plan (document reference J1.2)), to ensure that dust deposition does not give rise to significant adverse effects, although short term events may occur (e.g., due to technical failure or exceptional weather conditions).

9.10.2.6 In accordance with Guidance on the assessment of dust from demolition and construction (IAQM, 2024), the air quality assessment predicts the risk of dust impacts occurring on sensitive receptors identified within the study area, which has informed the identification of the Commitments proposed to control the effects (see **section 9.8**).

Receptor sensitivity

9.10.2.7 An impact pathway means the route by which dust and particulate matter may be carried from the source to a receptor. The main factor affecting the pathway effectiveness is the distance from the receptor to the source of dust. The orientation of the receptors to the source compared to the prevailing wind direction is a relevant risk factor for long duration construction projects. However, short term construction projects may be limited to a few months when the most frequent wind direction might be quite different, so adverse effects can potentially occur in any direction.

9.10.2.8 The Guidance on the assessment of dust from demolition and construction (IAQM, 2024) states that several attempts have been made to categorise receptors into high, medium, and low sensitivity categories. However, there is no unified sensitivity classification scheme that covers the different types of potential impacts on property, human health, and ecological receptors and so separate sensitivity categories are used for each of these effects. **Table 9.17**, **Table 9.18** and **Table 9.19** below set out the sensitivity of people, property, and ecological receptors to dust and PM_{10}, in accordance with IAQM guidance (IAQM, 2024).

Table 9.17: Sensitivities of people and property receptors to dust

Receptor	Sensitivity
• Users can reasonably expect enjoyment of a high level of amenity. • The appearance, aesthetics or value of their property would be diminished by soiling; and 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: – residential properties; – museums and other culturally important collections; and – medium and long-term car parks and car showrooms.	High
• Users would expect to enjoy a reasonable level of amenity but would not 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.	Medium
• The enjoyment of amenity would not reasonably be expected. • There is property that would not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling. • 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; – roads; and – short-term car parks.	Low

Table 9.18: Sensitivities of people and property receptors to PM_{10}

Receptor	Sensitivity
• Locations where members of the public are exposed over a time period relevant to the air quality objective (in the case of the 24 hour objective for PM_{10}, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include: – residential properties; and – schools, hospitals and residential care homes.	High
• Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM_{10}, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include:	Medium

Receptor	Sensitivity
– office workers; and – shop workers. • Generally excludes workers occupationally exposed to PM_{10} as protection is covered by Health and Safety at Work legislation.	
• Locations where human exposure is transient. • Indicative examples include: – public footpaths; – playing fields; – parks; and – shopping streets.	Low

Table 9.19: Sensitivities of ecological receptors to dust

Receptor	Sensitivity
• 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 particular dust sensitive species such as vascular plants included in the International Union for Conservation of Nature Red List for Great Britain. • Indicative examples include: – Special Area of Conservation designated for acid heathlands adjacent to the demolition of a large site containing concrete (alkali) buildings or for the presence of lichen.	High
• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. • Locations with a national designation where the features may be affected by dust deposition. • Indicative examples include: – SSSI with dust sensitive features.	Medium
• Locations with a local designation where the features may be affected by dust deposition. • Indicative examples include: – A Local Nature Reserve with dust sensitive features.	Low

9.10.2.9 The IAQM methodology (IAQM, 2024) combines consideration of the pathway and receptor to derive the sensitivity of the area**. Table 9.20**, **Table 9.21** and **Table 9.22** show how the sensitivity of the area has been derived for this air quality assessment, in accordance with the IAQM approach.

Table 9.20: Sensitivity of the area to dust impacts on people and property

Receptor sensitivity	Number of receptors [a]	Distance from the source (m) [b]			
		Less than (<) 20	<50	<100	<250
High	Greater than (>) 100	High	High	Medium	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

The sensitivity of the area has been derived for demolition, construction, earthworks and track out.

[a] The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.

[b] For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Table 9.21: Sensitivity of the area to PM_{10} impacts on human health

Receptor sensitivity	Annual mean PM_{10} concentration [a]	Number of receptors [b, c]	Distance from the source (m) [d]			
			<20	<50	<100	<200
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
	< 28 µg.m^{-3}	>1	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout.

Receptor sensitivity	Annual mean PM_{10} concentration [a]	Number of receptors [b, c]	Distance from the source (m) [d]			
			<20	<50	<100	<200

[a] This refers to the background concentration derived from the assessment of baseline conditions earlier in this chapter. The concentration categories listed in this column apply to England, Wales, and Northern Ireland but not to Scotland.

[b] The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.

[c] For high sensitivity receptors with high occupancy (such as schools or hospitals), the approximate number of occupants has been used to derive an equivalent number of receptors.

D For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Table 9.22: Sensitivity of the area to ecological impacts

Receptor Sensitivity	Distance from the Source (m) [a]	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout and for each designated site.

[a] Only the highest level of area sensitivity has been recorded.

9.10.2.10 The IAQM guidance (IAQM, 2024) lists the following additional factors that can potentially affect the sensitivity of the area. In addition, where necessary, professional judgement has been used to adjust the sensitivity allocated to a particular area.

- any history of dust generating activities in the area.
- The likelihood of concurrent dust generating activity on nearby sites.
- Any pre-existing screening between the source and the receptors.
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which the works will take place.
- Any conclusions drawn from local topography.
- Duration of the potential impact, as a receptor may become more sensitive over time.
- Any known specific receptor sensitivities which are considered to go beyond the classifications given in the table above.

Magnitude of impact

9.10.2.11 Guidance on the assessment of dust from demolition and construction (IAQM, 2024) gives examples of the dust emission magnitudes for demolition, earthworks, construction activities and trackout. These example dust emission magnitudes are based on the site area, building volume, number of Heavy Duty Vehicle (HDV) movements generated by the activities and the materials used.

9.10.2.12 These magnitudes have been combined with the anticipated duration of construction activities to determine the ranking of source magnitude. The features of the source of dust emissions and associated dust emission magnitude are set out in **Table 9.23** below.

Table 9.23: Source (magnitude of dust impacts)

Features of the source of dust emissions	Dust emission magnitude
Demolition – building over 75,000 m^3, potentially dusty construction material (e.g., concrete), on-site crushing and screening, demolition activities greater than 12 m above ground level. **Earthworks** – total site area over 110,000 m^2, potentially dusty soil type (e.g., clay), greater than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 6 m in height, total material moved greater than 100,000 tonnes. **Construction** – total building volume over 75,000 m^3, activities include piling, on-site concrete batching, sand blasting. Period of activities more than two years. **Trackout** – 50 HDV outwards movements in any one day, potentially dusty surface material (e.g., high clay content), unpaved road length greater than 100 m.	Large
Demolition – building between 12,000 to 75,000 m^3, potentially dusty construction material and demolition activities 6 to 12 m above ground level. **Earthworks** – total site area between 18,000 to 110,000 m^2, moderately dusty soil type (e.g., silt), five to ten heavy earth moving vehicles active at any one time, formation of bunds 3 to 6 m in height, total material moved 20,000 to 100,000 tonnes. **Construction** – total building volume between 12,000 and 75,000 m^3, use of construction materials with high potential for dust release (e.g., concrete), activities include piling, on-site concrete batching. Period of construction activities between one and two years. **Trackout** – 20 to 50 HDV outwards movements in any one day, moderately dusty surface material (e.g., High clay content), unpaved road length 50 to 100 m**.**	Medium
Demolition – building less than 12,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber), demolition activities less than 6 m above ground, demolition during winter months. **Earthworks** – total site area less than 18,000 m^2. Soil type with large grain size (e.g. sand), less than five heavy earth moving vehicles active at any one time, formation of bunds less than 3 m in height, total material moved less than 10,000 tonnes earthworks during winter months. **Construction** – total building volume below 12,000 m^3, use of construction materials with low potential for dust release (e.g., metal cladding or timber). Period of construction activities less than one year. **Trackout** – fewer than 20 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length less than 50 m.	Small

9.10.2.13 The sensitivity of the surrounding area and the magnitude of risk have been combined in the matrices provided in **Table 9.24** below to assign the level of risk for each activity type required during the construction of the Transmission Assets.

Table 9.24: Risk of dust impacts for each activity type

Sensitivity of area	Magnitude of dust impacts		
	Large	Medium	Small
Demolition			
No demolition proposed. No dust impact.			
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

Significance of effect

9.10.2.14 The dust risk categories that have been determined for each of the activities (earthworks, construction and trackout) have been used to define the appropriate site-specific mitigation measures outlined in **Table 9.15** based on those described in the IAQM dust guidance. The guidance states that provided the mitigation measures are successfully implemented, the resultant effects of the dust exposure will normally be 'not significant'.

Decommissioning

9.10.2.15 The risk of dust impacts arising during decommissioning of the Transmission Assets will be the similar to or less than the risk of dust impacts during the construction phase. Notwithstanding this, an Onshore Decommissioning Plan will be prepared and submitted prior to decommissioning of the Transmission Assets, to be secured as a requirement within the draft DCO. The Onshore Decommissioning Plan will set out the measures required to mitigate potential impacts of dust generated during the decommissioning phase.

9.10.3 Traffic

9.10.3.1 The EPUK and IAQM Land-Use Planning & Development Control: Planning for Air Quality guidance document (EPUK and IAQM, 2017) provides the following indicative threshold criteria for determining when an air quality assessment should be undertaken.

- Roads within an AQMA:

- an increase in annual average daily Light Duty Vehicle (LDV) flows by more than 100; or
- an increase in annual average daily HDV flows by more than 25.

