A585 Windy Harbour to Skippool Improvement Scheme

TR010035

6.5 Environmental Statement Chapter 5: Approach to Environmental Impact Assessment

APFP Regulation 5(1)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 6

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009

A585 Windy Harbour to Skippool Improvement Scheme

Development Consent Order 201[ ]

ENVIRONMENTAL STATEMENT CHAPTER 5: APPROACH TO ENVIRONMENTAL IMPACT ASSESSMENT

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6 APPROACH TO ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Introduction

6.1.1 This chapter outlines the purpose and main stages of the Environmental Impact Assessment (EIA) process, explains the methodology followed for the EIA for this Scheme, outlines how cumulative effects would be assessed and briefly introduces the process of other assessments undertaken in parallel. The focus of the EIA methodology is to ensure a robust approach.

The EIA Regulatory Context

6.1.2 The legal basis for EIA was formed within the European Community Directive 85/337/EEC which sets out the requirements for the preparation of an EIA for certain types of projects where they are likely to have significant effects on the environment. The original 1985 Directive has been subsequently amended twice and those amendments have been codified in Directive 2011/92/EU in December 2011. This has been further amended by 2014/52/EU.

6.1.3 Directive 2014/52/EU forms the EIA regime in Europe and was transposed into UK law for Nationally Significant Infrastructure Projects (NSIPs) under the Infrastructure Planning (EIA) Regulations 2017 in May 2017 (the 'EIA Regulations').

Stages in the EIA Process and Application to this Scheme

6.1.4 The 3 main stages of EIA include screening, scoping and preparation of the Environmental Statement (ES) (**this report**).

6.1.5 Screening is undertaken first to determine whether a project requires an assessment and, therefore, constitutes EIA development. This involves 'screening' a project against thresholds outlined in the EIA Regulations.

6.1.6 EIA Screening undertaken for the Scheme concluded that the Scheme constituted EIA Development under Schedule 2, Regulation 10 (f) (Construction of Roads) of the EIA Regulations and an ES was required to be prepared to support the Development Consent Order application.

6.1.7 Following screening, a Scoping Report outlining the proposed scope of the ES was prepared and submitted to the Planning Inspectorate (the Inspectorate) in November 2017. A Scoping Opinion was received from the Inspectorate in December 2017 and work commenced on the ES in accordance with the opinion received. Further detail regarding scoping is provided in Section 5.2.

6.1.8 Schedule 4 of the EIA Regulations highlights the information to be included within an ES. Part 1 highlights information 'as is reasonably required' and Part 2 details information that must be provided as a minimum. This information is provided in Table 5-1, which also indicates where information is provided within this ES.

Table 5-1: Approach to Environmental Impact Assessment - Requirements of Part 1 and Part 2 of Schedule 4 of the EIA Regulations and Details of their Location within this ES

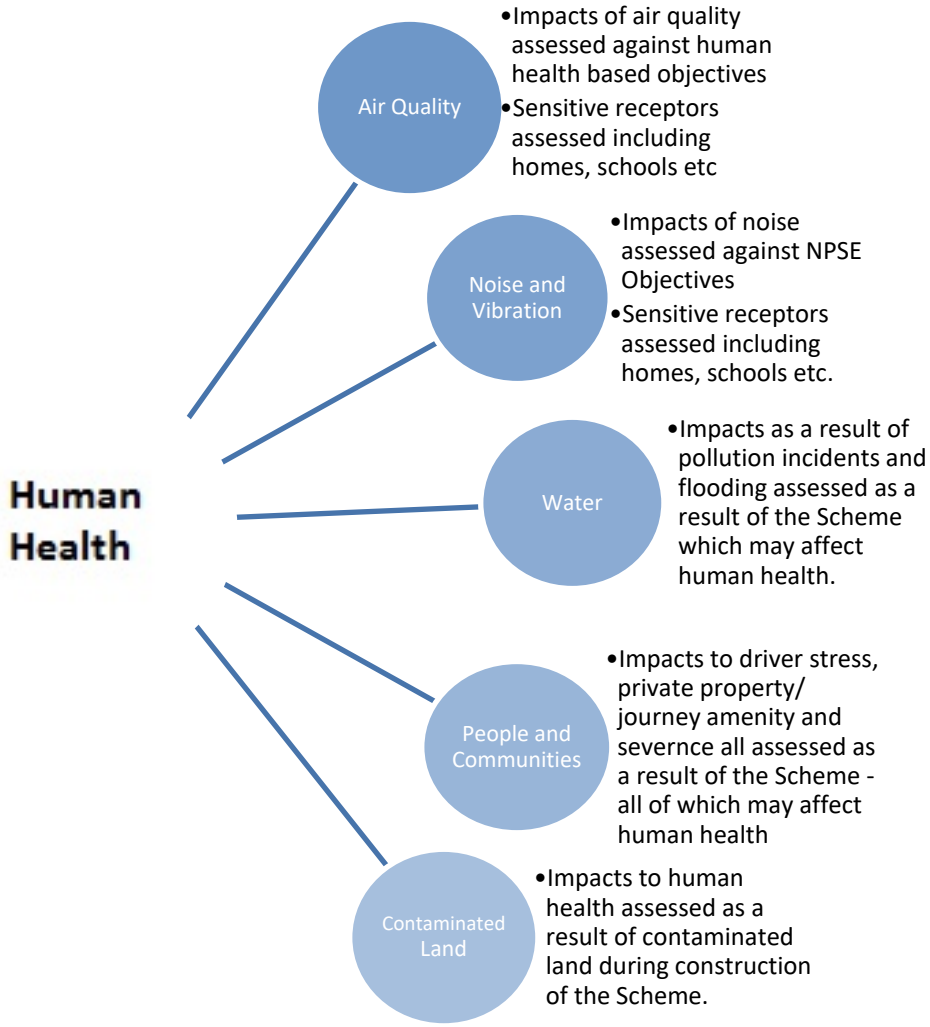
Requirements	Location within the ES
Part 1	
Description of the development, including in particular— (a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases; (b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; (c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.	Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2)
An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.	Chapter 4: Alternatives Assessment (document reference TR010035/APP/6.4)
A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.	Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)
A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the development, resulting from: (a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.	Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)
A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)
A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Provided in a separate document (document reference TR010035/APP/6.19)

