East Anglia TWO Offshore Windfarm

Chapter 19

Air Quality

Preliminary Environmental Information
Volume 1
Document Reference: EA2-DEVWF-ENV-REP-IBR-000814

Prepared by:	Checked by:	Approved by:
Paolo Pizzolla 2019.01.11 11:30:15 Z	Julia Bolton 2019.01.11 11:32:37 Z	Helen Walker 2019.01.11 11:48:41 Z

Revision Summary					
Rev	**Date**	**Document Status**	**Prepared by**	**Checked by**	**Approved by**
01	11/01/2019	For issue	Paolo Pizzolla	Julia Bolton	Helen Walker

Description of Revisions			
Rev	**Page**	**Section**	**Description**
01	N/A	N/A	Final draft

Table of Contents

Chapter 19 Air Quality figures are presented in **Volume 2: Figures** and listed in the table below.

Figure number	Title
Figure 19.1	Air Quality Study Area
Figure 19.2	Sensitive Human Receptors
Figure 19.3	Sensitive Ecological Receptors
Figure 19.4	Construction Phase Dust Distance Boundaries

Chapter 19 Air Quality appendices are presented in **Volume 3: Appendices** and listed in the table below.

Appendix number	Title
Appendix 19.1	Air Quality Technical Appendix
Appendix 19.2	Cumulative Impact Assessment with the Proposed East Anglia ONE North Project

Glossary of Acronyms

AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling System
APIS	Air Pollution Information System
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
CCS	Construction Consolidation Site
CEH	Centre for Ecology and Hydrology
CIA	Cumulative Impact Assessment
CL	Critical Load
CO	Carbon Monoxide
CoCP	Code of Construction Practice
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
Defra	Department of Environment Food and Rural Affairs
DETR	Department of the Environment, Transport and the Regions
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DPF	Diesel Particulate Filter
EC	European Commission
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EPUK	Environmental Protection United Kingdom
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HMSO	Her Majesty's Stationary Office
IAQM	Institute of Air Quality Management
km	Kilometres
km/h	Kilometres per hour
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
$mg.m^{-3}$	Milligrams (of pollutant) per cubic meter (of air)
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery

NSIP	Nationally Significant Infrastructure Project
OHL	Overhead Line
PEIR	Preliminary Environmental Information Report
PID	Public Information Days
PM_{10}	Particulate Matter with an aerodynamic diameter of less than 10 µm
$PM_{2.5}$	Particulate Matter with an aerodynamic diameter of less than 2.5 µm
SAC	Special Areas of Conservation
SCDC	Suffolk Coastal District Council
SoS	Secretary of State
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest
TG	Technical Guidance
UK	United Kingdom

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Construction consolidation sites	Compounds which will contain laydown, storage and work areas for onshore construction works. The HDD construction compound will also be referred to as a construction consolidation site.
Development Area	The area comprising the Proposed Onshore Development Area and the Offshore Development Area
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one offshore construction operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Jointing Bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links.
Mitigation areas	Areas captured within the Development Area specifically for mitigating expected or anticipated impacts.
National Grid infrastructure	A National Grid substation, connection to the existing electricity pylons and National Grid overhead line realignment works which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines to transport electricity from the National Grid substation to the national electricity grid
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to

substation	the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Onshore cable corridor	The corridor within which the onshore cable route will be located
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables and two fibre optic cables.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment, both within and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Proposed Onshore Development Area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Transition Bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

19 Air Quality

19.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) considers the potential impacts of the proposed East Anglia TWO project on air quality. This chapter was produced by Royal HaskoningDHV.

2. This chapter provides an overview of the existing baseline environment in respect to air quality, the findings of which have been used to inform an assessment of the potential impacts of the onshore cable route and associated infrastructure for the proposed East Anglia TWO project. This assessment also considers cumulative impacts of other proposed projects in respect of air quality.

3. The potential air quality impacts arising from the construction, operation and decommissioning of the offshore elements of the proposed East Anglia TWO project have been scoped out of this assessment. As a result, they are not considered further within this chapter.

4. It should be noted that the proposed East Anglia TWO project also has the potential to impact other receptors with a link to air quality, which are discussed in other chapters within this PEIR. Therefore, this chapter refers to other onshore chapters where appropriate. The relevant chapters are:

   - ***Chapter 22 Onshore Ecology;***
   - ***Chapter 26 Traffic and Transport;*** and
   - ***Chapter 27 Human Health.***

5. The terminology and impact assessment methodologies used in this chapter differ from the generic impact assessment terminology presented within ***Chapter 5 EIA Methodology***, as air quality guidance documents include specific assessment criteria.

19.2 Consultation

6. Consultation is a key driver of the Environmental Impact Assessment (EIA) process, and continues throughout the lifecycle of a project, from its initial stages through to consent and post-consent.

7. To date, consultation with regards to air quality has been undertaken via Expert Topic Group (ETG) meetings, described within ***Chapter 5 EIA Methodology***, with meetings held in April 2018, and the East Anglia TWO Scoping Report

(ScottishPower Renewables (SPR) 2017). Feedback received through this process has been considered in preparing the PEIR where appropriate and this chapter will be updated following the next stage of consultation for the final assessment submitted with the Development Consent Order (DCO) application.

8. ***Table 19.1*** provides a summary of those consultation responses that have been received as a response to the Scoping Report (SPR 2017) and are relevant to air quality. Responses from stakeholders have been captured in the table below.

Table 19.1 Consultation Responses

Consultee	Date/ Document	Comment	Response / where addressed in the PEI
Suffolk County Council and Suffolk Coastal District Council	08/12/2017 Scoping Response	Details of all potential construction site works which may give rise to dust (e.g. excavation, demolition, movement of vehicles, loading and stockpiling of soil and rubble, crushing of material etc.) shall be specified together with the location and the particular methods of dust suppression to be used for each specific activity.	The assessment of impacts associated with construction dust was carried out based on a worst-case scenario, as defined in ***section 19.3.2***. Mitigation measures commensurate with the level of dust expected to be generated by the worst-case activities are detailed in ***section 19.6.1.1.5*** and will be applied to the onshore transmission works and construction consolidation sites as a whole, and will be included in a code of construction practice (CoCP).
Suffolk County Council and Suffolk Coastal District Council	08/12/2017 Scoping Response	Atmospheric concentrations of particulate matter (PM_{10}) arising from all potential construction works, which may give rise to airborne dust shall also be predicted at the nearest relevant receptor locations and submitted for the purposes of the Local Air Quality Management Regime. The predicted concentrations for each receptor shall be formatted for comparison with the objectives included in the Air Quality (England) Regulations 2000 (SI928) and Air Quality (England) Amendment Regulations 2002 (SI3043).	It is not possible to quantitatively predict PM_{10} emissions from construction works. A qualitative assessment of dust and PM_{10} emissions was therefore undertaken in accordance with guidance provided by the Institute of Air Quality Management (IAQM), as detailed in ***section 19.6.1.1***. Quantitative assessment of PM_{10} and $PM_{2.5}$ emissions associated with road vehicle exhaust emissions was carried out and is detailed in ***section 19.6.1.2***.
Suffolk County Council and Suffolk Coastal District Council	08/12/2017 Scoping Response	If any of the Air Quality Standards or Objectives in the Air Quality (England) Regulations 2000 (SI928) and Air Quality (England) Amendment Regulations 2002	As detailed above, a quantitative assessment of PM_{10} associated with construction works could not be carried out. Concentrations of PM_{10} and $PM_{2.5}$ were predicted in the context of road vehicle

Consultee	Date/ Document	Comment	Response / where addressed in the PEI
		(SI3043), set for Local Air Quality Management, are predicted to be exceeded by the above mentioned activities, further assessment will be required. This may include monitoring at relevant receptor locations, detailed computer modelling and investigations of solutions to reduce pollutant concentrations.	exhaust emissions, and were compared to the air quality Objectives, as detailed in ***section 19.6.1.2***.
Public Health England	05/12/2017 Scoping Response	When considering a baseline (of existing air quality) and in the assessment and future monitoring of impacts these: Should include consideration of impacts on existing areas of poor air quality e.g. existing or proposed local authority Air Quality Management Areas (AQMAs); Should include modelling using appropriate meteorological data (i.e. come from the nearest suitable meteorological station and include a range of years and worst case conditions); and Should include modelling taking into account local topography.	Consideration was given to impacts at the Stratford St Andrew AQMA. Dispersion modelling was carried out using the closest, most representative meteorological data. Dispersion modelling was carried out using a full calendar year of hourly-sequential meteorological data, and results were based on the averages of these hourly recorded dispersion conditions. The dispersion modelling assessment considered the impact of road vehicle exhaust emissions, which occur at ground level, and are therefore not subject to the same meteorological influences as elevated emission sources such as stacks. The distances between the source (road traffic) and receptor (at the road edge) are sufficiently small such that local changes in topography are not expected to have a significant effect on the dispersion of pollutants.
Public Health England	05/12/2017 Scoping Response	Any assessment of impacts arising from emissions due to construction and decommissioning should consider potential impacts on all receptors and describe monitoring and mitigation during these phases. Construction and decommissioning will be associated with vehicle movements and cumulative impacts should be accounted	Human and ecological receptor locations were selected based on their proximity to the onshore construction works and/or road links affected by the proposed East Anglia TWO project, where the potential effect of development-generated emissions on local air pollution would be most significant. Mitigation measures are detailed

Consultee	Date/ Document	Comment	Response / where addressed in the PEI
		for.	in ***section 19.6.1.1.5.*** Traffic data for future year scenarios were derived using growth projections provided by Suffolk County Council which take into account Local Plan allocations. See ***Chapter 26 Traffic and Transport***
The Planning Inspectorate	20/12/2017 Scoping Response	The Inspectorate does not agree that the operational impact of dust and particulates can be scoped out. The Scoping Report makes reference to traffic flows in the operational phase but does not set out whether maintenance activities would generate dust and particles. Furthermore, the archaeology and cultural heritage aspect chapter notes 'grubbing out' as a potential dust-creating activity. This should be fully assessed in the air quality chapter and cross-referenced between chapters.	It is not expected that the operational activities associated with maintenance of the onshore cable route and substation would lead to any significant generation of dust and fine particulate matter as there would be no earthworks carried out. It is therefore considered that an operational phase assessment is not required. Operational dust assessments were also scoped out upon agreement with stakeholders at ETG meetings in April 2018. The reference to 'grubbing out' was made as an example of potential decommissioning phase activities that may be required if building foundations are removed. A decommissioning plan will be provided that will adhere to current legislation and best practice, which will include measures to minimise dust and fine particulate matter emissions. An assessment of operational phase impacts is therefore not considered to be required.
The Planning Inspectorate	20/12/2017 Scoping Response	Where matters have been scoped into the assessment in the Scoping Report, or the Inspectorate has not agreed to the scoping out of matters, operational impacts which could result in significant cumulative effects should be included in the cumulative impacts assessment.	The cumulative impact assessment is presented in ***section 19.7***. Operational dust assessments were also scoped out upon agreement with stakeholders at ETG meetings in April 2018.
The Planning Inspectorate	20/12/2017 Scoping Response	The study area for the assessment should be sufficiently broad to ensure that all receptors which could experience a significant effect are captured within the	The study area and receptors were discussed in the ETG meeting held with Suffolk Coastal District Council (SCDC). In addition, the assessed road traffic network was agreed during