- Roads outside of an AQMA:
  - an increase in annual average daily LDV flows by more than 500; or
  - an increase in annual average daily HDV flows by more than 100.

9.10.3.2 The EPUK and IAQM guidance document continues by stating that:

'If none of the criteria are met then there should be no requirement to carry out an air quality assessment for the impact of the proposed development on the local area, and the impacts can be considered to have insignificant effects.'

9.10.3.3 Therefore, only roads links where the threshold criteria identified above are exceeded have been specifically assessed.

9.10.3.4 Volume 3, Chapter 7: Traffic and transport of the ES sets out the estimates of average daily construction vehicle movements during the construction phase of the Transmission Assets. Data is provided for the road links located within the traffic and transport study area, which are all located outside of an AQMA. Therefore, as these road links are located outside of an AQMA, the higher threshold criteria of 500 LDVs and 100 HDV flows applies.

9.10.3.5 Taking the above information into account and based on the construction traffic flow estimates provided in Volume 3, Chapter 7: Traffic and transport of the ES, only the following road links are assessed:

Table 9.25: Traffic data used within the assessment

Road link ID	Road link name	Speed	Daily Two-Way Vehicle Flow			
			Without development		With development	
			LDV	HDV	LDV	HDV
L51	A585 between A583 and J3 of M55	50 mph	15,916	352	16,076	457
L57a	A584 Preston New Road between accesses A48 and A49	50 mph	13,949	241	14,176	366
L57b	A584 Preston New Road between Kirkham Road and Access A48	50 mph	13,949	241	14,176	366
L58a	A584 Preston New Road between A583 Blackpool Road and Access A51	50 mph	14,051	418	14,278	544

Road link ID	Road link name	Speed	Daily Two-Way Vehicle Flow			
			Without development		With development	
			LDV	HDV	LDV	HDV
L58b	A584 Preston New Road between accesses A49 / A51	50 mph	14,051	418	14,278	544
L65a	A583 Blackpool Road between Preston New Road and access A56	50 mph	24,504	660	24,834	835
L65b	A583 Blackpool Road between accesses A56 / A57	50 mph	24,504	660	24,834	829
L65c	A583 Blackpool Road between access A57 and Preston Western Distributor	50 mph	24,504	660	24,823	826
L67	A582 Edith Rigby Way from A583 and Avice Pimblett Way	50 mph	12,890	990	13,098	1,196
L68	A582 Edith Rigby Way from Avice Pimblett Way and William Young Way	50 mph	15,734	1,156	15,940	1,361
L70	A582 Edith Rigby Way between William Young Way and M55 Junction 2	50 mph	15,310	1,163	15,514	1,369
L73	M55 between M6 J32 and M55 J1	NSL (speed restriction to 50 mph around bend entering and exiting M6)	65,741	4,683	66,075	5,073
L74	M55 between J1 (A6) and J2 (PWD)	NSL	65,409	7,511	65,759	7,900
L75	M55 between J2 (PWD) and J3 (A585)	NSL	61,702	4,360	61,956	4,544
L77	M6 (North of M55 junction)	NSL (speed restriction to 50 mph around bend entering and exiting M6)	62,190	11,758	62,207	12,074

Road link ID	Road link name	Speed	Daily Two-Way Vehicle Flow			
			Without development		With development	
			LDV	HDV	LDV	HDV
L78	M6 between J32 and J31A	NSL	114,886	16,262	115,210	16,737
L79	M6 between J31A and J31	NSL	132,373	21,560	132,700	22,034
L80	M6 between J31 and J30	NSL	137,303	21,898	137,618	22,372
L81	M61 between M6 J30 and M61 J9 (M65 junction)	NSL	66,944	8,227	67,129	8,701
L82	M65 east of J2 (M61 junction)	NSL	58,123	7,353	58,191	7,668
L83	M61 south of M61 J9 (M65 junction)	NSL	62,821	7,010	62,920	7,325
L85	M6 between M6 J30 (M61 junction) and A6 junction	NSL	70,650	13,307	70,830	13,782
L87	M6 south of J29 (M65 junction)	NSL	84,680	15,711	84,747	16,027

9.10.3.6 Assessed links are shown in Figure 9.2.

9.10.3.7 In urban areas, pollutant concentrations are primarily determined by the balance between pollutant emissions that increase concentrations, and the ability of the atmosphere to reduce and remove pollutants by dispersion, advection, reaction and deposition. An atmospheric dispersion model is used as a practical way to simulate these complex processes; such a model requires a range of input data, which can include emissions rates, meteorological data and local topographical information.

9.10.3.8 The atmospheric pollutant concentrations in an urban area depend not only on local sources at a street scale, but also on the background pollutant level made up of the local urban-wide background, together with regional pollution and pollution from more remote sources brought in on the incoming air mass. This background contribution needs to be added to the fraction from the modelled sources and is usually obtained from measurements or estimates of urban background concentrations for the area in locations that are not directly affected by local emissions sources.

9.10.3.9 The ADMS-Roads model has been used in this assessment to predict the air quality impacts from changes in traffic on the local road network during construction. This is a version of the Atmospheric Dispersion Modelling System (ADMS), a formally validated model developed in the UK by Cambridge Environmental Research Consultants Ltd and widely used in the UK and internationally for regulatory purposes.

9.10.3.10 Modelling of the traffic generated has been undertaken using Defra's 2023 emission factor toolkit (version 12) which draws on emissions generated by the European Environment Agency (EEA) COPERT 5.6 emission calculation tool.

9.10.3.11 ADMS-Roads requires detailed meteorological data as an input. The most representative observing station for the region of the study area that supplies all the data in the required format is Blackpool, which is within the study area. Meteorological data from that station for 2023 have been used within the dispersion model.

9.10.3.12 The air quality assessment predicts the impacts at locations that could be sensitive to any changes. For assessing human health impacts, such sensitive receptors should be selected where the public is regularly present and likely to be exposed over the averaging period of the objective. LAQM Technical Guidance 22 provides examples of exposure locations and these are summarised in **Table 9.26.**

Table 9.26: Examples of where air quality objectives apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual-mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building's façades), or any other location where public exposure is expected to be short-term.
Daily-mean	All locations where the annual-mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building's façade), or any other location where public exposure is expected to be short-term.
Hourly-mean	All locations where the annual and 24 hour mean would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend 1-hour or longer.	Kerbside sites where the public would not be expected to have regular access.

9.10.3.13 Representative sensitive receptors for this assessment have been selected at properties where pollutant concentrations and/or changes in pollutant concentrations are anticipated to be greatest, as listed in **Table 9.27**.

Table 9.27: Modelled sensitive receptors

ID	Description	x	y
1	Residential	358495	422436
2	Residential	358315	423207
3	Residential	358413	425166
4	Residential	358305	425709
5	Residential	357814	426086
6	Residential	357236	426590
7	Residential	355397	422701
8	Educational Facility	355302	422782
9	Residential	356810	425147
10	Residential	357005	425591
11	Residential	357271	427752
12	Residential	357504	431275
13	Residential	357200	432072
14	Residential	354482	434318
15	Residential	353611	435478
16	Residential	353760	434488
17	Residential	353177	434221
18	Residential	352201	433860
19	Residential	344570	434643
20	Residential	341542	434665
21	Residential	341630	434394
22	Residential	341348	433288
23	Residential	341237	432924
24	Residential	348546	432499
25	Residential	348308	430753
26	Residential	348224	429827
27	Residential	346937	429616
28	Residential	344387	429376
29	Residential	343432	429341
30	Residential	343229	429197

9.10.3.14 The annual, daily and hourly-mean AQS objectives apply at the front and rear façades of all residential properties and at the school. The daily and hourly-mean AQS objectives only, apply at the business park and hotels. The

approaches used to predict the concentrations for these different averaging periods are described below.

Long-term pollutant predictions

9.10.3.15 Annual-mean NO_x and PM_{10} concentrations have been predicted at representative sensitive receptors using ADMS-Roads, then added to relevant background concentrations. Primary NO in the NO_X emissions is converted to NO_2 to a degree determined by the availability of atmospheric oxidants locally and the strength of sunlight. For road traffic sources, annual-mean NO_2 concentrations have been derived from the modelled road-related annual-mean NOx concentration using Defra's calculator.

Short term pollutant predictions

9.10.3.16 In order to predict the likelihood of exceedances of the hourly-mean AQS objectives for NO_2 and the daily-mean AQS objective for PM_{10}, the following relationships between the short term and the annual-mean values at each receptor have been considered.

Hourly-mean AQS objective for NO_2

9.10.3.17 Research undertaken in support of LAQM.TG22 has indicated that the hourly-mean limit value and objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60 $\mu g.m^{-3}$. The threshold of 60 $\mu g.m^{-3}$ NO_2 has been used as the guideline for considering a likely exceedance of the hourly-mean NO_2 objective.

Daily-mean AQS objective for PM_{10}

9.10.3.18 The number of exceedances of the daily-mean AQS objective for PM_{10} of 50 $\mu g.m^{-3}$ may be estimated using the relationship set out in LAQM.TG22:

*Number of Exceedances of Daily Mean of 50 $\mu g.m^{-3}$ = -18.5 + 0.00145 * (Predicted Annual-mean $PM_{10})^3$ + (206/Predicted Annual-mean PM_{10} Concentration)*

9.10.3.19 This relationship indicates that the daily-mean AQS objective for PM_{10} is likely to be met if the predicted annual-mean PM_{10} concentration is 31.8 $\mu g.m^{-3}$ or less.