Requirements	Location within the ES
An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16) and Section 5.5
Part 2	
A description of the development comprising information on the site, design and size of the development.	Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2)
A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.	Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)
The data required to identify and assess the main effects which the development is likely to have on the environment.	Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)
An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.	Chapter 4: Alternatives Assessment (document reference TR010035/APP/6.4)
A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	Provided in a separate document (document reference TR010035/APP/6.19)

Health

6.1.9 An assessment of human health is covered within Chapter 6: Air Quality (document reference TR010035/APP/6.6), Chapter 11: Noise and Vibration (document reference TR010035/APP/6.11), Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/Doc 6.12), Chapter 10: People and Communities (document reference TR010035/APP/6.10) and supplemented with information from Chapter 13: Geology and Contaminated Land (document reference TR010035/APP/6.13). Insert 5-1 presents linkages between existing topics and human health.

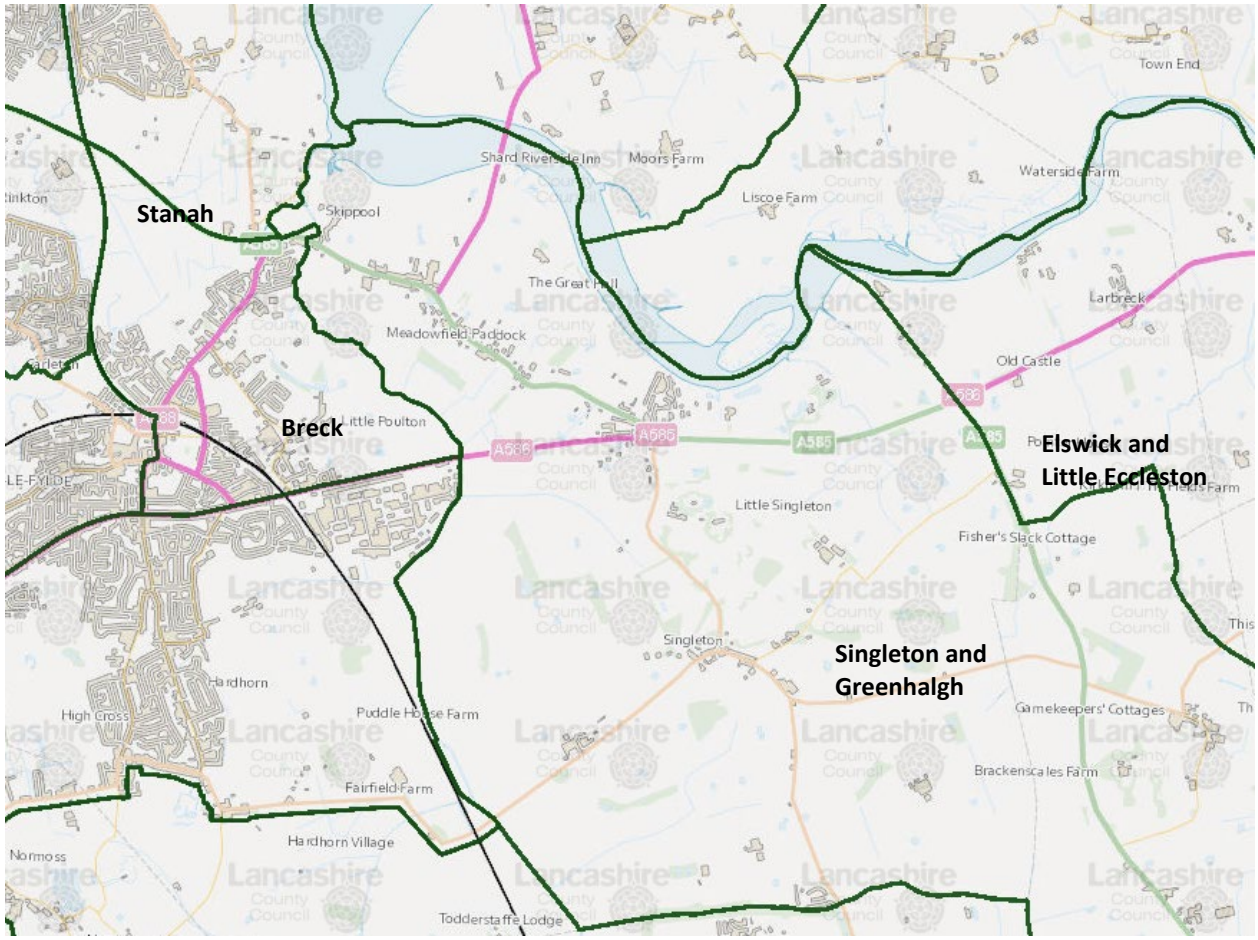
Insert 5-1: Approach to Environmental Impact Assessment - Diagram to show how Human Health is assessed