Consultee	Date/ Document	Comment	Response / where addressed in the PEI
		assessment. The extent of the study area should be agreed with relevant consultees and justified within the PEI.	consultation with SCDC, as described below.
The Planning Inspectorate	20/12/2017 Scoping Response	Where data sources are to be interrogated to provide baseline information the periods covered by the data should be provided in the PEI to enable understanding of the reliance that can be placed on the data.	The existing environment is presented in ***section 19.5***.
Suffolk Coastal District Council	5/10/2018 Consultation on detailed modelling methodology via email		No response had been received at the time of writing

9. Ongoing public consultation has been conducted through a series of Public Information Days (PIDs) and Public Meetings. PIDs have been held throughout Suffolk in November 2017, March 2018, and June / July 2018 with further events planned in 2019. A series of stakeholder engagement events were also undertaken in October 2018 as part of consultation phase 3.5. These events were held to inform the public of potential changes to the onshore substation location. This consultation aims to ensure that community concerns are well understood and that site specific issues can be taken into account, where practicable. Consultation phases are explained further in ***Chapter 5 EIA Methodology.*** Full details of the proposed East Anglia TWO project consultation process will be presented in the Consultation Report, which will be submitted as part of the DCO application.

10. ***Table 19.2*** shows public consultation feedback pertaining to air quality. Consultation phases are explained further in ***Chapter 4 Site Selection and Assessment of Alternatives.***

Table 19.2 Public Consultation Responses Relevant to Air Quality

Topic	Response / where addressed in the PEI
Phase 1	
• Dust and air pollution	Impacts of dust and air pollution are assessed in ***section 19.6***
Phase 2	
None	-
Phase 3	
• Concerns over air pollution from increased traffic and dust generation.	Impacts of dust and air pollution are assessed in ***section 19.6***
Phase 3.5	
• Concerns over diesel fumes on country roads affecting walkers • Impact of air pollution and dust generation from increased traffic • Concern over exceeding allowable NOx levels • Impact of air pollution on roadside vegetation and wildlife	Impacts of air pollution (on human and ecological receptors) caused by increased traffic are assessed in ***section 19.6.1.2***. Impacts linked with dust generation are assessed with ***section 19.6.1.1***.

19.3 Scope

19.3.1 Study Area

11. The study area for the air quality assessment was discussed at the Air Quality ETG, and the principle for definition of it was agreed with the SCDC environmental health officers (EHOs) on 26th April 2018. The study area for the air quality assessment is defined as follows:

- Construction phase dust and fine particulate matter emissions
  - Human receptors within 350m of the onshore cable corridor and within 50m of routes used by construction vehicles, up to 500m from the boundary of the onshore cable corridor; and
  - Ecological receptors within 50m of the onshore cable corridor and within 50m of routes used by construction vehicles, up to 500m from the boundary of the onshore cable corridor.
- Construction phase road traffic emissions
  - Human and ecological receptors within 200m of roads that are expected to experience increases in traffic movements as a result of the proposed East Anglia TWO project.

12. The air quality study area is shown in ***Figure 19.1***.

19.3.2 Worst Case Scenario

13. This section identifies the realistic worst case parameters associated with the proposed East Anglia TWO project alone. This includes all onshore infrastructure for the proposed East Anglia TWO project and the National Grid infrastructure that the proposed East Anglia TWO project will require for ultimate connection to national electricity grid.

14. ***Table 19.3*** identifies those realistic worst case parameters of the onshore infrastructure that are relevant to potential impacts on air quality during construction and decommissioning phases of the proposed East Anglia TWO project. Please refer to ***Chapter 6 Project Description*** for more detail regarding specific actvities, and their durations, which fall within the construction phase.

Table 19.3 Realistic Worst Case Scenario

Impact	Parameter	Notes
Construction		
Construction duration	The minimum realistic duration that the onshore works can be completed in, resulting in the highest traffic demand due to the intensity of activities, is 36 months (three years).	This duration has been used as the realistic onshore construction duration date for the purpose of the assessment of environmental impacts in this PEIR[1]. Vehicle movements have been calculated using this parameter and are detailed further in ***Chapter 26 Traffic and Transport***.
Construction Date	Earliest start of construction 2024.	2024 has been used as the realistic construction start date for the purpose of the assessment of environmental impacts in this PEIR[2]. Vehicle movements have been calculated using this parameter and are detailed further in ***Chapter 26 Traffic and Transport***.
Impacts related to the landfall	HDD temporary works area: 7,000m^2 (70m x 100m)	Landfall to be achieved via HDD. No beach access required.

[1] This assumed construction duration has been used for the assessment presented in this PEIR. Any refinement of the programme prior to submission of the DCO will be captured in the Environmental Statement.
[2] This assumed construction start date has been used for the assessment presented in this PEIR. Any refinement of the programme prior to submission of the DCO will be captured in the Environmental Statement.

Impact	Parameter	Notes
	Transition bay excavation footprint (for 2 transition bays): 1,554m^2 (37m x 42m) Landfall Construction Consolidation Site (CCS): 18,400m^2 (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m^3	
Impacts related to the onshore cable corridor	Onshore cable route: 287,360m^2 (8,980m x 32m) Jointing bay construction excavation footprint: 570m^2 (30.6m x 18.6m). Total for 36 jointing bays: 20,520m^2 (570m^2 x 36) HDD (retained as an option to cross SPA / SSSI): • Entrance pit CCS (x1): 7,000m^2 (100m x 70m) • Exit pit CCS (x1): 3,000m^2 (100m x 30m) Onshore cable route CCS: 18,400m^2 (160m x 115m). Total for 5 CCS: 92,000m^2 (18,400m^2 x 5) Temporary roads: • Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m^2 • Onshore cable route and substation access haul road (9m width): 18,675m^2 • Temporary access road: 23,495m^2 Onshore cable trench approximate quantity of spoil material: 13,321m^3	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field boundaries or roads as far as practical. Two link boxes sit underground beside each jointing bay at a depth of approximately 1.2m. The construction footprint of these is included in the jointing bay construction excavation footprint.
Impacts related to the onshore substation	Onshore substation CCS: 17,100m^2 (190m x 90m) Permanent footprint (used as CCS during construction): 36,100m^2 (190m x 190m) Substation operational access road: 12,800m^2 (1,600m x 8m)	Construction access is included above as the onshore cable route and substation access haul road.
Impacts related to the National Grid Infrastructure	National Grid substation CCS: 78,750m^2 (250m x 315m) Permanent footprint (used as CCS during construction): 45,500m^2 (325m x 140m)	Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and

Impact	Parameter	Notes
		included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in ***Figure 6.6*** of ***Chapter 6 Project Description***. Construction access is included above as the onshore cable route and substation access haul road. Operational access is included above as the substation operational access road,
Operation		
Impacts related to the landfall	2 transition bays will be installed underground, each with an operational volume of 227m^3	Transition bays will be buried approximately 1.2m underground – there will no above ground infrastructure.
Impacts related to the onshore cable corridor	36 jointing bays will be installed underground, each with an operational volume of 77m^3 72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m^3	Jointing bays will be buried approximately 1.2m underground – there will no above ground infrastructure. Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.
Impacts related to the onshore substation	Operational footprint: 36,100m^2 (190m x 190m) Substation operational access road: 12,800m^2 (1,600m x 8m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m^2 (325m x 140m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR). Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative

Impact	Parameter	Notes
		locations for cable sealing end CCSs and pylon realignment CCS are shown in ***Figure 6.6*** of ***Chapter 6 Project Description***.
Decommissioning		
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.		

19.3.3 Embedded Mitigation

15. A range of different information sources has been considered as part of embedding mitigation into the design of the proposed East Anglia TWO project (for further details see ***Chapter 6 Project Description*** and ***Chapter 4 Site Selection and Assessment of Alternatives***) including engineering requirements, feedback from community and landowners, ongoing discussions with stakeholders and regulators, commercial considerations and environmental best practice. Embedded mitigation measures relevant to air quality are detailed in ***Table 19.4.***

Table 19.4 Embedded Mitigation Measures for Air Quality

Parameter	Mitigation Measures Embedded into the proposed East Anglia TWO Project Design
General	
Site selection	The proposed East Anglia TWO project has undergone an extensive site selection process to date which has involved incorporating environmental considerations in collaboration with the engineering design requirements. Considerations include (but are not limited to) a preference for the shortest route length (where practical) and developing construction methodologies to minimise potential impacts. Key design principles, relevant to air quality, that have been adopted from the outset (wherever practical), include: • Avoid direct impacts with key internationally and nationally designated areas (Special Areas of Conservation (SACs), Special Protection Area (SPAs), Site of Special Scientific Interest (SSSIs), etc.); and • The cable corridor / route should be kept as straight and as short as practicable.

Parameter	Mitigation Measures Embedded into the proposed East Anglia TWO Project Design
Designated sites	The route of the onshore cable corridor was influenced from the onset of the proposed East Anglia TWO project design process by the location of designated sites, specifically The Sandlings SPA and component Leiston-Aldeburgh SSSI. The proposed East Anglia TWO project design minimises the overlap of the onshore cable corridor with these designated sites, choosing a crossing at the narrowest point, within habitat where no records of ornithological target species were found. Within areas of overlap with designated sites, HDD and/or open cut crossing techniques may be employed. The HDD entry pits would (where possible) be located away from these designated sites to avoid any potential impacts.
Long HDD at landfall	The landfall location was influenced from the onset of the proposed East Anglia TWO project design process by the presence of designated sites, specifically Leiston-Aldeburgh SSSI. The proposed East Anglia TWO project has committed to the use of HDD (refer to ***Chapter 6 Project Description***) at the landfall to minimise potential impacts. Furthermore, the HDD entry pit is located approximately 150m inland from the SSSI boundary and the HDD exit pit will be at sea. There will also be no requirement for access onto the beach at this location. Therefore, there will be no potential for any interaction with this site through the use of the HDD technique.
Access Strategy	The access strategy applies a hierarchical approach to selecting routes and where possible, seeks to reduce the impact of Heavy Goods Vehicle (HGV) traffic upon the most sensitive communities. This access strategy includes the following commitments: • All HGV traffic would be required to travel via the A1094 or B1122 from the A12, no traffic would be permitted to travel via alternative routes, such as the B1121 or B1119. • No HGV traffic would be permitted to travel though Leiston or Coldfair Green / Knodishall. • No HGV traffic would be permitted to travel via B1121 past Friston or Sternfield.
Adoption of car sharing for construction employees	A target of an average of at least 1.5 employees per vehicle is proposed and would be secured through the outline Construction Traffic Management Plan.
A haul road for the length of the onshore cable route	Reducing trips on the local highway network.