9.10.3.20 The daily mean objective is therefore not considered further within this assessment if the annual-mean PM_{10} concentration is predicted to be less than 31.5 $\mu g.m^{-3}$.

Fugitive PM_{10} emissions

9.10.3.21 Transport PM_{10} emissions arise from both the tailpipe exhausts and from fugitive sources such as brake and tyre wear and re-suspended road dust. Improvements in vehicle technologies are reducing PM_{10} exhaust emissions; therefore, the relative importance of fugitive PM_{10} emissions is increasing. Current official vehicle emission factors for particulate matter include brake

dust and tyre wear which studies suggest may account for approximately one-third of the total particulate emissions from road transport; but not re-suspended road dust (which remains unquantified.)

Significance criteria for effects on the local area

9.10.3.22 The EPUK and IAQM Land-Use Planning & Development Control: Planning For Air Quality document advises that:

'*The significance of the effects arising from the impacts on air quality will depend on a number of factors and will need to be considered alongside the benefits of the development in question. Development under current planning policy is required to be sustainable and the definition of this includes social and economic dimensions, as well as environmental. Development brings opportunities for reducing emissions at a wider level through the use of more efficient technologies and better designed buildings, which could well displace emissions elsewhere, even if they increase at the development site. Conversely, development can also have adverse consequences for air quality at a wider level through its effects on trip generation.'*

9.10.3.23 When describing the air quality impact at a sensitive receptor, the change in magnitude of the concentration should be considered in the context of the absolute concentration at the sensitive receptor. **Table 9.28** provides the EPUK and IAQM approach for describing the long-term air quality impacts at sensitive human-health receptors in the surrounding area.

Table 9.28: Impact descriptors for individual sensitive receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (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 than AQAL	Moderate	Substantial	Substantial	Substantial

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, limit value, or an Environment Agency 'Environmental Assessment Level (EAL)'.

2. The table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as negligible.

3. The table is only designed to be used with annual mean concentrations.

4. Descriptors for individual receptors only; the overall significance is determined using professional judgement. For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.

5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.

6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.

7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

9.10.3.24 The human health impact descriptors above apply at individual receptors. The EPUK and IAQM guidance states that the impact descriptors '*are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual receptors. Whilst it maybe that there are 'slight', 'moderate' or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances*.'

9.10.3.25 Professional judgement by a competent, suitably qualified professional is required to establish the significance associated with the consequence of the impacts. This judgement is likely to take into account the extent of the current and future population exposure to the impacts and the influence and/or validity of any assumptions adopted during the assessment process.

9.10.3.26 Decommissioning-related traffic is expected to be lower than the construction phase.

Uncertainty

9.10.3.27 All air quality assessment tools, whether models or monitoring measurements, have a degree of uncertainty associated with the results. The choices that the practitioner makes in setting up the model, choosing the input data, and selecting the baseline monitoring data will decide whether the final predicted impact should be considered a central estimate, or an estimate tending towards the upper bounds of the uncertainty range (i.e., tending towards worst-case).

9.10.3.28 The atmospheric dispersion model itself contributes some of this uncertainty, due to it being a simplified version of the real situation: it uses a sophisticated set of mathematical equations to approximate the complex physical and chemical atmospheric processes taking place as a pollutant is released and as it travels to a receptor. The predictive ability of even the best model is limited by how well the turbulent nature of the atmosphere can be represented.

9.10.3.29 Each of the data inputs for the model, listed earlier, will also have some uncertainty associated with them. Where it has been necessary to make assumptions, these have mainly been made towards the upper end of the uncertainty range informed by an analysis of relevant, available data.

9.10.3.30 The atmospheric dispersion model used for this assessment, ADMS Roads, has been validated by its supplier and is widely used by professionals in the UK and overseas. A site-specific verification (calibration) provides additional certainty and is particularly important when air quality levels are close to exceeding the objectives/limit values.

9.10.3.31 LAQM.TG22 requires that local authorities verify the results of any detailed modelling undertaken for the purposes of fulfilling their review and assessment reporting duties. Model verification refers to the checks that are carried out on model performance at a local level. Modelled concentrations are compared with the results of monitoring. Where there is a disparity between modelled and monitored concentrations, the first step is to review the appropriateness of the data inputs to determine whether the performance of the model can be improved. Once reasonable efforts have been made to reduce the uncertainties in the data inputs, an adjustment may be established and applied to reduce any remaining disparity between modelled and monitored concentrations. No adjustment factor is deemed necessary where the modelled concentrations are within 25% of the monitored concentrations.

9.10.3.32 For the verification and adjustment of NOx/NO_2 concentrations for review and assessment reporting purposes, it is recommended that the comparison involves a combination of automatic and diffusion monitoring, rather than a single automatic monitor. This is to ensure any adjustment factor derived is representative of all locations modelled and not unduly weighted towards the characteristics at a single site. Where only diffusion tubes are used for the model verification, the study should consider a broad spread of monitoring locations across the study area to provide sufficient information relating to the spatial variation in pollutant concentrations.

9.10.3.33 Local Authorities generally implement a broad spread of monitoring, particularly in areas that are known to be sensitive to changes in air quality. Consequently, Local Authorities are usually able to verify the models they use for review and assessment reporting purposes; however for individual developments, there is less likely to be a broad range of monitoring locations within the relevant study area. Notwithstanding this, a small number of monitoring locations have been identified within the study area and a model verification study has been undertaken for the proposed development.

9.10.3.34 The main components of uncertainty in the total predicted concentrations, made up of the background concentration and the modelled fraction, include those summarised in **Table 9.29**.

Table 9.29: Approaches to dealing with uncertainty used within the assessment

Concentration	Source of uncertainty	Approach to dealing with uncertainty	Comments
Background Concentration	Characterisation of current baseline air quality conditions	The background concentration used within the assessment is the most conservative value from a comparison of measured and Defra mapped concentration estimate.	The background concentration is the major proportion of the total predicted concentration.
	Characterisation of future baseline air quality (i.e., the air quality conditions in the future assuming that the development does not proceed)	The future background concentration used in the assessment is the same as the current background concentration and no reduction has been assumed. This is a conservative assumption as, in reality, background concentrations are likely to reduce over time as cleaner vehicle technologies form an increasing proportion of the fleet.	The conservative assumptions adopted ensure that the background concentration used within the model contributes to the result being towards the top of the uncertainty range, rather than a central estimate.
Fraction from Modelled Sources	Traffic flow estimates	High growth assumptions have been used to develop the traffic dataset used within the model.	The modelled fraction is likely to contribute to the result being between a central estimate and the top of the uncertainty range.
	Traffic speed estimates	The average speed has been reduced in congested areas to take account of slow-moving and queuing traffic.	
	Road-related emission factors – projection to future years	The most recently published emission factors have been used within the modelling and these are based on the current and best understanding of the variation in emission factors in future years.	
	Meteorological Data	Uncertainties arise from any differences between the conditions at the met station and the development site, and between the historical met years and the future years. These have been minimised by using meteorological data collated at a representative measuring site. The model has been run for a full year of meteorological conditions. This means that the conditions in 8,760 hours have been considered in the assessment.	
	Receptors	Receptor locations have been identified where concentrations are highest or where the greatest changes are expected.	
	Dispersion Modelling	The model predictions have been compared with monitored	

Concentration	Source of uncertainty	Approach to dealing with uncertainty	Comments
		concentrations and the model is performing well.	

9.10.3.35 The analysis of the component uncertainties indicates that, overall, the predicted total concentration is likely to be towards the top of the uncertainty range rather than being a central estimate. The actual concentrations that will be found when the development is operational are unlikely to be higher than those presented within this report and are more likely to be lower.

Model verification

9.10.3.36 The approach to model verification that LAQM.TG22 recommends for local authorities when they carry out their LAQM duties is summarised above. For the verification and adjustment of NOx/NO_2 concentrations, the guidance recommends that the comparison considers a broad spread of automatic and diffusion tube monitoring.

9.10.3.37 Blackpool Council, Fylde Borough Council, Preston City Council, and South Ribble Council all monitor roadside NO_2 concentrations passively using diffusion tubes at several locations in the vicinity of the Transmission Assets.

9.10.3.38 The concentrations monitored over recent years are provided in **Table 9.30**.

Table 9.30: Measured annual-mean NO_2 concentrations ($\mu g.m^{-3}$)

Monitoring Site	Local Authority	Measured Annual-mean NO_2 Concentrations ($\mu g.m^{-3}$)				
		2018	2019	2020	2021	2022
DF5	Blackpool	39	33	19.9	-	-
DF12	Blackpool	24.2	23.5	16.6	16.5	16.1
DF16	Blackpool	24.3	22.2	15.1	16.8	17.5
DF15	Blackpool	27.6	25.3	18.2	19.3	19.7
DF18	Blackpool	22.6	22.8	16.2	17.2	18.3
34n	Fylde	38.4	35.8	25.6	27.7	0
30n	Fylde	21.6	22.1	15.2	17.7	0
26n	Fylde	18.1	18.5	13.3	15.2	0
PRA1	Preston	23	24	20	21	20
PR1	Preston	35	35	28	34	30
PR39	Preston	44	42	34	37	33
PR40	Preston	37	38	31	32	32
PR48	Preston	37	34	28	32	29
PR50	Preston	27	28	22	24	22.4
PR38	Preston	-	36	27	29	29
PR47	Preston	32	32	27	29	28
23	South Ribble	-	-	-	-	17
18	South Ribble	30.9	30.5	22.6	24.6	22
19	South Ribble	32.8	32.1	23.8	25.6	24.5

9.10.3.39 The monitored annual-mean NO_x road contributions have been derived from the monitored annual-mean NO_2 concentrations using the LAQM.TG22 calculator. The monitored annual-mean NO_X road contributions have then been compared with the modelled annual-mean NOx road contributions. This comparison is provided in **Table 9.31** below.