6.1.10 Within each relevant topic specific chapter noted above a summary of impacts on human health is provided which also draws upon the health baseline presented in the paragraphs that follow.

6.1.11 The Scheme footprint and draft order limits fall within 4 wards in both Wyre and Fylde – 2 in Wyre (Breck and Stanah) and 2 in Fylde (Elswick and Little Eccleston and Singleton and Greenhalgh). Although the Scheme falls within 4 wards, it predominantly occupies the ward of Singleton and Greenhalgh in Fylde. The 4 wards are presented in Insert 5-2 below.

Insert 5-2: Approach to Environmental Impact Assessment - Ward Boundaries



6.1.12 To determine impacts on human health it is important to understand the age profile of an area to identify communities with potentially an increased susceptibility to health issues such as the young and older persons. Of the 4 wards, Elswick and Little Eccleston (Fylde) has the highest percentage of 0-15 year olds at 18.4%, Breck (Wyre) has the highest percentage of 16-64 year olds at 54.2% and Singleton and Greenhalgh (Fylde) holds the highest proportion of residents aged 65 and over at 35.7% (Local Government Association, 2015).

6.1.13 The highest average age of the 4 wards was 47 years in Singleton and Greenhalgh with the lowest average age recorded in Elswick and Little Eccleston at 44 years. This compares to an average age of 39 years for England (Census, 2011).

6.1.14 The 4 wards the Scheme is located within are not particularly deprived in terms of health. Singleton and Greenhalgh is the most deprived and falls within the 40% most deprived for health deprivation according to the Indices of Multiple Deprivation[1] (2015). Breck and Elswick and Little Eccleston fall within the 50% most deprived for health and Stanah falls within the 50% least deprived for health.

6.1.15 Life expectancy for males between 2014 and 2016 in both Fylde (79.2 years) and Wyre (79.0 years) were above the figure for the north west (78.2), however, they were

[1] The English indices of deprivation measure relative deprivation in small areas in England called lower-layer super output areas.

below the national figure of 79.5 years. Life expectancy for females reflects the same trend with both Fylde (82.7 years) and Wyre (82.5 years) being above the figure for the north west (81.7), however, they were below the national figure of 83.1 years (Local Government Association, 2015).

6.1.16 The Standard Mortality Ratio (SMR) for deaths from respiratory diseases between 2010 and 2014 were highest in Singleton and Greenhalgh at 156.0, this is significantly higher than the SMR for England (100.0). The lowest SMR of the 4 wards was recorded in Breck (89.1) (Local Government Association, 2015).

6.1.17 Suicide rates in both Fylde (12.4) and Wyre (11.5) are both higher than those in the north west (11.0) and England (9.9) (Local Authority Health Profiles, 2015).

6.1.18 The number of people killed or seriously injured on roads between 2014 - 2016 in Fylde stood at 148 whilst the number for Wyre was 171 during the same period. The relative values assigned to Fylde (63.8) and Wyre (51.9) are significantly above those of the north west (39.8) and England (39.7) (Local Authority Health Profiles, 2017).

6.1.19 As of 2015, physical inactivity levels in Fylde (32.5%) and Wyre (34.3%) were higher than both the regional (32.0%) and national (28.7%) levels. The percentage of people deemed active (150+ minutes of exercise a week) in Fylde (52.5%) and Wyre (49.8%) were under the regional (53.7%) and national (57.0%) figures also (Local Authority Health Profiles, 2015).

6.1.20 Obesity levels of children in Reception year between 2014 and 2017 were highest in Breck at 11.4%, slightly above the national figure of 9.6% (2016/2017). The lowest level was recorded in Stanah at 6.7%. Obesity levels of children in year 6 between 2014 and 2017 were highest in Stanah at 16.8% with the lowest level recorded in Breck at 12.7%, however all ward values were well below the national figure of 20.0% (2016/2017) (Local Authority Health Profiles, 2017).

6.1.21 In terms of economic activity, unemployment levels are lowest in Elswick and Little Eccleston at 2.8% of the population with the highest unemployment levels being recorded in Breck at 5.0%. All 4 wards fall well below the England and Wales unemployment rate of 7.6% (Nomis, 2016).

6.1.22 Income deprivation is not an issue within the 4 wards the Scheme is located within. Stanah is the least deprived in terms of income deprivation falling within the 20% least deprived areas in England and Singleton and Greenhalgh fall with the 40% least deprived area (IMD, 2015).