19.3.4 Monitoring

16. Post-consent, the final detailed design of the proposed East Anglia TWO project and the development of the relevant management plan(s) will refine the worst-case parameters assessed in the EIA. It is recognised that monitoring is an important element in the management and verification of the impacts of the proposed East Anglia TWO project. Outline management plans, across a number of environmental topics, will be submitted with the DCO application.

These outline management plans will contain key principles that provide the framework for any monitoring that could be required. The requirement for a final appropriate design and scope of monitoring will be agreed with the relevant stakeholders and included within the relevant management plan(s), submitted for approval, prior to construction works commencing.

19.4 Assessment Methodology

19.4.1 Guidance

19.4.1.1 Legislation and Policy (International)

19.4.1.1.1 European Union Directives

17. European Union (EU) legislation forms the basis for United Kingdom (UK) air quality policy. The European Union Air Quality Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management entered into force in 1996 (European Parliament 1996). Directive 96/62/EC and the first three Daughter Directives were combined to form the new European Union Directive 2008/50/EC (European Parliament 2008) on Ambient Air Quality and Cleaner Air for Europe, which came into force in June 2008.

19.4.1.1.2 United Kingdom Air Quality Strategy

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

19. The UK Air Quality Strategy was originally adopted in 1997 (Department of Environment, 1997) and has been reviewed and updated to take account of the evolving European Union legislation, technical and policy developments and the latest information on health effects of air pollution. The strategy was revised and reissued in 2000 as the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Department of the Environment, Transport and the Regions (DETR) 2000). This was subsequently amended in 2003 (DETR 2003) and July 2007 (Department for Environment, Food and Rural Affairs(Defra)). In 2018 a draft clean air strategy was published (DEFRA 2018).

19.4.1.1.3 Local Air Quality Management

20. The standards and Objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) (Her Majesty's Stationary Office (HMSO) 2000), and the Air Quality (England) (Amendment) Regulations (2002) (HMSO 2002). The European Union Limit Values have been implemented via the Air Quality Standards Regulations (2010), which set

out the combined Daughter Directive limit values and interim targets for Member State compliance (HMSO 2010).

21. The current air quality standards and objectives of relevance to this assessment are presented in ***Table 19.5***. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health. Pollutant objectives, however, incorporate target dates and averaging periods which take into account economic considerations, practicability and technical feasibility.

22. Where an air quality objective is unlikely to be met by the relevant deadline, local planning authorities must designate those areas as Air Quality Management Areas (AQMAs) and take action to work towards meeting the Objectives. Following the designation of an AQMA, local planning authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the Objectives and to improve air quality locally.

23. Possible exceedances of air quality Objectives are usually assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

Table 19.5 Air Quality Strategy Objectives (England) for the Purposes of LAQM

Pollutant	Air Quality Objective		To Be Achieved By
	Concentration	Measured as*	
Nitrogen Dioxide (NO_2)	200 µg.m^{-3}	1 hour mean not to be exceeded more than 18 times per year	31/12/2005
	40 µg.m^{-3}	Annual mean	31/12/2005
Particles (PM_{10})	50 µg.m^{-3}	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40 µg.m^{-3}	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	25 µg.m^{-3}	Annual mean (target)	2020
	15% cut in annual mean (urban background exposure)	2010 - 2020	

*The way the Objectives are to be measured is set out in the UK Air Quality (England) Regulations

19.4.1.2 Legislation and Policy (National)

24. The assessment of potential impacts upon air quality receptors has been made with specific reference to the relevant National Policy Statements (NPS). These

are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIP). Those relevant to the proposed East Anglia TWO project are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c).

25. The specific assessment requirements for air quality, as detailed in the NPS, are summarised in ***Table 19.6***, together with an indication of the section of this chapter where each is addressed. Where any part of the NPS has not been followed within the assessment an explanation as to why the requirement was not deemed relevant, or has been met in another manner, is provided.

Table 19.6 NPS Assessment Requirements

NPS requirements	NPS reference	PEIR reference
Any ES on air emissions will include an assessment of Carbon Dioxide (CO_2) emissions, but the policies set out in Section 2 [of EN-1], including the EU ETS, apply to these emissions. The IPC (now Planning Inspectorate) does not, therefore need to assess individual applications in terms of carbon emissions against carbon budgets.	EN-1 paragraph 5.2.2	Not applicable to assessment.
The ES should describe: • Any significant air emissions, their mitigation and any residual effects distinguishing between the proposed East Anglia TWO project stages and taking account of any significant emissions from any road traffic generated by the proposed East Anglia TWO project; • The predicted absolute emission levels of the proposed project, after mitigation methods have been applied; • Existing air quality levels and the relative change in air quality from existing levels; and • Any potential eutrophication impacts.	EN-1 paragraph 5.2.7	***Section 19.6***

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

19.4.1.3 Local Planning Policy

27. NPS EN-1, paragraph 4.1.5, states that:

"*Other matters that the IPC may consider important and relevant to its decision-making may include Development Plan Documents or other documents in the Local Development Framework. In the event of a conflict between these or any other documents and an NPS, the NPS prevails for the purposes of IPC decision making given the national significance of the infrastructure*."

28. The proposed onshore development area is located within SCDC's jurisdiction.

29. SCDC has recently closed consultation on the Suffolk Coastal First Draft Local Plan (SCDC 2018), which will contain planning policy and site allocations used to determine planning applications in the district until 2036. A review of the First Draft Local Plan identified the following policies of relevance to the assessment:

> *"Policy SCLP9.1: Low Carbon and Renewable Energy*
> *Council will support low carbon and renewable energy developments where they are within an area identified as suitable for renewable or low carbon energy or satisfy the following criteria:*
> *[…]*
> *d) Are complementary of the existing environment without causing any significant adverse impacts, particularly relating to the residential amenity…and air quality, unless those impacts can be appropriately mitigated.*
> *[…]"*
> *"Policy SCLP11.2: Residential Amenity*
> *When considering the impact of development on residential amenity, the Council will have regard to the following:*
> *[…]*
> *f) Light spillage, air quality and other forms of pollution; and […]*
> *Development will be acceptable where it would not cause an unacceptable loss of amenity to adjoining or future occupiers of development."*

30. Until the First Draft Local Plan is adopted, the existing Core Strategy remains in effect, which was published in 2013 (SCDC 2013). The following policies of relevance to air quality were identified:

> *"Development Management Policy DM23 – Residential Amenity*
> *When considering the impact of new development on residential amenity, the Council will have regard to the following:*
> *[…]*
> *(f) light spillage, air quality and other forms of pollution;*
> *[…]*

Development will be acceptable where it would not cause an unacceptable loss of amenity to adjoining or future occupiers of the development."

31. The requirements of these policies were considered in this assessment.

19.4.2 Data Sources

32. The data sources that will be used to inform the air quality baseline are provided in ***Table 19.7***.

33. In addition to the data sources listed below, the air quality assessment utilised traffic data provided by Royal HaskoningDHV transport consultants. Details of the derivation of the data and the assumptions used are provided in ***Chapter 26 Traffic and Transport***.

Table 19.7 Data Sources

Data	Year	Coverage	Confidence [3]	Notes
SCDC Air Quality Annual Status Report	2018	SCDC administrative region	High	Local monitoring data and baseline information
Centre for Ecology and Hydrology (CEH)	2018	UK	High	Details of critical loads for ecological habitats
Department for Environment Food and Rural Affairs (Defra) Local Air Quality Management Technical Guidance	2016	UK	High	Assessment methodology
Defra's LAQM Support Portal	2015	Study area	High	1 x 1km grid pollutant background maps
Institute of Air Quality Management (IAQM) and Environmental Protection UK	2017	UK	High	Assessment methodology
IAQM	2014	UK	High	Guidance on the assessment of impacts from construction dust

[3] Confidence level based upon the organisation responsible for collating data source (high = regulatory, low = non-regulatory)

Data	Year	Coverage	Confidence [3]	Notes
Highways Agency (now Highways England)	2007	UK	High	Design Manual for Roads and Bridges assessment methodology

19.4.3 Impact Assessment Methodology

19.4.3.1 Construction Phase Dust and Fine Particulate Matter Emissions

34. Assessment of potential impacts associated with construction phase dust and fine particulate matter emissions was undertaken in accordance with the latest IAQM guidance (IAQM 2014). The terminology differs from the generic impact assessment terminology presented within ***Chapter 5 EIA Methodology***.

35. A summary of the assessment process is provided below:

Construction phase assessment steps:

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

36. It should be noted that trackout is defined as the transport of dust and dirt from the construction site onto the public road network. Full details of the assessment methodology are provided in ***Appendix 19.1***.

19.4.3.1.1 Sensitivity

37. Definitions of the different sensitivity levels for human and ecological receptors to dust are given in ***Table 19.8***. Sensitivity levels are taken from IAQM guidance (IAQM 2014).

Table 19.8 Definitions of the Different Sensitivity Levels for Receptors to Construction Dust

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

19.4.3.1.2Magnitude

38. The magnitude of construction phase dust emissions should be defined for each type of activity. These are broken down into four categories: demolition, earthworks, construction and trackout. The dust emission magnitudes can either be small, medium or large and are dependent on the methods of work undertaken and the scale of the activity. It was anticipated that there would be no demolition required as part of the proposed East Anglia TWO project; therefore, this was not considered as part of the assessment.

39. The dust emission magnitudes for each activity are detailed in ***Table 19.9***.

Table 19.9 Definitions of the Different Magnitudes of Construction Phase Dust Emission

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Earthworks	Total site area <2,500m^2.	Total site area 2,500 – 10,000m^2.	Total site area >10,000m^2.
Construction	Total building volume <25,000m^3.	Total building volume 25,000 – 100,000m^3.	Total building volume >100,000m^3.
Trackout	<10 outward Heavy Goods Vehicle (HGV) trips in any one day. Unpaved road length <50m.	10-50 outward HGV trips in any one day. Unpaved road length 50-100m.	>50 outward HGV trips in any one day. Unpaved road length >100m.

40. As detailed in ***Table 19.9***, the IAQM guidance provides broad ranges of the area of a site, the total building volume and the number of outward vehicle trips which are used to determine the dust emission magnitude.