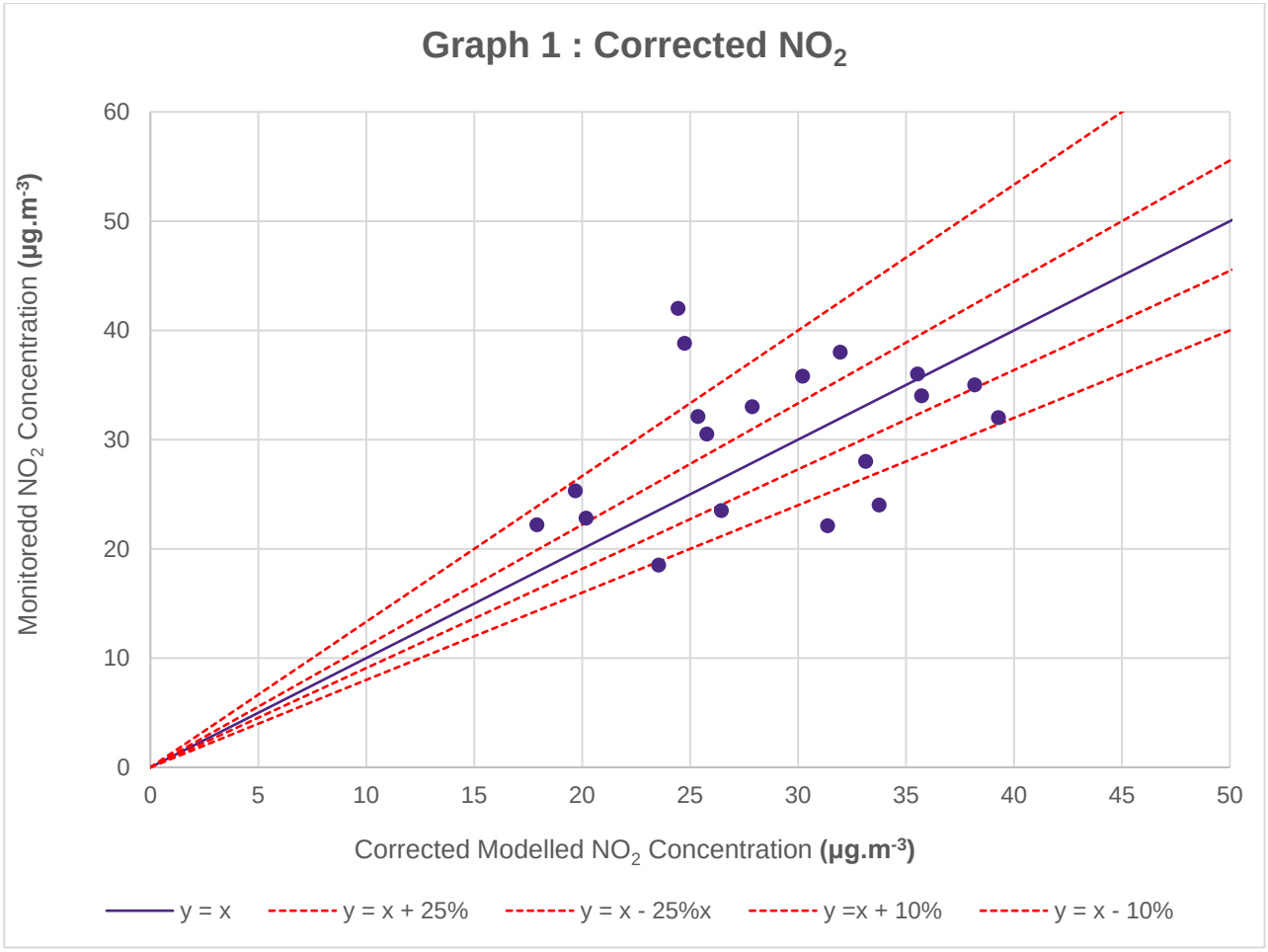
Table 9.31: Comparison of monitored and modelled annual-mean road NOx contribution (µg.m^{-3})

Monitoring Site	Annual-mean Road NO_X Contribution (µg.m^{-3})	
	Monitored	Modelled
DF5	41.1	7.5
DF12	21.4	6.8
DF16	18.9	2.6
DF15	25.0	3.5
DF18	20.0	3.7
34n	47.2	8.7
30n	18.6	9.3
26n	11.7	5.3
PRA1	22.4	10.6
PR1	45.5	13.0
PR39	61.5	5.8
PR40	52.2	9.6
PR48	43.3	11.7
PR50	30.5	10.3
PR38	47.7	11.6
PR47	39.0	13.7
23	35.8	6.4
18	39.2	6.2
19	54.1	5.9

9.10.3.40 It should be borne in mind that the monitored concentrations are themselves only estimates to the true concentrations at each point; the EU Directive on air quality (Directive 2008/50/EC) designates passive NO_2 samplers indicative measures with a potential uncertainty of +/-30 %. Ignoring any uncertainty errors in the monitoring results, the table above indicates that the model is over-predicting.

9.10.3.41 Modelled annual-mean NO_2 concentrations have been derived from the modelled annual-mean NO_x road contributions. The modelled annual-mean NO_2 concentrations have been plotted against the monitored annual-mean NO_2 concentrations in **Graph 9.1**.

Graph 9.1: Corrected NO_2



9.10.3.42 The corrected modelled annual-mean NO_2 concentrations are mostly within 25% of the monitored annual-mean NO_2 concentrations. The correction factor of 4.035 therefore improves the modelled concentrations and has been applied to all predictions used within the assessment.

9.10.3.43 The fractional bias can also be used to determine whether the corrected model has a tendency to over or under-predict. The fractional bias is calculated as:

(Average Monitored NO_X Concentration – Average Predicted NO_X Concentration)/0.5 x (Average Monitored NO_X + Average Predicted NO_X Concentration)

9.10.3.44 Fractional bias values vary between +2 and -2 and has an ideal value of zero. A negative value suggests a model over-prediction and a positive value suggests a model under-prediction.

9.10.3.45 **Table 9.32** sets out the average monitored concentration and the average predicted concentration.

Table 9.32: Comparison of monitored and adjusted modelled annual-mean road NOx contribution (µg.m^{-3})

Monitoring Site	Annual-mean Road NO_X Contribution (µg.m^{-3})	
	Monitored	Corrected modelled
DF5	41.1	30.3
DF12	21.4	27.4
DF16	18.9	10.6
DF15	25.0	14.0
DF18	20.0	14.9
34n	47.2	35.1
30n	18.6	37.6
26n	11.7	21.5
PRA1	22.4	42.8
PR1	45.5	52.6
PR39	61.5	23.3
PR40	52.2	38.9
PR48	43.3	47.1
PR50	30.5	41.4
PR38	47.7	46.7
PR47	39.0	55.2
23	35.8	26.0
18	39.2	25.2
19	54.1	23.9
Average	35.5	32.3

9.10.3.46 The fractional bias for this study is therefore (35.5 – 32.3)/(0.5 x (35.5 + 32.3)) = 0.09. As the fractional bias is small, the adjusted model is performing well.

9.10.4 Assumptions and limitations of the assessment

9.10.4.1 The background PM_{10} concentration has been drawn from the highest measured concentration at the nearest background monitoring location. Whilst this does not provide a site-specific concentration, it provides a sufficient level of detail to enable the assessment of the impact risk arising from dust generated during construction of the Transmission Assets to be predicted robustly. This is because PM_{10} concentrations are relatively evenly distributed across the UK due to the wide range of sources and the contribution of secondary particulate matter.

9.10.4.2 Assumptions made for the modelling of traffic emissions are outlined in **Table 9.29.**

9.11 Assessment of effects

9.11.1 Overview

9.11.1.1 The impacts arising from the construction and decommissioning phases of the Transmission Assets are set out in **Table 9.16**, along with the maximum design scenario against which each impact has been assessed.

9.11.1.2 A description of the likely effect on receptors caused by each identified impact is given below.

9.11.2 The impact of dust and suspended particulates on human and ecological receptors

Construction phase

Magnitude of impact

9.11.2.1 No demolition is proposed as part of the construction phase for the Transmission Assets. There would therefore be no impact as a result of demolition.

9.11.2.2 Given that the area of works within the Onshore Order Limits exceeds 110,000 m^2, the dust emission magnitude for the earthworks phase is classified, using the IAQM dust guidance, as **large**.

9.11.2.3 The total volume of the buildings (at the onshore substation sites) to be constructed would be over 75,000 m^3. The dust emission magnitude for the construction phase is therefore classified, using the IAQM dust guidance, as **large**.

9.11.2.4 The maximum number of outwards movements in any one day would exceed 50 HDVs. Therefore, the dust emission magnitude for trackout would be classified as **large**.