6.1.23 In summary, the average ages of the 4 wards are higher than the national average age. Physical inactivity levels in Fylde and Wyre are both higher than the national figure indicating the population is relatively inactive, however levels of child obesity in year 6 are significantly lower in the 4 wards in comparison to the national value. SMRs for deaths from respiratory diseases are relatively mixed however the figure for Singleton and Greenhalgh ward is significantly higher than the national figure. Levels of health deprivation are relatively low in the 4 wards as is the case for income deprivation. Economic activity levels for the all 4 wards are also above the national level.

6.2 Environmental Scoping

6.2.1 In accordance with Regulation 8(1) of the EIA Regulations, on 9 May 2017, Highways England requested the Inspectorate provide its opinion on the scope of the information to be included in the ES for the Scheme. To inform the Inspectorate's Scoping Opinion an EIA Scoping Report was submitted by Highways England clearly outlining the intended scope of each environmental topic. The EIA Scoping Report was submitted to the Inspectorate in November 2017 and the Scoping Opinion was received in December 2017 (document reference TR010035/APP/6.5.1). This ES has been prepared in accordance with the advice set out in the Scoping Opinion, the associated consultation responses, and the EIA Regulations.

6.2.2 Appendix 5.1: The Inspectorate's Scoping Opinion and Responses (document reference TR010035/APP/6.5.1) summarises the scoping responses received and indicates how they have been considered within this ES. This demonstrates that the ES has considered the requests and comments raised through the scoping consultation, where applicable.

6.2.3 The scope and contents of the ES have been informed by the Scoping Opinion. Table 5-2 presents a summary of the environmental issues that have been 'scoped out' of the ES, with an accompanying justification. Further detail is provided in the EIA Scoping Report.

Table 5-2: Approach to Environmental Impact Assessment - Environmental Issues Scoped out of the ES

Topic	Environmental Issues Scoped out of the ES
Air Quality	In accordance with DMRB, $PM_{2.5}$ would not be reported. Highways England has reviewed the latest measured PM2.5 concentrations collected across the UK and calculated increases in PM2.5 associated with an example of a large increase in vehicles by the edge of a motorway. On the basis of this, Highways England determined that there is no risk that an individual scheme would exceed the PM2.5 EU limit value and consequently, Highways England has not undertaken an assessment of PM2.5 for this Scheme.
Cultural Heritage	No themes scoped out.
Biodiversity	Based on data gathered through desk studies and targeted surveys, it is considered likely that the following species are absent from the survey area and are therefore scoped out of further assessment: • Reptiles • Water Vole The additional features below, may be present within the study area; however, due to their local status and low value, or distance from the Scheme, significant effects are very unlikely; these features are therefore scoped out of further assessment: • River Wyre – S41 Habitat

Topic	Environmental Issues Scoped out of the ES
	• Other (non-S41) Habitats • Aquatic Invertebrates • Terrestrial Invertebrates • Badger • Brown Hare • Hedgehog • Fish • Other Amphibian Species (i.e. not Great Crested Newts) • Invasive Flora • Protected and Notable Plants (including Fungi) Agreement regarding this approach was obtained from Natural England. Details are provided in Appendix 5.1: The Inspectorate's Scoping Opinion and Responses (Document reference TR010035/APP/6.5.1)
Landscape	No themes scoped out.
Noise and Vibration	Operational groundborne road traffic vibration was scoped out of the assessment. Full justification is provided in Chapter 11: Noise and Vibration (document reference TR010035/APP/6.11) paragraphs 11.3.83 – 11.3.87.
People and Communities	No themes scoped out.
Road Drainage and the Water Environment	No themes scoped out.
Geology and Contaminated Land	As there is little geological interest within the study area geology is scoped out of further assessment. In addition, operational impacts have been scoped out as once the road is constructed the road itself would act as a barrier to underlying ground conditions and road users (considered to be low value) would not come into contact with it on a day to day basis.
Materials	It is anticipated that only minor quantities of operational waste would be produced during the lifetime of the Scheme, therefore, an assessment of operational waste has been scoped out of the assessment.
Climate	Climate change adaptation - The vulnerability of the Scheme to climate change and incorporation of appropriate adaptation measures into the Scheme design would be part of the iterative design process. A risk assessment has been undertaken in conjunction with the design team and the

Topic	Environmental Issues Scoped out of the ES
	details of this risk assessment are reflected in Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2) and this has been assessed in other environmental topic chapters. The following would be excluded from the Greenhouse Gas Emissions assessment – Construction: • Product manufacturing • Preliminary desk-based studies • Transport of construction plant equipment to and from site Operation: • Operational water use • Other operational processes
Cumulative Effects	No themes scoped out.

6.3 Surveys, Predictive Techniques and Methods

Guidance – Design and Assessment

6.3.1 The development of major highways is governed through guidance and standards set out in 15 volumes of the Design Manual for Roads and Bridges (DMRB).