19.4.3.1.3Impact Significance

41. The dust emission magnitude should be combined with the sensitivity of the area to determine the risk of impacts prior to mitigation. This is shown in more detail in ***Appendix 19.1***. Once appropriate mitigation measures have been identified, the significance of construction phase impacts can be determined. The aim is to prevent significant effects at receptors due to the implementation of effective mitigation.

42. Impacts are unlikely to be significant where features of low sensitivity are subject to small scale or short-term impacts. If an impact is found not to be significant at the level at which the resource or feature has been valued, it may be significant at a more local level. Impacts are presented at different levels throughout the assessment where deemed applicable.

43. A matrix is not provided in the guidance to determine significance as it is considered that, with the implementation of effective mitigation measures, the residual impacts can be considered to be 'not significant' in accordance with guidance provided by the IAQM.

44. The requirement for a detailed assessment of construction vehicle exhaust emissions at human and ecological receptors was considered using screening criteria provided by the IAQM and Environmental Protection UK (EPUK) (IAQM and EPUK 2017), and the Design Manual for Roads and Bridges (DMRB) (Highways Agency 2007). Only the DMRB guidance contains criteria relating to assessment of designated ecological sites.

45. The assessment criteria are detailed in ***Table 19.10***.

Table 19.10 IAQM and EPUK and DMRB Road Traffic Assessment Criteria

Guidance document	Criteria	
IAQM and EPUK	Light Duty Vehicles (LDVs)	A change in annual average daily traffic (AADT) of more than 100 within or adjacent to an AQMA, or more than 500 elsewhere
	HGVs	An increase in HGV movements of more than 25 per day within or adjacent to an AQMA, or more than 100 elsewhere
DMRB	Light Duty Vehicles (LDVs)	Increase of 1,000 AADT or more
	HGVs	An increase in HGV movements of more than 200 per day

46. The increases in traffic flows on the road network as a result of the construction phase of the proposed East Anglia TWO project were screened using the criteria detailed in ***Table 19.10***. Road links which are anticipated to experience increases in traffic flows greater than the screening criteria were considered in the assessment. As such, sensitive receptor locations were identified on the affected road links only. Road links which were predicted to experience increases in vehicle numbers and HGVs in exceedance of the criteria are detailed in ***Table 19.11*****.**

Table 19.11 Road Links Considered in the Assessment

Link ID	Road	Number of vehicles generated by the construction phase of the proposed East Anglia TWO project	
		Total vehicles	HGVs
1	A12 north of the B1122	332	218
2	A12 between the B1122 and A1094	302	218
3	A12 south of the A1094	338	218
4	B1122 from the A12 to Lover's Lane	231	107
6	A1094 from the A12 to the B1121/B1069	308	210
9	B1069 from the A1094 to Coldfair Green	398	183
12	Lover's Lane / Sizewell Gap	257	107

19.4.3.1.4Dispersion Model

47. The potential impact of exhaust emissions from construction vehicles accessing the onshore transmission works was assessed using the Atmospheric Dispersion Modelling System for Roads (ADMS-Roads) v4.1.1.0. The main pollutants of concern for human health as a result of vehicle emissions are annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$. Concentrations of these pollutants were therefore the focus of the ADMS-Roads assessment.

19.4.3.1.5Assessment Scenarios

48. The peak year of onshore construction would occur in 2026 assuming a construction start date in 2024; this represents the maximum development-generated traffic and highest base traffic flows within the three-year construction period. This assumed construction start date has been used for the assessment presented in this PEIR. Any refinement of the programme prior to submission of the DCO will be captured in the Environmental Statement. The assessment has therefore considered the following:

- Verification / Base year (2017);
- Year of Peak Construction (2026) 'without project'; and
- Year of Peak Construction (2026) 'with project'.

49. A base year of 2017 was used as this was the most recent full calendar year for which monitoring and meteorological data were available.

19.4.3.1.6Traffic Data

50. 24-hour AADT flows and HGV percentages were provided by Royal HaskoningDHV transport consultants. The traffic data used in the assessment is detailed in ***Appendix 19.1***.

51. Traffic speeds were included in the air dispersion modelling as follows:

- Queues were modelled at junctions at 20km/h; and
- Speed data for free-flowing traffic conditions obtained from average speeds recorded during the traffic count surveys where applicable, or national speed limits. Where speeds vary across a road link, the lowest speed was used to provide a conservative assessment. For the purposes of model verification, the road speed adjacent to the monitoring location was used to more adequately represent monitored conditions.

19.4.3.1.7Emission Factors

52. Emission factors were obtained from the Emission Factor Toolkit v8.0.1 provided by Defra (Defra 2017a). There is uncertainty regarding the rate of reduction in emissions from road vehicles in the future, therefore emission factors for the 2017 base year were used in the 2026 'without project' and 'with project' assessment scenarios. However, it is acknowledged that the use of 2017 base year emission data in scenarios so far into the future are likely to be conservative.

19.4.3.1.8Meteorological Data

53. 2017 meteorological data from the Wattisham recording station was used in the ADMS-Roads model. This is the closest meteorological station to the study area.

19.4.3.1.9Model Verification

54. Model verification is the process of adjusting model outputs to improve the consistency of modelling results with respect to available monitored data. In this assessment, model uncertainty was minimised following Defra (Defra 2016) and IAQM and EPUK (IAQM and EPUK 2017) guidance.

55. Monitoring locations within the study area were reviewed to establish the suitability for use in model verification. Locations were considered where the assessed road links provided sufficient representation of road traffic sources that would affect monitored concentrations at that point.

56. A review of the monitoring data identified eight NO_2 diffusion tubes located on the considered road network with available data for 2017. The diffusion tubes are located in Little Gremham, Farnham and Stratford St Andrew and are all located along the A12. The eight diffusion tubes were therefore used in the derivation of the adjustment factor utilised in the assessment. Following the first round of model verification, two diffusion tubes were removed from the verification process (locations FAR1 and ST6) in accordance with Defra technical guidance (Defra 2016), as the difference between monitored and modelled concentrations was greater than 25%. Details of the model verification process are provided in ***Table 19.12***.

Table 19.12 Model Verification

Model verification	NO_2 diffusion tube monitoring location					
	LGM2	FAR2	STA1	STA2	STA7	STA8
2017 Monitored Total NO_2 ($\mu g.m^{-3}$)	19	28	35	26	31	39
2017 Background NO_2 ($\mu g.m^{-3}$)	7.7	8.0	7.5	7.5	7.7	7.7
Monitored Road Contribution NOx (total - background) ($\mu g.m^{-3}$)	21.24	39.35	55.81	35.93	46.39	64.85
Modelled Road Contribution NOx (excludes background) ($\mu g.m^{-3}$)	7.77	11.76	14.95	10.43	10.09	13.71
Ratio of Monitored Road Contribution NOx / Modelled Road Contribution NOx	2.73	3.35	3.73	3.45	4.60	4.73
Adjustment Factor for Modelled Road Contribution						3.89205
Adjusted Modelled Road Contribution NOx ($\mu g.m^{-3}$)	30.24	45.77	58.18	40.59	39.27	53.36
Modelled Total NO_2 (based on empirical NOx / NO_2 relationship) ($\mu g.m^{-3}$)	23.46	30.94	35.96	28.12	27.73	34.09
Monitored Total NO_2 ($\mu g.m^{-3}$)	19	28	35	26	31	39
% Difference [(modelled - monitored) / monitored] x 100	23.47	10.50	2.74	8.15	-10.55	-12.59

19.4.3.1.10 NOx to NO_2 Conversion

57. Oxides of nitrogen (NO_x) concentrations were predicted using the ADMS-Roads model. The modelled road contribution of NO_x at the identified receptor

locations was then converted to NO_2 using the NO_x to NO_2 calculator (v6.1) (Defra 2017b), in accordance with Defra guidance (Defra 2016).

19.4.3.1.11 Background Pollutant Concentrations

58. The ADMS-Roads assessment requires the derivation of background pollutant concentration data that are factored to the year of assessment, to which contributions from the assessed roads are added. Background NO_2, PM_{10} and $PM_{2.5}$ concentrations were therefore obtained from Defra mapping (Defra 2017c) for the 1km x 1km grid squares covering the study area and receptor locations for 2017.

19.4.3.1.12 Calculation of Short-Term Pollutant Concentrations

59. Defra guidance (Defra 2016) sets out the method for the calculation of the number of days in which the PM_{10} 24 hour Objective is exceeded, based on a relationship with the predicted PM_{10} annual mean concentration. The calculation utilised in the prediction of short-term PM_{10} concentrations was:

    No. 24-hour mean exceedances = -18.5 + 0.00145 x annual mean^3 + (206/annual mean)

60. Research projects completed on behalf of Defra and the Devolved Administrations (Laxen and Marner 2003) (AEAT 2008) concluded that the hourly mean NO_2 Objective is unlikely to be exceeded if annual mean concentrations are predicted to be less than 60µg.m^{-3}. This value was therefore used as an annual mean equivalent threshold to evaluate likely exceedance of the hourly mean NO_2 Objective.

19.4.3.1.13 Sensitivity – Human Receptors

61. The sensitivity of an individual receptor is not considered in the assessment of air quality impacts; the air quality Objectives in ***Table 19.5***, which are health-based, only apply at locations where there is relevant public exposure as detailed in ***Table 19.13***.

Table 19.13 Examples of where the Air Quality Objectives should/should not 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 facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations

Averaging period	Objectives should apply at:	Objectives should generally not apply at:
		at the building façade), or any other location where public exposure is expected to be short term.
24-Hour Mean and 8-Hour Mean	All locations where the annual mean Objective would apply, together with hotels and gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-Hour Mean	All locations where the annual mean and 24 and 8-hour mean Objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

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

19.4.3.1.14 Magnitude and Significance – Human Receptors

63. Guidance is provided by the IAQM and EPUK (IAQM and EPUK 2017) on determining the magnitude and significance of a project's impact on local air quality. The guidance was developed specifically for use in planning and assessing air quality impacts associated with mixed-use and residential developments. However, the criteria detailed below were utilised in the assessment to provide consideration of the impacts associated with the proposed East Anglia TWO project during the construction phase.

64. The impact descriptors that take account of the magnitude of changes in pollutant concentrations, and the concentration in relation to the air quality Objectives, are detailed in ***Table 19.14***.

Table 19.14 Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to the air quality objective			
	1	2 - 5	6 - 10	>10
75% or less of Objective	Negligible	Negligible	Slight	Moderate
76 - 94% of Objective	Negligible	Slight	Moderate	Moderate
95 - 102% of Objective	Slight	Moderate	Moderate	Substantial
103 - 109 of Objective	Moderate	Moderate	Substantial	Substantial
110% or more of Objective	Moderate	Substantial	Substantial	Substantial

Note: Figures are to be rounded up to the nearest round number. Any value less than 1% after rounding (effectively less than 0.5%) will be described as "Negligible".