Table 9.33: Dust emission magnitude for demolition, construction, earthworks and trackout

Demolition	Earthworks	Construction	Trackout
None	Large	Large	Large

Sensitivity of receptor

9.11.2.5 All earthworks and construction activities are assumed to occur within the Onshore Order Limits.

9.11.2.6 As such, dust sensitive receptors located within 20 m, 50 m, 100 m, 250 m of the Onshore Order Limits have been considered. Not all distances need to be considered as the IAQM guidance (IAQM, 2024) states in footnote b of **Table 9.21**:

'Estimate the total number of receptors within the stated distance. only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors < 20 m of the source and 95

high sensitivity receptors between 20 and 50 m, then the total number of receptors < 50 m is 102. The sensitivity of the area in this case would be high'.

9.11.2.7 The sensitivity of the area within the Onshore Order Limits has been classified and the results are provided in **Table 9.34** below.

Table 9.34: Sensitivity of the surrounding area for construction and earthworks

Potential impact	Sensitivity of the surrounding area	Reason for sensitivity classification
Dust soiling	High	There are more than 100 high sensitivity receptors (residential properties) located within 20 m of the Onshore Order Limits.
Human health	Medium	The background PM_{10} concentrations used for the purposes of the assessment was 14.8 $\mu g.m^{-3}$. In addition, there are more than 100 high sensitivity receptors (residential properties) located within 20 m of the Onshore Order Limits.
Ecology	High	There are several dust sensitive ecological receptors located within 20 m of the Onshore Order Limits. These include: • Ribble and Alt Estuaries SPA and Ramsar (high sensitivity); • Ribble Estuary SSSI (medium sensitivity); • Newton Marsh SSSI (medium sensitivity); • Lytham St Annes Dunes SSSI (medium sensitivity); and • Lytham St Annes LNR (low sensitivity).

9.11.2.8 The Dust Emission Magnitude for trackout is classified as large and trackout may occur on roads up to 250 m from the site. The sensitivity of the area has been classified and the results are provided in **Table 9.35**.

Table 9.35: Sensitivity of the surrounding area for trackout

Potential impact	Sensitivity of the surrounding area	Reason for sensitivity classification
Dust Soiling	High	There are more than 100 high sensitivity receptors (residential properties) located within 20 m of the Onshore Order Limits.
Human Health	Medium	The background PM_{10} concentrations used for the purposes of the assessment was 14.8 $\mu g.m^{-3}$. In addition, there are more than 100 high sensitivity receptors (residential properties) located within 20 m of the Onshore Order Limits.
Ecology	High	There are several dust sensitive ecological receptors located within 20 m of the Transmission Assets Order Limits. These include: • Ribble and Alt Estuaries SPA and Ramsar (high sensitivity); • Ribble Estuary SSSI (medium sensitivity); • Newton Marsh SSSI (medium sensitivity); • Lytham St Annes Dunes SSSI (medium sensitivity); and • Lytham St Annes LNR (low sensitivity).

Overall dust risk

9.11.2.9 The dust emission magnitude has been considered in the context of the sensitivity of the area to give the dust impact risk.

9.11.2.10 **Table 9.36** below summarises the dust impact risk for earthworks, construction and trackout before the implementation of mitigation measures.

Table 9.36: Dust impact risk for, earthworks, construction and trackout

Potential impact	Earthworks	Construction	Trackout
Potential impact of dust soiling	**High**	**High**	**High**
Potential impact on human health	**Medium**	**Medium**	**Medium**
Potential impact on ecology	**High**	**High**	**High**
Overall dust impact risk	**High**	**High**	**High**

Significance of effect

9.11.2.11 Based on the dust emission magnitudes and the receptor sensitivities in the area, and in the absence of the dust controls measures to be included as part of the Outline CoCP (document reference J1) (see **Table 9.15**)**,** the dust impact risk for construction and earthworks is categorised as **high.**

9.11.2.12 Therefore, the dust risk categories relevant to the identified construction activities have been used to define appropriate site-specific dust control measures, based on those described in the Guidance on the assessment of dust from demolition and construction (IAQM, 2024).

9.11.2.13 The IAQM dust guidance (IAQM, 2024) states that:

'For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant''

9.11.2.14 The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place.

9.11.2.15 Following the implementation of dust control measures (see **Table 9.15**) the dust impact risk for construction, earthworks and trackout associated with construction of the Transmission Assets is categorised as **negligible**, which is not significant in EIA terms. In addition, the effects of construction dust are predicted to be of local spatial extent, intermittent in frequency and mostly reversible.

Decommissioning phase

9.11.2.16 During decommissioning, it is expected that the onshore cables will either be left *in-situ* or removed from joint bays/link boxes to minimise the environmental disturbance during decommissioning. Opening of cable trenches is not anticipated.

9.11.2.17 Joint bays and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use.

9.11.2.18 Decommissioning of the onshore substations will be reviewed in discussion with the transmission system operator and appropriate regulators in light of any other existing or proposed future use of the onshore substations. If complete decommissioning is required, then all of the electrical infrastructure will be removed, and any waste arising disposed of in accordance with relevant regulations. Foundations will be broken up and the site reinstated to its original condition or for an alternative (separately agreed and consented) use.

9.11.2.19 The magnitude of dust impacts of decommissioning activities associated with earthworks and trackout are expected to be similar to or less than the impacts from construction at the onshore substations, as the site area and scale of work is unchanged. Impacts are likely to be less than during construction for the onshore export cable corridor and 400 kV grid connection cable corridor.

9.11.2.20 No additional construction work is anticipated during the decommissioning phase. The potential impacts during decommissioning of the Transmission Assets are expected to be similar to or less than the impacts during earthworks and construction. Notwithstanding this, an Onshore Decommissioning Plan will be prepared and submitted prior to decommissioning of the Transmission Assets. The Onshore Decommissioning Plan will set out the measures required to mitigate potential impacts of dust generated during the decommissioning phase. Therefore, the significance of effects during decommissioning is likely to be **negligible**.

9.11.3 The impact of emissions from traffic

9.11.3.1 As set out in **section 9.10.3.1**, the EPUK and IAQM Land-Use Planning & Development Control: Planning for Air Quality guidance document (EPUK and IAQM, 2017) provides indicative threshold criteria for determining when an air quality assessment should be undertaken. The guidance document continues by stating that:

'If none of the criteria are met then there should be no requirement to carry out an air quality assessment for the impact of the proposed development on the local area, and the impacts can be considered to have insignificant effects.'

9.11.3.2 Therefore, if the threshold criteria identified above are not exceeded on an individual road link, an assessment of construction-related vehicle movements need not be undertaken, and the effects can be considered not significant.

Construction phase

9.11.3.3 This section of the report summarises the construction phase air quality impacts of the key pollutants associated with the construction traffic.

Nitrogen dioxide (NO_2)

9.11.3.4 **Table 9.37** presents the annual-mean NO_2 concentrations predicted at the façades of existing receptors.

Table 9.37: Predicted annual-mean NO_2 impacts at existing receptors

Receptor ID	Concentration ($\mu g.m^{-3}$)		With - Without Dev as % of the AQS Objective	Impact descriptor
	Without Transmission Assets	With Transmission Assets		
1	18.6	18.7	0	Negligible
2	22.3	22.3	0	Negligible
3	18.6	18.6	0	Negligible
4	22.2	22.3	0	Negligible
5	20.5	20.5	0	Negligible
6	21.7	21.8	0	Negligible
7	24.9	24.9	0	Negligible
8	20.5	20.6	0	Negligible
9	20.9	20.9	0	Negligible
10	22.4	22.5	0	Negligible
11	29.0	29.1	0	Negligible
12	20.5	20.5	0	Negligible
13	32.3	32.4	0	Negligible
14	22.6	22.7	0	Negligible
15	20.1	20.1	0	Negligible
16	18.9	19.0	0	Negligible
17	25.0	25.2	0	Negligible
18	18.1	18.1	0	Negligible
19	15.0	15.0	0	Negligible
20	17.8	17.9	0	Negligible
21	17.0	17.1	0	Negligible
22	14.5	14.6	0	Negligible
23	14.1	14.1	0	Negligible
24	13.5	13.6	0	Negligible
25	13.1	13.1	0	Negligible
26	15.3	15.4	0	Negligible
27	13.7	13.7	0	Negligible
28	13.5	13.5	0	Negligible
29	14.2	14.3	0	Negligible
30	14.0	14.0	0	Negligible
Maximum	32.3	32.4	-	-

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact descriptor
	Without Transmission Assets	With Transmission Assets		
Minimum	13.1	13.1	-	-

9.11.3.5 Predicted annual-mean NO_2 concentrations at the façades of the existing receptors are below the AQS objective for NO_2. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is 'negligible'.

9.11.3.6 As all predicted annual-mean NO_2 concentrations are below 60 µg.m^{-3}, the hourly-mean objective for NO_2 is likely to be met at all receptors. The short-term NO_2 impact can be considered 'negligible' and is not considered further within this assessment.

9.11.3.7 Overall, the impact on the surrounding area from NO_2 is considered to be **'negligible'**, using the criteria adopted for this assessment and based on professional judgement.

Particulate Matter (PM_{10})

9.11.3.8 **Table 9.38** presents the annual-mean PM_{10} concentrations predicted at the façades of existing receptors.