6.3.2 Environmental design and mitigation guidance is provided within Volume 10 of the DMRB. Volume 11 of the DMRB provides guidance on EIA, including the level of assessment and reporting of environmental effects. Volume 11, Section 1, Part 1 of the DMRB supplemented by Interim Advice Note (IAN) 125/15 Environmental Assessment Update also identify topics that should be considered. This ES covers the following topics:

- Air Quality
- Cultural Heritage
- Biodiversity
- Landscape
- People and Communities
- Noise and Vibration
- Road Drainage and the Water Environment
- Geology and Contaminated Land
- Materials
- Climate
- Cumulative Effects

6.3.3 For each environmental topic the following is reported:

- Introduction
- Regulatory Framework / National Networks National Policy Statement (NN NPS) Requirements
- Methodology
- Study Area
- Existing and Future Baseline
- Mitigation and Enhancement Measures
- Residual Effects
- Monitoring
- Summary

6.3.4 Highways England issues IANs when new guidance emerges which is yet to be incorporated in volumes 1-15 of DMRB. There have been a number of recent updates to the DMRB in the form of IANs these are referenced within environmental topic chapters (Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)).

6.3.5 Where the DMRB does not provide topic specific guidance, alternative sources of guidance are proposed for use in the assessments. More details of the methods used for each individual topic are provided in Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16).

6.3.6 A range of guidance has been developed to inform the EIA process and the preparation of the ES. The guidance used in the technical assessments (Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16)) are detailed within individual chapters as appropriate.

6.3.7 The Inspectorate has published a number of Advice Notes to help guide applicants through the application process. The Inspectorate's Advice Notes directly relevant to the EIA are:

- Advice Note 3: EIA consultation and notification (August 2017)
- Advice Note 6: Preparation and submission of application documents (February 2016)
- Advice Note 7: EIA, preliminary environmental information, screening and scoping (December 2017)
- Advice Note 9: Rochdale Envelope (July 2018)
- Advice Note 11: Working with public bodies in the infrastructure planning process (November 2017)
- Advice Note 12: Transboundary Impacts and Process (March 2018)
- Advice Note 15: Drafting Development Consent Orders (July 2018)
- Advice Note 17: Cumulative effects assessment (December 2015)

Surveys

6.3.8 A number of environmental surveys have been undertaken to inform the known baseline and assessments undertaken. Details are provided within each environmental topic chapter - Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16).

Study Areas

6.3.9 The study areas for the Scheme are individually defined for each environmental topic based on the geographical scope of the potential impacts on receptors/resources and the relevant topic specific criteria. The study areas would also rely upon the outcomes of the traffic modelling as some study areas are defined using changes in traffic flows. The study areas for each topic are further described in Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16).

Baseline Data Gathering

6.3.10 In order to assess the impacts on environmental receptors that would be caused by the Scheme, and to identify any potential significant effects, an understanding of the baseline environment without the Scheme is necessary.

6.3.11 To gather a fully comprehensive, descriptive summary of the baseline, each individual topic has used appropriate data gathering methods and followed topic specific guidelines (where relevant). This has included conducting desk studies, undertaking specialist surveys as appropriate and engaging with stakeholders both to agree those methods of data collection and also to obtain any data they have.

6.3.12 When describing the baseline environmental conditions, the value / sensitivity of receptors that may be affected by the Scheme are also identified.

Future Baseline

6.3.13 For each of the environmental topics it is also necessary to project the baseline forwards and consider what changes there may be to the baseline conditions by the time construction of the Scheme commences. This is referred to as the 'Future Baseline' and is considered in each environmental topic chapter.

Mitigation Measures, Enhancements and Residual Effects

6.3.14 Mitigation of adverse environmental effects is an iterative part of the Scheme development following the hierarchy below:

- Avoidance – incorporate measures to avoid the effect, for example, alternative design options or modifying the Scheme programme to avoid environmentally sensitive periods
- Reduction – incorporate measures to lessen the effect, for example, fencing off sensitive areas during construction, use of a Construction Environmental Management Plan (CEMP)
- Compensation and/or Remediation – where it is not possible to avoid or reduce a significant effect then offsetting measures should be considered, for example the provision of replacement habitat to replace that lost to the Scheme

6.3.15 During the preparation of the ES a range of mitigation measures have been identified and incorporated into the Scheme. This mitigation, where relevant, has been discussed with statutory consultees and third parties. Only mitigation measures that are either a firm commitment or likely to be delivered have been considered in the assessment. Mitigation considered to be 'embedded' into the Scheme design is provided in Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2). All mitigation is outlined within each environmental topic chapter.

6.3.16 Enhancement measures are also detailed within topic specific chapters where appropriate.

6.3.17 Impacts that remain after mitigation are referred to as residual impacts. The assessment of the significance of the residual effects after mitigation is therefore the key outcome of the EIA. Only residual effects are reported within topic specific chapters. The paragraphs below outline the assessment process.

Assessment of Residual Effects - Defining Assessment Years, Scenarios and Phases

6.3.18 The assessment of effects involves comparing the situation with and without the Scheme. Dependent upon the topic, the effects need to be assessed for the Do-Minimum (without the Scheme but with committed development) and Do-Something (with the Scheme and with committed development) scenarios in the baseline year and a future assessment year (for example 15 years after 2022 which is the year of opening for the Scheme) - 2037).

6.3.19 The ES assesses the construction and operation effects of the Scheme. The construction of the Scheme is expected to last 2 years and this duration would be considered in the assessment.

6.3.20 The Scheme would be designed to maximise the scope for materials re-use in the event of decommissioning of its components. Assessments, where relevant, consider effects of replacing certain elements when they reached the end of their own design life, for example lighting columns. However, due to the long design life of the Scheme it is not considered appropriate for decommissioning of the Scheme in its entirety to form part of each environmental topic assessment.