65. Further to the determination of the impact at individual receptors, the guidance recommends that assessment is made of the overall significance of the impact from a development on local air quality. The overall significance will need to take into account the following factors:

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

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

19.4.3.1.15 Sensitivity – Ecological Receptors

67. Critical loads (CLs) for habitat sites in the UK are published on the Air Pollution Information System (APIS) website (Centre for Ecology and Hydrology (CEH) 2017). These are the maximum levels of nutrient nitrogen and acid deposition that can be tolerated without harm to the most sensitive features of these habitat sites.

19.4.3.1.16 Magnitude and Significance – Ecological Receptors

68. Guidance provided by the Environment Agency (Environment Agency 2017) states that where the contribution of a project leads to nutrient nitrogen deposition values below 1% of the critical load, impacts can be considered to be not significant. Therefore, any development-generated nutrient nitrogen deposition values above 1% of the critical load will require additional

assessment by an ecologist to determine whether any impacts may be experienced at the affected habitats.

19.4.4 Cumulative Impact Assessment

69. The proposed East Anglia TWO project Cumulative Impact Assessment (CIA) initially considers the cumulative impact with only the proposed East Anglia ONE North project against two different construction scenarios (i.e. construction of the two projects concurrently and sequentially). The worst case scenario of each impact is then carried through to the full CIA which considers other developments which are in close proximity to the proposed East Anglia TWO and East Anglia ONE North projects.

70. For a general introduction to the methodology used for the CIA please refer to ***Chapter 5 EIA Methodology***.

71. The cumulative impact assessment utilised the same methodology as detailed above in ***section 19.4.3***.

72. The results of the CIA are presented in ***section 19.7***.

19.4.5 Transboundary Impact Assessment

73. There are no transboundary implications with regard to local air quality.

19.5 Existing Environment

74. The characterisation of the existing environment is undertaken using data sources listed in ***Table 19.7*** plus other relevant literature.

75. The onshore study area is located wholly within SCDC's jurisdiction. An initial review of the baseline air quality conditions indicates that there is a statutory designated AQMA at Stratford St Andrew, within the onshore study area. The AQMA was declared due to exceedances of the annual mean NO_2 Objective.

19.5.1 Air Quality Monitoring Data

76. SCDC undertakes monitoring within the study area, along the A12, including within the Stratford St Andrew AQMA. Recent monitoring within the study area is detailed in ***Table 19.15***.

Table 19.15 NO_2 Monitoring Data Within the Study Area

Site ID	Location	Site Type	Monitored annual mean NO2 Concentration (µg.m-3)				
			2013	2014	2015	2016	2017
LGM 2	Carlton Lodge, Main Road, Little Gremham	Roadside	29	27	24	25	19
FAR 1	Turret House, The Street, Farnham	Roadside	29	27	24	25	24
FAR 2 a,b,c	Post Office Stores, The Street, Farnham	Roadside	31	29	30	29	28
STA 1 a,b,c	1 Long Row, Stratford St Andrew	Roadside	41	42	42	38	35
STA 2	Opposite Long Row, Stratford St Andrew	Roadside	27	25	28	25	26
STA 6	Jacobs Cottage, Main Road, Stratford St Andrew	Roadside	24	23	24	23	22
STA 7	30mph sign, Long Row, Stratford St Andrew	Roadside	34	30	34	34	31
STA 8 a,b,c	5 Long Row, Startford St Andrew	Roadside	-	-	44	43	39

77. As detailed in ***Table 19.15***, annual mean NO_2 concentrations within Stratford St Andrew (STA1 and STA8) have been above the Objective in recent years, which is consistent with the AQMA designation. As acknowledged in the SCDC 2018 annual status report (SCDC 2018), concentrations dropped below the annual mean Objective in 2017 for the first time since the AQMA was declared, which indicates that measures employed to improve air quality in the area have been successful.

19.5.2 Background Pollutant Concentrations

78. Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were obtained from the air pollutant concentration maps provided by Defra for the grid squares covering the study area (Defra 2017). 2017 background concentrations were used for all future year scenarios to provide a conservative assessment, as this assumed no reduction in pollutant concentrations over time. The highest and lowest background concentrations within the study area are detailed in ***Table 19.6***. The full table of background concentrations used in the assessment is provided in ***Appendix 19.1***.

Table 19.16 Background Pollutant Concentrations

Annual mean background concentration 2017 (µg.m-3)					
NO2		**PM10**		**PM2.5**	
Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
6.98	8.09	12.45	14.58	8.35	9.43

79. As detailed in ***Table 19.6***, background pollutant concentrations are 'well below', i.e. less than 75% of, the relevant annual mean Objectives. This is to be expected in a predominantly rural area away from localised pollution sources such as roads.

19.5.3 Identification of Receptors

19.5.3.1 Construction Phase Dust and Fine Particulate Matter Assessment

80. The IAQM guidance (IAQM 2014) states that a Detailed Assessment is required where there are human receptors within 350m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). Ecological receptors within 50m of the site boundary or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s), are also identified at this stage.

81. Receptor locations were identified in the areas closest to the anticipated maximum construction dust impact within the study area. In these areas, receptors were identified as follows:

- There are human receptors within 350m of the onshore infrastructure and within 50m of the planned construction vehicle route up to 500m from the boundary; and
- The onshore cable corridor will pass through a designated ecological site, and a planned construction vehicle route will run adjacent to the site.

82. A Detailed Assessment was therefore required to assess the impact of dust during the construction phase at human and ecological receptors.

83. The onshore cable corridor from landfall to the substation was assessed and the worst-case scenario was identified based on the number of receptors within 350m from the site boundaries and 50m from the routes of construction traffic. Coldfair Green, approximately 4km from landfall north of Thorpeness, was identified as the area with the most human receptors within 350m of the onshore works.

84. The worst-case area for ecological receptors was identified as the area where the onshore cable corridor passes through the Sandlings Special Protection Area (SPA) and Leiston-Aldeburgh Site of Special Scientific Interest (SSSI).

19.5.3.2 Construction Phase Road Traffic Emissions Assessment

19.5.3.2.1 Human Receptors

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

86. The sensitive receptor locations were selected based on their proximity to road links affected by the proposed East Anglia TWO project, where the potential effect of development-generated traffic emissions on local air pollution would be most significant, including within the Stratford St Andrew AQMA. The sensitive receptor locations are detailed in ***Table 19.17*** and in ***Figure 19.2***.

Table 19.17 Sensitive Human Receptor Locations

Receptor ID	Location	OS grid reference (m)	
		X	Y
R1	Stratford St Andrew	635743	259992
R2	Little Glemham	634052	258315
R3	Stratford St Andrew	635768	260011
R4	Yoxford	639434	268346
R5	Yoxford	639592	268705
R6	Darsham	640437	269662
R7	Yoxford	640084	269152
R8	Saxmundham	637631	263177
R9	Yoxford	640151	268598
R10	Middleton Moor	641699	267682
R11	Leiston	646315	262373
R12	Leiston	645824	262575
R13	Church Common	639264	259364
R14	Snape Watering	637793	260060
R15	Coldfair Green	643152	260593
R16	Coldfair Green	643263	260662

19.5.3.2.2 Designated Ecological Sites

87. The onshore cable corridor will pass through the Sandlings SPA and Leiston-Aldeburgh SSSI. The designated sites are located within 200m of roads which are anticipated to experience increases in traffic flows above those detailed in ***Table 19.10***. The APIS website (CEH 2017) was consulted to identify any habitats or features of these designated sites that are sensitive to nutrient nitrogen deposition. Where sensitive habitats or features were found, the Critical Loads for nutrient nitrogen deposition were obtained. Where there were several habitats or features with different sensitivities to nutrient nitrogen deposition, the most sensitive habitat was considered to provide a conservative assessment. The designated ecological sites considered in the assessment and associated Critical Load values are detailed in ***Table 19.18*** and shown in ***Figure 19.3***.

Table 19.18 Designated Ecological Sites and Critical Load Values

Designated ecological site	Most Sensitive Habitat or feature	Lowest Critical Load ($kgN.ha^{-1}.y^{-1}$)
Sandlings SPA	Wood lark (coniferous woodland)	5
Leiston-Aldeburgh SSSI	Wood lark (coniferous woodland)	5

88. In accordance with DMRB guidance (Highways Agency 2007), receptors were included in the model as a transect through the designated site, at 50m intervals back from the road up to 200m. The transect is shown in ***Figure 19.3*** and the locations are detailed in ***Table 19.19***.

Table 19.19 Ecological Receptor Transects

Designated Ecological Site	Transect ID	OS Grid Reference (m)	
		X	Y
Sandlings SPA/Leiston-Aldeburgh SSSI	T-1	646419	262369
	T-2	646438	262325
	T-3	646459	262280
	T-4	646480	262234
	T-5	646501	262189

19.5.4 Anticipated Trends in the Baseline Condition

89. Air quality within the study area is generally good, which is to be expected in an area which is largely rural in nature. However, air pollution is generally dominated by emissions from road vehicles, and in particular one part of the study area along the A12 in Stratford St Andrew experiences poor air quality

and has therefore been designated as a statutory AQMA. The quantity and composition of vehicle emissions is dependent on the type of fuel used, engine type, size and efficiency, vehicle speeds and the type of exhaust emissions abatement equipment employed. It is expected that air quality in the AQMA will improve over time with the evolution of the vehicle fleet and the use of alternative fuel vehicles, combined with the measures implemented by SCDC to improve air quality in this area. As such, it is anticipated that future pollutant concentrations will be reduced from baseline levels.

19.6 Potential Impacts

19.6.1 Potential Impacts during Construction

19.6.1.1 Impact 1: Construction Phase Dust and Fine Particulate Matter Emissions

90. A qualitative assessment of construction phase dust and fine particulate matter emissions was carried out in accordance with the latest IAQM guidance (IAQM 2014). Full details of the methodology and dust assessment undertaken are provided in ***Appendix 19.1***.

91. The construction works associated with the proposed East Anglia TWO project have the potential to impact on local air quality conditions as described below:

- Dust emissions generated by excavation, construction and earthwork activities associated with the construction of the proposed East Anglia TWO project have the potential to adversely impact sensitive receptors.
- Emissions of exhaust pollutants, especially NO_2 and PM_{10} from construction traffic on the local road network, have the potential to impact upon local air quality at sensitive receptors situated adjacent to the routes utilised by construction vehicles.
- Emissions of PM_{10} from non-road mobile machinery (NRMM) operating within the proposed onshore development area have the potential to impact local air quality at sensitive receptors in close proximity to the works.