Table 9.38: Predicted annual-mean PM_{10} impacts at existing receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact descriptor
	Without Transmission Assets	With Transmission Assets		
1	16.2	16.2	0	Negligible
2	17.0	17.0	0	Negligible
3	16.2	16.2	0	Negligible
4	17.1	17.1	0	Negligible
5	16.7	16.7	0	Negligible
6	17.1	17.0	0	Negligible
7	17.9	18.0	0	Negligible
8	16.8	16.8	0	Negligible
9	16.9	16.9	0	Negligible
10	17.3	17.3	0	Negligible
11	18.9	18.9	0	Negligible
12	16.7	16.7	0	Negligible
13	19.7	19.8	0	Negligible
14	17.2	17.2	0	Negligible

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact descriptor
	Without Transmission Assets	With Transmission Assets		
15	16.7	16.7	0	Negligible
16	16.2	16.2	0	Negligible
17	17.4	17.5	0	Negligible
18	16.1	16.1	0	Negligible
19	15.3	15.4	0	Negligible
20	16.5	16.5	0	Negligible
21	16.3	16.3	0	Negligible
22	15.6	15.6	0	Negligible
23	15.4	15.4	0	Negligible
24	15.2	15.2	0	Negligible
25	15.1	15.1	0	Negligible
26	15.8	15.8	0	Negligible
27	15.2	15.3	0	Negligible
28	15.2	15.2	0	Negligible
29	15.4	15.4	0	Negligible
30	15.3	15.4	0	Negligible
Maximum	19.7	19.8	-	-
Minimum	15.1	15.1	-	-

9.11.3.9 Predicted annual-mean PM_{10} concentrations at the façades of the existing receptors are below the AQS objective for PM_{10}. When the magnitude of change is considered in the context of the absolute concentrations, the impact descriptor is 'negligible' at all receptors.

9.11.3.10 As all predicted annual-mean PM_{10} concentrations are below 31.5 µg.m^{-3}, the hourly-mean objective for PM_{10} is likely to be met at all receptors. The short-term PM_{10} impact can be considered 'negligible' and is not considered further within this assessment.

9.11.3.11 Overall, the impact on the surrounding area from PM_{10} is considered to be **'negligible'**, using the criteria adopted for this assessment and based on professional judgement.

Fine Particulate Matter ($PM_{2.5}$)

9.11.3.12 **Table 9.39** presents the annual-mean $PM_{2.5}$ concentrations predicted at the façades of existing receptors.

Table 9.39: Predicted annual-mean $PM_{2.5}$ impacts at existing receptors

Receptor ID	Concentration (µg.m^{-3})		With - Without Dev as % of the AQS Objective	Impact descriptor
	Without Transmission Assets	With Transmission Assets		
1	10.0	10.0	0	Negligible
2	10.5	10.5	0	Negligible
3	10.1	10.1	0	Negligible
4	10.6	10.6	0	Negligible
5	10.4	10.3	0	Negligible
6	10.6	10.6	0	Negligible
7	11.1	11.1	0	Negligible
8	10.4	10.4	0	Negligible
9	10.5	10.5	0	Negligible
10	10.7	10.7	0	Negligible
11	11.7	11.7	0	Negligible
12	10.4	10.4	0	Negligible
13	12.2	12.2	0	Negligible
14	10.6	10.6	0	Negligible
15	10.3	10.3	0	Negligible
16	10.0	10.1	0	Negligible
17	10.8	10.8	0	Negligible
18	10.0	10.0	0	Negligible
19	9.5	9.5	0	Negligible
20	10.1	10.2	0	Negligible
21	10.0	10.1	0	Negligible
22	9.6	9.6	0	Negligible
23	9.5	9.5	0	Negligible
24	9.4	9.4	0	Negligible
25	9.3	9.4	0	Negligible
26	9.8	9.8	0	Negligible
27	9.4	9.5	0	Negligible
28	9.4	9.4	0	Negligible
29	9.5	9.6	0	Negligible
30	9.5	9.5	0	Negligible
Maximum	12.2	12.2	-	-
Minimum	9.3	9.4	-	-

9.11.3.13 Predicted annual-mean $PM_{2.5}$ concentrations at the façades of the existing receptors are below the AQS objective for $PM_{2.5}$. When the magnitude of

change is considered in the context of the absolute concentrations, the impact descriptor is 'negligible' at all receptors.

9.11.3.14 Overall, the impact on the surrounding area from $PM_{2.5}$ is considered to be 'negligible', using the criteria adopted for this assessment and based on professional judgement.

9.11.4 Future monitoring

9.11.4.1 Following the implementation of appropriate recommended mitigation measures (IAQM, 2024) set out in **section 9.8** the air quality effects arising from dust are not expected to be significant, and no future monitoring is proposed.

9.11.4.2 The results of modelling of traffic-related emissions shows that the impacts are negligible and therefore no additional mitigation and monitoring is required (refer to **Table 9.42**).

9.12 Cumulative effect assessment methodology

9.12.1 Introduction

9.12.1.1 The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Transmission Assets together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see Volume 1, Annex 5.5: Cumulative screening matrix and location plan of the ES). Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

9.12.1.2 The air quality CEA methodology has followed the methodology set out in Volume 1, Chapter 5: Environmental assessment methodology of the ES and Volume 1, Annex 5.5: Cumulative screening matrix and location plan of the ES. As part of the assessment, all projects and plans considered alongside the Transmission Assets have been allocated into 'tiers' reflecting their current stage within the planning and development process.

- Tier 1
  - Under construction
  - Permitted application
  - Submitted application
  - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact
- Tier 2
  - Scoping report has been submitted
- Tier 3
  - Scoping report has not been submitted

- Identified in the relevant Development Plan
- Identified in other plans and programmes.

9.12.1.3 This tiered approach is adopted to provide a clear assessment of the Transmission Assets alongside other projects, plans and activities.

9.12.1.4 There is potential for cumulative effects from dust during the construction phase to occur with other proposed developments within 500 m (2 x 250 m) of the Onshore Order Limits. This distance is based on the study area for the construction dust assessment. The specific projects, plans and activities scoped into the CEA, are outlined in **Table 9.40**.

Table 9.40: List of other projects, plans and activities considered within the CEA