Assessment of Residual Effects - Identifying Residual Impacts

6.3.21 A description of the likely significant environmental effects of the Scheme including the existence of the development, the use of natural resources and the emission of pollutants, the creation of nuisances and the elimination of waste, is required under Schedule 4 of the EIA regulations. These effects are identified where relevant in each of the ES topic Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16).

6.3.22 The effects may be negative or positive and can be described as:

- Direct or Primary Impacts: caused by activities which are an integral part of the Scheme resulting in a change in environmental conditions, for example loss of a hedgerow
- Indirect or Secondary Impacts: due to activities that affect an environmental condition or receptor, which in turn affects other aspects of the environment or receptors, for example settlement of a feature as a result of dewatering during construction

- Cumulative: comprising multiple effects from different sources within the Scheme, or in combination with other developments, on the same receptors
- Temporary: effects that would last for a limited duration, for example a closure of a footpath during part of the construction phase

Assessment of Residual Effects - Assessment of Major Accidents and Disasters

6.3.23 The EIA Regulations require all EIA projects to consider and assess the potential effects of major accidents and disasters and any consequential changes in the predicted effects of the project on the environment.

6.3.24 Major accidents and disasters cover the vulnerability of the Scheme to risks of major accidents and/or disasters and consequential changes in the predicted effects of the Scheme on environmental topics.

6.3.25 'Major' events that are relevant to and could affect the Scheme including both man-made and naturally occurring events include, for example, storm surge flood events or large road traffic accidents/collisions.

6.3.26 An industry standard methodology of assessing a project's vulnerability to major accidents and disasters has not been established. As such, a bespoke approach has been developed which seeks to identify potential hazards which the Scheme may be vulnerable to and any consequential risks which may give rise to environmental effects. Consideration has been given to the following:

- Hazards relevant to the location of project (e.g. Local Control of Major Accident Hazard (COMAH) facilities/Category A mining waste facilities)
- Hazards applicable to the nature of project (e.g. it is a highways project)
- Whether a source, pathway and receptor can be identified for the risks that remain

6.3.27 These hazards have been complied and discussed with the project team to determine whether they should be scoped in to the assessment. Table 5-3 presents the results of the hazard and risk identification and conclusions on whether or not these risks should be included within the ES topic Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16) for further consideration.

Table 5-3: Approach to Environmental Impact Assessment - Identification of Major Accidents and Disasters – Hazards and Risks

Hazard Source	Pathway	Resultant Impact	Environmental Receptor	Scope In / Out	Justification
Major road accident on the Scheme including, for example an oil/chemical tanker resulting in a serious spillage	Road drainage system to surrounding watercourse	Serious pollution event to watercourses including harm to aquatic and riverine flora and fauna.	Water, aquatic ecosystems, human health	In	The Scheme has a drainage system which includes attenuation prior to discharge into water courses. An assessment of the risk of spillage as a result of major accidents has, therefore, been undertaken and is reported in Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) of this ES.
Storm surge event associated with (Wyre Estuary/Main Dyke) adjacent to the Scheme	Low lying land and drainage channels	Inundation of the construction works site, contamination of surface waters and soils. Loss of life to construction and/or tunnel workers.	Water, human health	In	The construction and works are being completed in an area with an elevated risk from flooding (Flood Zone 3). A Flood Risk Assessment has been completed in consultation with the Environment Agency to determine event scenarios to be assessed as well as climate change allowances. This is reported in Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) of this ES.
COMAH registered establishment, 3.2km to north. Lower Tier. (Victrex Manufacturing,	Prevailing winds Marine environment (via tidal Main Dyke)	Fire/explosion could release toxins to air or marine environment. Could result in windblown	Water, air, flora and fauna	Out	The operations are subject to the COMAH Regulation 2015 and therefore all measures necessary to prevent major accident and limit their consequences to people and the environment are in place and inspected by the competent authority. This includes a requirement to prepare a Major Accident Prevention Policy.

Hazard Source	Pathway	Resultant Impact	Environmental Receptor	Scope In / Out	Justification
Limited, Hillhouse, Thornton Cleveleys)		smoke/soot.			Implementation of the above policies and procedures would limit the potential to impact on the Scheme and, as such, these issues are not considered further in this ES.
COMAH registered establishment, 2.7km to north. Upper Tier. (Vinnolit Hillhouse, Limited, Hillhouse, Thornton Cleveleys)	Prevailing winds Marine environment (via tidal Main Dyke)	Fire/explosion could release toxins to air or marine environment. Could result in windblown smoke/soot.	Water, air, flora and fauna	Out	
COMAH registered establishment, 2.4km to north. Lower Tier. (AGC Chemicals Europe, Limited, Hillhouse, Thornton Cleveleys)	Prevailing winds Marine environment (via tidal Main Dyke)	Fire/explosion could release toxins to air or marine environment. Could result in windblown smoke/soot.	Water, air, flora and fauna	Out	

6.3.28 As identified in Table 5-3, this ES includes an assessment of the identified major accidents and disasters that have been scoped in. Both issues scoped in relate to Chapter 12: Road Drainage and Water Quality (document reference TR010035/APP/6.12) where they are discussed further.