19.6.1.1.1 Step 1: Screen the need for a Detailed Assessment

92. The IAQM guidance states that a Detailed Assessment is required if there are human receptors located within 350m and ecological receptors within 50m of the site boundary. Human receptors are present within 350m of the onshore cable corridor, which also passes through a designated ecological site. A Detailed Assessment is therefore required.

19.6.1.1.2 Step 2A: Define the Potential Dust Emission Magnitude

93. The IAQM guidance recommends that the dust emission magnitude is determined for demolition, earthworks, construction and trackout. As there is

not expected to be any demolition undertaken as part of the proposed East Anglia TWO project, it was not considered in the assessment.

94. The potential dust emission magnitude for the proposed onshore development area was determined using the criteria detailed in ***Table A19.1*** of ***Appendix 19.1***. The dust emission magnitudes were determined from the worst-case scenarios identified in ***Table 19.3*** and detailed in ***Table 19.20***.

95. Coldfair Green, approximately 4km from the landfall (which is north of Thorpeness), was identified as the area with the most human receptors within 350m of the onshore works. The works closest to the designated ecological site are at a different location, closer to the landfall (1.7km north-west). The worst-case assessment was therefore undertaken based on the construction works undertaken in the vicinity of each type of receptor.

Table 19.20 Defined Dust Emission Magnitudes Associated for Each Onshore Construction Activity

Construction Activity	Dust Emission Magnitude Assessment – Human Receptors	Dust Emission Magnitude Assessment – Ecological Receptors
Earthworks	It was assumed that up to two CCSs will be built within 350m of human receptors, as the worst-case scenario area is near the junction of two sections of cable route, with each section having a CSS of 18,400m^2. It was assumed that up to 4 jointing bays will be built within 350m of human receptors, which have an area of up to 570m^2 each and a depth up to 1.2m. Earthworks within the onshore cable route will comprise removal and storage of topsoil, followed by excavation and reinstatement of 2 trenches. Total earthworks area is greater than 10,000m^2. The dust emission magnitude is therefore Large.	It was assumed that up to two CCSs will be located within 50m of the ecological receptor, as the ecological receptor is at the junction of two sections of cable route, with each section having a CSS of 18,400m^2. It was assumed that up to 2 jointing bays will be built within 50m of ecological receptors, which have an area of up to 570m^2 each and a depth up to 1.2m. Earthworks within the onshore cable route will comprise removal and storage of topsoil, followed by excavation and reinstatement of 2 trenches Total earthworks area is therefore greater than 10,000m^2. The dust emission magnitude is therefore Large.
Construction	There are not anticipated to be any buildings constructed within the CCS, however it was assumed that cement-bound sand will be used to line the cable trench and pack around the ducts then backfilled using the stored subsoil and topsoil which is potentially dusty.	There are not anticipated to be any buildings constructed within the CCS, however it was assumed that cement-bound sand will be used to line the cable trench and pack around the ducts then backfilled using the stored subsoil and topsoil which is potentially dusty. The dust emission magnitude is therefore

Construction Activity	Dust Emission Magnitude Assessment – Human Receptors	Dust Emission Magnitude Assessment – Ecological Receptors
	The dust emission magnitude is therefore Medium.	Medium.
Trackout[4]	There are greater than 50 outward daily HGV movements from the CCS during the construction phase. The dust emission magnitude is therefore Large.	There are between 10 and 50 outward daily HGV movements from the CSS during the construction phase. The dust emission magnitude is therefore Medium.

96. The dust magnitudes for earthworks, construction and trackout are summarised for each worst-case area in ***Table 19.21***.

Table 19.21 Dust Emission Magnitudes

Activity	Dust Emission Magnitude for Worst Case Scenario	
	Human Receptors	Ecological Receptors
Earthworks	Large	Large
Construction	Medium	Medium
Trackout	Large	Medium

19.6.1.1.3Step 2B: Define the Sensitivity of the Area

97. The sensitivity of the area to dust soiling and impacts on human health was determined using the criteria in ***Table A19.3*** and ***Table A19.4*** of ***Appendix 19.1***. ***Figure 19.4*** details the distance bands from the site boundary used in determining the sensitivity of the area. The sensitivity of the area is defined as:

- Sensitivity of people to dust soiling
  - Earthworks and Construction: There are between 10 and 100 receptors within 50m of the onshore cable corridor. The sensitivity is therefore **Medium**; and
  - Trackout: There are between 10 and 100 receptors within 50m of roads used by construction vehicles up to 500m from the site boundary. The sensitivity is therefore **Medium**.
- Sensitivity of people to health effects of PM_{10}
  - Earthworks and Construction: The highest annual mean background PM_{10} concentration across the study area is less than 24µg.m^{-3} and

[4] HGV movements are indicative and based on parameters used in the ***Chapter 26 Traffic and Transport*** impact assessment.

there are 10 - 100 receptors within 50m of the onshore cable corridor. The sensitivity is therefore **Low**; and

- Trackout: There are between 10-100 receptors within 50m of roads used by construction vehicles, up to 500m from the site. The sensitivity is therefore **Low**.

- Sensitivity of the area to ecological impacts
  - Construction and Earthworks: the Leiston-Aldeburgh SSSI and Sandlings SPA is an internationally designated site and is thus a high sensitivity receptor, and is located within the site boundary. The sensitivity is therefore **High**.
  - Trackout: the site access road is within 20m of the Leiston-Aldeburgh SSSI and Sandlings SPA, therefore the sensitivity is **High**.

98. The sensitivity of the area to dust soiling, human health and ecological impacts for each activity is summarised in ***Table 19.22***.

Table 19.22 Sensitivity of the Area to each Activity

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

19.6.1.1.4Step 2C: Define the Risk of Impacts

99. The dust emission magnitude and sensitivity of the area are combined and the risk of impacts determined using ***TableA19.1 – TableA19.7*** in ***Appendix 19.1***. The risks for dust soiling, human health and ecological impacts are shown in ***Table 19.23***.

Table 19.23 Risk of Dust Impacts

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

100. It should be noted that the proposed East Anglia TWO project would employ embedded mitigation measures relating to construction dust, as noted in ***Table***

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

101. Implementation of embedded mitigation measures would ensure that the risk of dust impacts is lower than those identified in ***Table 19.23***.

19.6.1.1.5 Mitigation Measures

102. Step 3 of the IAQM guidance identifies the appropriate good practice mitigation measures required based on the findings of Step 2 of the assessment methodology. Step 2 of the dust assessment determined that the greatest risk of impacts was 'high risk' resulting from construction activities without the implementation of mitigation measures.

103. The recommendations detailed below are taken from the IAQM guidance document, and are considered to be 'highly recommended' by the IAQM for sites with a high risk of dust impacts. The measures below would be undertaken in addition to those measures included as embedded mitigation within the scheme. The measures below would be considered and where appropriate incorporated into the CoCP, to be agreed with the local planning authority prior to construction commencing.

19.6.1.1.5.1 Communications

104. Measures in relation to communications could include:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary and the head or regional office contact information. This may be the environment manager/engineer or the site manager.

19.6.1.1.5.2 Dust Management

105. Measures in relation to dust management could include:

- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by SCDC.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to SCDC when asked.

- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
- Liaise with any other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to note any dust deposition, record inspection results, and make the log available to SCDC when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Erect solid screens or barriers around dusty activities, or the site boundary, that are at least as high as any stockpiles on site.
- Take measures to control site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced, and 10 mph on unsurfaced, haul roads and work areas.
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement the Travel Plan that has been produced for the proposed scheme, which supports and encourages sustainable travel for contractor operatives and staff (public transport, cycling, walking, and car-sharing).
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Bonfires and burning of waste materials should not be permitted.

19.6.1.1.5.3 Measures Specific to Earthworks

106. Measures in relation to earthworks could include:

- Re-vegetate or cover earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Only remove the cover in small areas during work and not all at once.

19.6.1.1.5.4 Measures Specific to Construction

107. Measures specific to construction could include:

- Ensure sand and other aggregates are stored in silos, bunded areas or in a controlled and well-managed manner.
- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust release.

19.6.1.1.5.5 Measures Specific to Trackout

108. Measures specific to trackout could include:

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
- Ensure loaded vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Install a wheel washing system (with rumble grids to dislodge accumulated dust and mud) prior to leaving the site where reasonably practicable.
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Locate site access gates at least 10m from receptors where possible.

19.6.1.1.5.6 Measures Specific to Non-Road Mobile Machinery (NRMM)

109. Non Road Mobile Machinery (NRMM) and plant would be well maintained. If any emissions of dark smoke occur then the relevant machinery should stop immediately and any problem rectified. In addition, the following controls would apply to NRMM:

- All NRMM should use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004).
- All NRMM will comply with regulation (EU) 2016/1628 of the European Parliament and of the European Council;
- All NRMM should be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting).
- The ongoing conformity of plant retrofitted with DPF, to a defined performance standard, should be ensured through a programme of onsite checks.
- Implementation of energy conservation measures including instructions to throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded, ensure equipment is properly maintained to ensure efficient energy consumption.

110. The implementation of the appropriate mitigation measures, in addition to embedded mitigation measures, will reduce the magnitude of dust emissions and the likelihood of their occurrence. The residual impacts from construction are considered to be not significant, in accordance with IAQM guidance.

19.6.1.2 Impact 2: Construction Phase Road Traffic Exhaust Emissions

19.6.1.2.1 Human Receptors

111. The 24-hour AADT flows and HGV percentages used in the air quality assessment scenarios are detailed in ***Appendix 19.1***.

112. Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations for the 2026 year of peak construction are detailed in ***Table 19.24*** to ***Table 19.27***. Concentrations for 'without project' scenarios and the predicted change in NO_2, PM_{10} and $PM_{2.5}$ concentrations, as a result of the proposed East Anglia TWO project, are also shown for comparison purposes.