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
Up to 280 dwellings, with associated infrastructure and open space (06/2022/1177) (1).	Permitted	0.28	The reserved matters application is seeking approval for 280 dwellings (between 2-4 bed, terraced, semi-detached and detached and up to 3 storeys and 10 in height), SuDS, public open space and other landscaping.	Construction phase – Yes Operational phase - Yes
Construction of crossroads at junction of Kilnhouse Lane, Queensway and the proposed Heyhouses Bypass (22/0188) (3).	Under construction	0.25	This supports the other applications in the area for the provisioning of up to 1150 dwellings in Richmond Point (ref 08/0058), of which 89 have been built to date. A new M55 link road that will give access to the development is yet to be constructed, and this application seeks to provide an interim access arrangement, to allow further parcels of the Richmond Point site to be developed (beyond the current limit of 168 dwellings). This includes a signal controlled pedestrian crossing and an interim access road.	Construction phase – Yes Operational phase - Yes
Installation of a solar PV farm with associated infrastructure and access (21/0904) (4).	Under construction	0.37	Installation of solar panels and associated infrastructure, approximately 25MW, 40 year operating life, with a further 6 months to allow for decommissioning and reinstatement.	Construction phase – Yes Operational phase - Yes
Formation of 12 new natural grass sports pitches (20/0114) (6).	Under construction	0.00	This site is part of the Blackpool Airport Enterprise zone, which includes a wide range of businesses. This application is for 12 grass sports pitches with a small portion designated as public open space.	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
Erection of twelve dwellings with associated access road, garages and parking spaces (10/0552) (8).	Under construction	0.02	Erection of twelve dwellings, including three, six-bed and nine five-bed dwellings. All are 2.5 storeys tall. This application follows from the previously approved application ref 18/0155, which sought permission for 12, four bedroom homes. This was itself a reapplication of a lapsed approval.	Construction phase – Yes Operational phase - Yes
Siting of containerised battery energy storage units including electrical ancillary equipment on vacant land off Howick Cross Lane (07/2022/00021/FUL) (9).	Under construction	0.00	Siting of containerised battery energy storage units including electrical ancillary equipment on vacant land off Howick Cross Lane (up to 57MW of storage capacity). The scheme includes the formation of a new site vehicle entrance off Howick Cross Lane and the installation of 2.5m high galvanised palisade fencing and gates.	Construction phase – Yes Operational phase - Yes
Gas fired electricity generating facility (GFEGF) (07/2018/3907/SCE) (10).	Pending	0.05	The proposed site intended to be developed for an energy facility comprises a gas fired electricity generation facility made up of eleven 4.5MW Gas Engine Casements with associated cooling fans, control buildings, switch gear, transformers, gas regulation compound, gas connection compound and a 132kV substation, access, fencing, internal roads, attenuation tanks and other ancillary infrastructure.	Construction phase – Yes Operational phase - Yes
Outline application for business, industrial and storage/warehousing uses(22/0267) (23).	Under construction	0.00	An outline planning application for a mixed-use development including for business, industrial and warehousing, with all matters reserved. The application site covers 13ha of land.	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
			It is located to the north, east and south of the consented 20/0014, which is for 12 grass sports pitches.	
The development of 882 dwellings, as a component of approved outline application for 1150 dwellings (08/0058 (outline application) 15/0400 (reserved matters application for 882 dwellings) (24).	Under construction	0.37	An outline planning application has been granted for 1150 new houses, provision for a school site and 34ha of parkland. This was approved following a reopened public enquiry by the SoS in 2012. Following this, phase two development is for 882 dwellings (phase one is the 66 dwellings detailed below) with associated landscaping and infrastructure. Construction has begun but cannot continue until sufficient access has been provided. Temporary access is being sought under planning application reference 22/0188, until the proposed M55 link road has been constructed. The total area of the 882 dwellings is 24.7ha. There will be 56% two and three-bedroom homes and 44% four and five-bedroom homes.	Construction phase – Yes Operational phase - Yes
The development of 66 dwellings, as a component of approved outline application for 1150 dwellings (08/0058 (outline application)13/0257 (reserved matters application for 110 dwellings)17/0862 (full application for 66 dwellings)) (25).	Under construction	0.07	An outline planning application has been granted for 1150 new houses, provision for a school site and 34ha of parkland. This was approved following a reopened public enquiry by the SoS in 2012. Phase one of the development involved a reserved matters application for 110 (13/0257 a), which was not implemented. Instead, an	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
			application for 66 dwellings was approved, and has been constructed. Total site area is 64.8ha, of which 34ha is for open parkland, 30ha for housing and 1ha for the school use. The dwellings are a mixture of 3-5 bed dwellings and are all detached. The implemented development to date is on the survey boundary edge, but consented development in application 15/0400 contains areas inside the boundary. The area now designated as parkland also lies within the site boundary.	
Erection of stable building for private use (18/0527) (27).	Under Construction	0.18	The proposed stable building would be 3.6m in height	Construction phase – Yes Operational phase - Yes
Application for approval of reserved matters of layout, scale, appearance, access and landscaping pursuant to planning permission 11/0221 relating to erection of 1 no. public house including access works, parking facilities and landscaping treatment (21/0487) (33).	Permitted	0.05	Reserved Matters Application For 1 No. Public House (Matters of Layout, Scale, Appearance, Access And Landscaping Applied For), Including Access Works, Parking Facilities And Landscaping Treatment, Associated With The Outline Planning Application Ref: 11/0221. This Relates To A Development Of 1400 Residential Dwellings, 20 Ha Of Class B2 General Industrial / Class B8 Storage And Distribution, Primary School, 2 Local Neighbourhood Centres), Class A4 Drinking Establishment, Class D1 Health Centre, Class	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
			D1 Community Building, Vehicle Access Onto Preston New Road And Mythop Road With Associated Road Infrastructure, Car Parking, Public Open Space, Sports Pitches, Allotments, The Retention And Improvement Of Natural Habitats, Watercourse, Ponds, Reed Beds Hedgerows And Landscaping Features.	
Upgrade of existing telecommunications base station comprising removal of existing 12 metre high monopole and installation of replacement 17.5 metre high monopole supporting 6 antenna on an open headframe, internal works to existing ground-based cabinets and ancillary development (22/0148) (44).	Permitted	0.24	The proposed upgrade of an existing base station consisting of the removal of the 12m monopole and installation of a 17.5m monopole supporting 6 no antenna on an open headframe with internal works to the existing ground-based cabinets and ancillary development thereto.	Construction phase – Yes Operational phase - Yes
Application under s106a of the town and country planning act to modify an extant planning obligation relating to planning permissions 08/0058, 17/0861, 17/0862, 18/0544 and 18/0546 (22/0845) (165).	Under construction	0.07	Application for residential development comprising of 66 no. Detached dwellings and garages.	Construction phase – Yes Operational phase - Yes
Application for approval of reserved matters pursuant to outline planning permission 15/0547 for the erection of 170 dwellings for appearance, landscaping, layout and scale (17/0957) (298).	Under construction	0.32	The application proposals include the following: · Residential – 170 No. residential units. The units will be a mix of 1 to 5 bed; dwellings, all of which shall be 2 storeys; · Landscaping / Open Space – Extensive areas of open space are to be provided in accordance with the outline consent.	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
Outline application for residential development of 30 dwellings including 10 affordable dwellings (access and layout applied for and other matters reserved) (17/0595) (303).	Pending	0.21	Outline planning application for 30 residential, including 10 affordable dwelling at Oak House Farm, Oak Lane, Newton, PR4 3RR. The site has been identified with emerging Fylde Local Plan to 2032: Revised Preferred Option for Housing Allocation.	Construction phase – Yes Operational phase - Yes
Outline residential application (matters applied for - access, layout & scale) comprising of a 3 storey building for up to 38 apartments (17/0299) (309).	Under Construction	0.43	38 assisted flats and 33 car parking spaces. Flats would include: - 1 Bed Flats with footprint of 48.36m2 - 2 Bed flats with footprint of 72.54m2.	Construction phase – Yes Operational phase - Yes
Erection of 2, two storey buildings for use as light industrial/storage and offices within Use Class B8 and E(g) with associated parking, landscaping and access (Outline application for access, landscaping, layout and scale) (22/0365) (718).	Permitted	0.00	Development of two buildings comprising 16 units - each unit with a warehouse, staff room and supporting infrastructure. This includes access and car parking.	Construction phase – Yes Operational phase - Yes
Erection of up to 35,000sqm of business, industrial and storage and warehousing uses (Classes E(g), B2 and B8); Erection of up to 275sqm retail floorspace (Class E(a)); Erection of up to 275sqm cafe floorspace (Class E(b)); Highways works (22/0265) (719).	Permitted	0.32	Mixed use development, phase 1 of the Blackpool Enterprise Zone. This comprises: - Road infrastructure and highways improvements; - New access road Cafe, retail unit, nursery alongside wider approval for employment floor space (8.97ha area); - Associated infrastructure including drainage, landscaping, car parking and substation.	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
Relocation of intermediate roundabout on proposed Heyhouses to m55 link road and realignment of adjacent highways to tie in with highway alignment approved under planning permission 05/10/0779 (LCC/2019/0012) (783).	Permitted	0.50	Relocation of intermediate roundabout on proposed Heyhouses to M55 Link Road and realignment of adjacent highways to tie in with highway alignment approved under planning permission 05/10/0779.	Construction phase – Yes Operational phase - Yes
Dry ski slope, mountain bike track, creation of leisure lake and siting of up to 13no. lodges to be occupied by children in care (Class C2) together with associated development (06/2023/0245) (820).	Permitted	0.02	Erection of dry ski slope and mountain bike track, creation of leisure lake and siting of up to 13 lodges to be occupied by young people in the services of Pioneer Tec together with associated development.	Construction phase – Yes Operational phase - Yes
Scoping opinion in respect of a 49.9MW solar farm (23/0739) (879).	Permitted	0.12	The proposed development as a whole comprises the construction and operation of A 49.9 MW solar farm development and the associated infrastructure, including; - Solar PV modules mounted on to frames to form arrays; - Inverter units, Transformers; - Switch room; - Fencing and security measures (thermal CCTV); - Access tracks; - Onsite cabling; - Offsite cabling; - Landscaping; and - Habitat enhancement.	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
Hybrid planning application relating to enterprise zone development consisting of full application the construction of new access roads, existing highways improvement works and drainage works; and outline planning application for the construction of 5 no. Hangars, a commercial unit (class b2 / e(g)) and car parking, alongside associated infrastructure works with access applied for and all other matters reserved (23/0589) (882).	Pending	0.00	Hybrid planning application comprising of; full planning application for the construction of new access roads, existing highways improvement works and drainage works and outline planning application for the construction of 5 no. hangars, a commercial unit and car parking, alongside associated infrastructure works.	Construction phase – Yes Operational phase - Yes
Hybrid planning application comprising: (a) Full application for the construction of new access roads, existing highways improvement works and drainage works. (b) Outline planning application for the erection of 5 no. hangars, a commercial unit (Use Class B2 or E(g)) and car parking, alongside associated infrastructure works. Blackpool airport, land west of Amy Johnson way, Blackpool, FY4 2RP (23/0634) (896).	Pending	0.00	Hybrid planning application comprising: (a) Full application for the construction of new access roads, existing highways improvement works and drainage works; (b) Outline planning application for the erection of 5 no. hangars, a commercial unit (Use Class B2 or E(g)) and car parking, alongside associated infrastructure works.	Construction phase – Yes Operational phase - Yes
Use of vacant land to create a connection through to the existing car park and to create 50 new parking spaces. South shore primary care centre, lytham road, Blackpool, FY4 1TJ (23/0623) (897).	Permitted	0.33	Use of vacant land to create a connection through to the existing car park and to create 50 new parking spaces.	Construction phase – Yes Operational phase - Yes
Display of double sided internally illuminated 7m high totem pole. Land at Squires Gate	Under construction	0.39	Display of double sided internally illuminated 7m high totem pole.	Construction phase – Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
lane adjacent Blackpool retail park (23/0571) (899).				Operational phase - Yes
Variation of condition 2 of application Reference Number: 07/2022/00052/VAR - Variation/removal of conditions 2, 5, 12-14 of permission 07/2021/00252/FUL for development of a 49.99 MW Battery Storage Facility, with associated infrastructure and landscaping (07/2024/00013/VAR) (914).	Permitted	0.02	Variation of condition 2 of application Reference Number: 07/2022/00052/VAR - Variation/removal of conditions 2, 5, 12-14 of permission 07/2021/00252/FUL for development of a 49.99 MW Battery Storage Facility, with associated infrastructure and landscaping (914).	Construction phase – Yes Operational phase - Yes
Scoping opinion in respect of a 49.9mw solar farm (22/0204) (948).	Permitted	0.000	Request for screening opinion pursuant to the town and country Planning (environmental impact assessment) regulations 2017 in Respect of a 25mw solar farm, battery energy storage scheme and Associated development.	Construction phase – Yes Operational phase - Yes
Erection of 3, two storey buildings for use as light industrial/storage and offices within Use Class B8 and E (g) with associated parking, landscaping and access (Reserved Matters Application to agree details of appearance following grant of outline permission ref. 22/0365) (24/0223) (960).	Pending	0.395	Reserved matters for 3, two storey buildings for use as light industrial/storage and offices within Use Class B8 and E(g) with associated parking, landscaping and access (Outline application for access, landscaping, layout and scale).	Construction phase – Yes Operational phase - Yes
Erection of a 30 mw battery energy storage system facility consisting of 11 battery cell units, 11 battery inverter units, substation, switchroom, auxillary transformer, battery control room, 4 cctv columns, 3m security rated acoustic fence, internal access roads, parking and turning area, and associated hard and soft landscaping (24/0295) (970).	Pending	0.078	30MW Battery Energy Storage System	Construction phase – Yes Operational phase - Yes

Project/Plan (CEA list no. document reference F1.5.5)	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Overlap with the Transmission Assets
Clifton Marsh Solar Farm, Lancashire (06/2024/0767) (975).	Pending	0.04	49.9 megawatt solar farm with associated infrastructure.	Construction phase – Yes Operational phase - Yes

9.12.2 Scope of cumulative effects assessment

9.12.2.1 The impacts identified in **Table 9.41** have been selected as those having the potential to result in the greatest cumulative effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been based on the Project Design Envelope set out in Volume 1, Chapter 3: Project description of the ES as well as the information available on other projects and plans.