Assessment of Cumulative Effects

6.3.29 The assessment of cumulative effects identifies where 2 or more sources of impact interact, to give rise to impacts on environmental resources or receptors. Two types of cumulative effects have been assessed:

- The combined action of interrelated Scheme specific environmental effects causing impacts on a single resource/receptor
- The combined action of the Scheme and other planned developments environmental effects in combination on a single resource/receptor

6.3.30 The approach to assessing cumulative effects is based upon the Cumulative Effects Assessment (CEA) within the Inspectorate Advice Note 17 which sets out a staged process for CEA in NSIPs. The scope of the approach and how it would be applied to this Scheme is provided in Chapter 16: Cumulative Effects (document reference TR010035/APP/6.16).

Assessment of Transboundary Effects

6.3.31 Appendix 6.5.3 (document reference TR010035/APP/6.5.3) provides the transboundary screening undertaken for the Scheme. It concludes that there would be no significant effects on other EEA member states as a result of the Scheme.

6.4 General Assessment Assumptions and Limitations

6.4.1 Assumptions and limitations specific to each topic are outlined within Chapters 6 – 16 (document reference TR010035/APP/6.6 – 6.16) and within Section 3.

6.5 Significance Criteria

Assessing Significance

6.5.1 Advice note; DMRB HA 205/08 Assessment and Management of Environmental Effects, defines the criteria for assigning the significance of the environmental effect as a function of the 'value' of the receptor and the 'magnitude' or 'scale' of the impact. This is shown below by Table 5-4 (note Table 5-4 presents an example and may differ between topics and specific guidance for topics).

Table 5-4: Approach to Environmental Impact Assessment - Typical Matrix for the Assessment of Significance of Effects (DMRB HA 205/08)

Sensitivity / Value	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Very High	Neutral	Very High	Neutral
High	Neutral	High	Neutral	High	Neutral
Medium	Neutral	Medium	Neutral	Medium	Neutral
Low	Neutral	Low	Neutral	Low	Neutral

Sensitivity / Value	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Negligible	Neutral	Negligible	Neutral	Negligible	Neutral

6.5.2 In arriving at the significance of effect, the assessor would also consider whether the effect is positive or negative, permanent or temporary, direct, indirect, secondary, cumulative, short, medium or long-term as set out in paragraph 5.3.22.

6.5.3 This is the broad approach used when assessing significance of effects. However, for certain topics such as air quality and noise, the above criteria or approach is not used. Instead, environmental impacts can be quantified against thresholds defined using numerical values to identify impacts. This quantification is done through calculations or computer modelling.

6.5.4 Although as a minimum, all impacts are defined according to the following broad descriptors:

- Adverse or beneficial (i.e. they are undesirable effects, or they represent an improvement over the baseline situation)
- Short-term or long-term (This is defined differently dependent on the topic it refers to and the sensitivity of the receptors)
- Construction or operation (i.e. caused by the construction of the Scheme, or by the operation of the Scheme after opening)
- Significant or not significant

6.5.5 The identification of the significance of the effect would differ between topics, with regards to scales, terminology, criteria and the overall approach. Volume 11 of DMRB provides information on determining this for certain topics. Table 5-5 presents which effects are 'significant' and 'non-significant' for the purposes of the EIA for each environmental topic.

Table 5-5: Approach to Environmental Impact Assessment - Definition of 'Significant' Effects for the Purpose of EIA

ES Chapter	Definition of 'Significant' Effects for the purpose of EIA
Chapter 6: Air Quality (document reference TR010035/APP/6.6)	Significant effects are defined within Highways England's Interim Advice Note 174/13 '*Evaluation of Significant Local Air Quality Effects*'.
Chapter 7: Cultural Heritage (document reference TR010035/APP/6.7)	Based on professional judgement and the guidance set out in the Historic Environment Good Practice Advice in Planning Note 2, a 'significant' effect is considered of moderate significance of effect or above and/or one where it can be said that a receptor would experience substantial harm.
Chapter 8: Biodiversity (document reference TR010035/APP/6.8)	Effects recorded as moderate and above are deemed to be significant based on professional judgment.
Chapter 9: Landscape (document reference	The assessment of residual landscape and visual effects has been undertaken following the methodology

ES Chapter	Definition of 'Significant' Effects for the purpose of EIA
TR010035/APP/6.9)	set out in Chapter 9: Landscape (document reference TR010035/APP/6.9) paragraphs 9.3.1 to 9.3.19. Residual effects are considered to be significant where the effects are assessed as moderate, large or very large.
Chapter 10: People and Communities (document reference TR010035/APP/6.10)	Effects recorded as moderate and above are deemed to be significant based on professional judgment.
Chapter 11: Noise and Vibration (document reference TR010035/APP/6.11)	For construction noise and vibration significant environmental effects are assumed to be above the Significant Observed Adverse Effect Level (SOAEL) for 10 or more days (or nights) in any 15, or for more than 40 days (or nights in any 6-month period for the purposes of EIA. For operational noise and vibration receptors with a moderate or major magnitude is considered to result in a significant environmental effect for the purposes of EIA unless clear justification is provided.
Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12)	Moderate, large and very large effects are considered 'significant' for the purposes of EIA.
Chapter 13: Geology and Soils (document reference TR010035/APP/6.13)	Effects which are very large, large or large / moderate are considered to be significant for the purposes of EIA.
Chapter 14: Materials (document reference TR010035/APP/6.14)	Based on guidance from Highways England, residual material resources effects are considered to be significant where the effects are assessed as large. Waste effects are considered to be significant where the effects are assessed as moderate, large or very large.
Chapter 15: Climate (document reference TR010035/APP/6.15)	Based on guidance from Highways England, residual effects on climate (greenhouse gas emissions) are considered to be significant where increases in carbon emissions will have a material impact on the ability of Government to meet its carbon reduction targets. Regarding, climate change vulnerability to the Scheme, residual effects which are moderate, large and very large effects are considered significant for the purposes of the EIA. Where exists consequential loss