Table 19.24 Annual Mean NO_2 results at Sensitive Human Receptor Locations

Receptor ID	Annual mean NO_2 concentrations ($\mu g.m^{-3}$)				
	Without the proposed East Anglia TWO project	With the proposed East Anglia TWO project	Change	Change as percentage of objectives (%)	Impact descriptor
R1	37.79	39.00	1.21	3%	Moderate Adverse
R2	24.80	25.54	0.74	2%	Negligible
R3	27.73	28.60	0.87	2%	Negligible
R4	25.19	25.81	0.62	2%	Negligible
R5	17.96	18.34	0.38	1%	Negligible
R6	17.16	17.61	0.45	1%	Negligible
R7	20.26	20.85	0.59	1%	Negligible
R8	19.44	19.86	0.42	1%	Negligible
R9	11.99	12.66	0.67	2%	Negligible
R10	9.26	9.61	0.35	1%	Negligible
R11	10.08	10.49	0.41	1%	Negligible
R12	9.22	9.46	0.24	1%	Negligible
R13	17.18	18.15	0.97	2%	Negligible
R14	13.88	14.46	0.58	1%	Negligible
R15	11.31	12.05	0.74	2%	Negligible
R16	12.20	13.10	0.90	2%	Negligible

Table 19.25 Annual Mean PM_{10} results at Sensitive Human Receptor Locations

Receptor ID	Annual mean PM_{10} concentrations ($\mu g.m^{-3}$)				
	Without the proposed East Anglia TWO project	With the proposed East Anglia TWO project	Change	Change as percentage of objectives (%)	Impact descriptor
R1	14.22	14.27	0.05	0%	Negligible
R2	14.87	14.89	0.03	0%	Negligible
R3	13.94	13.97	0.03	0%	Negligible
R4	13.57	13.60	0.03	0%	Negligible
R5	13.34	13.36	0.02	0%	Negligible
R6	14.90	14.92	0.02	0%	Negligible
R7	15.01	15.04	0.03	0%	Negligible
R8	14.19	14.21	0.02	0%	Negligible
R9	13.40	13.42	0.02	0%	Negligible
R10	13.82	13.83	0.01	0%	Negligible
R11	12.68	12.70	0.02	0%	Negligible
R12	13.85	13.86	0.01	0%	Negligible
R13	13.78	13.82	0.03	0%	Negligible
R14	14.54	14.56	0.02	0%	Negligible
R15	12.58	12.61	0.02	0%	Negligible
R16	12.61	12.64	0.03	0%	Negligible

Table 19.26 Short-term Exceedances of PM_{10} at Sensitive Human Receptor Locations

Receptor ID	Number of Exceedances of the short-term PM_{10} Objective (Days)		
	Without the proposed East Anglia TWO project	With the proposed East Anglia TWO project	Change
R1	0	0	0
R2	0	0	0
R3	0	0	0
R4	0	0	0
R5	0	0	0
R6	0	0	0
R7	0	0	0

Receptor ID	Number of Exceedances of the short-term PM_{10} Objective (Days)		
	Without the proposed East Anglia TWO project	With the proposed East Anglia TWO project	Change
R8	0	0	0
R9	0	0	0
R10	0	0	0
R11	1	1	0
R12	0	0	0
R13	0	0	0
R14	0	0	0
R15	1	1	0
R16	1	1	0

Table 19.27 Annual Mean $PM_{2.5}$ results at Sensitive Human Receptor Locations

Receptor ID	Annual mean $PM_{2.5}$ concentrations ($\mu g.m^{-3}$)				
	Without the proposed East Anglia TWO project	With the proposed East Anglia TWO project	Change	Change as percentage of objectives (%)	Impact descriptor
R1	9.41	9.44	0.03	0%	Negligible
R2	9.78	9.79	0.02	0%	Negligible
R3	9.24	9.26	0.02	0%	Negligible
R4	8.93	8.95	0.02	0%	Negligible
R5	8.78	8.79	0.01	0%	Negligible
R6	9.57	9.58	0.01	0%	Negligible
R7	9.64	9.65	0.02	0%	Negligible
R8	9.40	9.42	0.01	0%	Negligible
R9	8.73	8.74	0.01	0%	Negligible
R10	8.96	8.96	0.01	0%	Negligible
R11	8.48	8.49	0.01	0%	Negligible
R12	9.33	9.34	0.01	0%	Negligible
R13	9.10	9.12	0.02	0%	Negligible
R14	9.45	9.46	0.01	0%	Negligible

Receptor ID	Annual mean $PM_{2.5}$ concentrations ($\mu g.m^{-3}$)				
	Without the proposed East Anglia TWO project	With the proposed East Anglia TWO project	Change	Change as percentage of objectives (%)	Impact descriptor
R15	8.43	8.45	0.01	0%	Negligible
R16	8.45	8.47	0.02	0%	Negligible

113. The results of the construction phase road traffic emissions assessment indicate that annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ were predicted to be 'well below' (i.e. less than 75% of) the respective air quality Objectives in the year of peak construction at all receptors outside of the Stratford St Andrew AQMA, both 'without' and 'with' the proposed East Anglia TWO project in place. NO_2 concentrations were predicted to approach the annual mean Objective at receptor R1 which is located on Long Row, Stratford St Andrew which is where the AQMA is designated.

114. The change in NO_2 concentrations was no greater than 3% at all receptors; this corresponded to a 'negligible' impact at receptors R2 – R16 due to low total NO_2 concentrations, in accordance with IAQM and EPUK guidance (IAQM and EPUK 2017). Receptor R1 was predicted to experience a 'moderate adverse' impact due to higher overall concentrations which are consistent with the AQMA designation.

115. It should be noted that the assessment considered a conservative scenario whereby base year (2017) emission factors, background pollutant concentrations and NOx to NO_2 conversion rates were used in the 2026 scenarios, and therefore it was assumed that there would be no reduction in emissions over time. The measures implemented by SCDC as part of their Air Quality Action Plan for the Stratford St Andrew AQMA are beginning to reduce pollutant concentrations within the AQMA, as described in their 2018 Annual Status Report (SCDC 2018). It is therefore considered that by 2026, overall pollutant concentrations are likely to be reduced, and the subsequent magnitude of impact is also likely to be smaller than predicted at all receptors.

116. Furthermore, the derivation of the traffic data used in the assessment was based on a worst-case scenario as described in ***section 19.3.2***.

117. All predicted NO_2 concentrations were well below $60\mu g.m^{-3}$ and therefore, in accordance with Defra guidance in LAQM.TG (16) (Defra 2016), the 1-hour mean Objective is unlikely to be exceeded (see ***Table 19.5***). Based on the calculation provided by Defra, as detailed in ***section 19.4.3.1.12***, the short-term

PM_{10} objective was predicted to be met at all modelled locations with less than 35 exceedances of the daily mean objective of 50µg.m^{-3}. Using the Defra calculation, there was no change in the number of days exceeding the daily mean Objective between the 'without' and 'with' development scenarios.

118. IAQM and EPUK Guidance states that professional judgement should be used to determine the overall significance of impact taking into account the impact at individual receptors. This assessment concludes that development-generated traffic impacts upon local air quality are not significant based upon:

- A predicted negligible impact at all receptor locations except one, which was predicted to experience a 'moderate adverse' impact;
- Predicted pollutant concentrations were 'well below' the relevant air quality Objectives at all considered receptor locations outside of the AQMA;
- Development-generated traffic was not predicted to cause a breach of any of the air quality Objectives at any identified sensitive receptor location; and
- A conservative approach to the assessment was taken, with the use of conservative traffic assumptions and 2017 emission factors, background concentrations and NOx to NO_2 conversion rates in the future year assessment scenarios.

19.6.1.2.2 Ecological Receptors

119. The results of the assessment of nutrient nitrogen deposition on designated ecological sites are detailed in ***Table 19.28***.

Table 19.28 Nutrient Nitrogen Deposition Results

Designated ecological site	Transect ID	Nutrient nitrogen deposition (kgN.ha.y^{-1})		Change (kgN.ha.y^{-1})	Change as % of lowest Critical Load
		Without East Anglia TWO	With East Anglia TWO		
Sandlings SPA/Leiston-Aldeburgh SSSI	T-1	1.01	1.05	0.041	1%
	T-2	0.76	0.77	0.009	0%
	T-3	0.74	0.74	0.005	0%
	T-4	0.73	0.73	0.004	0%
	T-5	0.72	0.72	0.003	0%

120. As detailed in ***Table 19.28***, increases in nutrient nitrogen deposition were no greater than 1% of the most stringent critical load at the transect location closest to the road network. Impacts are therefore considered to be

insignificant, in accordance with Environment Agency guidance (Environment Agency 2017).

19.6.2 Potential Impacts during Decommissioning

121. No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.

19.7 Cumulative Impacts

19.7.1 Cumulative Impact with proposed East Anglia ONE North Project

122. The East Anglia ONE North offshore windfarm project (the proposed East Anglia ONE North project) is also in the pre-application stage. The proposed East Anglia ONE North project will have a separate DCO application but is working to the same programme of submission as the proposed East Anglia TWO project. The two projects will share the same landfall and cable route and the two onshore substations will be co-located.

123. The proposed East Anglia TWO project CIA will therefore initially consider the cumulative impact with only the proposed East Anglia ONE North project.

124. The CIA considers the proposed East Anglia TWO project and the proposed East Anglia ONE North project under two construction scenarios:

- Scenario 1 - the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously; and
- Scenario 2 - the proposed East Anglia TWO project and the proposed East Anglia ONE North project are built with a construction gap.

125. The worst case (based on the assessment of these two construction scenarios) for each impact is then carried through to the wider CIA which considers other developments which are in close proximity to the proposed East Anglia TWO project (***section 19.7.2***). For a more detailed description of the assessment scenarios please refer to ***Chapter 5 EIA Methodology***.

126. Full assessment of scenario 1 and scenario 2 can be found in ***Appendix 19.2***. This assessment found that scenario 1 represented the worst case impacts for air quality. A summary of those impacts can be found in ***Table 19.29***.

127. ***Table 19.29*** shows that no significant impacts with the proposed East Anglia ONE North project have been identified for the proposed East Anglia TWO project.

Table 19.29 Summary of Potential Impacts Identified for Air Quality under Construction Scenario 1

Potential Impact	Receptor	Sensitivity	Value	Magnitude	Significance	Examples of Potential Mitigation Measures	Residual Impact
Construction							
Impact 1: Construction phase dust and fine particulate matter	Human receptors	Dust soiling: medium Human health: low	-	Large	Assessment methodology does not assign significance before mitigation	Embedded mitigation with additional measures as recommended by the IAQM	Not significant
	Ecological receptors	High	-	Large			
Impact 2: Construction phase road traffic emissions	Human receptors	High	High	Moderate adverse at one receptor, negligible at 15 receptors	Not significant	Not required	Not significant
	Ecological receptors	High	High		Not significant		Not significant
Operation							
No cumulative operational phase impacts are expected							
Decommissioning							
No decision has been made regarding the final decommissioning policy for the proposed East Anglia TWO onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the proposed East Anglia TWO substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.							

19.7.2 Cumulative Impact Assessment with Other Developments

128. The assessment of cumulative impacts has been undertaken here as a two stage process. Firstly, all impacts considered in ***section 19.6*** have been assessed for the potential to act cumulatively with other projects. Potential cumulative impacts are set out in ***Table 19.30***.