Table 9.41: Scope of assessment of cumulative effects

Cumulative effect	Phase[a]			Project(s) considered	Justification
	C	O	D		
The impact of dust soiling (nuisance) on property arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	Maximum design scenario as described for the Transmission Assets (**Table 9.16**) assessed cumulatively with the following other projects/plans: • A total of 31 Tier 1 projects located within 500 m of the Onshore Order Limits. • Assumed that all cumulative projects will implement suitable primary and tertiary mitigation, as recommended in the Guidance on the assessment of dust from demolition and construction (IAQM, 2024).	The maximum design scenario presented in **Table 9.16** above identifies the largest geographical area and the longest time period required to complete construction of the Transmission Assets. Therefore, the maximum design scenario provides the greatest potential for spatial and temporal cumulative effects to occur between the Transmission Assets and other projects/plans with respect to air quality.
The impact of an increase in suspended particulate matter on people arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓		
The impact of dust deposited on ecological receptors arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓		
The impact of an increase in NOx, PM_{10} and $PM_{2.5}$ on people arising from traffic generated by onsite construction and decommissioning activities.	✓	×	✓	Traffic data modelled in **section 9.11.3** includes cumulative developments as outlined in Volume 3, Chapter 7: Traffic and transport of the ES.	Traffic data modelled in **section 9.11.3** includes cumulative developments as outlined in Volume 3, Chapter 7: Traffic and transport of the ES.

9.13 Cumulative effects assessment

9.13.1 Introduction

9.13.1.1 A description of the significance of cumulative effects upon air quality receptors arising from each identified impact is given below.

9.13.2 Construction phase

9.13.2.1 There is potential for cumulative effects to occur with other proposed developments within 500 m (2 x 250 m) of the Onshore Order Limits. This distance is based on the study area for the construction dust assessment. However, on the basis that other proposed developments implement suitable primary and tertiary mitigation, as recommended in the guidance on the assessment of dust from demolition and construction (IAQM, 2024), both sites will have a negligible dust impact. It is therefore considered that cumulative effects arising during construction of the Transmission Assets will be **not significant**.

9.13.2.2 An Outline Construction Traffic Management Plan (CTMP) (document reference J5) is proposed, as set out in **section 9.8** in order to manage construction traffic flows.

9.13.2.3 Traffic data modelled in **section 9.11.3** includes cumulative developments as outlined in Volume 3, Chapter 7: Traffic and transport of the ES. On that basis, the cumulative effects from construction traffic are predicted to be **not significant**.

9.13.3 Operation and maintenance phase

9.13.3.1 As set out in Volume 1, Chapter 3: Project description of the ES, the onshore substations will be unmanned and traffic will be restricted to preventative and corrective works. Therefore, traffic flows during the operation and maintenance phase will be below the thresholds for air quality assessment. The potential impacts with respect to air quality arising from operation and maintenance of the Transmission Assets have been scoped out of the assessment. There is therefore no potential for this phase to contribute to any significant cumulative effect.

9.13.4 Decommissioning phase

9.13.4.1 The potential impacts during decommissioning of the Transmission Assets are expected to be similar to the impacts during earthworks and construction. Therefore, it is considered that cumulative effects arising during decommissioning of the Transmission Assets are **not significant** following the implementation of dust mitigation measures.

9.14 Transboundary effects

9.14.1.1 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with

regard to air quality from the Transmission Assets upon the interests of other states as the study area is only 250 m (and therefore within the UK).

9.15 Inter-related effects

9.15.1.1 Inter-relationships are the impacts and associated effects of different aspects of the Transmission Assets on the same receptor. These are as follows.

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Transmission Assets (construction, operation and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor group than if just one phase were assessed in isolation.
- Receptor led effects: Assessment of the scope for all relevant effects across multiple topics to interact, spatially and temporally, to create inter-related effects on a receptor.

9.15.1.2 A description of the likely interactive effects arising from the Transmission Assets on air quality is provided in Volume 4, Chapter 3: Inter-relationships of the ES.

9.16 Summary of impacts, mitigation measures and monitoring

9.16.1.1 Information on air quality within the study area was collected through a desk review.

9.16.1.2 **Table 9.42** presents a summary of the impacts, measures adopted as part of the Transmission Assets and residual effects in respect to air quality. The impacts assessed include the following.

- The potential impact of dust soiling on dust sensitive receptors arising from earthworks and construction.
- The impact of an increase in suspended particulate matter on people arising from dust emissions generated by onsite construction and decommissioning activities.
- The impact of an increase in suspended particulate matter on ecology arising from dust emissions generated by onsite construction and decommissioning activities.
- The impact of vehicle emissions during construction and decommissioning.

9.16.1.3 Overall, it is concluded that there will be no significant effects arising from the Transmission Assets during the construction, operation and maintenance or decommissioning phases in relation to dust and construction traffic related emissions.

9.16.1.4 **Table 9.43** presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The cumulative impacts assessed include the following.

- The impact of dust soiling (nuisance) on property arising from dust emissions generated by onsite construction and decommissioning activities.
- The impact of an increase in suspended particulate matter on people arising from dust emissions generated by onsite construction and decommissioning activities.
- The impact of dust deposited on ecological receptors arising from dust emissions generated by onsite construction and decommissioning activities.
- The impact on human receptors arising from air emissions generated by vehicles during the construction and decommissioning phase.
- The impact on ecological receptors arising from air emissions generated by vehicles during the construction and decommissioning phase.

9.16.1.5 Overall, it is concluded that there will be no significant cumulative effects from dust and construction traffic related emissions arising from the Transmission Assets alongside other projects/plans.

9.16.1.6 No potential transboundary impacts have been identified in regard to effects of the Transmission Assets.

Table 9.42: Summary of environmental effects, mitigation and monitoring

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
The impact of dust soiling (nuisance) on property arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	CoT33: Measures based on the highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above. CoT35, CoT36.	Large	High	Negligible	No further mitigation required beyond measures based on highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Negligible	No future monitoring is proposed.
The impact of an increase in suspended particulate matter on people arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	CoT33: Measures based on the highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above. CoT35, CoT36.	Large	Medium	Negligible	No further mitigation required beyond measures based on highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Negligible	No future monitoring is proposed.
The impact of an increase in suspended particulate matter on ecological receptors arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	CoT33: Measures based on the highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above. CoT35, CoT36.	Large	High	Negligible	No further mitigation required beyond measures based on highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Negligible	No future monitoring is proposed.

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
The impact of vehicle emissions on human heath and ecological receptors during construction and decommissioning.	✓	×	✓	N/A	Large	Up to high	Negligible	None	Negligible	No future monitoring is proposed.

[a] C=construction, O=operation and maintenance, D=decommissioning

Table 9.43: Summary of cumulative environmental effects, mitigation and monitoring

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Tier 1										
The impact of dust soiling (nuisance) on property arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	Measures based on the highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Large	High	Negligible	No further mitigation required beyond measures based on highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Negligible	The desk study is considered sufficient to inform the assessment of construction dust and site specific surveys are not considered necessary at this stage.
The impact of an increase in suspended particulate matter on people arising from dust emissions generated by onsite construction and	✓	×	✓	Measures based on the highly recommended measures for sites with high dust risk (IAQM, 2024) as set	Large	Medium	Negligible	No further mitigation required beyond measures based on highly recommended measures for sites with high dust risk (IAQM, 2024) as set	Negligible	The desk study is considered sufficient to inform the assessment of construction dust and site specific surveys are not considered

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
decommissioning activities				out in **Table 9.15** above.				out in **Table 9.15** above.		necessary at this stage.
The impact of an increase in suspended particulate matter on ecological receptors arising from dust emissions generated by onsite construction and decommissioning activities.	✓	×	✓	Measures based on the highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Large	High	Negligible	No further mitigation required beyond measures based on highly recommended measures for sites with high dust risk (IAQM, 2024) as set out in **Table 9.15** above.	Negligible	The desk study is considered sufficient to inform the assessment of construction dust and site specific surveys are not considered necessary at this stage.
The impact of vehicle emissions on human health and ecological receptors during construction and decommissioning.	✓	×	✓	N/A	Large	Up to high	Negligible	None	Negligible	No future monitoring is proposed.

[a] C=construction, O=operation and maintenance, D=decommissioning

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