ES Chapter	Definition of 'Significant' Effects for the purpose of EIA
	or damage to environmental receptors as a result of vulnerability of the Scheme, residual effects which are slight are also considered significant.

6.6 Duplication of Assessment

6.6.1 In parallel to the preparation of the ES a number of other assessments have been undertaken that are closely linked to the ES and in some cases have informed assessment conclusions. Duplication has carefully been avoided and where necessary appropriate cross referencing used. The paragraphs that follow outline other assessments undertaken.

Habitats Regulations Assessment

6.6.2 A Habitats Regulations Assessment (HRA) has been prepared in consultation with Natural England. Under Article 6 of the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive"), an assessment is required where a plan or project may give rise to significant effects upon a Natura 2000 site (otherwise referred to as a European site). The requirements of the Habitats Directive are transposed into UK law through the Conservation of Habitats and Species Regulations 2017 (as amended) (the "Habitats Regulations").

6.6.3 The first stage of the HRA was to determine whether there was the potential for 'Likely Significant Effects' on European Sites as a result of the Scheme. Where likely significant effects were identified the HRA moved to the second stage where an Appropriate Assessment was undertaken to determine whether there would be an adverse effect on the integrity of the European sites and to identify the requirement for mitigation measures to be implemented in order to avoid or minimise significant adverse effects.

6.6.4 The HRA identified the following European Sites potentially affected by the Scheme (refer to Figure 1.2 within Chapter 1: Introduction (document reference TR010035/APP/6.1) for the location of the sites listed below):

- Morecambe Bay and Duddon Estuary Special Protection Area
- Morecambe Bay Ramsar site

6.6.5 A HRA (document reference TR010035/APP/5.4) has been prepared as part of the Development Consent Order (DCO) application.

Water Framework Directive Assessment

6.6.6 The Water Framework Directive (WFD) was adopted and came into force in 2000 and establishes a legislative framework for the protection of surface waters (including rivers, lakes, transitional waters and coastal waters) and groundwater throughout the EU. The WFD is transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the 2017 Regulations).

6.6.7 The overall aims and objectives of the WFD are to:

- Enhance the status and prevent further deterioration of surface water bodies, groundwater bodies and their ecosystems
- Ensure progressive reduction of groundwater pollution
- Reduce pollution of water, especially by Priority Substances and Certain Other Pollutants
- Contribute to mitigating the effects of floods and droughts
- Achieve at least good surface water status for all surface water bodies and good chemical status in groundwater bodies by 20158 (or good ecological potential in the case of artificial or heavily modified water bodies)
- Promote sustainable water use

6.6.8 The 2017 Regulations place a general duty on the Secretary of State (SoS), and the Environment Agency (EA) to exercise their 'relevant functions' so as to secure compliance with these WFD objectives. A WFD Screening Report has been submitted as part of the DCO application – document reference TR010035/APP/5.6.

6.7 References

Department for Transport (2014) *National Policy Statement for National Networks*

Environmental Impact Assessment Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

Environmental Impact Assessment Directive 2014/52/EU

Habitats and Species Regulations 2017

Highways England (various) *Design Manual for Roads and Bridges, Volume 11, Environmental Assessment*

Highways England (2008) *Design Manual for Roads and Bridges, Volume 11, Environmental Assessment, Part 5, Assessment and Management of Environmental Effects*

Highways England (2015) *Interim Advice Note 125 / 15 Environmental Assessment Update*

Infrastructure Planning (EIA) Regulations 2017

Local Government Association (2018) *Housing, Health and Wellbeing in Fylde*

Local Government Association (2018) *Housing, Health and Wellbeing in Wyre*

Planning Inspectorate (2017) *Advice Note 3, EIA Consultation and Notification*

Planning Inspectorate (2016) *Advice Note 6, Preparation and Submission of Application*

Planning Inspectorate (2017) *Advice Note 7, Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping*

Planning Inspectorate (2018) *Advice Note 9, Rochdale Envelope*

Planning Inspectorate (2017) *Advice Note 11, Working with public bodies in the infrastructure planning process*

Planning Inspectorate (2018) *Advice Note 12, Transboundary Impacts and Process*

Planning Inspectorate (2018) *Advice Note 15, Drafting Development Consent Orders*

Planning Inspectorate (2015) *Advice Note 17, Cumulative effects assessment*

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017