Table 19.30 Potential Cumulative Impacts

Impact	Potential for Cumulative Impact	Rationale
Construction		
Construction phase dust and fine particulate matter emissions	Yes	Dust impacts are only expected to occur where receptors are located within 350m of the dust-generating activities. Cumulative dust impacts may arise where two projects are located within 700m of each other and there are relevant receptors present.
Construction phase road traffic emissions	Yes	There is the potential for increases in development-generated traffic flows to lead to cumulative impacts at receptors where they occur on the same road links.
Operation		
Operational phase impacts have been scoped out of the air quality assessment, therefore there is no pathway for a significant cumulative impact to occur.		
Decommissioning		
No decision has been made regarding the final decommissioning policy for the proposed East Anglia TWO onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the proposed East Anglia TWO substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.		

129. The second stage of the CIA is an assessment of whether there is spatial overlap between the extent of potential effects of the onshore infrastructure and the potential effects of other projects scoped into the CIA upon the same receptors. To identify whether this may occur, the potential nature and extent of effects arising from all projects scoped into the CIA have been identified and any overlaps between these and the effects identified in ***section 19.6***. Where there is an overlap, an assessment of the cumulative magnitude of effect is provided.

130. Following a review of projects which have the potential to overlap temporally or spatially with the proposed East Anglia TWO project, one development has been scoped into the CIA.

131. ***Table 19.31*** provides specific detail regarding the project.

132. The full list of projects for consideration will be updated following PEIR and agreed in consultation with local authorities. The remainder of the section details the nature of the cumulative impacts against all those receptors scoped in for cumulative assessment.

Table 19.31Summary of Projects considered for the CIA in Relation to Air Quality

Project	Status	Development period	[5]Distance from East Anglia TWO proposed onshore development area (km)	Project definition	Level of information available	Included in CIA	Rationale
Sizewell C New Nuclear Power Station	Scoping Opinion Adopted by the Secretary of State (SoS) on 02.06.2014	Uncertain	0.49km	Full Scoping Report Available: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010012/EN010012-000103-Sizewell%20C%20EIA%20Scoping%20Report_Main%20text.pdf	Tier 5[6]	Yes	Elements of the Sizewell C New Nuclear Power Station are within 700m of the proposed onshore development area. As there is a 350m impact buffer for sensitive receptors from the Sizewell C New Nuclear Power Station and the proposed Easr Anglia TWO project,cumulaitve impacts are possible.

[5] Shortest distance between the considered project and East Anglia TWO– unless specified otherwise
[6] Based on criteria outlined in ***section 5.7.2*** of ***Chapter 5 EIA Methodology***

19.7.2.1 Cumulative Impacts during Construction

19.7.2.1.1 Construction Phase Dust and Fine Particulate Matter Emissions

133. Elements of the Sizewell C New Nuclear Power Station are within 700m of the proposed onshore development area, and therefore there is the potential for cumulative construction dust impacts where the duration of the construction phases overlap with the proposed East Anglia TWO project alone and under cumulative Scenario 1 assessment detailed above.

134. It is anticipated that Sizewell C New Nuclear Power Station will have carried out a construction dust impact assessment in accordance with IAQM guidance. In accordance with the guidance, the implementation of mitigation measures which are commensurate with the level of dust risk of the site will result in impacts that are **not significant**. Significant cumulative impacts are therefore highly unlikely.

19.7.2.1.2 Construction Phase Road Traffic Emissions

135. The consideration of the potential for cumulative road traffic impacts as a result of the interaction with Sizewell C New Nuclear Power Station is detailed in ***Chapter 26 Traffic and Transport***.

136. In summary, the level of information currently available within EDF Energy's Stage 2 consultation document is not sufficient to undertake a full CIA at this stage. However, the Applicant will seek to continue working closely with EDF Energy, and with statutory consultees, to assess potential cumulative impacts.

137. The traffic data provided for future year scenarios include local growth factors provided by Suffolk County Council which take into account expected increases in traffic flows associated with local plan allocations. Therefore, the assessments undertaken for the proposed East Anglia TWO project alone and cumulative Scenario 1 assessment have considered a cumulative scenario with regard to other plans and projects included in those growth factors.

138. Overall, the cumulative impacts will not change from those presented in ***Table 19.29***.

19.8 Inter-relationships

139. A summary of the likely inter-related effects arising from the proposed East Anglia TWO development on air quality are presented in ***Table 19.32***.

Table 19.32 Inter-Relationships for Air Quality

Inter-relationship all Phases and Linked Chapter	Section where Addressed	Rationale
Chapter 22 Onshore Ecology	***Section 19.6.1.2.2***	Emissions from construction-generated traffic leads to increases in deposition of nutrient nitrogen at designated ecological sites
Chapter 26 Traffic and Transport	***Section 19.6.1.2*** ***Section 19.7.2.1.2***	Air quality is impacted by emissions from road traffic
Chapter 27 Human Health	***Section 19.6.1.2.2*** ***Section 19.6.1.2*** ***Section 19.7.2.1.2***	Human health is impacted by emissions from during construction works and from road traffic

19.9 Interactions

140. The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. For clarity, the areas of interaction between impacts are presented in ***Table 19.33*** along with an indication as to whether the interaction may give rise to synergistic impacts.

Table 19.33 Interactions Between Impacts on Air Quality

Potential interactions between impacts **Construction phase impacts**		
	Impact 1: Construction dust and fine particulate matter	**Impact 2: Construction vehicle exhaust emissions**
Impact 1: Construction dust and fine particulate matter	-	Yes
Impact 2: Construction vehicle exhaust emissions	Yes	-
Operation phase impacts		
Operational impacts on air quality have been scoped out (SPR 2017)		
Decommissioning phase impacts		
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail		

Potential interactions between impacts
and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.

19.10 Summary

141. A summary of the potential impacts identified with relation to air quality is provided in ***Table 19.34***. It was concluded that impacts on air quality associated with construction phase dust and road traffic emissions were not significant at both human and ecological receptors. Cumulative impacts were also not predicted to be significant.

Table 19.34 Potential Impacts Identified for Air Quality

Potential Impact	Receptor	Sensitivity	Value	Magnitude	Significance	Examples of Potential Mitigation Measures	Residual Impact
Construction							
Impact 1: Construction phase dust and fine particulate matter	Human receptors	Dust soiling: medium Human health: low	-	Large	Assessment methodology does not assign significance before mitigation	Embedded mitigation with additional measures as recommended by the IAQM	Not significant
	Ecological receptors	High	-	Large			
Impact 2: Construction phase road traffic emissions	Human receptors	High	-	Moderate adverse at one receptor, negligible at 15 receptors	Not significant	Not required	Not significant
	Ecological receptors	High	-	Negligible	Not significant		Not significant
Operation							
Operational phase air quality impacts have been scoped out (SPR 2017)							
Decommissioning							
No decision has been made regarding the final decommissioning policy for the proposed East Anglia TWO onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the proposed East Anglia TWO substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.							

Potential Impact	Receptor	Sensitivity	Value	Magnitude	Significance	Examples of Potential Mitigation Measures	Residual Impact
Cumulative Construction Impacts with Other Developments							
Impact 1: Construction phase dust and fine particulate matter	Human receptors	Dust soiling: medium Human health: low	-	Large	Assessment methodology does not assign significance before mitigation	Embedded mitigation with additional measures as recommended by the IAQM	Not significant
	Ecological receptors	High	-	Large			
Impact 2: Construction phase road traffic emissions	Data available is not sufficient to complete the assessment at this stage.						
Cumulative – Operational							
No cumulative operational phase impacts are expected.							
Cumulative – Decommissioning							
No decision has been made regarding the final decommissioning policy for the proposed East Anglia TWO onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the proposed East Anglia TWO substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ.* The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.							

19.11References

AEAT (2008) Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective, http://laqm.defra.gov.uk/documents/NO2relationship_report.pdf

Centre for Ecology and Hydrology (2018) Air Pollution Information System Website, accessible via URL www.APIS.ac.uk.

Department of Energy and Climate Change (DECC) (2011a) Draft Overarching National Policy Statement for Energy (EN-1) London: The Stationery Office

Department of Energy and Climate Change (DECC) (2011b) National Policy Statement for Renewable Energy Infrastructure (EN-3) London: The Stationery Office

Department of Energy and Climate Change (DECC) (2011c) National Policy Statement for Electricity Networks Infrastructure (EN-1) London: The Stationery Office

Department for the Environment Food and Rural Affairs (Defra) (2018) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London: HMSO [Online], Available at: https://www.gov.uk/government/consultations/air-quality-draft-clean-air-strategy-2018

Department for the Environment Food and Rural Affairs (Defra) (2016) Local Air Quality Management Technical Guidance Document Local Air Quality Management.TG (16) London: Defra

Department for the Environment Food and Rural Affairs (Defra) (2017a) Emission Factor Toolkit v7.0. Available at: http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html#eft

Department for the Environment Food and Rural Affairs (Defra) (2017b) NOx to NO2 Calculator. Available at: <http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html >

Department for the Environment Food and Rural Affairs (Defra) (2017c) Background Mapping Data. Available at: < http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011 >

Department of the Environment (DoE) (1997) The UK National Air Quality Strategy London: HMSO

Department of the Environment, Transport & the Regions (DETR) (2000) Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London: HMSO

Department of the Environment, Transport & the Regions (DETR) (2003) Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Addendum. London: HMSO

Environment Agency (2017) Air Emissions Risk Assessment for your Environmental Permit https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

European Parliament (1996) Council Directive 96/62/EC on Ambient Air Quality Assessment and Management

European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe

Her Majesty's Stationary Office (HMSO) (1995) The Environment Act 1995 (c.25) London: TSO

Her Majesty's Stationary Office (HMSO) (2000) Statutory Instrument 2000 No. 928 The Air Quality (England) Regulations 2000 London: HMSO

Her Majesty's Stationary Office (HMSO) (2002) Statutory Instrument 2002 No. 3043 The Air Quality (England) (Amendment) Regulations 2002 London: HMSO

Highways Agency (2007) Design Manual for Roads and Bridges Volume 11 Environmental Assessment Section 3 Environmental Assessment Techniques Part 1 HA207/07 Air Quality

Institute of Air Quality Management (IAQM) (2014). Guidance on the Assessment Dust from Demolition and Construction

Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) (2017). Land-Use Planning & Development Control: Planning for Air Quality

Laxen and Marner (2003) Analysis of the Relationship Between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites

Planning Inspectorate (2017) Scoping Opinion Proposed East Anglia TWO Offshore Windfarm.

Planning Inspectorate (2017a) Scoping Opinion Proposed East Anglia ONE North Offshore Windfarm.

Suffolk Coastal District Council (SCDC) (2018) Annual Status Report.

This page is intentionally blank.